

# MRAC Hamateur Chatter

The Milwaukee Radio Amateurs Club

March 2016 Volume 24, Issue 3

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

## Presidents' Letter

Welcome to spring in Wisconsin! First, I want to do quick recap from our annual Potluck Dinner (aka, the Food Meeting). I want to extend a special thanks to Chef Al KC9IJJ for preparing a wonderful dinner for us last month. We had a great time socializing with fellow hams in addition to all the good food.

We also discussed the entries for the club Logo Contest. The membership at the Potluck Dinner still could not decide on a winning logo based on the current set of entries. So, we have decided to extend it one more month to accept some more submissions. If we still cannot decide on a winning logo at the March meeting, we will turn it over to a professional designer with club input. You can see all of the current submissions on the website: <http://www.w9rh.org/100th-anniversary/logo-contest/>

This month's meeting will be on March 31, 2 days before the annual AES Superfest on April 2nd. Matt Welch W8DEC will give a presentation about APRS & Public Service Communications. Many of us have packet equipment collecting dust so why not put it to use. There are many usages for APRS that we do not take advantage of, and we are excited to get more tips from Matt.

Just as a reminder, especially with our 100th anniversary coming fast, we are in need of members to step up and help with the planning for our upcoming anniversary events. Right now, we are planning to hold a banquet to celebrate our anniversary. But we also hope to hold other activities throughout the year. Ideally, we would like have special events with guests from the ARRL and other amateur radio experts.

Here are some of the ideas people have suggested:

1. Host a year-long special event station like the ARRL did (W100AW).
  2. Create a special membership certificate or gift to commemorate the anniversary for members.
- Hold a membership contest to get more members to be part of this anniversary celebration, with a potential contest to see who can recruit the most members during the anniversary year. All of the suggestions have been great, so keep them coming!

While we do want to provide many activities from MRAC for the anniversary, we as the board will need EVERYONE to help us both spread the word AND volunteer for coordinate/assist with these activities. This is your club and your anniversary celebration too, so start thinking NOW of how you want to be involved. Committees are forming soon, and we want everyone to be involved in some way with our anniversary activities.

Finally, we are going to try something new on Saturday, May 21, which is the same weekend of the Dayton Hamvention. MRAC is sponsoring a Ham Radio Tailgate behind AES in the morning. This is a great way to be part of a local ham flea market similar to what you'd experience at Dayton, without all the driving AND for FREE to the public! Much like the South Milwaukee fest, sellers will pay \$5 to sell out of the back of their cars. We still have a few details to work out, but mark your calendars NOW and check our newsletter, website, on the NET, and on our Facebook page for more details soon. As always, we welcome volunteers, so drop me a note if you want to get in on the ground floor for this event.



### MRAC Officers:

#### Terms Expiring in 2016

- President – Dave, KA9WXN
- V-President– Vacant
- Secretary – MBH, KC9CMT
- Treasurer – MBH, KC9CMT

#### Terms Expiring in 2017

- Director – Al, KC9IJJ
- Director – Hal, KB9OZN
- Director – Tom, W9TJP

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

(414) 332- 6 7 2 2

Visit our website at:

[www.w9rh.org](http://www.w9rh.org)

Mail correspondence to:

**M. R. A. C.**

**PO Box 26233  
Milwaukee, WI**

**53226-0233**

Board of directors meeting called to order at 7:06 pm by Dave Shank, KA9WXN club president.

Director's present: Michael KC9CMT, Dave KA9WXN, Tom W9TJP, Al KC9IJJ.

Absent: Hal KB9OZN,

**Preliminary Discussion:** The FM simplex contest was yesterday February 21<sup>st</sup>, Dave, KA9WXN will be doing the scoring this year. We definitely need someone to take over the contest for 2017. The phone bill is our largest expense, Dave KA9WXN will call AT&T and try to get a better deal. It's also clear that the club needs to attract new members. The Treasurers report for January 2016 was presented by Michael, KC9CMT. The treasurers report was approved as read by KC9CMT, a motion to accept was made by Tom, W9TJP, seconded by Al, KC9IJJ. The January balance ended with \$19,827.87 in Club accounts. The Board of Directors' meeting minutes were accepted as published in the February chatter by a unanimous vote. New member certificates will be mailed if not handed out when they become available. Club dues will increase to \$20 per year effective April 1<sup>st</sup>, 2016.

**Meeting programs:** February will be the Food Gathering that goes along with the MRAC/MARRS swapfest. The menu and amount of food needed is still being worked on as of February 22. Getting press on the Ham Nation Podcast would be good press for our 100<sup>th</sup> Anniversary in 2017. March program to be a guest from the coming AES SuperFest, discussing APRS for ARES. Our April meeting is the annual election, the MRAC will be contacting certain individuals that the club directors think may be able to serve on the board of directors. plus a presentation on the upcoming Hamfest at Dayton, Ohio that is held in May. April 2<sup>nd</sup> is the AES SuperFest this year. The May meeting will be the annual auction as in past years. The June meeting will be after Field Day this year so the program presentation will be a field day wrap up. There will be no meetings during July and August again this year. The church has been advised of all our meeting dates for 2016, clearing up their confusion. A donation of \$100 was sent to the church along with a letter of appreciation in January 2016.

**Field Day:** The board has discussed moving our Field day to the MATC South Campus. A tentative approval has been given by the dean of MATC South Campus. MATC has a radio club that could be involved. As of now it has not completely been decided. The board would like to have a working committee for the field day 2017 effort. The board has tentatively approved spending \$200 for access to a relatively secure area.

### Special Project Committees & Committee reports:

**Repeater Report:** The club would like more than one repeater control operator. A club repeater control operator should be a extra class operator to have the kind of privileges that are necessary to operate field day to its fullest extent.

**New Business:** Dave, KA9WXN has continued discussions on events for the clubs' 2017, 100<sup>th</sup> anniversary.

**We need to start planning special event stations for the entire year of 2017.** Dave, KA9WXN will attempt to generate interest among the membership in forming a committee to handle planning. The winner of the logo contest should be picked during the February meeting, 2017 is the 100<sup>th</sup> anniversary. The contest will be open to club and non-club people, must hold a Amateur Radio License to be in contest. Copy to be included in the new Logo, ARRL affiliation, Club 100<sup>th</sup> year, and callsign with Frequency. The board does want to go ahead with planning a banquet during the 100<sup>th</sup> anniversary year. Time and place to be determined.

**Swapfest Committee:** Attendance was slightly down from 2015. Table sales were consistent with 2015. Unfortunately at least one vendor did not show up, leading to an open space in the main section. Photos were taken and published in the February Chatter. The final financial figures from the swapfest are not yet available as of February 22, 2016. Photos should be taken of all club activities and uploaded to the club Facebook page and copied to the newsletter editor for insertion into the paper. We will continue to use the Google spreadsheet for the 2017 swapfest. The date and venue of the 2017 swapfest is still being discussed. There are a number of places and dates being considered. There has been some discussion about having a out-of-trunk event using the AES grounds sometime during the warm weather months, perhaps during the Dayton Hamfest weekend for people that are not going to Dayton.

**Special Projects:** The club needs someone to take over the FM simplex contest for February of 2017. Joe N9UX is having the scoring of the contest being done by Dave KA9WXN this year. Joe N9UX is mostly not involved with the FM Simplex contest as of this year. The club really needs PR and recruitment, business cards have been printed and will be handed out at all personal activities. Joe, N9UX has talked about doing another balloon launch in 2016. The board of director's has entered discussions regarding the logistics of having a banquet that would be the day before or during AES SuperFest. The club could send out invitations for the banquet.

**Work needs to start on the 100<sup>th</sup> anniversary celebration that falls in 2017.** The club wants a special event callsign to use during the 100<sup>th</sup> year events. Dave WB9BWP, the club trustee would have to request the callsign from the FCC. The club would also like to have a membership drive for new members for 2017. There would be a special certificate for the any new member of the club, or a cash/equipment award. There could also be an award for anyone in the club that attracts a certain number of new members. This is still being discussed. Have some special QSL cards printed up for contacts during the calendar year of 2017. The club would like to query members about working on projects for the 100<sup>th</sup> anniversary.

**Website update:** Dave, KA9WXN the website coordinator for the MRAC is building another website based on WordPress. Club members have been using our PayPal account to renew their dues. The club also has a Wiki page. Dave, WB9BWP will be working on the Wiki page. Tiff has been helping Dave, KA9WXN to build the website.

A motion was made to adjourn the meeting at 8:25 pm by Tom W9TJP, seconded by Al KC9IJJ., Meeting adjourned at 8:26 pm.

The Library room will be returned to an orderly condition as it was when we arrived.

## Micro-power 555 Timers

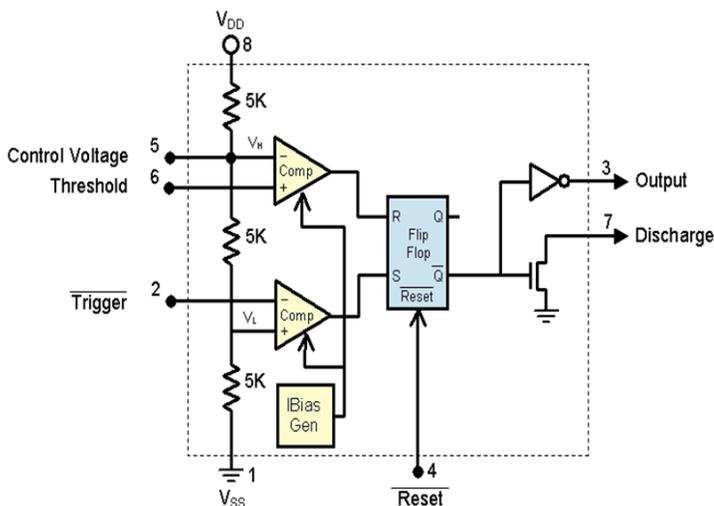
Custom Silicon Solutions (CSS) is introducing a new version of the popular 555 Timer IC. It is pin-for-pin compatible with the original 555 Timer, but by applying an advanced, mixed signal process, we have cut its power by over 10X and have added programmable features to this classic circuit. It can still be configured to mimic a standard 555 timer, but with its internal timing capacitor and programmable six-decade counter, it can do much, much more. And, despite all these features, the same eight-pin configuration has been maintained – thanks to a small, built-in EEPROM that stores configuration data.

### 555 Timer History

The original 555 timer was designed by Hans Camenzind at Signetics in 1970. Its part number was derived from the three 5KΩ resistors that provide the 1/3 x VDD and 2/3 x VDD trip levels. It contained about 15 resistors and 25 transistors and drew ~3mA at 5V. In contrast, our [CSS555C](#) device contains over 2000 active and passive circuit elements and draws less than 5uA at 5V. The 555 timer is one of the most successful and long lived IC's of all time. About a dozen manufacturers still produce bipolar and CMOS versions. Almost 1 billion devices are still sold each year!

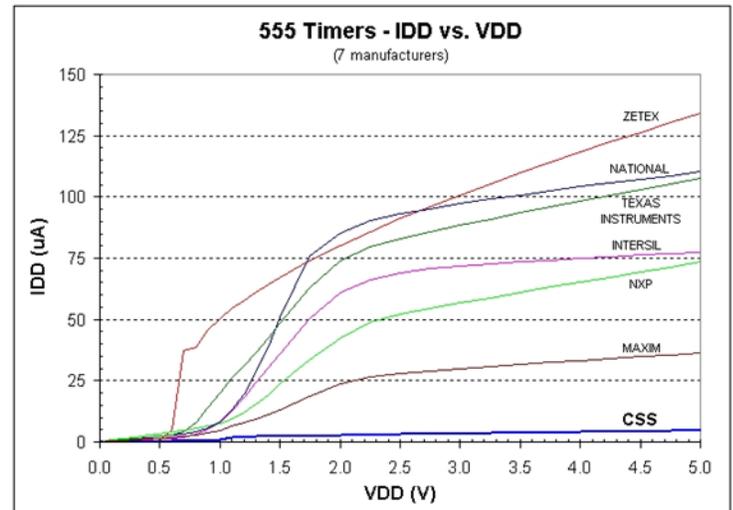
A block diagram of the original 555 timer IC is shown below. It consisted of a resistor divider, two comparators, a flip-flop and two output devices. Its simple architecture made it extremely flexible. It has been used in a wide range of applications, too numerous to list. Entire books can be found that are entirely devoted to application circuits for the 555 timer.

Original 555 Timer Circuit



### Goal #1 – Reduce Power

One of the goals for our CSS555 timer was to reduce the supply current to below 5uA. We drew from circuits originally developed for battery powered utility meters and implantable medical devices. Both applications required micro-power mixed signal ICs. The result is a new 555 timer that draws 10X less current than any other 555 IC. A comparison of seven low power 555 timers is shown in the table below.



### Goal #2 – Make Long Delays and weight loss. Easy to Generate

A second goal for the new CSS555C was to make it easier to generate long delays. The original 555 timer required a large RC time constant to accomplish this. Large capacitors have several drawbacks: high price, poor accuracy and wide variation over temperature. The CSS555C includes an internal six-decade programmable counter that effectively multiplies the value of the timing capacitor by the counter setting. It provides seven multiplier settings: 1, 10, 100, 10<sup>3</sup>, 10<sup>4</sup>, 10<sup>5</sup> and 10<sup>6</sup>. Accurate delay times, from milliseconds to days, are easily implemented with small sized capacitors.

### Goal #3 – Provide an Accurate Internal Timing Capacitor

The internal counter eliminates the need for a large value timing capacitor. It would be even better to eliminate the capacitor altogether. The CSS555C does that! A 100pF capacitor has been integrated into the IC. It features a low temperature coefficient (TC < 100 ppm/°C) and ±1% accuracy. It is factory trimmed, but can be re-trimmed (electronically) after PCB assembly. (This allows errors in the timing resistors to be compensated for by trimming the internal capacitor.)

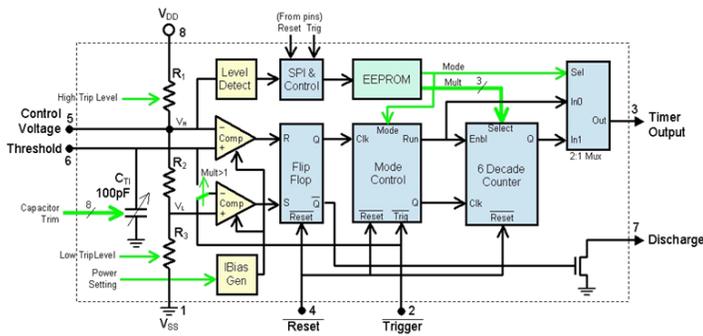
### Goal #4 – Reduce the Minimum Operating Voltage, Maintain Speed & Accuracy

Two additional analog settings have been included to increase the flexibility of the device. The trip levels can be changed from the traditional 1/3, 2/3 to 10% and 90%. The wider trip levels extend the minimum operating voltage down to 1.2V. The power level can be increased for applications that require higher speed and/or accuracy. (Increasing the power level speeds up the comparator response time.)

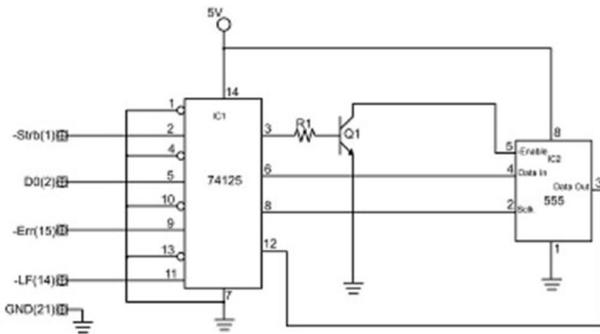
### Goal #5 – Maintain the Standard 8 Pin Configuration

For most timer applications, the [CSS555C](#) can be used as a direct replacement for the standard 555. An internal EEPROM holds the configuration data and capacitor trim setting. A serial interface, using existing pins, is designed to maintain the standard pin count and functions. A block diagram of our new CSS555C timer is shown below. It still has the same basic elements (and 8 pins) of the original 555, but we've added some great new features.

Advanced CSS555C Timer Circuit



Programming a 555 chip



[Phillip] needed a way to trigger an input every 8 hours or so. This is a snap with a microcontroller with a proper timer, but he recently heard about a very cool programmable timer chip that's also a 555. Of course CSS555 timer chip has an obscure programming interface, but that isn't a problem when you can program it yourself with a parallel port.

The [CSS555 timer chip](#) (PDF...) is a strange little beast. It's pin compatible with everyone's favorite timer IC, but also has a programming mode that allows the output to trigger on every 1 cycle, every 10 cycles, and so on up to one output every million cycles. Basically, it's a 555 with a huge programmable capacitor [that only costs two bucks](#).

After building a programming circuit from a 74125 hex buffer chip, [Philip] connected his programmer to the parallel port of an ancient PC. For a little retro computing cred, he wrote a small app in Forth that pushes commands from the parallel port to the CSS555 chip, greatly increasing the time delay of the chip's stock configuration.

It's a neat build, and an awesome introduction to a really cool timer chip. Of course this could be easily replicated with a \$2 microcontroller, but that wouldn't give [Philip] the satisfaction of using a 555.

Weather Awareness

Remembering the Dallas Tornadoes of April 2, 1957

Tuesday, April 2, 1957 was a warm spring day across North Texas. Temperatures climbed into the lower 70s in Dallas during the afternoon, with dewpoints in the upper 60s to near 70 degrees. A strong 100-115 m.p.h. upper level jet split over the region, with the southern portion darting from west to east across North Texas, and the northern branch moving over southwest Oklahoma. At mid-levels, a trough centered over the southwestern United States provided ample mid-level wind shear across the Southern Plains.

Many of the supercell thunderstorms on April 2, including the parent storm of the Dallas tornadoes, developed near a warm front extending from just north of Mineral Wells east to Dallas to Monroe, Louisiana. A surface cold front extended along an inverted surface trough from near Del Rio northward to Childress.

Twisters Touch Down

At 3 p.m., the first tornado touched down along present-day I-20 in southern Dallas County. The twister moved north along Polk Street past the current location of I-30. Continuing north, the tornado moved one mile east of Hampton Street, down a hill and into a neighborhood destroying many homes. The tornado moved northwest of downtown Dallas, going across the Trinity River levee and into an industrial complex. The initial tornado finally entered the rope, or dying, stage in the parking lot of Love Field, and fully dissipated after crossing Bachman Lake.

A second tornado developed just one mile east of the rope tornado. This tornado moved from northwest Dallas into Collin County, destroying farm homes. It is unknown where the second tornado dissipated. The initial Dallas tornado killed 10 people and injured 200 during its 45-minute life span. It also resulted in \$4 million in damages, which equates to over \$28.6 million in 2006 dollars. The tornado was rated F3 on the Fujita scale.

Status of the Science

Today, forecasters at your National Weather Service in Fort Worth analyze data from weather observations and study weather patterns to forecast severe weather episodes days in advance. Technology such as weather radar and satellite imagery, as well as storm spotters in the field, help forecasters pinpoint the severe weather threat area when the skies darken.

However, in the 1950s severe weather forecasting was very different. A series of devastating tornadoes ripped through America's heartland during the decade causing significant loss of life and millions of dollars in property damage. North Texas was no exception to these outbreaks. On May 11, 1953 an F5 tornado ripped through downtown Waco killing 114. That tornado was part of a larger outbreak of severe weather from May 9 through May 11 across the Central Plains. The Waco tornado ranks as one of the top 10 deadliest tornadoes in written American history.

The science of severe weather meteorology was in its infancy in the 50s, and un-forecasted tornado outbreaks were resulting in public outrage. The Severe Local Storms unit (SELS), the predecessor to the Storm Prediction Center, was developed in the 1950s through demand for better prediction and understanding of severe weather.



### The Future

If the Dallas tornadoes of 1957 were to occur today, more significant damage would likely occur, with the possibility of catastrophic loss of life. These tornadoes are a reminder that major metropolitan areas are not immune their destructive forces.



The May 3, 1999 tornado outbreak cut a swath of destruction through central Oklahoma, including the Oklahoma City metro area. The storms resulted in over 40 deaths, 675 injuries, and \$1.2 billion in damages.

A deadly tornado can strike anywhere in North Texas, including the Dallas / Fort Worth metroplex. The best defense to protect your family is to stay updated with forecasts, watches, and warnings via NOAA All-Hazards radio or commercial television and radio outlets. Have a severe weather plan in place at your home, office, and school, and practice it regularly.



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

## The Thought Experiment

### Is Time Travel Possible? Some different views

Steven Ravett Brown

#### Rich Woodward

Travelling through time is something we all appear to do every day, this morning I was in the past but now I'm in the present which was the future! I assume however what you are talking about is when an individual travels to a time outside of the ordinary scope. There's an interesting article in Le Poidevin & McBeath's book *The Philosophy of Time* on the subject but I can't remember who wrote it, however here are two key issues.

First if we were to travel back in time it would appear possible that we could change the past, possibly causing a causal loop whereby our actions in the past affect the way we are in the future. Second there is the ontological status of the past and the future.

To deal with the first problem, consider the 'Back to the Future' scenario where the character potentially stops his mum meeting his father and therefore prevents his own existence. If this were to happen however it would not be the case that in the future that he could go back and prevent his own existence. The argument therefore entails that if he can prevent his own existence then he can't prevent his existence. The other apparent way to avoid this problem is to suggest that you can't affect the past when you go back, but this is somewhat strange. The way around this problem is to say that the Time traveler can affect the past however he can't change it. The 'past' is already a determined system which the time traveler may cause an event in but any event that he causes will have already happened. He is therefore free to affect the past but he cannot change anything that happened in it. The second issue is whether there is anywhere to travel to. There are two main positions on time which broadly are the tensed view and the tenseless view. Without going into the positions too much the tenseless view of time is that there is nothing ontologically privileged about the 'present' that we perceive, all times are equally real, thus this position is somewhat analogous to the conception most of hold on space where there is nothing special about 'here' rather it is just the place we happen to occupy. If you are a tenseless (b-theorist) theorist then there clearly is a 'place' to go to when you time travel.

The second position that is held is the tensed theory (a-theory) of time whereby there is something privileged about the present, namely it is the only time that is present. Time flows from the future into the present, and the present to the past. One of the main motivations for this position is that it allows us to hold that the future is open and allows for a non-deterministic position of the world. The a-theorist has more work to do than the b-theorist at this point as for the a-theorist three main positions are viable:

- a. Only the present exists.
- b. The past and the present exist.
- c. The past present and future exist.

Now depending on which of a—c you accept you're potential to travel to those places is affected, clearly if you hold a then time travel is a priori impossible, if b then you can't go to the future.

There are other issues but I feel these are the main two. As I say if you have an interest in time I strongly recommend Le Poidevin and McBeath's anthology [*The Philosophy of Time*. Oxford University Press 1993].

My straightforward answer is no, it is not possible, no matter how you bend it. But if I left it there, someone else will say, it is conceivable under such and such circumstances. So I'm going to have to invite you along on a little journey of problems, just two or three of them, but all bristling with way-out complexities. I'll try and make them as easy as possible, because it's worth thinking about these matters, and also because our lives are so much under the influence of science and science fiction today that the average person can hardly make out what to believe. And by golly, time travel is part of the fare! You must have noticed how much it is taken for granted, as if there were no argument about it!

Well now, since we have to start somewhere, let's take a peek at the 'space of all possible things/ events/ ideas'. Somewhere in this space you'll find time travel and no doubt millions of other ideas, thoughts, objects, events and possibilities that have been dreamt about. They are all in this 'space' as potentials, waiting to be realized. Yet the first thing to note about the 'space of all possible things etc.' is this: there is no such space; for even the 'space' itself, the concept of this 'space', is part of the 'space of all possible things etc.!' Hence it is not a real space, not a finite, three-dimensional volume, where things happen. So you understand that I'm talking about a *conceptual* space, an *infinite* realm with *infinite* possibilities that (so to speak) travels along with our *finite* realm of real things and real possibilities. It is the realm of the 'Maybe'.

The importance of this concept of infinity is not well appreciated, certainly not by time travelers. They tend rather indiscriminately to toss finite and infinite states around as if they were Lego blocks. They talk about 'worm holes' and 'black holes' and 'big bang', and of 'string theory' and 'quantum flutters', which are all entangled with infinity. But consider that infinity means, by definition, that you can't count what's in it. So when you ask, how many atoms in the universe, you are immediately defining the universe as finite.

Having got this far, what about time? Well, it's really the same problem all over again. Is the universe in 'time' or not? Is time 'in' the universe or independent? Astronomers want to convince us that time was created with the big bang, but there is a big chink in that logic. For if the spread of time is finite, then of course the universe must be finite. And vice versa. But if the universe is finite, then we've only pushed the problem of infinity out of the way, because we are then supposing another universe which must contain ours; and that universe is probably contained in yet another: Russian doll universes all the way down. In philosophy this is called 'infinite regress'.

We're obviously getting ourselves into a huge mess. Let's narrow down our focus and note down a sort of definition: 'God invented time to prevent everything from happening at once.' This gives us a vital first clue to what's wrong with time travel. On this definition, time is a *concept of simultaneity*. It means that if two separate objects/ events occur such that third parties observing them agree in their happening at the same instant, these parties then have a means of plotting the events on a graph, marking their lines of approach and

departure and assigning values (seconds, hours, days) to all changes in position.

This graph is a 'frame of reference', which can now function as a tool for establishing the simultaneity of all events that fall within its scope. Evidently to make this work, a point at rest has to be presupposed, called the 'residual observer', around which the other events revolve.

Now another difficulty comes up. When you have three, four, a thousand, a billion frames of reference, practically all of them unknown to us because of the sheer size of the visible universe, the notion of simultaneity suddenly runs amok; our little graph just can't cope any more and you'll find that a second residual observer becomes necessary, then a third, a fourth...and in an infinite universe...? You guessed it: an infinite number of residual observers. Where does that leave our simple concept of time? Doesn't it mean there are as many 'times' as residual observers? True again.

So this doesn't get us anywhere. We're attacking the whole problem back to front. To find out 'what time really is', we need to put ourselves in the seat of time itself. We need to ride along with time on a beam of light. So let's now confront this issue with a 'practical' example.

Let's say you've been dispatched from Earth to Alpha Centauri. In earth terms that trip is going to take four years at the speed of light; that's not time travel, but it will serve for an opener. When you last looked back, you might have seen your parents standing there, waving goodbye. A couple of days later, you look again and still they're there. Patient people! But when you look again a year later and find they haven't moved, you are suddenly jolted into the realization that, of course, their image is travelling at the same speed with you. *Time is standing still for you in relation to that scene.* Now difficult as it may be, try and draw a sound conclusion from this. These are not your parents, but merely their image. What then, if you could suddenly double back and return? The point is: *nothing changes*; and when you arrive, to your parents you will only have hovered in the stratosphere for a while and then come back down.

Now clearly this is nonsense. You've been en route for a year! Consequently there is an irresolvable contradiction: you cannot, as a physical body, be in two places at the same moment, but this is what the story entails.

It gets worse when you really start time travelling. Imagine yourself accelerating beyond the speed of light. As you gaze out the porthole, you'll see start seeing things you shouldn't: ice ages, continental drift, the earth aflame like a drop of molten iron etc etc. On our diagram of Earth, Alpha Centauri and yourself, your numbers are running into the negative: you've reversed the time relation between you and planet Home.

Now there is another side to this story. To observers on earth you would first dissolve and then disappear. Conventionally we take this to mean that the speed of light can only be attained by electromagnetic radiation (EMR), accordingly your acceleration has the effect of converting you and your craft into EMR. But this in turn means that, in relation to Earth, you have ceased to exist. You cannot therefore simply double back and hurtle back to Earth. She won't be there when you arrive. On your diagram, where Earth and Alpha Centauri comprise a frame of reference in close simultaneity, you have removed the residual observer, yourself.

Well, I promised you this was going to be complex, mind-boggling and irritating. For while you may conceivably exceed the speed of light in relation to your own system, you cannot exceed it in relation to light itself. Here the equation is  $EMR = Time$ . The grain of EMR in the universe is also the grain of time, and the best or simplest way to make sense of this is to reverse the notion of speed. To attain the speed of light means, in this context, for you to become decoupled from any frame of reference whatever because you have become connected to the stream of time/ light itself. But this 'stream' being the grain of time itself, means *you are standing still* again, only this time in relation to the whole universe. Then the objects of the physical universe, galaxies and nebulae and novae, will be fizzying around you in a bewildering torrent of crisscross patterns across the entire 'sensurround' horizon. Indeed some or many of these objects may actually 'collide' with you, at the speed of light (!).

One last question: could you not 'decouple' from this unwished-for state and return to a definite existence? Unfortunately the answer, once again, must be 'no'. I keep saying 'you', as though there was a 'you' in this EMR stream. But of course, there's not: you have become a beam of light, pure EMR, which contains not the thinnest thread of information. Once upon a time, in your real life, 'you' were (among many other things) a packet of information; this is now gone, terminally erased. And this is of course the real crux of the matter.

Simultaneity is the coincidence of objects (information) in a frame of reference: and all these frames of reference are finite entities which might all, in principle, be coordinated in a network of finite observers. But 'behind' this structure is the structureless grain; picture it like a single dew drop somewhere in the midst of the Sahara desert. And in this structure less space all events occur simultaneously, just as the sand in the desert 'occurs' all at once; but for us, who have a finite perspective on them, these events occur in sequence and under conditions to which the concept of simultaneity can be fitted.

I hope all this makes sense to you! If you wanted to put it into a nutshell, you could say that time travel cannot happen because time is not real: it's not a road or a space or a field where you can identify Point A and Point B in relation to one permanent, unchanging residual observer. It is (as I said) the idea of some things occurring measurably simultaneously. So the crucial component (you might have picked this up when you recognized your parents as only an image) is this: that light waves bearing images are not physical reality. On this discrepancy the whole fancy breaks apart. Time travel, so understood, is mistaking a 'report' for the event itself; and of course a report can long outlast the event which has meanwhile ceased to be.

And this brings us back to the 'space of all possible things', where we started. Here simultaneity is meaningless, because in an infinite space nothing is simultaneous with anything else, there is no frame of reference and no residual observer; and indeed, there is nothing whatever in this 'space', not an atom, not a breath. Just dreams of finitude, of finite possibilities. Dreams of being, for nothing in this 'space', nor the space itself, has being.

### Jürgen Lawrenz

It depends what you mean by 'conceptually possible'. I would say that time-travel is logically possible because there seems to be no contradiction in the concept (which is obviously very different from saying its physically possible in our world.) The interesting questions, as far as I can tell is what known as the grandfather problem. Suppose that time-travel is possible. Now, suppose you go back to the time when your grandfather is in his youth and you kill him — this would mean that in the future, there will be no you. But then how could you have come back from the future and killed him? Here I agree with David Lewis. He reckons that time-travel is possible but you can't change anything in the past. This is because he thinks of time as a big line and each point is equally real. Consider time T, when you travel back to point T\*. Now, Lewis wants to say that point T\* is equally real when you travel back as when you are there at point T\*. The only difference is your perception of T\*. The answer Lewis gives to the grandfather problem is that you can't kill your grandfather or change anything for that matter, for the reason that you were there already. This sounds weird but if you think about it, it makes sense.

## Early Radio: Military Communications

### Year of The Rat

By-Pat Eastes

As 1967 closed out and 1968 arrived, there was a noticeable pickup in hostilities. Even though we had been busy, it appeared that every time we went up, we were engaging the enemy. They seemed to be better armed, and there seemed to be more of them. The incident described earlier where Smoky got shot down and the 35 element got shot up occurred just two days prior to what is now known as Tet of 68. As soldiers in the front, we had no knowledge of any buildup other than what our intuition told us. I do not remember getting any intelligence from our briefings that there was a major buildup of enemy troops, but it was somewhat obvious that the war was accelerating. Cu Chi and Dau Tieng were getting mortared pretty regularly, keeping us tired and irritable. Sleep was never easy except with the help of alcohol, but now even the slightest noise kept us awake. "Incoming" was a cry/curse that was even heard during the day, which was out of character for the VC, who mainly mortared us at night.

31 Jan was the Vietnamese New Year, bringing in the year of the Rat. Having lived in Okinawa as a kid, I was somewhat aware of the Oriental New Year, and how each year was named the year of the Pig, Goat, Rat, etc., but it had no real meaning for an Occidental such as myself. I knew that the ARVNs were probably getting drunk in their celebration of the New Year, just as we did on the night of the 31st of December, and that was about the extent of my understanding. The North Vietnamese, much wiser, knew that this would be a perfect time to start a major assault on the South, while the ARVNs were down on their guard. Of course, we believed that the ARVNs had much to learn about how to fight, anyway. My experience with them was never good. They were very happy to let the Americans do the dirty work, and didn't seem to

care much about whatever might happen to their country. At any rate, the NVA knew that the alert level of the ARVN would be even lower, making their job that much easier. Their buildup had been going on right under our noses for some time, and while we knew that there was more action, we had no real idea of what was going on.

I write this from the perspective of an individual of little rank, who basically was out of the loop as far as long range goals. The generals no doubt had much more that they knew, and the history books have proven that. But for the Warrant Officer pilot, our world was from mission to mission, not really understanding or even caring about an overview. We were trying to not get shot down, not get killed or maimed in the mortar attacks, and make it through another mission while counting the days to DEROS. This is pretty much the plight of the common soldier in all wars; while the big guys with the stars on their epaulets direct our lives and think about the big picture, the people in the shit just try to make do, to survive to live and fight another firefight, while thinking about where they would rather be.

On the night of 31 Jan, I was detailed to fly a LRRP extraction. The LRRPS (Long Range Reconnaissance Patrol) were along the Saigon River, north of Saigon, and they were reporting large enemy troop movements in their area. They rightfully were scared of being detected, and made their way to a spot where they could be picked up by one of our slicks. I flew gun cover, and I don't recall any problems with the extraction. Put yourself in the place of the slick crew, however. LRRP extractions were usually hot, you are landing in a spot where your only point of reference is a flashlight or strobe, you cannot use your landing light for fear of being shot, at any second you could be fired upon by unseen VC who are just waiting to be the proud soldier that got an American helicopter, and all the while the people that you are picking up are speaking in frightened tones because they are surrounded by enemy troops. All I had to do was give gun cover; the slick had to make the approach, get the LRRPS, and get out in one piece. NO FUN!

During the extraction, we saw ARVN compounds all around the area welcome in the Year of the Rat, pointing their weapons skyward and firing tracers into the air. Of course, with us being IN the air, we weren't too impressed with their lack of concern for our safety, but at the same time, the show was impressive. On our return to Cu Chi after the completion of the extraction mission, we took a wide berth around any ARVN compounds so as not to become a casualty of their drunken revelry. About 0200, while we were trying to get some Zs, we were awoken by huge white flashes accompanied by tremendous explosions. My first experience with the NVA and their 122mm rockets was just what they hoped for; something that would scare the crap out of us, put us on edge, and generally disrupts our lives. As those first rockets started to fall, we in the Centaurs who were not assigned to fly made a mad dash to trenches which were in the process of becoming bunkers, but now were merely holes in the ground.

We lay there, covering up as best we could, listening to a sound that in the next few weeks become all too familiar; the WHOOSH of the incoming rockets, followed by the deafening explosion and flash that made night into day for a millisecond. The enemy was evidently targeting the flight line and runway, and since we lived on the flight line, our area was nailed by the rocketeers. As the rockets came in, it became easy to judge when they were going to land close or pass us by, and as the close ones were about to hit, we hugged mother earth and hoped/prayed that it wouldn't be the last thing that we ever heard. The initial attack was over in a few minutes, and then, giving us a while to think that maybe it was over, another barrage ensued. By the second attack, I was in flak jacket and pisspot, but hearing the intensity of the explosions, there was little comfort in wearing such protection. As yet, I had not seen the crater that a 122 left. When I did, in our troop area and in the Corral after first light, it was obvious that if you were anywhere near the point of impact you could kiss your ass goodbye. All of a sudden, mortar attacks seemed almost fun in comparison to rockets.

Dawn of 1 Feb broke, showing overcast skies, weather indicative of our moods after surviving our first rocket attack. The craters left by the 122s were about 10 to 12 feet across, and maybe 6 feet deep. One had hit near my aircraft that I had flown earlier that night on the LRRP mission, and the helicopter would not be flyable for some time, having numerous holes ripped in it from the rocket. We dug part of that rocket out of its crater, seeing ChiCom markings on it. As we were looking at it, the SCRAMBLE horn sounded from Operations. I didn't have an aircraft to fly, but went to Ops to see what was going on. Our Ops officer was giving the Number One standby team their mission; a large NVA force was attempting to overrun Tan Son Nhut Airbase, and they were to respond to give air support to the ground forces.

NVA!? Up to now, we knew that we had been fighting some NVA regulars, but most of our contacts were thought to be with VC. LRRPS had seen large movements of troops just Northwest of Saigon; that's why we got them out last night. Now Tan Son Nhut is being attacked. We always thought that TSN was out of the war; I had been to the Air Force Officer's club there once, and everybody looked like they were state-side. They seemed to regard us, in our worn fatigues, unshined boots, and "bush" odor as some kind of apparition. Now, they were getting attacked. At first, it almost sounded funny, and we could picture these guys in their starched fatigues or TWs (tropical worsteds) scrambling around, getting some of what we got, and not liking it.

Our Number One team cranked up, took off, and while still enroute to TSN called back and told Ops that there were NVA everywhere and that all available gunships needed to respond. All I could do was sit there, having had my ship damaged by the rockets. I sat in Ops, listening to the battle, and heard Doc saying that he was going in near the perimeter of TSN. Our squadron commander, LTC Glenn Otis, had gotten one of our slicks to use as his C and C bird, and they went in and got Doc and his crew. I will not get into specifics of what happened with the 3/4 Cav ground troops on this day, other to say that they literally saved Tan Son Nhut from the NVA, and LTC Otis, with his leadership and bravery under fire, received the Distinguished Service Cross for his part in directing the ground units in their run from Cu Chi to Saigon. Without

his actions, it is likely that the NVA would have taken TSN, at least initially. Other books have described what happened there, and did it much better than I can. My hoochmate, Mike Siegel, received a Distinguished Flying Cross for his actions as Aircraft Commander in flying Col. Otis' bird. Acts of bravery that day were numerous, and many were no doubt unheralded.

Meanwhile, I sat in basecamp, a spectator in the first actions of Tet. That morning was long and, to understate, stressful. Those of us without aircraft to fly got sandbags and constructed makeshift bunkers. It seemed, after events of that night, that we might be needing them in the near future. By that afternoon, I got assigned to relieve one of the other ACs, who had been on station most of the day and was more than ready for a break. I had heard that on every run there was intense return fire, but I had also heard that we were giving out heavy casualties to the bad guys, and while scared, I was ready to get in the action. As I lifted off and started heading towards Saigon, the smoke and fires from the battle were evident all along Highway 1. When I got on station, I was told that we were needed to fire on a warehouse just off of TSN, in the Cholon section of Saigon. Other fire teams were in the area, shooting up the world. It seemed really strange to be rolling in on buildings in the city of Saigon, but it was happening, none the less. At this point, such things as "no fire zones" were not applicable. everything was a fair target, because the NVA were seemingly everywhere. As I started my run on the warehouse, we received heavy AK fire from it, and we returned with rockets, minis, and door gun. As we expended our weapons into the building, it quickly became a smoking hulk, looking a lot like pictures that we had all seen of WWII bombed out buildings. Whoever had been in the building was no longer returning our fire after our passes. And from the look of the building, it was not a healthy place to be.

We returned with rearmed aircraft and continued our assault on the city of Saigon. We were directed to targets of opportunity by the ground troops, and worked in conjunction with the "Razorbacks", the gun platoon of the 120 AHC, whose home base was Hotel 3, the Tan Son Nhut helipad. They lived in villas, and in comparison to us had a pretty good life, but they were in the War now, and they gave a very good account of themselves. We also worked with some Air Force "spookies", C47s equipped with several miniguns that were operated by hand by their crews. As we received more and more fire, with a lot of 50 cal. Mixed in, the Spookies climbed higher and higher, until their tracers were burning out above us, not doing a lot of good to the ground guys except moral support. In fact they put us at risk several times from being shot down by their fire.

Try to picture this scene; there are the Spookies, circling the fight at maybe 5000 or 6000 feet. Below them are helicopter flareships, dropping flares to illuminate the area in their eerie glow. We are below the flareships, along with one or two other gunship fire teams. All the guns are flying blacked out, in order to make less of a target for the 50s. We in the guns are dodging flares, Spooky fire, the other fire teams, and the 50 cal and AK fire that showers us whenever we make a gun run. On the ground are many diverse units of US and ARVN troops, who are trying to stay out of our way and direct our fire on the best targets.

. The NVA are seemingly everywhere; whenever we make a pass on a target, Charles opens up on us from another position, not to mention those who we are shooting at returning fire at us in a most convincing manner. Fires are all around, from burning buildings, vehicles and the like. And while all of this is going on, our helmets fill our heads with radio chatter from the grunts, the Spookies, the other fire teams, our wingman, and our own crew, calling out such niceties as "we just received 50 fire from that building" or "the gooks just RPGd that APC down there!". All in all, the confusion of war was all around us. The whole thing seemed at times to be surreal, like you were in some sort of dream but couldn't awake from it. It wouldn't get a lot better for a long time.

Upon returning to Cu Chi, we found that we had been rocked again. This, too, was to be an unpleasant fact of life for the next few months. Not chancing what seemed to be inevitable, we went to our makeshift bunkers to try to get some sleep. I had just dozed off when another rocket attack started. Laying in a ditch, wet, tired, scared and pissed off does not make for deep sleep. Guns on the perimeter opened up in force. The gooks must be attempting to breach our wire. I really don't need this sh\*t, I say to whoever is close by, being the master of the Obvious that I am. The guys on the wire are really shooting now, and the rockets are still falling. I hunker up, trying to become small, but knowing that a direct hit on my bunker and I am little more than a pink mist. I just hope that the odds will go my way for this attack. Although I know that I will never get used to this, in the months ahead I actually got to where I could sleep through a rocket attack unless they were landing right in our troop area.

The next day brought little relief. I flew in support of more troops on the outskirts of Saigon, mostly Saber units that were cleaning up small patches of ground, retaking what had been ours a couple of days ago.

Each fight was fierce, and while we didn't get shot down, we got many holes in our aircraft, requiring some immediate repairs for such things as the tail rotor driveshaft that was nearly severed by a 50, radios being shot out, and replacement of rotor blades when they got more than three holes in them (or, one 50, which would cause the aircraft to vibrate badly). On one of these numerous missions that all seem to run together, my chopper lit up a "Hydraulics" warning light. On a UH 1C, there are two hydraulics systems which allow for a backup system in case of a failure of the other. Charlie models cannot be flown with no hydraulics, unlike their other Huey brethren, because their larger rotor blades are just too powerful to be moved by humans. So, when we got the Master Caution light, our next procedure was to put the aircraft on the ground ASAP. We were only a short way from a Saber laager position, and as the bright young Warrants that we were, we decided to see if we could turn off the only functional system and see how the aircraft would handle. I had the aircraft, and my Peter Pilot turned off the switch for the number 2 hydraulic system (number one was the one that was inoperable). The helicopter immediately went into a violent right climbing turn, and I could not budge the cyclic, as much as I wanted to. As I was yelling to get the operable hydraulics turned back on, the Peter Pilot was reading my mind. As he flipped the switch back on, we both realized that if we should lose both hydraulics, we were screwed. We put the bird down at the Saber laager, hitched a ride back to Cu Chi in a passing slick, and left our aircraft to be towed back

We learned more than we ever wanted to know about NVA 50 Cal. antiaircraft machineguns during this time. They were really 51s, being 12.7mm, but who was counting. The NVA were very good at setting up triangulated AA positions, and when we would roll in on one, two others would open up from other directions on us. When the bullets went by, there was a loud "POP", and I swear that the tracers looked as big as basketballs when directed at us. On one mission, I remember getting shot at by 4 different 50s from four different directions at the same time, with the tracers crossing each other and our ship at their intersection point. When the aircraft took a 50 hit, it wrenched violently, where with AK fire there might be a bit of noise and possibly you could feel the hit through the cyclic. With a 50, there was no doubt.

I know that on at least three different occasions that I destroyed 50 cal. positions. Once, on a night flight in support of ground troops, we rolled in on the enemy which was engaging our grunts. As I touched off the first rocket, two 50s opened up on us. One of them was almost on line with my line of attack, and with a small adjustment, I put the ship right on this particular gun crew and dumped all my rockets right on top of him. At the same time, my wingman took on the other 50, nailing him with rockets, as well. There was no more fire from either of those positions, and I knew that my rockets had been on target. Another occasion was when we were again fired upon by a triangulated position, and one of the positions had the misfortune of being directly in front of me as I started my gun run. He, too, got several 2.75" rockets poured on top of him. This one was in the daytime, and not only did we not get any return fire, but we also got a secondary explosion, which indicated that the NVA also had other armaments in that position.

Another time, also during the height of Tet, we got scrambled to assist an ARVN company between Cu Chi and Saigon. It was reported to us that they were pinned down in a villa, and needed air support. When we got in the air, we made contact with the ARVNs US advisor via FM radio. As soon as we talked to him, we learned that he was wounded, laying in the courtyard of the villa, and that his ARVN troops had retreated to a safe area. They refused to make an attempt to retrieve the wounded American, wanting us to soften the enemy. We learned from the advisor that there was probably a platoon sized NVA element in a villa building about 30 yards from him, and as we made a low pass over the American's position, we received heavy AK fire, and a single 50 opened up on us, as well. We told the American to take whatever cover he could, and made a pass directly at the NVA building, breaking back over the wounded soldier. Again, we and our wingman took heavy fire, and my aircraft was rocked by a hit from the 50. But now we had the 50's position, and on my second pass I placed about 6 or 7 rockets right on top of him.

The American, who could see what had happened from his very close position, told us that one of the rockets had been a direct hit on the 50 crew's position. The AK fire lessened, as well, and we called upon the ARVN to go after the advisor. They weren't about to budge. The American was trying to maintain radio contact with us, but it was plain that he was badly wounded, and our orders to the ARVN leader became more and more demanding that they go after him so that we could get him medevacked to Cu Chi, which was only a 5 minute flight away. No, they would not go after him. It was at this time that we seriously contemplated rolling in on the

ARVN troops, since the cowardly little bastards were not about to save the poor American. Not wishing to be court-martialed, we decided that we would not kill our supposed allies, but it was Oh so tempting. Our crew was fuming, screaming every kind of obscenity at our Brothers in Arms, who were going to let that American soldier die because of their cowardice. We flew ever lower and slower over the wounded American, firing miniguns and door guns at the NVA position until there was no return fire. Even then, the spineless bastards refused to retrieve what was now the body of an American serviceman, there in their country to save them from Communism. We left, helpless, without ammo, furious, and hoping that the NVA would kill every cowardly ARVN in that contingent. When I returned to our Operations, I gave an angry account of our allies' fighting ability, which I was assured would be forwarded to a higher authority. I don't know if anything happened to that ARVN unit, but I hope that they were all killed. They richly deserved it.

Tet rolled on. Day after day, the battles, rocket and mortar attacks, sleepless nights and constant contact became a blur. It is amazing that when under this type of combat stress, the body seems to be on auto pilot, and exhaustion from lack of sleep becomes almost normal to the point that we seemingly could still perform well for days on end. I am sure that our combat readiness suffered badly, but we were all so tired that nobody seemed to notice. The Offensive lasted a month, and during that time my unit alone was in on the deaths of many, many VC and NVA. Our losses were zero killed, but several wounded. In the war of attrition, there can be little doubt as to who the victor was. While we decisively won the battles during Tet, and put such a crimp in the enemy that the VC were virtually wiped out during the time, the press corps and the anti-war protestors gave the victory to the North. The political ramifications were harmful to the war effort, and the high officials did little to make it better. Tet became a political victory for the Communists, despite them getting their butts severely kicked militarily. Those of us who were doing the fighting and saw how both sides were faring never could understand how the NVA/VC got one in the Win column for this fight, but that is how the history books record the Tet Offensive.

## EMI Electromagnetic Interference Basics

- a summary about EMI - electromagnetic interference - the types of EMI and how they affect electronic equipment.

There are many forms of electromagnetic interference, EMI that can affect circuits and prevent them from working in the way that was intended. This EMI or radio frequency interference, RFI as it is sometimes called can arise in a number of ways, although in an ideal world it should not be present.

EMI - electromagnetic interference can arise from many sources, being either man made or natural. It can also have a variety of characteristics dependent upon its source and the nature of the mechanism giving rise to the interference.

By the very name of interference given to it, EMI is an unwanted signal at the signal receiver, and in general methods are sought to reduce the level of the interference.

### Types of EMI - Electromagnetic Interference

EMI - Electromagnetic Interference can arise in many ways and from a number of sources. The different types of EMI can be categorized in a number of ways.

One way of categorizing the type of EMI is by the way it was created:

**Man-made EMI:** This type of EMI generally arises from other electronics circuits, although some EMI can arise from switching of large currents, etc.

**Naturally occurring EMI:** This type of EMI can arise from many sources - cosmic noise as well as lightning and other atmospheric types of noise all contribute.

Another method of categorizing the type of EMI is by its duration:

**Continuous interference:** This type of EMI generally arises from a source such as a circuit that is emitting a continuous signal. However background noise, which is continuous may be created in a number of ways, either manmade or naturally occurring.

**Impulse noise:** Again, this type of EMI may be man-made or naturally occurring. Lightning, ESD, and switching systems all contribute to impulse noise which is a form of EMI.

It is also possible to categorize the different types of EMI by their bandwidth.

**Narrowband:** Typically this form of EMI is likely to be a single carrier source - possibly generated by an oscillator of some form. Another form of narrowband EMI is the spurious signals caused by intermodulation and other forms of distortion in a transmitter such as a mobile phone or Wi-Fi router. These spurious signals will appear at different points in the spectrum and may cause interference to another user of the radio spectrum. As such these spurious signals must be kept within tight limits.



**Broadband:** There are many forms of broadband noise which can be experienced. It can arise from a great variety of sources. Man-made broadband interference can arise from sources such as arc welders where a spark is continuously generated. Naturally occurring broadband noise can be experienced from the Sun - it can cause sun-outs for satellite television systems when the Sun appears behind the satellite and noise can mask the wanted satellite signal. Fortunately these episodes only last for a few minutes.

### EMI coupling mechanisms

There are many ways in which the electromagnetic interference can be coupled from the source to the receiver. Understanding which coupling method brings the interference to the receiver is key to being able to address the problem.

**Radiated:** This type of EMI coupling is probably the most obvious. It is the type of EMI coupling that is normally experienced when the source and victim are separated by a large distance - typically more than a wavelength. The source radiates a signal which may be wanted or unwanted, and the victim receives it in a way that disrupts its performance.

**Conducted:** Conducted emissions occur as the name implies when there is a conduction route along which the signals can travel. This may be along power cables or other interconnection cabling. The conduction may be in one of two modes:

**Common mode:** This type of EMI coupling occurs when the noise appears in the same phase on the two conductors, e.g. out and return for signals, or +ve and -ve for power cables.

**Differential mode:** This occurs when the noise is out of phase on the two conductors.

The filtering techniques required will vary according to the type of EMI coupling experienced. For common mode lines are filtered together. For differential mode they may be filtered together.

**Inductive coupling:** What is normally termed inductive coupling can be one of two forms, namely capacitive coupling and magnetic induction.

**Capacitive coupling:** This occurs when a changing voltage from the source capacitively transfers a charge to the victim circuitry.

**Magnetic coupling:** This type of EMI coupling exists when a varying magnetic field exists between the source and victim - typically two conductors may run close together (less than  $\lambda$  apart). This induces a current in the victim circuitry, thereby transferring the signal from source to victim.

By determining the form of coupling that exists and the way in which it is reaching the victim, it may prove to be that the most effective method of reducing the EMI is by putting measures in place to reduce the coupling and reduce the level of interference to an acceptable level.

Electromagnetic interference, EMI is present in all areas of electronics. By understanding the source, the coupling methods and the susceptibility of the victim, the level of interference can be reduced to a level where the EMI causes no undue degradation in performance.

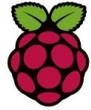
## Next Regular Meeting

The next meeting will be on **Thursday, March 31st, 2016**, 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:

**April 28th, 2016- 7 pm**

**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](http://www.w9rh.org)

**Or phone (414)-459-9741**



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## 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: [W9rhmrac@Gmail.com](mailto:W9rhmrac@Gmail.com)

**or by Post to:**

Michael B. Harris

807 Nicholson RD

South Milwaukee, WI 53172-1447

## VE Testing:

March 26th, 9:30am— 11:30am

**No testing: June, July or December**

**Location: Amateur Electronic Supply Time: 9:30 AM (Walk-ins allowed)**

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

## Area Swapfests

March 20th, [Hamfest 2016](#) Location: Jefferson, WI Type: ARRL Hamfest Sponsor: Tri-County Amateur Radio Club - W9MQB Website: <http://w9mqb.org>

April 2nd, [AES SuperFest](#) Location: Milwaukee, WI Type: ARRL Hamfest Sponsor: Amateur Electronic Supply Website: <http://www.aesham.com/aes-superfest>

## MRAC Working Committees

### 100th 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

### Newsletter Editor

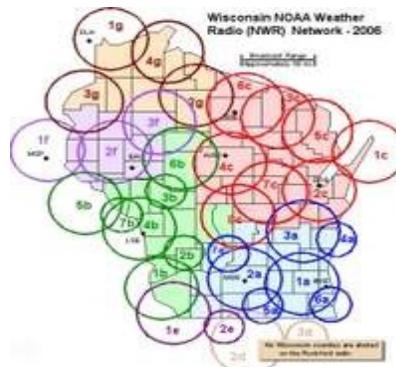
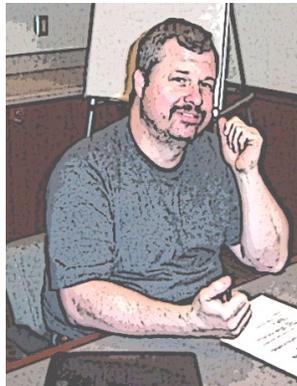
- Michael-KC9CMT
- Pancho- KA9OFA

### Webmaster

- Dave, KA9WXN

### 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)-459-9741**

Address correspondence to:

**MRAC, PO Box 26233, Milwaukee, WI 53226-0233**

Email may be sent to: [w9rh@arrl.net](mailto: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 ± 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 MRAC HamChatter is a monthly publication of the Milwaukee Radio Amateurs' Club. Serving Amateur Radio in Southeastern Wisconsin & all of Milwaukee County**

**Club Call sign – W9RH**

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

**Editor: Michael B. Harris, Kc9cmt, [kc9cmt@Earthlink.net](mailto:kc9cmt@Earthlink.net)**

*Welcome*

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

Mon. 8:45 PM 147.165- ARRL Audio News

Mon. 8:00 PM 442.875+ WIARC net also on EchoLink 576754

**Mon. 8:30 PM 146.820 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

Tue. 9:00 PM 145.130+ MAARS Hand Shakers 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 28.365Mhz 10/10 International Net

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

Wed. 9:00 PM 145.130+MAARS SwapNet, Allstar FM-38

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

Thur. 8:00 PM 443.800+ Tech Net

Thur. 9:00 PM 146.910+ Computer Net

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

Fri. 9:00 PM 145.390+ W9RH 2 MTR. FM Net

Sat. 7:30 AM MW Classic Radio Net , Freq.—3885 AM

Sat. 8:00 PM 146.910+ YL's Pink HAMsters Net

Sat. 9:00 PM 146.910+ Saturday Night Fun Net

Sun 8:00 AM, State ARES Net 3967/3977.5/145.470

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 146.910+ Information Net

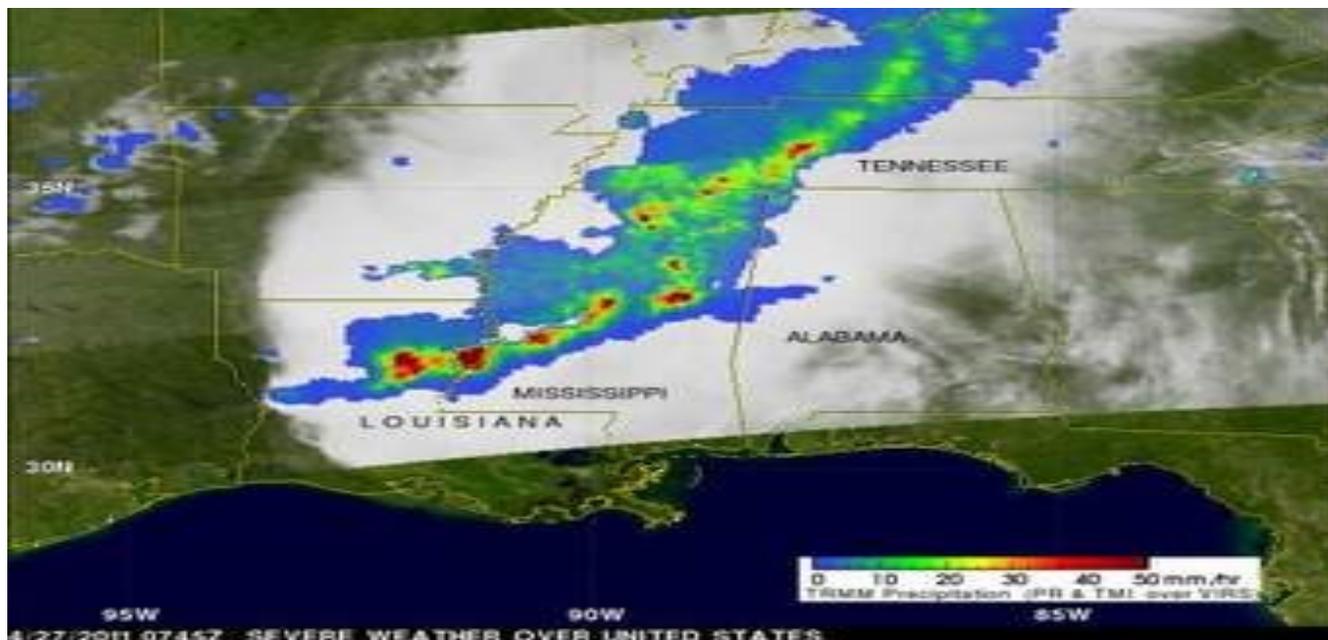
Sun 8:00 PM 28.365 10/10 International Net (SSB)

Sun 9:00 PM 146.910+ Swap Net

Daily: Milwaukee — Rag Chew Net: 7:00 AM, 3850 SSB + Florida Net 7 am, 14.290 mhz.

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.



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**Saturday Forums**

Times: TBA

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Lou Dietrich, N2TU

APRS & Public Service Communications  
Matt Welch, W8DEC

Ham Radio & High Altitude Balloons  
Joe Schwarz, N9UX

FSQ (Fast Simple QSO)  
Warren Pugh, KC9IL

**Clubs**

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LeFrog & Ozaukee Radio Club  
Milwaukee Area Amateur Radio Society  
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N9LKH (145.130/144.530, PL 127.3 Hz) and KC9LKZ (M.A.D.O.G.)  
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