BROWARD COUNTY FLORIDA

EMERGENCY COMMUNICATIONS TRAINING

December 2014

NO ARES/RACES MEETING IN DECEMBER

THE FORT LAUDERDALE ANNUAL WINTERFEST BOAT PARADE DECEMBER 13th, 2014

Amateur Radio Operators needed

Less than two weeks to go before the Parade comes to town

I have the following positions available
Commercial Street Bridge
Oakland Park Bridge
Birch State Park
7th Avenue Bridge
Smokers Park
Sunrise Bridge
3rd Avenue Bridge

For those that worked the parade last year will get the same assignments if they contact me immediately.
For those new hams that want to participate but do not know what to do,
I will pair you up with someone that has worked the Parade before.

This event is shown in many different Countries with over 1 MILLION VIEWERS
You will have a front row seat to the parade since all the parade boats
(100 of them) will pass right in front of you.
This is the best seat in the house! You will also be able to bring your wife or friend.

On December 10 we will be having a communications meeting at the Fort Lauderdale Chamber of Commerce (can you say PIZZA?)
In 2015 we will also have a volunteer appreciation party
Please email me the following information ASAP for a position in the Parade.

I will need your name, call, cellphone # and an address to register you.

Any questions, please ask.

Robin Terrill N4HHP
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n4hhp@comcast.net

Broward County ARES & RACES & SKYWARN Wishes All Our Amateur Radio Friends and Families

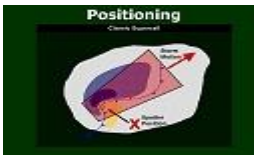
SKYWARN TRAINING

How do I know where to find the severe weather? Clique on the pictures

Typically you should look for the area where the updraft and downdraft regions of the storm meet. This will vary based on the type of storm you encounter. For a graphical representation of these scenarios, reference the slides below. You can differentiate between an updraft region and a downdraft region based on visual clues. An updraft region will have upward motion, inflow and cloud formation. A downdraft region will have downward motion and outflow; this will be where you usually find hail, wind and rain.

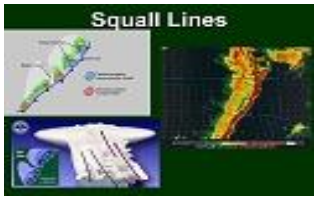
If I'm a mobile spotter, how do I position myself to view the storm safely?

Always position yourself so you have a good view of the updraft region of the storm. This is where severe weather is most likely to occur, and it will keep you out of the downdraft region of the storm where you could be in danger from downburst winds and severe hail. When positioning yourself in the updraft region, be sure not to get too close to the area of rotation/"interest". Always keep yourself a safe distance away and keep your engine running if you stop to observe for a few minutes. Avoid dirt roads.



What should I expect to see and identify on a squall line?

You should have positioned yourself in the updraft region of the storm, in this case along the leading edge of the squall line. In most cases, there will be a shelf cloud present that indicates the boundary between the updraft region and downdraft region of the storm. Tornadoes are infrequent in squall lines; usually the primary threat will come from gusty winds and perhaps hail.



What should I expect to see and identify on a supercell?

If you are in the updraft region of a supercell, then you should have a good view of any of the features shown in the slides below. Review the slides for more information. One of the most common spotter mistakes is reporting scud clouds (non-rotating, ragged clouds below the main cloud base) as funnel clouds or wall clouds. Be sure to watch any feature you suspect may be rotating for several minutes to validate your thinking. Remember, when looking for the "action area" in a supercell, find a rain-free base.

So remember... ROTATION ROTATION ROTATION!

Above photo/program originated courtesy of NWS Norman.

A Brief History of Your New Radio

Sent in by Jan/K9JCL

The little radio you hold in your hand is the result of thousands of people's work and ideas. There are a lot of "histories" that could be written about it, here's one of them. I hope you enjoy it.

First, we learned about radio…

In 1887, Heinrich Rudolf Hertz (1857-1894), a German physicist, performed an experiment to test the predictions of two other scientists, James Clerk Maxwell (1831-1879) from Scotland and Michael Faraday (1791-1867) from England the electromagnetic waves should be able to travel through space, and not just through wires. His experiment was a success, and he was able to show that you could send "radio waves", as they later came to be known, through empty space. At the time it was really only interesting to scientists, no one expected to actually do anything with it.

Then, we figured out a use for it...

Pretty quickly, though, people started to see that you could do something with radio waves. In particular, you could use them to send information. At the time, the way you sent messages great distances was using the telegraph, developed commercially by Samuel Finley Breese Morse (1791-1872), an American. Telegraphy used long wires stretched between cities and depended on "morse code" (actually invented by his assistant,

Alfred Lewis Vail (1807-1859), which is a way to spell with long and short pulses. Usually, those pulses were the result of a "code key", a kind of switch which caused an electromagnet on the other end go the wire to attract an arm on a device called a "sounder" which makes a click. The operator learns to understand the meaning of the clicks, and can "copy" the code. The telegraph was used to report on the battles of the American Civil War, and changed the way people got news and information, but it was very limited. About the same time, many people began thinking about "wireless telegraphy". (In fact, while we refer to "radio", the name "wireless", shortened from "wireless" telegraphy is used to talk about the technology, though "radio" is still what we call the stuff we actually listen to.) The idea of not needing wires to send telegraphic messages was very attractive to businessmen. Scientists are happy with experiments but "inventors" usually want to sell things; and "wireless" looked like it could make someone a lot of money!

Then, we found a way to sell it…

So, right around the turn of the twentieth century, a lot of people were trying to figure out how to make Hertz waves useful and "wireless" possible. People like Nikola Tesla (b. 1856, d. 1943), a brilliant Serbian-born American inventor. Tesla was one of the first practical experimenters in wireless, but, tragically, in spite of his amazing insights and abilities, he died poor and alone, in a hotel room. His life was very interesting, and worth reading about. Even right here in South Bend in 1899, an Electrical Engineering professor at Notre Dame named Jerome Green made what may be the first long distance radio transmission in the United States. "Long distance" is relative, and his transmission was from the Notre Dame campus to the Saint Mary's campus, about two miles. He used a very long antenna hung from the side of the basilica, and managed to send the morse code for the letter "S", which is three dots. His attempts to repeat his experiment in Chicago failed, and he blamed the mass of overhead wires used for telephone and telegraph for interfering with the signal.

Today, there is an Amateur Radio station called "the Jerome Green Amateur Radio Station (JGARS) which uses the call sign "ND1U" It is part of the College of Engineering. Amateur Radio operators (called "hams") use radios for experimentation, public service, and fun. Becoming a ham is very easy with a little study, and it's a great hobby.

Another inventor early on in radio was Guglielmo Marconi (1874-1937). Marconi was not the brilliant inventor that Tesla was, but he was a far better businessman. Marconi is sometimes considered "the inventor of radio", but this is misleading. He commercialized radio, that is, he found a way to sell it. His experiments and inventions were not necessarily as clever as others, but because he managed to get something built he could sell before

others, he was successful. His product was wireless telegraphy, and once he managed to sell his version to the U.S. Navy, he was sure to be a commercial success. But, even with this commercial success, wireless was still just telegraphy, and expensive, and only used when you really needed it (in particular, by ships at sea, where wires just won't do).

Then, we made it talk…

By this time, the telephone was also in regular use, having appeared as a device for local use (it couldn't compete yet with the distance that the telegraph could manage). But it didn't take much to imagine "wireless telephony" as the next step. Making it work, though, was another matter. One of the very little known inventor-heroes of radio is a man named Jozef Murgaš (1864-1929). He was a Slovak, and a Catholic Priest who came to America and lived in Wilkes-Barre Pennsylvania. He was also a prolific and brilliant inventor, particularly of radio devices. His story is something like Tesla's because he wasn't a very good businessman and so he gets little credit for his work, but, unlike Tesla, his end was not tragic. He was happy with what he accomplished, even if he never became famous.

Father Murgaš started with wireless early on, and right away he invented a two tone system of telegraphy far more effective than the morse code. This system allowed people who knew it to transmit text about five times faster than the morse code used by Marconi's system. Even though it was far better, Marconi had locked in his system by selling it to the U.S. Navy who wasn't willing to throw away the equipment they'd spent so much on. So, outside local enthusiasts, Murgaš' system was never adopted. Murgaš may also have been the first in the United States to make a voice transmission. He holds U.S. Patent 1,196,969 on a device that helped make this possible. While he never managed to successfully sell his work, it didn't bother him, he was happy with his life. However, others were watching him very carefully because they saw something they could use to make themselves rich (and famous, which, it turns out, is just as important to that sort of person).

Thomas Alva Edison (1847-1931) was one of those people. You might know Edison as "the inventor of the light bulb". This isn't quite right. Once again, like Marconi, Edison was a commercializer. Edison **was** a prolific inventor in his own right, and he is worth reading about. But the main part of his genius was recognizing and selling good ideas. Edison watched Murgaš carefully, and even spoke with Marconi about what he was up to. Murgaš may not get the credit, but he was a very important inspiration to other inventors who eventually managed to
sell his ideas in various forms, and so get both the credit and the money. But, all of efforts to make radio "talk" were hampered by a big problem: tiny signals. To make wireless telephony useful, some way to was needed distinguish between "signal" (the information, in this case human speech) and "noise" (all of the "non-information" which came from many sources, natural and man-made, remember Professor Green's trouble in Chicago).
Different things were tried, which mostly involved "tuning" the "wireless set" (receiver) better. Making it listen to a smaller portion of the electromagnetic spectrum was the first problem that was tackled. The knob on your radio that allows you to "choose a station" is all about that. It moves a little "window of listening" up and down the band, and the stations each have their spot. This was a very new idea back then, and much more crude, but it helped. It wasn't enough, though, to really make things work well. Somehow, the signal had to be "amplified", that is, made stronger so it could be heard.

Then, we found that the light bulb had a secret…

Edison's method of invention was what we would call today, "brute force" (or, if you want to be all scientific about it, "empirical"). When he was commercializing the light bulb, (it had already been "invented", he was trying to make one he could sell), he made hundreds of different versions using all sorts of materials for the "filament" (the glowing part). He tried everything from burnt string to, eventually, tungsten metal which is what he settled on, and what "incandescent" lamps use today (they may be gone in your lifetime as new technologies like CFL (Compact Fluorescent), LED (Light-Emitting Diode), and even more exotic, efficient technologies replace them). Somewhere along the way, for reasons that aren't clear, he included a piece of
wire in the bulb above the glowing filament and sticking out of the top. When he touched it, accidentally he got a shock. This surprised him since the wire wasn't touching the filament. Edison kept meticulous notes, so he wrote it down. It didn't mean anything to him, though, so he also forgot about it.

Lee de Forest (1873-1961) noticed it, though. De Forest was an American inventor, something like Edison, in that he was an empiricist. He managed to make useful things without really understanding them well. He wasn't brilliant, like Tesla, but he was persistent, and very interested in personal and commercial success. De Forest realized that there was electrical current flowing from the filament to the wire (in what is called a "thermionic stream"). If a smaller voltage (like the weak radio signal that was a voice) could somehow control that flow, to would be possible to "amplify" it. The small signal could be used to make a bigger copy of itself.
De Forest invented what he called the "Audion" which was just this sort of amplifier. By putting a "grid" between the filament and the wire, he could put a small signal on the grid and influence the flow from the filament to the wire. This was a huge advance, even if he didn't really understand how it worked, other people figured out how to use it. In particular, the telephone companies found it **very** useful because, remember, they couldn't make phone calls go very far, and "repeaters" that amplified the signal made Long Distance possible. De Forest got quite rich from this, but, he still didn't understand his own work.

On the other hand, Edwin Howard Armstrong (b.1890, d. 1954) did understand it He was a truly brilliant American electrical engineer who saw the real power of the Audion (technically called a "triode" because it has three elements). His deep insights into the operation of the triode allowed him to develop something called the "regenerative receiver", which made broadcast radio (the kind you like) practical. He also invented FM (Frequency Modulation) which is far more pleasant for broadcasts than the AM (Amplitude Modulation) that was used until then. We still use it today, but for talk radio where "fidelity" isn't important, while FM is used for music because it is quieter and can reproduce a wider range of sounds. Armstrong got into a legal fight with de Forest over the patent on this new circuit. Unfortunately, Armstrong was an ideologue, that is, he believed that if something was "right" he should fight for it to the end. So, instead of making a deal with de Forest, which would have still allowed him to profit from his invention, he felt he needed to "win". He fought de Forest (who had a **lot** of money to spend and an even bigger idea of how important he was) in the courts, and eventually, he lost the case on a technicality. It was devastating to Armstrong, who lost his marriage, and eventually his life over it. A great tragedy which once again showed how the commercially successful can keep the truly brilliant from contributing.

While Armstrong's life reads like a tragedy, ending in his dramatic suicide, it is a fascinating one, and one of the more fascinating events concerns his wife, Marion McInnis (1898- 1979). Though they had split up when Armstrong became so unstable because of the stress of the lawsuits, and hit her with a fireplace poker. After his death, she pursued and won every one of the suits for her husband even though they only a matter of "moral" victory. A more pleasant connection to your radio is that Armstrong made the first portable radio as a gift for McInnis when they were married.

Armstrong's work revolutionized radio and made commercial broadcasting possible. The creation of the first radio "networks" and the rise of RCA (Radio Corporation of America) is another fascinating story (in which Armstrong figures). But I will leave you to find out about it if you are interested since it is yet-another history's worth of information. (That's worth learning about!) From the time that Armstrong's wonderful circuit made radios a practical household item developments in vacuum tubes (the British called them "valves", because the controlled the flow of electrons) developed steadily. Tubes became more powerful and smaller. The advent of World War II brought even more capable and much smaller tubes (called "acorn tubes" because that's what they looked like); but the war also brought something else, something directly connected to your little radio.

Then, we got rid of the tubes…
Of course, even the tiniest "acorn" tubes were much bigger than could fit in your radio. And, not only were they big, they were hot. The filaments in them had been carefully designed to produce more electrons than photons (light waves/ particles), which is, of course the idea of a light bulb. But they still had to get hot enough to glow, because it was the heat (therm- from thermionic) that produced the electron stream (-ionic). Heat means power, too. So the batteries that ran portable radios had to be very big, and the voltages required were very high. Your radio runs from 3 volts, these required 45 volts, and even that had to be converted even higher. So, tubes weren't very practical for something really portable, and they were inefficient, since a lot of the power needed

to run them went into heat. They also didn't last all that long; they burned out just like light bulbs. So, what to do about it?

Well, in 1905, long before World War II, Albert Einstein (1879-1955) had his "Annus Mirabilis" which means "miracle year" in Latin. It's called that because he wrote four scientific papers which were so far-reaching it took hundreds of scientists decades of work to really understand all the implications of them. Part of the focus was on something called the "photoelectric effect". This was an observation that when light fell on certain combinations of metals, electricity was produced. This effect was very confusing to scientists because they had concluded that light (which is electromagnetic radiation, just like radio only vibrating a **lot** faster) travels as waves. Just how waves could do this was quite a mystery. Einstein solved it, but it was very upsetting to the scientists of his time. His solution was to say that light was **both** waves and particles **at the same time**. This didn't go over very well because it seemed crazy; but the more it was looked at, the more clear it was that he was right!

These papers began the investigation into Quantum Mechanics, the study of things so small that they are smaller than particles of light itself. You can't see things that are at the quantum level, and they act in very strange ways indeed. In fact, they act so strangely that a prominent scientist declared, "if Einstein is right, science itself is impossible!" Thankfully, he was wrong about that. Einstein was right, and scientists worked it out.

By the time World War II was nearing its end, the people at a really amazing place called Bell Labs, which was the research part of the AT&T's Bell System telephone monopoly, had been working on a project for replacing vacuum tubes in those "repeaters" that first made the Audion tube a commercial success. They needed something more reliable, and lower power. Some of their repeaters were built into the transoceanic cables that ran across the atlantic from America to Europe. Changing a bad tube in a place like that is just a little inconvenient, and powering them meant everything got hotter than they'd like. So, they were investigating something called "semiconductors". These were materials that were neither conductors nor insulators, but seemed to do some of both.

Conductors allow electric current to flow easily. Most metals are excellent conductors, copper is usually used in wire because it is both a good conductor and not **too** expensive. It's not cheap either, but it's practical to use. Silver is a better conductor but it costs too much. It is used in special cases, like certain connectors. Insulators are don't allow electric current to pass; things like rubber, dry wood, and glass are examples. Today, most insulators are man-made materials. Different plastics are very good insulators for low voltages. But if you look up on the poles that carry the power to houses and businesses you will still see glass (and ceramic) insulators for the very high voltages that are used. (In your neighborhood, before the power gets to your house, it is probably around 15,000 volts, but the receptacles on the walls are only about 1/100 of that, at 120 volts.)

Semiconductors, though, are able to conduct **sometimes**. The first devices made were "diodes" (remember, the Audion was a "triode"). Di- in diode means two. The -ode part is each of the parts (an anode and a cathode). The diode is like a "check valve" used to keep water from backing up in drains, it lets current flow one way, but not the other. The diode is a very useful component, but the real goal was a semiconductor triode, that could act like the tubes and be an amplifier.

Julius Edgar Lilienfeld (1882-1963), who was an Austro-Hungarian born American physicist, received a patent on something he called "Amplifier for electric currents" in 1928. In theory this was what the people at Bell Labs was looking for, a semiconductor triode. In practice, it didn't work. The idea was right, but it couldn't be made. Still, he'd anticipated the work of the team that did make the practical version but more than 20 years.

John Bardeen (1908-1991) and Walter Brattain (1902-1987) were physicists who worked at Bell Labs' Solid State Physics Group under the supervision of William Shockley (1910-1989). Shockley was a brilliant theoretician, but he was also a very greedy man. He wanted fame and fortune, and believed he deserved it. From November to December 1947, Bardeen and Brattain performed practical experiments on the semiconductors in a successful effort to create a working semiconductor amplifier. Shockley, meanwhile, was

working on something much more like Lilienfeld's amplifier, all on paper. Bardeen and Brattain had come to their experiments by a fortunate accident, as is often the case in invention. The materials that were needed for this work had to be very pure. In fact, purifying them was one of the biggest challenges. One of the scientists had gotten a sample of germanium, an early material used in semiconductor production for some tests. He'd connected it to a voltmeter for other reasons, but noticed that if he shined a light on the sample, it produced a very large (relatively speaking) voltage. This was Einstein's photoelectric effect in action, but a much stronger one than they had ever seen. When they looked careful at the sample, they noticed an irregularity in the middle of it. It seemed to have cooled funny. Probing around, they found that the funny bit in the middle was a little less pure than the ends, forming a "junction" between the two. This was a huge breakthrough. They realized they needed a sort of sandwich with a specially impure "filling" on pure "bread".

The experiments of 1947 were all about refining this idea, and when they were finished they succeeded in producing a "solid state" (semiconductor, not vacuum tube, which is "hollow") amplifier. The device was crude, made of a little of the lucky germanium, gold foil, and a triangle of plastic, but it worked! A small signal could be made into a bigger copy using it. When they showed it to Shockley, he was surprised. What wasn't a surprise to people who knew him was that he took credit for the discovery and the famous photo of the three of them has Shockley at the bench, a place he **never** sat, he was a theoretical physicist, not at all at home in the lab. He was brilliant, and contributed a lot due to his deep understanding of the quantum theory that came, eventually, from Einstein's Annus Mirabilis, but he didn't invent this device.

This was a huge accomplishment, and they needed to name the device. They wanted it to sound modern, and cool, but weren't having much success. Many suggestions were made, but John Robinson Pierce (1910–2002) one of the Bell Labs physicists suggested "transistor" for "transfer resistor", and it stuck. The transistor was born. Shockley, Bardeen, and Brattain shared the Nobel Prize for Physics for its invention, though Shockley's name didn't end p on the patent because he hadn't contributed directly. Even more upsetting was that his own attempt to patent his Lilienfeld-like device, the one he'd made on paper, was blocked by the Lilienfeld patent. He never was much of a financial success, and managed to alienate the people he worked with who went on to form an important next step in your radio: Texas Instruments (TI).

Then, we had to make them cheap…
Producing transistors wasn't easy. The methods to make practical transistors took a long time to work out, and even when they could make them reasonably well "yield" (the number of good ones out of a batch) was fairly low. The only way to make transistors a commercial success was to produce a **lot** of them so they would be cheap. People from Bell Labs went to Texas to work that out. They had two problems: making transistors, and selling them. Eventually, they worked out the first, but the second was a bit sticky. After the telephone company and the military bought all they could use, there were quite a few left. They needed a customer. Fortunately, one found **them**.

Finally, we had to put them together…
Masaru Ibuka (1908-1997) was a Japanese scientist who wanted to become a successful businessman. He and Akio Morita (1921-1999) decided to go into the electronics business together, so they formed Tokyo Tsushin Kogyo Kabushiki Kaisha (Tokyo Telecommunications Engineering Corporation) and built tape recorders, a very high tech thing at the time, the first in Japan. However, in post-war Japan, the real opportunities were trade with the U.S. and they wanted a product for that market. In the early 1950s, Ibuka traveled in the United States to a technical meeting about Bell Labs' new invention: the transistor. He was among the first to license the transistor, and created the first
transistor radio (the great-grandfather of your radio!) the TR-63, and he bought all the transistors that TI could make. He and Morita changed the name of the company to "Sony" because they thought "sonny-boy" was a popular phrase in the U.S., and "sonus" means sound in Latin. The transistor radio was a huge success in the U.S. and every teenager wanted one. It was the iPod of the 1950s.

So, while your radio used an integrated circuit (a very large number of transistors in one device), and silicon rather than germanium, which is a better choice for transistors, it's history stretches back to the beginning of radio and electronics. I hope you enjoy the radio, and maybe you will find you have an interest in the technology

behind it. Things have changed a lot since Armstrong, and even since Ibuka, but your little Sony radio is the legacy of those men and thousands of others who contributed to all the parts and ideas that make it possible.

"Frequency" TV Series Would Reprise Amateur Radio-Themed Movie
Sent in By Al sachs/KD4KNV

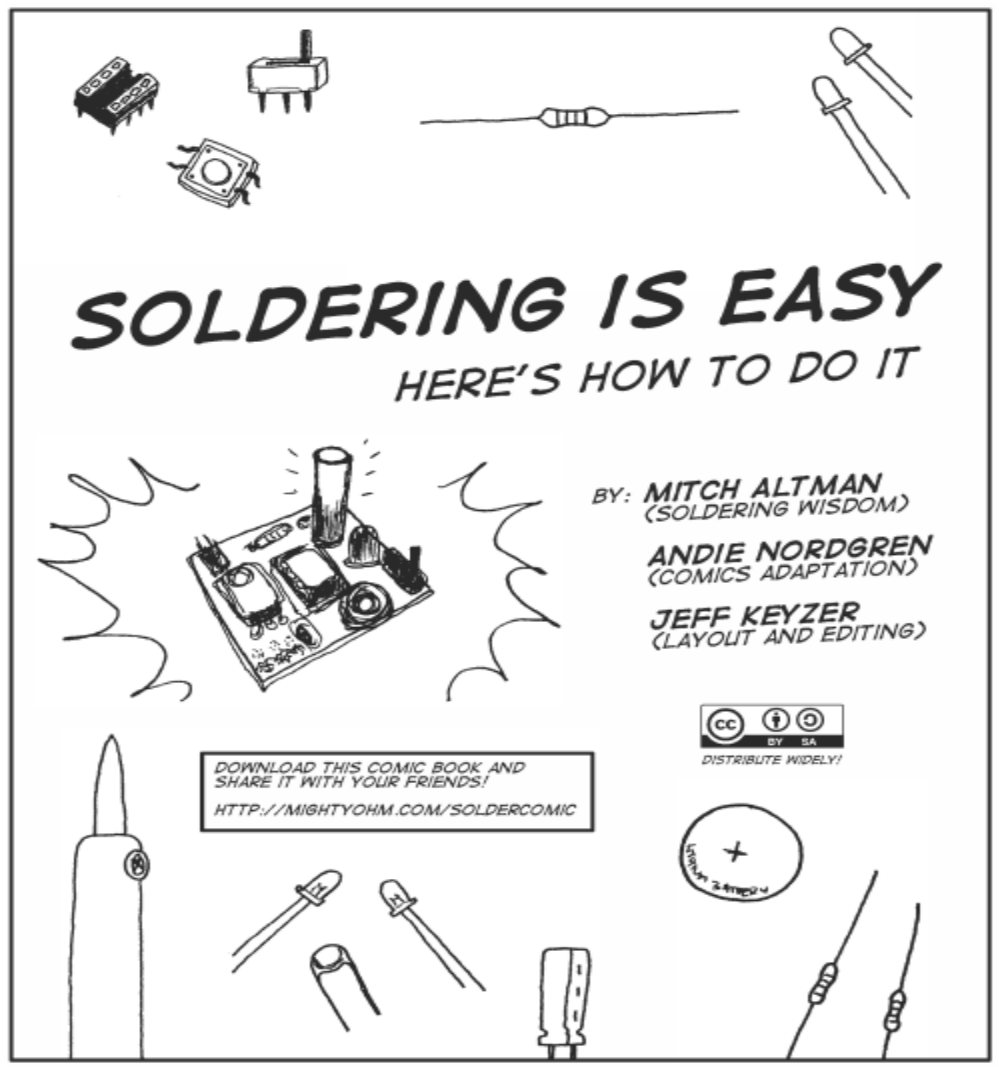
Mike Baxter, KA0XTT — Tim Allen's character in the "Last Man Standing" TV show on ABC — may be getting some competition on the ham bands, as NBC appears poised to launch a television series based on the 2000 movie ***Frequency***, in which ham radio — aided by some spectacular solar phenomena — plays a central role in the sci-fi thriller.

According to a November 13 **article** in *The Hollywood Reporter***,** NBC has already committed to the series. Jeremy Carver is writing the script for Warner Brothers Television and will be the series' executive producer. Toby Emmerich, who wrote the movie, will be a co-producer.

While Amateur Radio has made only fleeting appearances in "Last Man Standing," it is an essential plot device in *Frequency*. In the movie, a New York City fireman, Frank Sullivan, played by Dennis Quaid, re-connects via a bizarre ham radio link with his son, John, 30 years in the future. Jim Caviezel, now a star in the CBS drama, "Person of Interest," portrayed John Sullivan, an NYPD detective. John Sullivan comes across his late father's 1960's-era Heathkit transceiver, through which — with the help of quirk of nature and some Hollywood magic — he is able to communicate with his father through time and space.
Once back in touch, father and son conspire in efforts to change the past while also untangling their complicated personal relationship. Both also attempt to prevent a murder.

The ham radio theme and the chance to see vintage ham gear and real, glowing vacuum tubes (Frank Sullivan's old Heathkit has no cover) on the big screen were sufficient to generate considerable interest within the Boat Anchor community when the movie debuted. The ARRL worked with the film's producers. *Frequency* remains widely available in DVD and through video services.
-- *Thanks to John Bigley, N7UR,* Nevada Amateur Radio Newswire

Announcing the “Soldering is Easy” Complete Comic Book!



Do you want to learn how to solder? Do you want to make really cool things? Do you want to teach other people how to solder (and make cool things too)?

I’m happy to announce the release of Soldering is Easy, a comic book that will teach anyone the basics of soldering.

This seven page comic book explains in detail and with pictures how to make a good solder connection. It also teaches you all the other bits and pieces of knowledge that you need to successfully solder together an electronic kit, even if you’ve never soldered before!

The comic is released under a Creative Commons license (Attribution-ShareAlike), so you are free to teach with it, color it, modify it, share it with your friends, translate it, and basically do whatever you like with it!

“Soldering is Easy” Comic Book (PDF)

Do you have what it takes to become a shelter communicator in Broward County with your ham radio?

After a manmade or natural event that effects normal communications where it is overloaded or nonexistent, the amateur radio operators (Hams) are called into action. This type of communications is usually a full time, 24 hours position. Local, city and county governments, city Emergency Operations Centers, (EOC) fire and police departments, the Red Cross and other agencies and numerous other utility agencies rely on amateur radio operators (HAM) to provide initial communications between each other until normal communications is returned.

ARES/RACES Operating Procedures

In the event a disaster of any nature affecting radio communications to one or more agencies in Broward County occurs, the following Standing Operating Procedures (SOP) will be implemented:

In the event of a local emergency/disaster, or when the treat of severe weather for the area is immanent, amateurs may be called into action.

EMERGENCY NET

Upon being contacted by the Broward County Emergency Management Division (BEMD), or other authority, a net is to be activated on the local repeater. All ARES members, and licensed amateurs, should immediately monitor the primary repeater frequency, the Broward Amateur Radio Club's (BARC) VHF 146.910 MHz -6 PL 110.9 the secondary frequency, the Motorola Amateur Radio Club's 146.790 -6 PL 88.5 Hz or the tertiary repeater, the SFDXA 147.330 MHZ +5 PL 103.5 Hz.

If the repeater is down, the repeater output (146.910) frequency will be used for direct (simplex) communication. Do not vary off this simplex frequency unless advised by the Net Control Station (NTS). Additional net frequencies will be issued by the NCS as necessary.

NOTE: The Radio Amateur Civil Emergency Service (RACES) Nets can ONLY be activated for "Civil Emergencies" and only under the authority of the Broward County Emergency Management Division Director. ARES (Amateur Radio Emergency Service) Operators will be activated in most instances. (See: RACES ACTIVATION below)

NET CONTROL

The Net Control Station is responsible for:

1. Opening the net on the primary net frequency, or alternate frequency.

2. Maintaining order on the net.

3. Assign stations and "tactical callsigns" to the specific locations requested by the incident commander / emergency management official.

4. Maintain an up-to-date list of all stations and tactical callsigns assigned to the different locations.

5. Maintain an up-to-date list of all radio amateurs checked into the net for availability.

6. Assign relief operators at the assigned locations as needed.

TACTICAL CALLSIGNS

Tactical callsigns will be used in addition to the individual callsigns of the operators assigned to specific locations for official communication. These tactical callsigns will be assigned by the net control and will reflect the location/duties of the assigned operator. For example: N4HHP might be assigned to operate the station at the Broward County Emergency Operations Center… and the tactical callsign would be "Broward County EOC." The Net Control operator would use the tactical callsign "Net Control." These would be used in addition to the amateur callsign required for legal identification at the end of their communication. The NSC will identify once every 10 minutes. Our Station Callsign at the EOC is W4BEM.

RESPONDING OPERATORS

Registered Broward County Amateur Radio Emergency Service (ARES) operators may be dispatched to different locations as necessary by the ARES Emergency Coordinator (EC). Note that it may be necessary to utilize volunteer operators who are not ARES/RACES members. However, registered ARES members will be used as "Primary" communicators.

A ham with a demanding signal may serve as the net control location from their vehicle or home at the discretion of the EC. The EC will be in charge of appointing who will be net control and what the assignments will be for this communications operation.

CONDUCT

In all instances, ARES/RACES operators are NOT to interfere with the business being handled by the entities we are supporting.

1. When you arrive at an assigned location, notify the person in charge of that area that you are there and are ready to provide communications.

2. Ask where would be the best place for you to locate, out of the way, but available when needed.

3. Operators should check-in with Net Control when arriving at an assigned location and when being relieved by another operator or released by the person in charge of that area.

4. Once regular communications are re-established, (if applicable) notify Net Control and inform the person in charge of that area that you are leaving if further assistance is not required. DO NOT leave your assigned area until relieved by a relief operator or until released by the person in charge of that area, or re-assigned or relieved of your duties by Net Control.

5. Inform Net Control when you are once again available for further assistance.

The Broward County Emergency Management Division RACES Plan

Amateur Radio communications is a valuable resource to have available in event of any emergency. It can be used to augment other communication services and could even be possibly the only communications available, should a large-scale, acute disaster occur. It is conceivable that an emergency could occur in Broward County that would require RACES operations, when other communications modes were severely overloaded, or even non-existent due to a manmade or natural disaster. With this in mind, the Broward County RACES plan was developed. Amateur Radio Operators thus utilized will be known as RACES, the Radio Amateur Civil Emergency Service.

The Local Emergency Management Director will appoint an Extra Class Amateur Radio to serve as the RACES officer (RO). The RO will conduct drills and generally oversee RACES operations locally. The RO will also keep lists of operators and available equipment and resources to support the local RACES program, keep log of drills and pertinent traffic during actual emergencies, assign other RACES personnel of their duty stations, etc. All RACES operators are volunteers and provide their communications expertise and service without pay or compensation.

The Broward County Emergency Operations Center (EOC) is equipped with Very High Frequency (VHF) Ultra High Frequency (UHF) High Frequency (HF) Digital, DSTAR, All-Star, Civil Air Patrol, Echolink, Red Cross, Marine and other transceivers.

Local use of 2 meter VHF

The operating frequency is VHF operations will be on Frequency Modulation (FM) on the frequency of 146.910 MHz -6 PL 100.9 Hz. In event that the repeater is inoperative during an emergency, the simplex frequency of 146.910 Mhz. will be used. The alternate frequency of 146.520, 146.550 and other simplex frequencies can also be implemented as needed.

Training Net – VHF

The Broward County ARES/RACES 2 meter net will be exercised once a week on the frequency of 146.910 MHz -6 PL 110.9 or 146.790 -6 PL 88.5 Hz. This net is called the Broward County Emergency Preparedness Net (BCEPN) and meets every Wednesday with the exception of holidays and actual emergencies taking place.

Activation

Primary notification of RACES personnel will be by telephone from the BEMD Director to the RACES Officer or alternate who in turn contacts the EOC staff hams. Hams will be notified on the primary frequencies and by telephone. All hams are urged to monitor the primary frequencies and check into the net to see where they can be utilized if they have or do not have an assignment. Again, these frequencies are 146.910 MHz -6 PL 110.9 Primary, or 146.790 -6 PL 88.5 Hz.

Upon notification the RO (or other designated RACES operator/s) will proceed to the EOC (or a possible other location) to activate the local 2 meter emergency net. The net can be activated and placed in active status or standby status, as needed. The RO will maintain a radio log, showing times, locations, traffic, messages, message numbers, etc.

The base RACES station at the EOC will be operated by the RACES EOC staff members. The RO or the Assistant RO (ARO) can assign other RACES operators to serve at Command Posts, shelters, or wherever they are needed, depending upon the availability of operators.

All operations will be in complete accordance to Amateur Radio Rules and Regulations, Part 97, as published by the Federal Communications Commission. In the event of National Emergency, such as nuclear attack, RACES will be operated only under special FCC provisions.

How a Piece of Wire Can Double Your Radio Range

With written permission from http://codegreenprep.com/category/social/comms/

Adding a simple piece of wire to your walkie-talkie could double its range.

Some things in life you can never have too much of. But for this article, we'll concentrate just on radio range/efficiency! There are many ways to boost the range of your two-way radios. We write about this topic regularly and basically, the suggestions we offer fall into one of two categories – either getting a more powerful radio transmitter and more sensitive radio receiver, or boosting the effectiveness of your antenna.

Between these two choices, improving the effectiveness of your antenna is always the better approach. More powerful transmitters and more sensitive receivers are, of course, more expensive than standard grade units, and a more powerful transmitter is also going to need much more power to operate – chewing through batteries maybe ten times faster, and/or becoming a power-hog when you're off-grid and power is precious and limited. One more important issue – the more powerful your signal, the further it goes, and the greater the number of people who might receive it. This is seldom a good thing, particularly when you are trying to keep a low profile.

This is why our focus is not just on greater transmitting power, but also on better overall efficiency of the antenna so it can receive weaker signals more clearly, and – with our radios – if we improve our antenna, we often then cut back on our transmit power, keeping it at the minimum needed for the range we require. Enough introduction. By now, you're probably keen to understand the 10¢ device and how it can double your radio range. Actually, we may have misstated the truth – the device might cost you less than 10¢!

How a Piece of Wire Can Double Your Radio Range

This device is simply a piece of wire which dangles down off your hand-held radio transceiver. That sounds too good to be true, doesn't it, and a bit like the 'patch' devices that used to be sold to gullible fools to add to their cell phones, with claims either that they would magically filter out harmful radiation or boost the phone's range or something.

But we're not trying to sell you anything, and there is actual solid radio theory that readily explains how and why this works as it does. And, most of all, you will actually perceive the great boost to your radio's signal yourself – you will know if it works or doesn't work.
Without going too much into the theory, but also giving you enough to understand that this is a bona fide scientific real thing, most antennas need two parts in order to work properly. Sometimes the two parts are obscured as part of a single overall antenna structure, but any good antenna definitely does have two parts to it.

However, with a hand-held transceiver (HT) the people who design them have pretty much unanimously decided that people prefer small portable robust units rather than larger, bulkier, and more fragile units. They have taken that perception and used it to justify making the antennas small and inadequate. They know the antenna is inefficient, but it is also small and strong, and they feel that is more important to most people, most of the time, than is a bulkier more fragile antenna but with better range (and with removable/replaceable antennas, if you do want/need a better antenna, you can simply buy one, as most of us do).

The manufacturers are probably correct in their assumption, and most of the time, we accept the limited performance we get from our HT antennas – but sometimes we need better performance, and that's what this article is all about. We explain this so you understand the answer to the question 'If this is so great, how come it isn't already being offered on all radios?'.

To be more technically precise, the antenna on most handhelds is typically some type of quarter-wave monopole radiator, usually inductively loaded to shorten its physical length while preserving its electrical length, most commonly a normal-mode helix. Adding this extra piece of wire changes it to a half-wave dipole.
You already know that the first thing you should do with any HT is to replace its standard 'rubber ducky' stub antenna with a better antenna, with 'better' being in part synonymous with longer/bigger. See our two-part article about adding an external antenna to your HT, and if you have one of the lovely little Baofeng UV-5Rradios (see our commentary about why these are usually your best compromise choice here) then you'll see on this page the first thing we recommend you do to optimize the Baofeng is adding a specific improved antenna (the Nagoya 701, costing a mere $6 or so on Amazon).

But even these improved antennas are still massively inadequate because they don't provide some type of radiating element for both halves of the antenna. Instead, the radio designers use various compromises in their design that basically end up as using your body as the other ('ground') half of the antenna system. You'll be unsurprised to learn that the human body, while wonderful in many ways, is not very good at doing double duty as a radio antenna! So, to address this limitation, you can add the missing other half of the antenna to the radio yourself. All it needs to be is a specific length of ordinary wire (bell wire or phone wire, ideally multi-strand so it is flexible, and insulated). For 2M, this would be about 19.5″, for 1.25M, it would be 11.5″, and for 70cm, it would be about 6.5″. For best results, you want to strip the insulation off a short piece of the wire and then connect the exposed wire to the 'ground' or outside part of the antenna connector. This is very easily done with the Baofeng units – just unscrew the antenna sufficiently to be able to poke in the wire then screw down the antenna again to secure it. It might help if you break off/file down/drill a bit off the side of the plastic shroud surrounding the antenna mounting screw, making it easier to get the wire in and firmly clamped by then antenna.

You can also use various types of washers or electrical clamps and connectors to create a connection too, depending on how much work you want to put into this enhancement. Once you have connected your wire, just let it hang down freely while using the HT. Don't grip the wire when holding the HT, but let the wire hang down separately. When the radio is not in use, you can wind the wire around the set or do whatever else you like to store it conveniently.

What Sort of Improvement Will You Get?

You will notice a significant improvement in both transmitting and receiving on 2M, some improvement on 1.25M, and much less improvement on 70cm. We'll spare you the antenna theory issues as to why this is.
But on 2M, you can expect your signal strength to increase by perhaps 6dB. Some hams report as much as a 9dB improvement, but we find that improbable. A 6dB improvement is the same as increasing your transmitting power four-fold, so it is a huge/massive improvement, and truly could double your range – or could now allow you to reduce your transmitting power while still getting a signal out as far as before, and getting a greatly improved receive signal.

Now for an interesting extra point. Not only do you not always need to boost your transmit and receive capabilities, but sometimes this can be inappropriate. Sure, you can maybe offset a more efficient antenna by reducing your transmit power, but if you are already receiving very strong incoming signals, and particularly if you have some unwanted signals on nearby frequencies, boosting the signal from the antenna to the receiver can sometimes cause problems. If you find, after adding this extra wire to your HT, that it actually receives more poorly than before, even though it is transmitting better, you have a problem with your receiver circuitry being de-sensitized by strong adjacent signals, and in such a case, you should stop boosting your antenna.

For this reason, there is another way you could conveniently control your antenna, making it easier to selectively add or remove the extra wire. Have just a short lug connected to the antenna 'ground' base on the HT, and protruding slightly from the radio. Then if you need a boost in capabilities, you can conveniently clip whichever antenna you want onto the radio, but if your receiver is being overloaded, you can unclip it again without any great hassle or bother.

Some Extra Tips and Suggestions

First, if you use your HT on more than one band, you will need different length wires for each band (19.5″, 11.5″ and 6.5″ for the common 2M, 1.25M and 70cm bands). If you regularly switch bands, what you might want to do is have the 6.5″ wire mounted permanently, and keep two extender lengths, 5″ and 13″, then if you switch bands from 70cm, you connect the extender onto the bottom of the 6.5″ wire.

Note that the connection needs to be electrical, not just physical. There are easy and complex ways of doing this – the easiest is stripping a bit of insulation off the end of the 6.5″ wire and off one end of the two extender wires, then simply twisting the two together. Slightly more elegant would be to have an alligator clip on the extender wire, and more elegant still would be to have a paired socket and plug connector at the end of each wire.

Second, you don't actually need to have your antenna wire physically connected to the ground of the main antenna at all. You will get best results if it is connected, but if that is difficult – or if it is impossible, for example, with a radio that has a fixed antenna that you can't unscrew to access its ground – you can create a capacitive coupling between the radio and your antenna, by simply terminating your wire in a metal path (tin foil or copper or whatever) and affixing the patch somewhere on the radio. The bigger the patch size, the better, and some locations will work better than

others. Some trial and error experimentation might be called for to work out the best place to place the patch. Of course you could also open up the radio casing and hard wire/solder the wire to a ground point on the radio's circuit board or access the antenna's connector internally, then have the wire coming out through a hole in the case, and that would be slightly better than the capacitive coupled device, but is more hassle.

Third, some people have chosen to connect the extra wire to the antenna's connector rather than to the radio. There's no reason not to do this, and if you don't want to do anything to your radio, and/or if it is easier to add the extra wire to the antenna's connector rather than to the radio's connector, that's an equally fine solution.

Lastly, if you're still not convinced about how a simple piece of wire can add so amazingly to your radio's range, Google 'tiger tail antenna' to see many credible articles confirming it works. But, really, you don't need to do this, because it only costs you 10¢ and only takes you five minutes to do it yourself. You'll hear the difference, as will the people you're communicating with. And surely that's what counts.

ARE YOU A MEMBER OF BROWARD COUNTY ARES & RACES?
BROWARD COUNTY ARES & RACES
INVITES YOU TO OUR MONTHLY MEETINGS!

Use your radio license and make a difference in our community

The ham radio operators of Broward County have always played a very supportive roll in back-up emergency communications within Broward County.

Did you know?

- **No dues of membership fees**
- **Both ARES/RACES is an organization not a club!**
- **Learn emergency communications skills**
- **Learn about different modes of communications**
- **Learn about one another**
- **Learn direction finding skills**
- **Learn about Skywarn and storm spotter skills**
- **Participate in drills, public service events, field day and much more**

What does Broward County ARES/RACES do?

We provide back-up communications for served agencies in our community. These served agencies include but are not limited for Broward County Emergency Management Division, American Red Cross, and the National Weather Service and special events that go on in our County. We provide emergency communications during drills, table top exercises and public events such as the annual American Diabetes Association Tour de Cure's bike rides and the annual Fort Lauderdale Winterfest Boat Parade

If you would like to join Broward County ARES & RACES of Broward County, please visit us at a meeting on the third Tuesday of each month (except December). Our meeting place is at Broward Health in the Oak Room located at 1600 South Andrews Avenue. See the map on the last page of this newsletter.

For more information please contact:

Carol Sjursen / KJ4AWB
Broward County ARES Emergency Coordinator
kj4awb@arrl.net

Robin Terrill / N4HHP
Broward County RACES Officer
n4hhp@comcast.net

Broward Emergency Management
ARES / RACES Membership Application

Please type or print clearly

EOC Use Only

RACES # _____ RACES POSITION

Effective _____ _____

Expires _____Approved by _____

Completion of this Application DOES NOT OBLIGATE YOU

Enrollment in RACES qualifies you for County insurance in the event RACES is activated, and you are performing duties.

This information provides a database of qualified Amateur Radio operators available for ARES/RACES emergency activation.

ARES/RACES participation is voluntary.

By submitting this application you consent to a background check.

Name

Address

City Zip Code County

Home Phone Work Cell

Amateur Call License Class Expiration Date Date of Birth

Emergency Contact Phone

Email Address to receive Broward County ARES / RACES Alerts / Bulletins

You reside at the above address during what months? From _____ To _____

Are you capable of setting up a station in the field? Indicate what, below, if yes YES NO

What languages are you fluent in? _____

In the event of an emergency do you have family members you must assist? YES NO

Are you willing to Staff a shelter during a hurricane? YES NO

Is your home station capable of operation without commercial power? YES NO

Could you serve another area in Florida by joining the Communications Away Team (CAT)? YES NO MILES AWAY _____

Indicate below any capabilities you have i.e. big beam, tall tower, high power, special mode etc. that could assist in the event of an emergency.

Modes	160	80	40	30	20	17	15	12	10	6	2	1.25cm	70cm	Add. Bands/ Comments
SSB- Power in Watts														
CW- WPM														
TOR- RTTY, PSK31, WinLink, Pactor II, etc.														
SSTV, DSSTV, NBTV														
Mobile / RV- Modes and Power in Watts														
Packet- Baud 300, 1k2, 9k6														
APRS- GPS, WX, DF, Tracker														
ATV- AM, FM														
FM- Power in Watts														
Satellite- AO, FO, RS, SO etc.														

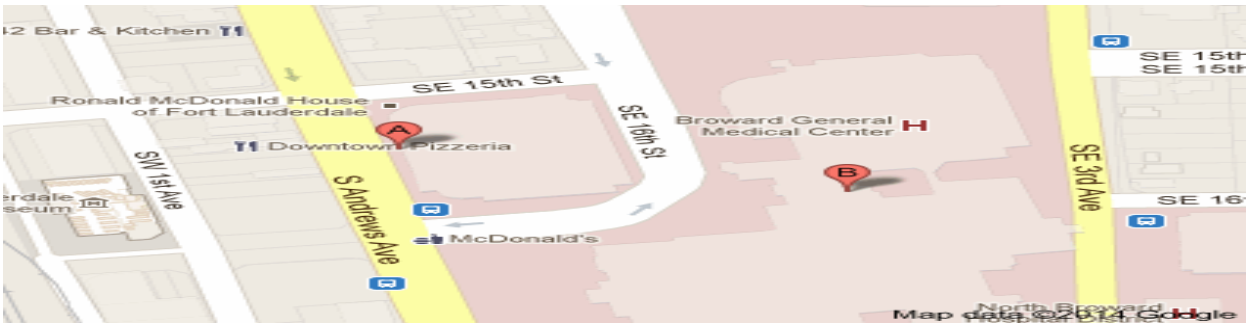
Other modes or special operation / capabilities / equipment i.e. CERT, CAP, Coast Guard, Marine, MARS, REACT, Contest Station, Remote Control, eet.

Do you have ICS 100 200 700 800 Do you have Emcomm 1 2 3 (circle those that you have) Please submit Certificate Copies.

Signature Date

Use back of this application for additional space. Please be as detailed as possible with all information.

Please list experience, qualifications and other special considerations or capabilities. Use back of this application for additional space. Revised 04/2014



Broward County ARES/RACES

3rd Tuesday of the month, at 7:30 P.M. Meeting in the Oak Room.

Broward Health (The old Broward General Medical Center)

1600 South Andrews Avenue, Fort Lauderdale, FL 33316 Meeting is held In The Oak Room

Parking will be in the 7 story parking garage, (see A Above). The entrance to the building is on the first floor directly across from the parking garage. You will need to go in the main entrance and sign in at the security desk and they will issue you a pass to wear. Bring a driver's license with you or a picture I.D. Do not by-pass security. They will tell you how to get to the Oak Room.

From I-95 or 595

Take I-95 or 595 to SR 84. Go east on 84 until you get to Andrews Avenue turn left (North) until you get to the hospital on your right. 1600 South Andrews Avenue

From I-95 to Broward Blvd

Take I-95 to Broward Blvd. East on Broward Blvd until you get to Andrews Avenue turn Right (South) until you get to the hospital on your Left. 1600 South Andrews Avenue

Talk-in will be on the 146.910 Mhz. -600 PL 110.9 Hz.
If you get lost or need directions, please call our cell phones:

Robin Terrill, N4HHP RACES Officer 954 *249*-5343
Robin Terrill, N4HHP Broward County Skywarn Coordinator 954 *249*-5343
Carol Sjursen, KJ4AWB ARES Emergency Coordinator 954 803-6338

Sign Up to Receive Your Free Tropical Weather Emails

If you would like to contribute an article or two, please send them to me with source and credits attached.
If you would like to receive this training Newsletter when they come out, please reply to n4hhp@arrl.net