



The HWN Report

The Official Newsletter of the Hurricane Watch Net

Volume IV, Issue 2

February 2025

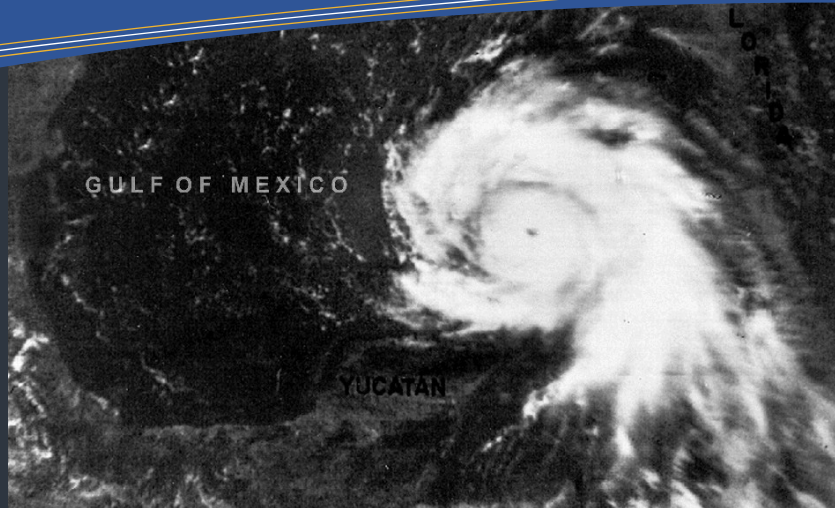
HWN 60th Anniversary and Celebration

Labor Day Weekend, 2025, will mark the 60th Anniversary of the Hurricane Watch Net.

In honor of our 60th Anniversary, we will host an "On-Air Celebration" on June 7th and 8th. We will operate on 14.325 MHz and 7.268 MHz. More information on the event will be posted on our website, hwn.org, our social media pages, and more. We hope you will join us.

COMING SOON

March 2025, we begin hosting a new video podcast to hosted on our YouTube Channel, www.youtube.com/HurricaneWatchNet. This program will focus on the tropics, the history of amateur radio's involvement with the National Weather Service and the National Hurricane Center, Hurricane Preparedness, and more.



Hurricane Camille 1969

Hurricane Camille, A Deadly Lady

By Bobby Graves – KB5HAV

By today's standards, weather forecasting in 1969 was in its infancy. The satellite image as seen above of Hurricane Camille was considered "state of the art" by the standards of the day.

There were 3 weather satellites used to capture images of Hurricane Camille: ESSA-8 (launched December 15, 1968), ESSA-9 (launched February 26, 1969), and Nimbus-3 (launched April 14, 1969). The three of these were polar-orbiting satellites which means they circle the Earth from pole to pole, providing images of the entire planet. Unfortunately, there were no geostationary weather satellites back then. They would come along years later.

- The ESSA-8 satellite could take 8 to 10 pictures every 24 hours. Each photo covered a 2,000-square-mile area at a resolution of 2 miles per pixel.
- The ESSA-9 satellite cameras had a resolution as ESSA-8, 2,000-square-mile area at a resolution of 2 miles per pixel. However, the cameras took single images of a particular region of the Earth's surface once a day.
- Nimbus-3, specifically designed for meteorological observations, typically took pictures twice daily by capturing global imagery during each orbit, which occurred roughly every 108 minutes.

The first geostationary weather satellite, GOES-1, wasn't launched until October 16, 1975. It was set to cover the Indian Ocean. GOES-2 was launched on June 16, 1977, and its coverage area was the North Atlantic, Caribbean, and Gulf of Mexico.

The weather satellite now used by NOAA and the National Hurricane Center in Miami, FL is GOES-16. It was launched on November 19, 2016. GOES-16, which is in a stationary orbit located about 22,300 miles over the Equator, takes a full disk image of the Earth every 10 minutes in its default "flex mode" while providing images of the continental United States every 5 minutes and smaller regional areas as frequently as every 30 seconds depending on the location of interest. It has a resolution of 0.3-1.24 miles per pixel.

In 1969, the Saffir-Simpson Hurricane Wind Scale had not yet been created. That came along in 1971.

Landfalling hurricanes with sustained winds over 156 miles per hour were, and thankfully remain, rare. At the time, the previous storm with winds this strong or stronger was the 1935 Hurricane that hit Long Key, FL.

In 1969, there was no 24-hour news and weather as we have today. In Mississippi, where I was born and raised, TV Stations began their broadcast day at 6:00 AM and went off air promptly at midnight. And the night before Camille made landfall, I recall watching the local evening news with my family. One of the news anchors, Burt Case, from WJTV in Jackson, Mississippi was on the coast covering the storm. He would call into the station and give live reports and updates.

Hurricane Camille formed in mid-August of 1969. It made landfall on the Mississippi Gulf Coast near Waveland on

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August 18th with maximum sustained winds estimated at 175 mph and gusts well over 200 mph. Two big ships were washed ashore at Biloxi. According to one of the ship's records, its anemometer stopped working after a peak wind speed of 200 knots (230 mph). Camille had a 12-mile wide eye and a peak official storm surge of 24 feet.



Beached ships in Gulfport, MS

Our founder, Jerry Murphy, K8YUW was stationed in Gulfport while in the Navy before and after Hurricane Camille. In an email from Jerry dated August 2020, he said, *"After Camille, we stayed active for a couple of days, collecting and disseminating reports of damages, etc., both to and from the National Hurricane Center. I was in Gulfport and reported what I saw to the National Hurricane Center, and was able to report to our Naval officials words from NHC and other agencies. National Guard, Red Cross, Salvation Army, and many others, depended on our feet on the ground for info, and to communicate with their others"*.

Camille was a dangerous, destructive, and deadly hurricane, wiping out almost everything on the Mississippi Gulf Coast.

According to records, Camille had a 24-foot storm surge. Some of the worst-hit areas were Waveland, Bay St. Louis, Pass Christian, Gulfport, and Biloxi. More than 11 inches of rain occurred in Hancock County, and most low-lying areas were flooded with up to 15 feet of water. U.S. Highway 90, which is close to the shore, was broken up in many areas, and sand and debris blocked much of it.

Just south of Gulfport are some barrier islands, one is Ship Island. The strength of Camille split the island in two. The body of water between West Ship Island and East Ship Island is now called "Camille's Cut".

Camille took the lives of 131 people and caused about \$950 million (1969 dollars) of damage, in Mississippi alone.

Over the years, I have tried to remind people that Hurricanes are not just a coastal event. 2024s Hurricane Helene was a sad reminder of this fact. Tropical systems can cause major issues well inland. While Hurricane Camille flattened nearly everything along the Mississippi Gulf Coast and damage left everyone in shock, the storm was not over, not by a long shot!

As Camille moved well inland, the rainfall helped to ease drought conditions in Tennessee, and Kentucky as the storm dropped about 3 to 5 inches of rain on the area. There was heavy flash flooding in West Virginia responsible for destroying 36 houses and 12 trailers.

The State of Virginia was hit extremely hard with torrential rainfall...12 to 20 inches with a maximum of 27 inches. According to a report I read, Most of the rainfall occurred during a 3-5 hour period on August 19-20. In the mountain slopes between Charlottesville and Lynchburg, more than 26 inches of rain fell in 12 hours, but the worst was in Nelson County where 27 inches fell. There, rainfall was so heavy that reports were received of birds drowning in trees, cows floating down Hatt Creek, and survivors having to cup their hands around their mouths and noses to breathe through the deluge. Though the official rainfall amount recorded was 27 inches, unofficial estimates are much greater. Some estimate that more than 40 inches of rain fell at Davis Creek. Most gauges were washed away; however, it was reported that an empty 55-gallon drum filled with 31 inches of water, and it wasn't located in the center of the heaviest rainfall. So much rain fell in such a short time in Nelson County that, according to the Na-

tional Weather Service when this happened, it was *"the probable maximum rainfall which meteorologists compute to be theoretically possible."* Shortly after landfall in Mississippi, and to this day, there is a story of a "Hurricane Party" that occurred on the third floor of the Richelieu Manor Apartments in Pass Christian, MS. No one knows for sure if this is fact or fiction. Regardless, and sadly, the wind and storm surge took the lives of 23 people at these apartments – there was only one survivor.



The Richelieu Manor Apartments in Pass Christian, MS before and after Hurricane Camille paid a visit.

Hurricane Camille killed 259 people and caused \$1.42 billion (1969 USD, \$9.27 billion 2017 USD) in damages. According to NOAA, "to date, a complete understanding of the reasons for the system's power, extremely rapid intensification over open water and strength at landfall has not been achieved".

For decades, many residents of the Mississippi Gulf Coast stated they would not evacuate for a hurricane unless it were another Camille. I had family who lived in the Moss Point and Pascagoula area who would say the same thing. They simply believed there could never be another hurricane that powerful. However, that changed when Hurricane Katrina came ashore on Monday, August 29th, 2005. But, that is a story for another day!

It is rare for a Category 5 Hurricane to make US landfall. In fact, in the last 100 years, only four have struck the US: the "1935 Labor Day Hurricane" which hit the Florida Keys on September 3, 1935; Camille which hit Waveland, Mississippi on August 18, 1969; Andrew which hit Homestead, Florida on August 24, 1992, and Michael which hit Mexico Beach, Florida on October 10, 2018. Let us pray we never witness the power and destruction a Category 5 Hurricane can bring!

From the Manager



By Bobby Graves, KB5HAV

I certainly hope you are enjoying our monthly newsletter. I hope that you find the material contained within each publication to be not only interesting but informative as well. And please, it would be an honor if you found our newsletter worth sharing with others!

With each newsletter this year, at the top of the first page, you will find a satellite photo of a historic hurricane as well as an article regarding that storm.

With each newsletter, we plan to post information relating to the weather and personal storm preparedness. We plan to have an article on at least one of our members called "Member Focus". Since we have many members, and friends, who have experienced hurricanes up close and personal, and perhaps participated in other forms of "Emergency Communications", we will have a segment titled, "Ham Stories".

Member Focus – Tony Siese, VP9HK



By Tony Siese, VP9HK

I was born in Wales. On completing college, I did my National Service in the British Army, spending most of that time at a Military Hospital in Germany. On my demobilization, I worked in the Welsh valleys for three years. Having seen a position for an Optometrist advertised in Bermuda, I applied for the position that initially was for three years, and I got the job, arriving on February 9th 1961.

My first hurricane was Arlene in 1964. No prior notice was given that a storm was approaching the island, and because my home was relatively close to the office, the staff all stayed with me until the storm passed.

In 1985, I first met Jerry Herman N3BDW (Net Manager at the time) and his wife, Mary when they visited Bermuda and he was responsible for me getting involved with the Hurricane Watch Net.

The next storm of note was Emily in 1987. Just four months earlier, I had moved into my current home. At 6:00am on September 25th, 1987, I received a telephone call from Don Kay, KØ1ND (SK 2017). Emily was supposed to dissipate over the mountains of the Dominican Republic and Don called to say it had regenerated and was heading our way and should arrive about 10:00am. It was a very fast forward moving storm with a speed of about 44mph. Communications were not what they are today, forecasts were not as accurate and if it had not been for Don Kay, we would not have been aware of what could have been a disaster. Telephone calls were made, making people aware, two of which were to my sons who had a yacht on an exposed mooring and needing to be taken to a secure sheltered mooring. My eldest son, with another friend, took a couple of small motorboats and tying the yachts to them, fore and aft, took off across the Great Sound to get them to a secure mooring in Paradise Lake. His friend managed to get to Paradise Lake. Unfortunately, my son lost one lashing and ended up towing the yacht. By this time the wind was picking up and the waves were increasing. The motor boat was swamped and he climbed

This month, our "Member Focus" is on one of our longest active members, Tony Siese, VP9HK.

For our "Ham Focus", we present Ron Meihls, KB3MBS. Ron is our newest "Honorary Member" having served the Hurricane Watch Net for 20 consecutive years.

In a special segment, you will meet one of our Associate Managers, Wendell Neal, K5WAN.

For a technical segment, we have an article from John McGowan, K2JBX on LED lighting.

Since the main theme for the 2025 National Hurricane Conference is "Looking Back 20 Years After Katrina", in our next issue of "The HWN Report", we will take a look at that historic storm.

If you have an idea or article for "The HWN Report", please let me know. You can reach me at editor@hwn.org.

aboard the yacht. The wind was driving him over to the Somerset shore but before he reached it, the wind changed, the yacht was swamped and sank. He was left in the water with just a life jacket – his main concern was to stay in the Sound and not be dashed on the rocks. He was in the water for two hours before he was seen from the cruise ship, "The Meridian", which was riding out the storm in the Great Sound. They lowered a lifeboat, took him aboard and the ship's doctor checked Michael before allowing him to go ashore. He was taken to the dock of the Lantana Cottage Colony where K1EFI was on vacation with his wife. He contacted me on 2 meters to tell me Michael had just been brought ashore. To this day, Michael will not talk about his near death experience.

Fortunately, Emily was a very fast moving storm and it came and left very quickly. Don's estimate that it would arrive at 10:00am was a little off. After calling my sons, I went into my office at 7:00am to cancel my appointments. I parked my car outside of the office, calling my patients to cancel their appointments, came out to find the car parked in front of mine had the back damaged from a pipe which had blown off the roof. There was a construction site at the end of the road and workers were directing traffic to get out of the way with the possibility of plywood sheets flying around. As I was driving, I was reporting on conditions via VHF to the Emergency Measures Organization (EMO) at Police HQ. Various roads were blocked off and I had to leave my car at the hospital and walk the rest of the way home. Trees were blocking roads, electrical lines were on the road and we had to be very careful where we walked. The Police asked the Radio Society member at HQ what was the idiot doing walking around in the storm and he told them "He is attempting to get home".

By 9:30 – 10:00 am, the storm had passed. With clear skies, the noise from the birds which were caught up in the storm and found rest in Bermuda was quite amazing. That is one area where, being an island, birds have somewhere to rest having been caught up in the vortex of a storm.

The tree damage was quite high and I still have a lot of firewood from that storm. I lost a few trees and also a pergola. A tornado came from the south west, took down two trees in its' path, went between my house and the next door neighbor's, up the hill and took off the roof of a house at the top of the hill. The trees and pergola were removed and the pergola replaced by the house insurance.

Fortunately, there was no loss of life. The cleanup took a couple of weeks. We were without mains electricity for three weeks, losing about \$600.00 worth of food in the freezer. No generators were available on the island and we had some generators brought in five days later. That generator lasted 22 years and was a worthwhile investment. Another portable generator was purchased but now have had a permanent installation which automatically cuts in when the mains supply is lost.

This was the first direct hit for many years and a lot of lessons were learned. The Royal Bermuda Regiment was embodied (as it is during any emergency) and together with Public Works and BELCO (Bermuda Electric Light Co.) the island returned to relative normality within a few days with the exception of the electricity supply. Of course, each house has its' own water supply, so that is a problem we do not experience.

For the next 20 years, the "Hams" played an integral part with the EMO giving them storm updates as received from the Hurricane Centre. The previous system when the weather was under the control of the US Military, reports were sent from the Hurricane Centre to the base and they had to send it to Washington to be cleared before it could be released to the local authorities. The local authorities discovered the "Ham" reports were identical to those issued by the US authorities and they received them about one hour earlier! I spent some 20 years with the EMO reporting on the various storms. The Radio Society received a Government Award for their assistance during hurricanes.

(Editors Notes)

About 11 years ago, Tony told me of an old Bermuda method of predicting the weather using "shark oil". When I asked about this in detail, he said, "Shark oil has been used to predict weather in Bermuda for centuries. The

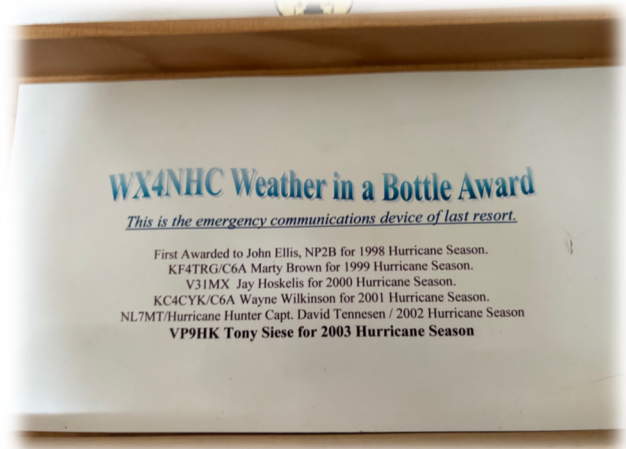
oil from a shark's liver is bottled, and whilst I am not able to read it the way the old Bermudians can, who are able to predict the wind direction as well with the way some of the twirls occur in the liquid, I am learning fast. Before weather forecasters were invented, Bermudians were predicting the weather with a great deal of accuracy using shark oil and also when spider webs are low, this also indicates a storm. If you google shark oil weather predictions and also spider weather predictions, you can find all sorts of information."



Shark Oil

In 2004, Tony attended the Hurricane Mini-Conference held at the National Hurricane Center in Miami, FL. While there, he gave a presentation on the landfall and effects of Hurricane Fabian that hit Bermuda in September 2003. After his presentation, John McHugh, K4AG, WX4NHC Amateur Radio Station Coordinator, and Julio Ripoll, WD4R, WX4NHC Assistant Amateur Radio Station Coordinator, presented Tony with the "WX4NHC Weather in a Bottle Award".

In 2016, I had the pleasure of making Tony an "Honorary Member" of the Hurricane Watch Net. At the time, he had been with HWN for 31 years. His dedication to helping others affected by Hurricanes and being a reporting station whenever his home and island of Bermuda were affected is deserving of such recognition. To this day, Tony remains a valued member of HWN!



Ham Stories



By Ron Meihls, KB3MBS

I was contacted by Bobby KB5HAV about my entering my 20th year with the Hurricane Watch Net and if I would like to write an article about some of my experiences for the past twenty (20) years. I thought it was a great idea. But to save from writing a bound book (which I could) I will keep it to just a few pages! My interest in HAM radio dates back to the early 1970s when I could not get Morse code down and then my lifestyle changed for many, many years. Then, with some help from a local (ELMER), I passed the code and got my ticket in 2005. Of course, when I got my ticket, I almost immedi-

ately joined the Hurricane Watch Net and the Maritime Mobile Service Net, both of which have been a very interesting twenty {20} years. In the almost twenty years of being in the Hurricane Watch Net, I have met a lot of great radio operators and friends and have lost a lot of great operators and friends. But as we all experienced working with the Hurricane Watch Net, you can have some activations that are a day or two, and then you can have other activations that last more than a week of continuous operations on multiple bands.

As you can imagine, my radio shack has changed quite a bit in the past twenty years. You can never have enough radio stuff! It has always been gratifying and rewarding when you make contact with stations during a hurricane and in many cases, we are the only link and communications outside of their location, so all of those hours of listening and listening pay off when you get that satisfaction of helping them. We have a great net-

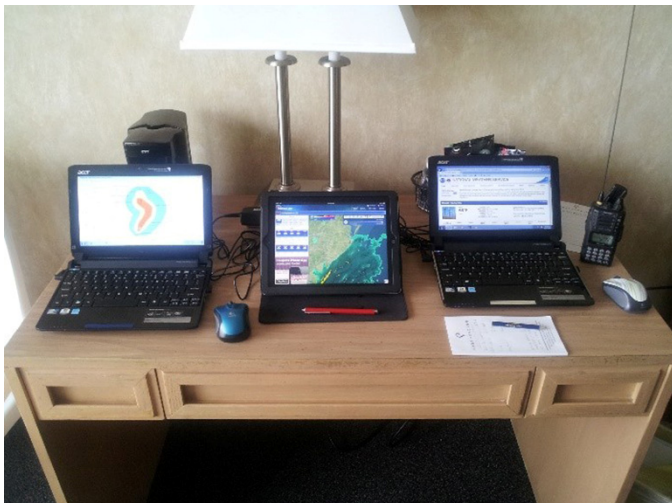
work of Hurricane Watch Net operators, many of which are in the direct path of these deadly hurricanes. There were a couple of events in the last twenty years that I'd like to tell you about.

During Hurricane Sandy, my wife, Diane, and I would usually go to the Outer Banks in North Carolina for her birthday. The year of Hurricane Sandy in October 2012 was no different. We were on the lower part of the Outer Banks in Buxton, NC when Hurricane Sandy bared down. We were advised to evacuate the lower section of the Outer Banks, so we drove an hour north to Nags Head, NC, and found a hotel. We are not weird but we take a lot of computer and radio equipment on our trips away and this was no exception. We were on the third floor of a hotel right against the ocean, with a small sand dune between us and the ocean. On the 1st day, we had our little operations center set up in our hotel room. Along with computers, weather tracking equipment, and 2-meter radio equipment linked to the mainland, we watched things get really ugly. As we watched the sliding



Station of KB3MBS

glass doors to our hotel room bulge in and out the entire day and evening, there was enough wind blowing through the sliding doors that it was blowing the ceiling tiles out of their frames in our bedroom. We also took in rain and seawater from the windows and sliding doors. The wind was howling very bad and at about 2 am in the morning the entire area was illuminated clear out into the ocean as a huge power substation blew up and made a beautiful firework show. The hotel had one elevator and we kind of chuckled that we would not go on the elevator because of the unstable power and sure enough, it went down shortly after. On the last afternoon, Diane and I geared up and walked the beaches and got our butts sandblasted, and took pictures of the waves crashing into the shore. For us, it was a neat experience, but we found sand in our Ford Explorer in every nook and cranny you could ever think of.



Pics of the station in the hotel on the beach.

In 2010, during my Net on the Maritime Mobile Service Net, Jean-Robert

Gaillard, Jr. (HH2JR) in Port au Prince, Haiti made contact with me while the earthquakes were happening. He had to evacuate his home while talking to me because of the shaking of his house. He is a friend I made in Haiti and I still keep in contact with him. This was the great earthquake that killed a quarter of a million people. Shortly thereafter, I was contacted regarding deployment to Haiti to help with comms after the earthquake event. A few days later, I was on a jet heading to Port au Prince, Haiti on to the MASH hospital at the airport. I was there for about nine days, and it was a big eye-opener to see the aftermath of such a massive earthquake. During the time I was there I used the NHC call sign of HH2/WX4NHC call sign for my communications back to the States. I was very honored to be one of only ten operators from the United States to be sent there for this task.



Left to right – Jean-Robert Gaillard, Jr., HH2JR and Ron Meihls, KB3MBS

Back in August of 2014, we were talking to a woman at a florist who, if I'm not mistaken, was a cancer patient and she started speaking about the event in Virginia that was being set up for lots of kids that have cancer. I got the contact information and made contact with the coordinator for the Camp Fantastic Cancer Event in Front Royal, VA, and decided to get a special event call sign (**N3C**) and have a field day with the kids. On August 19, 2014, I went down and set up a remote station using a Yaesu 857D radio with an auto-tuner and a power supply. The antenna was a simple G5RV that we strung from the top of a flagpole to a building.



Portable station with maps for the kids

I had all states of the United States on one big board and the world on the other board. The children made contacts over the pond and we did a lot of listening. I had tags with pins so when the kids made a contact their name and the call sign was pinned on the map so they could see where in the world they just spoke to. As you can imagine, with my setup, we were not

a booming DX station. But that was just great because the kids really didn't understand all of the equipment, they were just totally amazed that they could talk into a microphone that was hooked to a black box and were able to talk to other people in the world. And they just thought that was so cool. That made everything worthwhile and that's some of the great things you can do with the HAM Radio and the community.



Burial site of Hiram P. Maxim, W1AW

On September 1, 2019, our local Amateur Radio Club (W3CWC) set up a special event for Hiram Percy Maxim. He was an American radio pioneer, inventor, and co-founder of the American Radio Relay League (ARRL). Maxim is buried in Rose Hill Cemetery here in Hagerstown, MD. He was born in Brooklyn, NY on September 2, 1869, and married Josephine Hamilton of Hagerstown, MD hence his burial here in Hagerstown. The special event call sign was (**W3HPM**) on a frequency of 14.245. I made a total of 56 contacts regarding the special event. For more information, please visit this link: https://en.wikipedia.org/wiki/Hiram_Percy_Maxim

Just last year during Hurricane Milton, large areas had lost all communications. There was an operator that had gathered messages from the surrounding neighbors and he forwarded them to the Hurricane Watch Net radio system. I was fortunate enough to have been the one who made the calls to all 9 families to tell them that their loved ones were safe and sound. There is no better satisfaction than to hear the relief in the family's voices on the phone that their Loved ones were safe. It has been fun and a great honor to be part of such a renowned organization as the Hurricane Watch Net which has been around since 1965. They are a great group of highly trained individuals and extremely dedicated to the mission.

Ron Meihls
HWN
KB3MBS

Meet Wendell Neal, K5WAN – Associate Manager



I became a Technician Class operator in 2009 and immediately began studying for my General and Extra Class licenses and passed both tests (at the same VE session) a couple of months later. Being born in 1960, I was a "late

bloomer" to Amateur Radio. My lifelong passion for radio in general probably comes from my father. He was a career truck driver but obtained his Third-Class Radiotelephone License and went to work for a 5,000-watt AM radio station in Atlanta, GA, WYZE 1480. He ran the Sunday morning Gospel Show but we would all gather at the station on Saturday nights, back when the artists used to visit radio stations and play their latest Country hit songs live in the studio. This is where I also fell in love with the sound of the pedal steel guitar.

My interest in the weather finally spurred me to obtain my ham license. I remember being sheltered in the basement of our home in Atlanta whenever severe weather moved through. We would huddle together listening to the NOAA weather broadcast on an old Radio Shack Patrolman radio. When I got old enough to drive, my dad would let me take the family car out anytime we had rough weather. I was fascinated with the types of clouds and storm structures and would study anything I could get my hands on if it was weather-related.

Back in the mid-70s, the CB bug got me along with everyone else. With my Realistic TRC30A Navaho base station, Sigma 5/8 wave ground plane, and Moonraker 4 antennas, I really thought I was "top-notch." As usual, the CB craze died out, life got in the way and radio communications were not a part of my life for many years although the interest was still there.

Most of my career was focused on Safety Management, mostly in the transportation industry, and still is today after all these years. After working in my home state of Georgia, then Ohio, then Oklahoma, living in "Tor-

nado Alley resurrected my passion for weather and my passion for radio communications. Obtaining an Amateur license was one of those "Round Tuit" items, but I finally focused and got my license and immediately got involved in the SKYWARN program. After a few years, opportunity came knocking and I was hired by KOTV6 television station as one of their media Storm Trackers. The six years I spent with the Weather Department at KOTV6 were some of the best times in my life. What a blast it was to work closely with some of the best meteorologists in the business! I have also spent time as a net control operator for various nets both weather and non-weather related.

I mentioned pedal steel guitar earlier, but I also spent time playing drums, rhythm guitar, and bass guitar and I've played with many bands throughout my lifetime.

These days my time is spent working from home as a Quality Control Consultant for insurance companies. I have been a proud member of The Hurricane Watch Net for three years now. I have a sincere heart for Emergency Management and Emergency Communications and have dedicated myself to helping those in need, particularly if severe weather is involved. Being a small part of the Hurricane Watch Net is truly a privilege and a labor of love. It is my honor and hope to serve mankind for many years to come.

I currently reside back in my home state of Georgia with my dear wife Teresa, who puts up with my "ham radio addiction." All kidding aside, I'm very blessed to have a wife who is truly supportive in all areas of my life.

Hopefully, I'll catch you on the air someday.

73 and God Bless!
Wendell Neal de K5WAN

LED Lighting



By John McGowan –K2JBX

If you're having trouble finding replacement indicator lamps for your radio equipment, then LED lighting may be the answer.

I have found multiple uses for LED lighting strips. The strips come on a roll about 16 feet long and have adhesive backing for easy mounting.

These can be found online at such places as Amazon and the like. Lighting strips come in several colors also in temp such as 3000K, 3200K, 4000K, cool white, warm white, and daylight. I prefer to use the warm light tones as they are more natural in color.

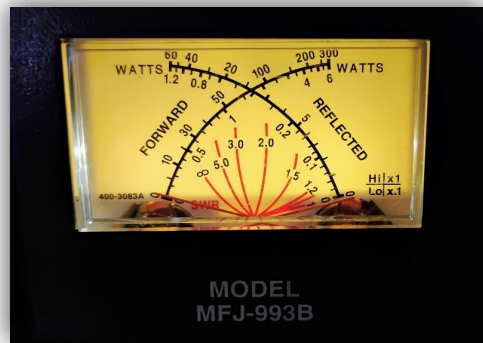
Lighting strips have SMDs (surface mounted diode) that are configured allowing for the strip to be cut every 2 inches. There is a connection point at each section marked + -. I use 24 gauge stranded wire to solder leads to my strips but there are also available solderless connectors.



I have replaced the indicator lamps in both my YAESU G-1000 DXA and my MFJ-993B.

The MFJ tuner was a simple replacement. I cut a 2-inch-long strip and removed the RED wire connected to the old indicator lamp and soldered this to the LED strip + connection. Leaving the old indicator lamp in place I made a connection from the ORANGE wire to the - mark on the LED strip. The voltage reading between the RED + and Orange- wires is 12DC.

Once all the connections are done, I secure the light strip using RTV silicone such that the strip was at the bottom of the meter facing toward the top of the meter. This casts a soft backlight on the meter.



The YAESU involves a lot of disassembly to get to the back of the display but when complete the result is a perfect edge light meter face. Once the meter was removed from the housing, I made up a 2-inch-long strip with short leads of about 4 inches each. I secured the strip once again using RTV silicone placing the SMDs against the clear plastic bezel. The old indicator lamp has 2 gray wires connected to it which go to the J 1006 connection point on the circuit board. Terminal # 9 (last wire on the left) is the 12v DC + connection leaving the other gray wire for the - connection. Since the factory lamp is on the opposite side, I soldered my leads to the gray wires and covered them with heat shrink.



I made LED conversions to these meters in 2015 and they still look great.

Around the house and at our hunting camp I have installed LED strips under the upper kitchen cupboards to render nice task lighting on the countertops. I also installed strips on top of my kitchen cupboards to give a soft backlight effect. These LEDs have been turned on for the past 10 years and cost pennies each year to operate.



Another option for under cupboard lighting one can use "Puck" lights. These typically come with 120v Halogen lamps. I have utilized old 12VDC

battery chargers for the power source. On some of my retrofits, I have removed the old under-counter fluorescent lights and connected my DC power supplies to the existing 120v power wires which allowed me to use the wall switches for control.

I recommend selecting a 20w -8-10 LED lamp. A G4, GZ4 lamp will fit the puck socket.



There are also several options for lamp sockets and adapters.



The above is with single or double-pin base

G4 sockets

If you have yard lights like mine, you can replace the 912 wedge lamps with LED lamps. If your old yard lamps were powered using AC then you will need to convert it to DC. 12-15v is ok.

Do not use electronic power packs - they cause the LEDs to flicker! A 16-foot roll will require a 1.5 amp power adaptor.



Sources for LED lamps and accessories:
superbrightleds.com, amazon.com, or Google search.

Wind Scales used by the National Weather Service

The Saffir Simpson Hurricane Wind Scale

Shortly after Hurricane Camille in 1969, the United Nations commissioned Herbert Saffir, a structural contractor, to study low-cost housing in hurricane-prone areas. While conducting his studies, he discovered that there were no damage-based scales for hurricanes like those for earthquake intensity, such as the Modified Mercalli or Richter scales.

Mr. Saffir proposed a simplified 1-5 grading scale as a guide for areas that do not have hurricane building codes. Two factors were used to justify this grading scale. Wind gust speeds sustained for 2–3 seconds at an elevation of 30 feet, and subjective levels of structural damage. He gave the proposed scale to the National Hurricane Center for their use. Robert Simpson, director of the NHC at the time changed the terminology from “grade” to “category”, organized them by sustained wind speeds of 1-minute duration, and added storm surge height ranges, adding barometric pressure ranges later on. In 1975, the Saffir-Simpson Scale was released to the public.

In 2009, the National Hurricane Center eliminated barometric pressure and storm surge ranges from the categories, transforming it into a pure wind scale, called the Saffir–Simpson Hurricane Wind Scale. This update became official in May 2010. The changes were intended to indicate that a Category 2 hurricane that hits a major city will likely cause far more cumulative damage than a Category 5 hurricane that hits a rural area. The agency cited examples of hurricanes as reasons for removing “scientifically inaccurate” information, including Hurricane Katrina (2005) and Hurricane Ike (2008), which both had stronger than estimated storm surges, and Hurricane Charley (2004), which had weaker than estimated storm surge. Since being removed from the Saffir–Simpson Hurricane Wind Scale, storm surge prediction, and modeling are handled by computer numerical models such as ADCIRC and SLOSH.

The Advanced CIRCulation (ADCIRC) storm surge model combines rain, atmospheric pressure, and wind forecasts to predict when, where, and to what extent flooding will inundate a coastal community with greater precision than other available models. SLOSH stands for Sea, Lake, and Overland Surge from Hurricanes. It is a computerized model developed by the National Weather Service (NWS) to estimate storm surge heights and winds resulting from historical, hypothetical, or predicted hurricanes.

In 2012, the NHC extended the wind speed range for Category 4 by 1 mph in both directions, to 130–156 mph, with corresponding changes in the other units (113–136 knots, 209–251 km/h), instead of 131–155 mph (114–135 knots, 210–249 km/h). The NHC and the Central Pacific Hurricane Center assign tropical cyclone intensities in 5-knot increments, and then convert them to mph and km/h with a similar rounding for other reports. So an intensity of 115 knots is rated Category 4, but the conversion to miles per hour (132.3 mph) would round down to 130 mph, making it appear to be a Category 3 storm. Likewise, an intensity of 135 knots (~155 mph, and thus Category 4) is 250.02 km/h, which, according to the definition used before the change would be Category 5.

To resolve these issues, the NHC had been obliged to incorrectly report storms with wind speeds of 115 knots as 135 mph, and 135 knots as 245 km/h. The change in definition allows storms of 115 knots to be correctly rounded down to 130 mph, and storms of 135 knots to be correctly reported as 250 km/h, and still qualify as Category 4. Since the NHC had previously rounded incorrectly to keep storms in Category 4 in each unit of measure, the change does not affect the classification of storms from previous years. The new scale became operational on May 15, 2012.

In conclusion, the Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures. In the western North Pacific, the term "super typhoon" is used for tropical cyclones with sustained winds exceeding 150 mph.

Saffir-Simpson Hurricane Wind Scale

Category	Sustained Winds	Types of Damage Due to Hurricane Winds
1	74-95 mph 64-82 knots 119-153 km/h	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roofs, shingles, vinyl siding, and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96-110 mph 83-95 knots 154-177 km/h	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3 (Major)	111-129 mph 96-112 knots 178-208 km/h	Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4 (Major)	130-156 mph 113-136 knots 209-251 km/h	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5 (Major)	157 mph or higher 137 knots or higher 252 km/h or higher	Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

The Enhanced Fujita Scale for Tornadoes

Fujita Scale

Tornadoes occur on every continent, but due to its geography, the mainland United States normally records more tornadoes per year than anywhere in the world. Before the mid-twentieth century, our understanding of how they worked, why they formed, and how to predict them, was very limited. They can be devastating, but they strike with relative infrequency and without much warning—all of which makes them difficult to study.

In a 1971 publication titled "Proposed Characterization of Tornadoes and Hurricanes by Area and Intensity," a University of Chicago meteorologist, Ted Fujita, laid out his scale to measure tornado intensity by linking estimated wind speeds to the "Beaufort Wind Scale" and to the degree of damage that they caused. Fujita based the latter on the hundreds of tornado damage surveys that he had conducted on the ground and from the air. Later that year, Fujita, in collaboration with Allen Pearson, head of the National Severe Storms Forecast Center/NSSFC (currently the Storm Prediction Center/SPC), introduced the "Fujita Scale" to rate the strength of any given tornado.

For example, Mr. Fujita's scale indicated that tornadoes with winds of 207 to 260 miles an hour, causing devastating damage, would be classified as F4. He described the damage that F4 tornadoes cause as: "Whole frame houses leveled, leaving piles of debris; steel structures badly damaged; trees debarked by small flying debris; cars and trains thrown some distances or rolled considerable distances; large missiles generated."

The "Fujita Scale" quickly impacted the field of meteorology. Today, a version of that scale is still used to categorize every tornado in the U.S.

What is the Enhanced Fujita (EF) Scale?

After three decades, the National Weather Service decided to rework the scale to better define damage indicators, account for construction quality, and definitively correlate damage with wind speed. A team of meteorologists and engineers began work on and soon issued the "Enhanced Fujita Scale". Among the experts who devised the new scale were two of Fujita's former students: severe-weather experts Greg Forbes, SM'73, PhD'78, now retired from The Weather Channel, and Roger Wakimoto, PhD'81, of the University of California, Los Angeles. In early 2007, the "Fujita Scale" was decommissioned and replaced by the "Enhanced Fujita Scale". The new scale more accurately matches wind speeds to the severity of damage caused by a tornado. The EF Scale remains the standard of the U.S. National Oceanic and Atmospheric Administration (NOAA). Though it was devised according to American construction practices, other nations now use adapted versions of the "Enhanced Fujita Scale".

Enhanced Fujita Scale (for Tornadoes)

- **EF 0 Tornado (65-85 mph) (105-137 km/h)** Minor or no damage. Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
- **EF1 Tornado (86-110) (138-177 km/h)** Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
- **EF2 Tornado (111-135) (178-217 km/h)** Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off the ground.
- **EF3 Tornado (136-165) (218-266 km/h)** Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
- **EF4 Tornado (166-200 mph) (267-322 km/h)** Extreme damage. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
- **EF5 Tornado (>200 mph) (>322 km/h)** Total destruction of buildings. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 109 yards; high-rise buildings have significant structural deformation; incredible phenomena will occur.

Do You Have Ideas or Articles for this Newsletter?

If you have ideas or articles you would like to see in this newsletter, as well as have any questions or comments, they are most welcomed and can be sent to editor@hwn.org

When submitting an article, please adhere to the following guidelines:

- Articles should be of general interest to readers if possible.
- Articles should be in MS Word format (.doc) or plain text files. (.txt)
- Vulgar or offensive language should be avoided.
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