MarMtg Fri 6:30 Apr 27 at the
MCL Cafeteria in Kettering

2018-4/5

ANOMALOUS PROPAGATION

Newsletter: ***The Midwest VHF/UHF Society***

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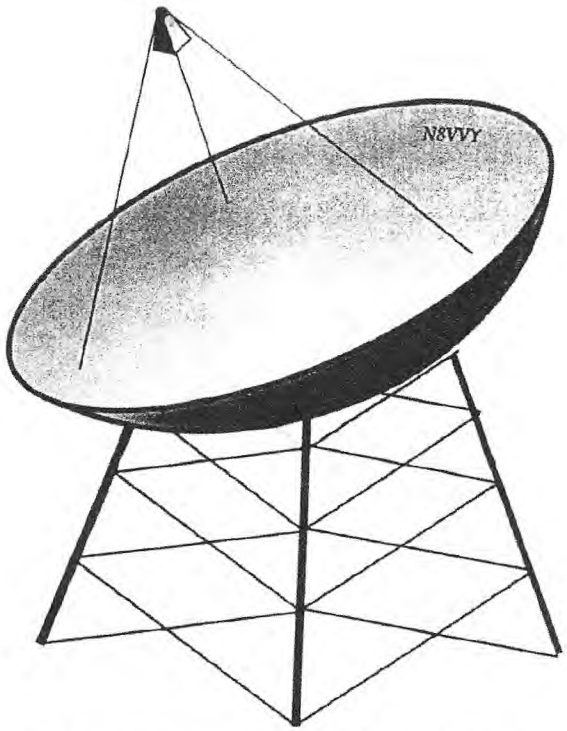

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Annual Society membership is $ 12.00. Please make checks payable to Joe Muchnij, N8QOD

MIDWEST VHF-UHF SOCIETY

Vol.32 No.4 www.mvus.org Apr: 2018

Beacons: 1296.079 **W8KSE** EM79ur Dayton, OH---- 2W to Big Wheel at 800' AGL.

Listen for the **K9AYA Beacons** at EM79qk, 2W @ 10,368.000 MHz
both are copied by K4TO daily. 1W @ 5,760.000 MHz

Hamvention: May 18, 19, 20 2018

MVUS Booth 6708

Microwave Update later this year: Oct. 11-14

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De N8ZM: As I write this in the middle of April, we have seen the last 6 Mondays with snowfall. Has Global Warming led to another Ice Age? Just asking.
IF it ever does warm up, W8RKO and I will be headed to the Englewood water tank to install the 2m and 432 beacon antennas, as well as a mesh network antenna. This site is maybe 80' higher than we were at HARA with the beacons, so they should be better copy a lot further out. Don't listen for them yet, as the weather is still flaky and we have the usual distraction in the month of May to occupy our time as well.
Hamvention is Coming! HamVention is coming! And MVUS will be in booth 6708, pretty much the same location as last year. As you have probably heard, the new building is delayed so we will be in the big tent again. Lighting and anchors holding the tent in place should be better this year. I have enlisted (conscripted?) the services of members Schulsinger, Human, Burke, and Stauffer to look after the booth this year, but please feel free to stop by and give them a break. Please, if you have any cool VHF or microwave stuff to display, we'd appreciate having it in the booth to attract attention.
Also in the booth will be a poster plugging Microwave Update 2018. We had a meeting this past week to work on a lot of the details and make a few decisions. Things are moving along nicely and we hope to have the registration portion of the website going shortly. MUD registration for the full two days, including both lunches, the banquet, and the proceedings book and CD, will be $145 in advance, $155 after October 1st. We will be set up to accept Pay Pal, but other arrangements can be made with our treasurer. If you are planning to attend, I suggest that you make hotel reservations soon as they are telling us there are other events that weekend and there is a lot of pressure on our room block. Check out microwaveupdate.org.
John, N8UR, is in charge of collecting presentations and papers for MUD, and has a few already, but more are always welcome. We can always put more material in the proceedings than we might have time for as presentations, so though you might not wish to give a talk, at least write up your latest project and have it published in the book. After all, conferences are all about sharing what we've learned, regardless of the medium used. Contact n8ur@mvus.org.
See you on the 27th! De Tom, N8ZM

Joe, WA8OGS, contributed the following tidbits of interesting information:

K1FO was well-known for his 432 MHz yagi designs and amplifiers. Steve (silent key) wrote this about his **432 EME** station: "The equipment here is 24x15 el Yagis, rear mounted with polarity rotation. Open wire & LDF4-50 phasing lines. TX power is 1500 watts at the array. RX is a FHX-35LG HEMT to a MGF-1412, with lots of filtering after the 1st PA. Total system temperature is ~ 72K with the RX nF portion approximately . 27 dB."

BIGGER 432 MHz Antenna
The well-equipped 432 MHz array of NC1I has forty-eight 15-element K1FO rear-mounted yagis with polarity rotation, using a feed-mounted MGF1412 cavity preamp with a 0.28 dB noise figure. (See picture on cover of April 1995 QST).

lThis & That 4-18

Self Driving Cars. Do they avoid pot holes; and what about puddles from a rain? [Gerd]

Interesting. In an hours drive, a SUV emits more carbon dioxide than a human in his entire life. [Jotted that down from a magazine with the comment: do some calculation. Gerd]

Century of the Migrants. There are about 1 billion migrants today from the 7.5 billion total population. [Thomas Nail at Aeon]

Suspension. Harold J. Collins, Dayton, Oh. -The Commission suspended his license for 6 months for allegedly have taken the examination under the name of Isrel H. Snyder for the purpose of obtaining an amateur operator's licenses for Mr. Snyder. [Radio magazine May 1939, pg.70]

Hanging. "You simply cannot hang a millionaire in America." - [Bourke Cockran, American politician and orator, 1854-1923]

Lockhorns: "Leroy wears the same belt as ten years ago… just four inches lower." [Cartoon]

Ignorance. 60 years ago I knew everything; now I know nothing; education is a progressive discovery of our ignorance. [Will Durant]

1930s Advertising. The old magazine had a few very interesting articles about antennas and equipment. One was by John Kraus, W8JK. Most had a few final paragraphs moved to the end where most advertisement were so the readers did get to see them. To this day, you find the same technique, which I am sure, most hams do not like. If I am in the market for something, I know where to find the ads! [Gerd]

Cellphones in School. The school imposed a strict ban in December. Since then, students have reported getting more work done in study hall and the cafeteria has grown louder as students talk to one another. [Newspaper]

Animal Mating Habits. There are two ways animals choose mates: One: the males compete with each other and the winner selects the female. The other way: The males compete with each other to impress the female, and the female selects. [L.M. Boyd]

Music...is some kind of electricity that makes a radio out of a man. [Woody Guthrie]

Love. In love there are two evils: war and peace. [Horace 65 to 8 BC]

TV. Television has proved that people will look at anything rather than each other. [Ann Landers]

More on TV. Television is a medium because anything well done is rare! [Fred Allen, 1894-1956]

The Fast Lane. The trouble with life in the fast lane is that you get to the other end in an awful hurry. [John Jensen]

Remarkable. The most remarkable thing about my mother is that for thirty years she served the family nothing but leftovers. The original meal has never been found. [Calvin Trillin]

Autonomous Vehicles Will Be DOA

Lou Frenzel | Apr 06, 2018

No matter what the investigation reveals regarding the latest driverless car tragedy, it's already stirred up intense reactions on both sides of the fence of the autonomous debate.

DOA. That's my prediction of how autonomous vehicles (AVs) will be accepted in the marketplace when they're formally introduced. From surveys I've seen, the majority of people don't really want self-driving cars. Of course, a segment of the population is verbally supporting AVs in surveys and opinion forums, but will these people actually buy one? I will be surprised if sales ever exceed 1% of the total auto market. And after all the publicity related to the two recent deaths related to self-driving cars, that anti-AV demographic will probably grow larger.

You've probably already heard of the recent death of a woman pedestrian in Tempe, Arizona by an Uber AV test Volvo. That's one sure sign that AVs simply aren't ready for the real world. It's amazing that the LiDAR, radar, and cameras did not detect her. Was it the fault of the sensors, the algorithms, or what? My impression is that the sensor and AI technologies were better than that. Maybe the victim was actually at fault?

The test driver wasn't paying attention either, and that may have been a factor. But it's difficult for a backup driver to maintain a high level of attention for any length of time when the car is on autopilot. Hopefully we will learn from this tragedy. In the meantime, some but not all companies are suspending AV tests until some conclusion is reached.

Another recent death in California also indicates that the current AV systems may not be ready for deployment. This death was in a Tesla Model X SUV with the Autopilot in self-driving mode. It may have been malfunctioning, but it did apparently give the driver some warning that wasn't responded to. Maybe the driver was at fault by not responding. I can predict that most AV owners will not be paying attention as they should be while riding. A government investigation will hopefully reveal the problem.

Still in Hot Pursuit

In any case, two deaths aren't enough to stop the aggressive development of AVs. Auto manufacturers, technology, and taxi companies continue with their hell-bent effort to develop the definitive AV. Driving safety is the ultimate goal here, but the whole thing is really more of a competition to see who gets there first with the best features and capabilities. And patents. And riches.

Billions of dollars is being spent on something that most potential customers don't seem to want. It strikes me as something we're doing just because we can, and then thinking up the rationale later. In any case, there's maximum momentum right now, and we should see some commercial self-driving vehicles in another year or so.Most of us will probably not buy an AV. Instead, we'll increasingly embrace the excellent advanced driver-assistance systems (ADAS) being incorporated in most new vehicles. These can and do reduce accidents. The addition of V2V and V2X radios are expected to further improve safety. In my opinion, the combination of ADAS and V2V/V2X plus an alert human driver is probably better than an AV to improve safety.

The whole point of the AV is to eliminate human error in driving. But will AVs really reduce accidents? The 2016 Federal data, the most recent available, says that over 37,000 persons died in a vehicle accident. AVs, as they say, will eliminate most of those accidents caused by human error… we hope.

The human is fallible, of course. However, I believe the AI and sensor technologies in the self-drivers are also fallible, but in a different way. As I see it, AVs will reduce some types of accidents, but will introduce another new offsetting class of accidents with conventional vehicles and pedestrians. Developers will do their best to design the best hardware and algorithms, and rigorous testing will get the bugs out. But as you know, nothing is perfect.

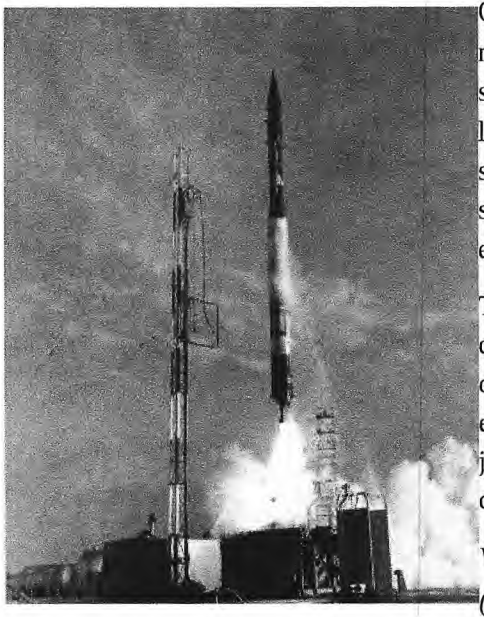
I can't get over the feeling that we're abdicating too many of our responsibilities to robots. I'm not against automation, per se, in applications like manufacturing and materials handling. But for some things, I question it. Are you ready to entrust your life not only to the complex mechanical and electrical structures of a self-driver, but also to unique software algorithms of artificial intelligence?

Automation makes us lazy and minimizes the need for personal thinking. Technology seems to be dumbing us down. But that seems to be our present and our future. I just can't seem to get a better attitude about what apparently is inevitable.

In spite of the rosy outlook and hype of driverless cars, we will continue to buy our new SUVs with their ever-more-efficient internal combustion engines and ADAS. The AV technological developments in sensors and machine learning are spectacular and will find uses elsewhere. And, needless to say to most readers here, the whole AV movement is a big benefit to the electronics industry. That's good for all of us. Maybe I should just shut up and get with the program.

Navy's Vanguard Marks 60 Years in Earth Orbit Jack Browne, Apr 10, 2018

The second satellite ever launched by the United States continues to orbit the Earth more than 60 years later.



Orbiting satellites are now taken for granted, and often part of daily communications networks or entertainment services. But 60 years ago, the U.S. Navy's Vanguard I satellite became only the second U.S. satellite placed into Earth's orbit. It followed the launch of its U.S. predecessor, the Army's Explorer I satellite, and two earlier Sputnik satellites from the Soviet Union. The launch of Vanguard I *(see figure)* came on the second try, with the first attempt crashing on the rocket launch pad about three months earlier.

The tiny aluminum satellite, part of the Navy's Vanguard Project, is only 16.5 cm in diameter. It was placed in orbit at an altitude of almost 2500 miles. John Dchaub, director of the Naval Center of Space Technology (NCST) at NRL, looks back at the event: "We are still in awe of what the Vanguard team accomplished 60 years ago. In just 30 months, with the successful launch of Vanguard I, their work brought to culmination the efforts of America's first official space satellite program."

Vanguard I was launched on March 17, 1958 from Cape Canaveral in Florida. (Courtesy of Naval Research Lab)

The miniature orbiting satellite proved invaluable to gaining a better understanding of upper atmospheric physics, geodynamics, dynamical astronomy, and solar terrestrial relationships. The satellite itself served to measure the effects of a space environment on an orbiting spacecraft. The satellite included a number of instruments powered by batteries or photovoltaic cells, including a Minitrack beacon, a set of mercury batteries, a 108-MHz transmitter, and two temperature sensors.

The transmitters were used to send engineering and tracking data, but also to determine the total electron content between the satellite and the Navy's ground stations. The mercury batteries lasted for 20 days but the solar cells, developed by the Army Corps of Engineers, provided power for seven years. Even though data transmissions fell silent in 1964, the satellite continues to orbit the Earth 60 years later.

Perimeter Protection. Gerd,WB8 iFM

It's the time of year when you think about lightning and are you protected? It took me many years to learn and get to the point that I felt, I had the problem solved. Then last year I got another direct hit with no damage to the house and its content, my system worked!
However, a couple of days later, we found a tree, about 50 feet behind the house that had been hit and shed a couple of long pieces of bark, but was otherwise OK!

I have all my antennas in front of the house, mostly mounted on the 80 foot tower, which is only a few feet away from the house, and all the ca half dozen ground rods arte a;lso in front. Reading up in some older booklets a point was made about perimeter grounds and I decided: that was the way to go. I would a few more ground rods in back of the house, off course, integrated with the other grounds in front of the house.

As the connecting conductor I have successfully used stainless steel band, ca 1 3/4" by 15/1000". After many years these bands look as shiny as new. Now I have to rush, get the rods, get some more tape and get going!

Follow up on the toaster oven reflow conversion kit.

Mike W8RKO

I have completed the toaster oven conversion. This is a kit that came from http://www.whizoo.com. The kit contains components to convert a Black and Decker T01303SB toaster oven for reflow soldering of PC boards. The kit contains all the necessary parts for the conversion. This includes adding insulation to the oven, adding solid state relays to control the heating elements, a controller, and adding an extra heating element. You have to supply your own toaster oven. Fabrication work has to be done to the oven.

First the oven box is sealed with high temperature RTV (red). Holes have to be drilled to accommodate the relay panel, extra heating element, mounting the controller, and door opener bracket. Insulation is added inside of the oven box as well as around the oven box. You have to be careful when working with the insulation blanket. This material contains ceramic particles. Use a mask and gloves as the dust goes everywhere if you are not careful. I would do this outside. Gold "heat" reflection tape is added to the front door glass and some on the sides inside of the oven box. I apparently added more gold tape to the front door then they intended. I ran about 12" short when adding the remainder to the inside of the oven box. The kit included a couple of pieces of aluminum to fashion brackets to hold the controller box and servo door opener bracket. The servo allows for cooling at the end of the process. I chose to design and make brackets from my 3D printer rather than fashion angle brackets.

The power supply for the controller is a 5-volt "wall wart" that is mounted inside of the oven enclosure (outside of the oven box on the side where the original controls were mounted). Push on terminals are placed on the 120-volt prongs of the wall-wart. I would have rather had something like a small open frame 5-volt power supply but the wall wart works. It is held in place with cable ties next to the bracket holding the solid state relays. The instructions are sufficient but I did have to study the photographs on the web site to make sure I was interpreting the instructions correctly.

The final step is to run a calibration routine from the controller. This routine analyzes the temperature characteristics of your oven such as how long it takes to heat, cool down, and how each heating element affects the temperature. There is a single temperature probe inside of the oven. This is a wire thermocouple that extends about 4" inside of the oven box. When I tried to solder a PC board I got an error about a 20 degree error. Not sure what their definition is of the 20 degree error. Watching the process on the status screen it appeared the heating process was working as it did right after my calibration. I think the issue was I moved the temperature probe. This is easy to do as it is just a wire hanging inside of the oven. I ran the calibration routine again and the problem has not returned. I need to be careful that I don't move that probe without running the calibration routine again. I have made a couple of board with both lead-free and lead solder paste and they look correct.

The Difference a Year makes. Gerd, WB8 iFM

Last year at the Hamvention I looked at Lithium batteries. Then, I was turned off by the high prices. This time I will look again and I might just find some reasonably priced. Last year the price for lithium batteries fell dramatically by ca. 50%.

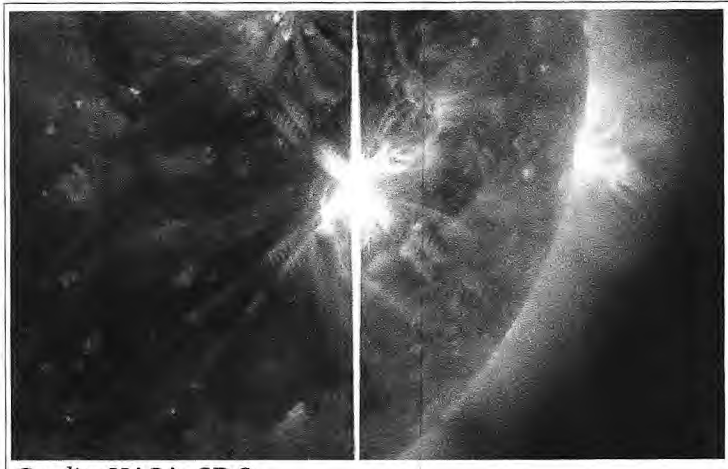
The only gadgets in the house that run on lithiums are my digital camera, the ultrasonic toothbrush and the small electric drill. Maybe some laptops as well, but I am not sure..
Just leafing through the MFJ catalog, that was in the mail yesterday, I find that some gadgets run on lithiums and there are even individual cells offered at $9.- a piece (3Ah). You would need 3 or 4 of those to power your (12V) transceiver for a short period of time. I have presently 3 12V lead batteries rated at 7Ah for that purpose.

Since last year in September I got a small electric car and I've been learning how to gas-up from a 115V house receptacle. Not been to a gas station since, except the one time we ran out of juice, sri electricity and they were so kind of letting us "plug-in. That battery stores 24 kWh and cost when it was new (2014) roughly $1000. The new price now is half of that: $ 500. If I made that battery up with MFJ cells, it would run to $729.

The Sun Is Spitting Out Strange Patterns of Gamma Rays—and No One Knows Why

The discovery, although mysterious, might provide a new window into the depths of our most familiar star

- By Shannon Hall on March 28, 2018 SA



Credit: NASA, SDO

Our closest star remains an enigma. Every 11 years or so its activity crescendos, creating flares and coronal mass ejections—the plasma-spewing eruptions that shower Earth with charged particles and beautiful auroral displays—but then it decrescendos. The so-called solar maximum fades toward solar minimum, and the sun's surface grows eerily quiet.

Scientists have studied this ebb and flow for centuries, but only began understanding its effects on our planet at the dawn of the space age in the mid-20th century. Now it is clear that around solar maximum the sun is more likely to bombard Earth with charged particles that damage satellites and power grids.

The solar cycle also plays a minor role in climate, as variations in irradiance can cause slight changes in average sea-surface temperatures and precipitation patterns. Thus, a better understanding of the cycle's physical drivers is important for sustainable living on Earth.

Yet scientists still lack a model that perfectly predicts the cycle's key details, such as the exact duration and strength of each phase. "I think the solar cycle is so stable and clear that there is something fundamental that we are missing," says Ofer Cohen, a solar physicist at the University of Massachusetts Lowell. One obstacle to figuring it out, he says, is that crucial details of the apparent mechanisms behind the cycle—such as the sun's magnetic field—are largely hidden from our view. But that might be about to change.

Space X Mars Mission

By Karissa Bell

Elon Musk says he's making "great progress" toward his goal of getting to Mars by 2022. Speaking during a last-minute appearance at SXSW, Musk said he thinks SpaceX's Mars ship will be ready for its first trips in less than a year.

"In the short term, Mars is really about getting the space ship built, and we're making great progress," he said.He predicted that the ship would be ready to take to the skies next year — albeit for short flights only.

"We are building the first ship, the first interplanetary ship right now, and I think we will be able to do short flights, short sort of up and down flights, probably sometime in the first half of next year," he said.

Though still a long way from getting all the way to Mars, it would be an important milestone for Musk, who has said he wants to get to the red planet by 2022.

Still, the SpaceX and Tesla CEO noted that he has a history of being overly ambitious when it comes to providing timelines. "People have told me that my timelines have historically been optimistic," he said.

In true Elon Musk fashion, he also spoke about his well-known fear of artificial intelligence.

"We're quite close o the cutting edge in AI and it scares the hell out of me," he said. "We have to figure out some way to ensure that the advent of digital super intelligence is one which is symbiotic with humanity. ***I think that's the single biggest existential crisis that we face."***

Though many experts have discounted his doomsday fears, Musk dismissed AI critics and doubled down on his position. ***"Mark my words, AI is far more dangerous than nukes."***

This fear of AI, by the way, is part of the reason why Musk is so keen on Mars. He explained that colonizing Mars, would be an important step necessary to ensuring humanity's survival in the event of a future dark age.

This EV-charging road in Sweden works like a slot car track

By Andrew Krock, 4-13-18

Stopping to charge up your electric vehicle wastes a fair bit more time than stopping to top off a gas tank. So why bother stopping at all?

Sweden has opened up what The Guardian is calling the world's first stretch of electrified road. While it's just a proof of concept for now, this 1.2-mile stretch of juiced-up road has the capability to provide an EV with charge as it moves along.

How it works is pretty straightforward. There's a metal strip embedded in the road that provides power. An electric vehicle will need a movable arm to deploy and contact the strip, which will provide the circuit necessary to charge the car's batteries. If the car changes lanes, the arm disconnects. It's similar to how slot cars receive their power.

All the jolty bits are deep within the rails, so pedestrians won't have to worry about being electrocuted.

Don't think you'll get free electrons, though. The road's system is capable of figuring out how much energy each vehicle uses, so it could then send a bill to the owner or use some sort of connected method to automatically debit a person's account. This part is still a bit unclear.

E-Cars in the US. Gerd, WB8iFM

Why is it that we in the US have to look to other countries to see what is going on with electric cars? There are "Electric Cars" in the US, but most of them are Hybrids, which are basically cars with two engines, one "gasoline" the other "electricity" powered. Pure "Electrics" are in the minority. But they are the "Real Thing".

The main problem with the "electric car" is the size, weight and price of the battery that drives the car and supports everything else and the requirement of recharging that battery, which takes a lot of time and cannot compete with "gassing up a combustion engine car. That limits its use to shorter distances between charges. Presently, with a new vehicle, the range is between 100 and 200 miles, which is ideal to use for your daily commute and or trips around town for entertainment, shopping etc.. When you think about it, that is where maybe 90% of driving is normally done. A full charge can take many hours when done from your home 120v outlet. So, for longer trips we use a VW-Golf-Diesel, which gets us around 500 miles on one tank.

Getting back to the "Electric". Charging stations are plenty, but they are poorly organized/ maintained, some charge you some don't. What it amounts to is like a lottery you may get lucky or not! Most cars come with a 120V charger and cable, ready to plug in. However, for a few hundred dollars you can get a 240V cable that speeds up your charge. This, however, requires a 240V-30A outlet, which fortunately is already installed in the garage.

s the above article shows, Sweden is installing slots in roads to let electric vehicles get charged, We have no details, but it sure sounds like a system that could catch on in helping vehicles to get a some extra charge while driving to complete a trip.
Finally, battery swapping, which is done in some countries and with industrial type vehicles, is not possible in the US because every manufacturer has his own type battery, of course, NOT compatible with another manufacturers car!

MICROWAVE UPDATE 2018

OCTOBER 11-14, DAYTON, OHIO
An International ARRL Technical Conference

The focus is on amateur radio on the microwave bands, including equipment design, construction and operation.

LOCATION:
Holiday Inn Dayton/Fairborn I-675

Registration & Conference Updates:
www.MicrowaveUpdate.org
(check the website periodically for updates)

CONFERENCE INCLUDES:
Seminar Presentations • Test & Measurement Lab
Antenna Gain Measurements • Thursday Tour: Voice of America Museum
Sunday Tour: US Air Force Museum
Vendor Demo/Sales Area • Flea Market Area
Banquet & Door Prizes

ARRL publishes the Conference Proceedings.
For further info contact:
Tom Holmes, MUD 2018 General Chair at n8zm@mvus.org

The Midwest VHF/UHF Society is pleased to host this October 2018 event, and is looking forward to welcoming you to Dayton, Ohio for MUD 2018