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in Kettering

Nov.-Dec. 2017

ANOMALOUS PROPAGATION

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

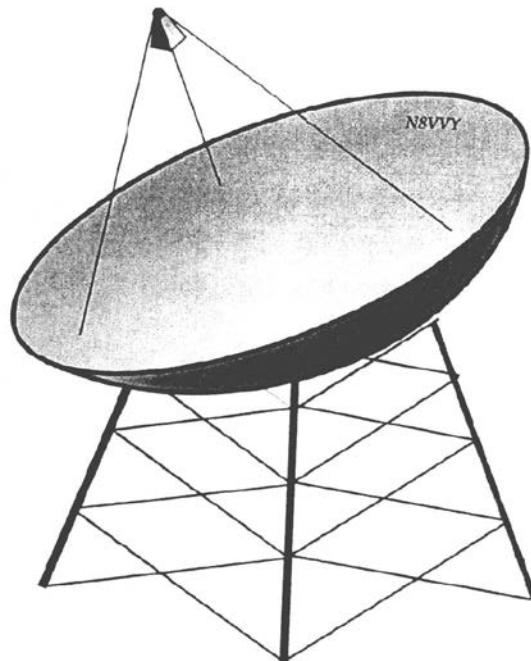
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Corrections for the Oct. AP

There were a few errors in last months AP 10-17, and I got feedback from several members, I am sorry! However, putting a positive spin on it: I am happy to get some feedback, so I know the newsletter is read!

In the CERN article instead of Hydrogen substitute “**Hadron**”. Now what is a Hadron? A *Hadron is any particle that is made from quarks, anti-quarks and gluons. The most famous example of a hadron is a Proton.*

The other error pertains to the date for the first Launch of the Space station: this was Nov 20 in 1998.

DE N8ZM: While it is a bit late for November, this is actually the November-December edition of Anom Prop, and by the time you see this the November meeting will have already occurred. Although there were only about a half dozen in attendance (I'll blame that on it being the day after Thanksgiving), we did have a good discussion about the Microwave Update Conference we are hosting here in 2018. Less than 11 months away now!

I am very pleased with the level of support from the folks I have asked to take on specific jobs, so I think we will have a conference to be proud of. One very important person to this effort has been Evelyn Midkiff, XYL of Randy, WB8ART. She did all of the research to find the best deal on a venue for the event, digging into past MUD's to see what was needed and asking detailed questions of each hotel she contacted about facilities and costs. But she hasn't stopped there, as she has agreed to be the Assistant General Chair, which means she will be helping me stay on top of everything and keeping me on schedule, if that's possible. Thanks, Evelyn!

Further back in this issue of Anom Prop, or maybe the next one (Gerd gets to decide what goes into each issue, not me) I will include a list of the MUD 2018 Committee people for reference. It's a great team!

By the way, MUD 2018 will be October 12/13, at the Holiday Inn in Fairborn, Ohio, so mark your calendars now. We are planning some good things to do on Thursday as well, so come a day early. The hotel has agreed to honor the conference rate for the 3 days ahead of and after the conference, provided you booked a room during the event, so that you can hang around Dayton and see the many attractions we have here that might not be practical to visit in May when you are here for that other little show.

To change the subject quite drastically, I want to talk about VHF contests for a minute. In the December QST, the results for the ARRL June VHF 'test' were published, and our group came in 5th in the Unlimited Multioperator class. Had we entered the Limited class, we would have placed 9th! It is interesting how things have changed in recent years, as not so long ago we had no chance of making the top 10 in Unlimited. When we started, nearly 20 years ago, we only had 6m and 2m, so Limited was the logical place to be. As we added 222 and 432, we naturally generated larger scores, which made us more competitive in Limited. In the last 2-3 years we have added 902 and 1296, which forces us into Unlimited unless we choose to only hand out QSO's but not claim the points for those two highest bands. However, we have benefitted, score-wise, from those added bands, as well as the fact that a number of the big stations that once were serious competitors in Unlimited have decided to abandon the bands above 432 and drop back to the Limited class. Strategy can be important if you want to do well in the class you have chosen.

Another interesting development is the increasing importance of digital modes, and not just for VHF contests. Unless you have been hiding in a cave for the past year, you have probably heard of FT8, which has been very effective at speeding up the QSO process. Not only do QSO's take less time than some of the older digital modes, but in doing so have made it possible to work more grid squares, especially on 6m. This is a definite score enhancer. It certainly isn't a total replacement for SSB and CW in contests, but it does serve as another tool for adding entries to the log. In the September VHF contest, our 6m guys were having so much fun using FT8 that we occasionally had to remind them that there were QSO's waiting for them on SSB! But it's really no different than being in the SSB portion of the band while there are some rare grids to be worked on CW. It's what makes contesting interesting and is all a part of the strategy and tactics required to manage a contest operation.

One more contest related note: the January ARRL contest is the 20th & 21st. Mark your calendar and plan to be on the air for at least a portion of the weekend. A 40m dipole gets out pretty well on 6! And we work FM too!

One more topic change. I hope all of you had a great Thanksgiving, and wish you a very wonderful holiday season. Our December meeting is on the 22nd, well before the guy in the red suit shows up. See you there.

De Tom, N8ZM

This & That, 11/12-17

It's a Wash. Multitasking is the new normal, but so is burnout and chronic anxiety. Meanwhile, we're learning that people who "multi-task", do everything less well. How's that for stress reduction? [Marilyn Preston, DCP]

Only Irish Coffee provides in a single glass all four essential food groups: alcohol, caffeine, sugar and fat. [Alex Levine]

Money can't buy you happiness ... but it does bring you a more pleasant form of misery. [Spike Milligan]

Decision Making. "The man who insists on seeing with perfect clearness before he decides, never decides." [Henri Frederic Amie, Swiss critic, (1821-81)]

"Space, Light & Order..." are the things that men need just as much as they need bread or a place to sleep." [Le Corbusier]

Marketing. "Ah, a new menu...the print is smaller and the prices larger. [Cartoon the Lockhorns]

Hams. Those blackface comedians of an antique age first covered their faces with ham fat so their burnt-cork makeup could be wiped off easily. They were called *hamfatters*, then *ham actors*, then "**hams**". [L.M. Boyd]

The oldest cultivated food plant is hemp. [L.M. Boyd]

Hurricane Needs. "We have no water, no batteries...no nothing ." [Flood Survivor]

Oxygen. After 30 years of writing columns, I am easily an addict who needs a deadline the way normal people need oxygen. [Kathleen Parker]

Monuments. Traveling, sight seeing, we often come across dilapidated, partially damaged monuments, then called ruins of past glory. Who did it? Few people ask that question. Was it mother nature, or animals, or humans? There is a saying in Germany: "It was the tooth of time!" [Gerd]

Problem Solving. We cannot solve problems with the same thinking we used when we created them. [Einstein]

Tesla Veteran Explains How Electric Motors Crush Gas Engines

Electric motors, have gas engines beat in just about every category there is, a Tesla drivetrain developer says.

By [David Z. Morris](#) Nov 17, 2015

Before leaving this year to join electric bus manufacturer [Proterra](#) as director of battery engineering, **Dustin Grace** spent almost nine years working on drive trains at Tesla (“TSLA”). Grace sees the electric machines he has helped to perfect as feats of engineering as much as they are agents of environmental redemption. Arguing that electric motors are inherently superior to gasoline engines, he walks through several fundamental advantages that electric motors have over gas:

Electric motors generate motion, not heat. A fossil-fuel engine produces motion, basically, with tiny controlled explosions. Those explosions push interlocking pieces of metal, which connect to a driveshaft. All that metal rubbing together generates a lot of heat, even when the parts are swimming in oil. That’s energy that’s not being used to push a vehicle forward.

The contrast with an electric motor couldn’t be bigger. “There’s zero contact,” Grace says, between the motor and a vehicle’s driveshaft. “Just an air gap. The only thing reacting … is a magnetic field.”

With the driveshaft pushed magnetically instead of mechanically, even a running electric motor is barely warm to the touch, eliminating a major energy waste.

That efficiency has one small downside. The wasted heat from a gas engine becomes free cabin heat in the winter, while electric vehicles have to produce extra heat as needed. Cold also has a negative impact on batteries, meaning that [electric systems take hits](#) to range, performance, and charging speed in the cold.

They’re more powerful (most of the times that matter). This one goes against all our images of feral, gas-thirsty Detroit muscle cars. But for proof, look no further than Tesla’s recently introduced [“Ludicrous Speed” mode](#), which makes the car’s acceleration competitive with gas-driven supercars that cost millions of dollars.

That’s possible because at lower speeds, electric motors deliver more torque than gas engines. “Torque is what you need to get a car going,” says Grace, and with more of it, electrics out-accelerate comparable gas engines.

Gas engines do still perform better at very high speeds than electric—so motorsports and law enforcement may stay gas-dependent for longer.

They’re simpler. Electrics’ better torque has a secondary advantage. With less torque at low speeds, gas engines need help from a transmission to get moving. Electric engines by and large don’t need transmissions.

Diesel buses, for example, usually have complex eight- or nine-speed transmissions. Proterra’s buses, by contrast, have a two-speed transmission—and its only role is changing efficiency profiles, not acceleration.

Grace says that ditching the complex gears and fluids of a transmission leads to better efficiency and agility. In effect, he says, “there’s this internal brake inside of a transmission that keeps it from wanting to spin freely.”

They’re (vastly) easier to service. Electric drive trains have far fewer subsystems—no transmission, no oil tank, no catalytic converter. That means there’s less to break down. (It’s also fairly mind-bending—looking at an electric motor, you might think someone just stole half the machine.)

And the heart of an electric drive train—the motor—is much smaller and more streamlined than its gas counterpart. Even the motor that drives Proterra’s full-sized buses is small enough to be lifted by one person. It can be entirely removed by a team of two mechanics, and it’s cheap enough that it can be replaced for purely preventative reasons.

They feed themselves. Every electric motor is also an electric generator. That makes it very simple to implement regenerative braking, which recaptures forward momentum as battery charging. The really amazing part is that this process, just like acceleration, is electrical, not mechanical.

“The rotor is always spinning in the same direction,” says Grace, “but the electrical field reverses.” That sends electrons streaming back into the battery (so to speak), while helping slow the vehicle.

They’re smarter. “Even today’s gasoline cars generate very accurate data,” Grace admits. But electric vehicles give you more and better opportunities to monitor and adjust them. “Your control systems are much more accurate, and probably more transparent as to what’s going on.” As software updates become an increasingly regular part of car ownership, electrics will be that much more flexible.

Better metrics also let manufacturers detect faults in vehicles before they become a big problem. At Proterra, for example, Grace can receive text alerts when buses in operation have certain problems. The team can arrange a fix before the customer notices anything is wrong.

All that adds up to an electric machine that is, in Grace’s words, “a very beautiful, efficient thing.” And now the one big limitation—battery storage—is finally being overcome..

Microwave Update 2018 / Committee

General Chair: Tom Holmes, N8ZM

Asst. General Chair: Evelyn Midkiff,

Event Treasurer: Joe Muchnij, N8QOD

Talks and Proceedings: John Ackermann, N8UR (authors, presenters contact John soon)

Banquet: Mike Schulsinger, N8QHV (Ideas for banquet speaker always welcome!)

Banquet Prizes: Joe Burke, WA8OGS, and Steve Coy, K8UD

Registration: Randy Midkiff, WB8ART

Web: John Ackermann, N8UR, Dave Lundy, and Mike Suhar, W8RKO

Official Photographer: Dave Lundy

Audio Visual: Steve Coy, K8UD, and George Byrkit, K9TRV

Publicity: Joe Burke, WA8OGS

Hospitality Room: Tom Holmes, N8ZM

Flea Market: Mike Suhar, W8RKO

Daytime recycling sessions (auction): Mike Suhar, W8RKO, and Kent Britain, WA5VJB

Tours: Joe Burke, WA8OGS, and Joe Muchnij, N8QOD

Demo Room Coordinator: Mike Suhar, W8RKO

Antenna Range, Noise Figure, Phase Noise, and Test Bench:

Daun Yeagley, N8ASB, John Ackerman, N8UR & Tom Holmes, N8ZM.

Microwave Update 2017 in Santa Clara, CA

by Mike Suhar, W8RKO

I attended MUD in Santa Clara, CA in October. This year it was sponsored by “The 50 MHz and UP” group. They had approximately 73 in attendance from what I could tell.

The day before the presentations started we had a tour of the Stanford Radio Club. This is on a mountain top overlooking Santa Clara. It is also the same property where the 150-foot Stanford dish is located. Very impressive layout of antennas from HF up to 10GHz EME. They had several operating positons in two separate buildings.

Also present at the conference were various items set up for demonstration. They had a room for testing various items people brought with them such as pre-amp noise figure. Some had items for sale and between presentations Kent Britain held an auction for various items donated for the cause.

The presentations and/or papers in the proceedings covered many topics related to VHF and higher equipment and operation. What I found most interesting was the presentation on improving the 10-GHz slot antenna by Jeffrey Pawlan, WA6KBL. He did a lot of modeling and building of slot antennas based on his research. The typical slot 10-GHz antenna is omni coverage but the variation in the side lobes is high. His study was to reduce the variation in the omni pattern. His initial design worked very well but very expensive to have machined. He is working on a design that will still maintain the design goal but something he can fabricate in his well-equipped home shop.

Barry Malowanchuk, VE4MA, discussed automotive radar systems and their modules that are showing up in production cars. Typical automotive uses are lane change alerts, adaptive cruise control, collision avoidance braking, blind spot warning, and backup warning systems. These systems operate in the 24 and 76 GHz range. The 24 GHz range will be phased out as in favor of 76 to 81 GHz. Barry dissected a couple of the modules he was able to obtain and explained how they worked.

There were four SDR related topics in the proceedings. One from Mike Seguin, N1JEZ, talking about the LimeSDR unit. Our own **Jim Bacher, WB8VSU**, has been experimenting with this particular device.

The conference was very well done and all the topics very interesting. I am glad I had an opportunity to attend. I announced that MUD 2018 would be in Dayton, Ohio and invited everyone to Ohio in 2018 for the conference.

Topics in the Proceedings:

EME

Working out the 23cm EME band by Courtney Duncan, N5BF

Improving the 77 GHz EME station by Sergei Zhutyaev, RW3BP

Antennas

Choke Ring Feed Horns for Offset Reflectors by Brian Thorson, AF6NA

Assembly Techniques for IMU Style Feeds by Larry Pignolet, N1AXB

3D Printed 122 GHz Cassegrain Antenna by Michelle Thompson, W5NYV

Tweaking Vivaldi Antennas by Kent Britain, WA5VJB

Transmission Lines

QuickSmith-Web by Nathan Iyer, KJ6FOJ

Low Impedance Parallel Wire Transmission Lines by Dr. Gerald Johnson, K0CQ

Filters

Evanescence Mode Circular Waveguide 10 GHz Filters by Tom Apel, K5TRA

OE9PMJ 24, 47, 75.5, and 78 GHz Filter Dimensions and Construction by Dr. Gerald Johnson, K0CQ

Understanding the OE9PMJ Microwave Filter for 24, 27, and 78 GHz by Paul Wade, W1GHZ

Microwave Radios

3456 MHz Rig Proposal by Graham Stratford, VE3FMH

Simple and Cheap Transverter for 10 GHz by Paul Wade, W1GHZ

Amateur Radio Use for Automotive Radar Equipment by Barry Malowanchuk, VE4MA

Making an 80 GHz Radio Using Surplus Gigabeam Modules by Gary Lauterbach, AD6FP

A Simpler 122 GHz Transverter by Mike Lavelle, K6ML

Software Defined Radios

The LimeSDR on VHF and Microwaves by Mike Seguin, N1JEZ

Introduction to GNU Radio and Basic Digital Signal Processing by John Petrich, W7FU

High Performance SDR Transceiver: VHF to Microwave by John Petrich, W7FU

Advanced SDR Ham Radios: VHF, UHF, Microwaves by John Petrich, W7FU

Sources

Arduino Controlled Microwave Frequency Sources by Greg McIntire, AA5C

The Orion-I ADF4351 PLL Synthesizer by Joseph Hass, KE0FF

Synthesized Signal Sources from China by Paul Wade, W1GHZ

Bits and Pieces

A Smart Fool-Resistant Conditional Sequencer by Paul Wade, W1GHZ

The 4 following subjects are by Dr. Gerald Johnson, K0CQ:

Identifying the Useful Frequency Range of an Unknown Double Balanced Mixer, P8640B Frequency Doubler, What is it? & another: What is it?

3 Things about Problem Solving which Albert Einstein teaches Us

Published in: [Leadership & Management](#)



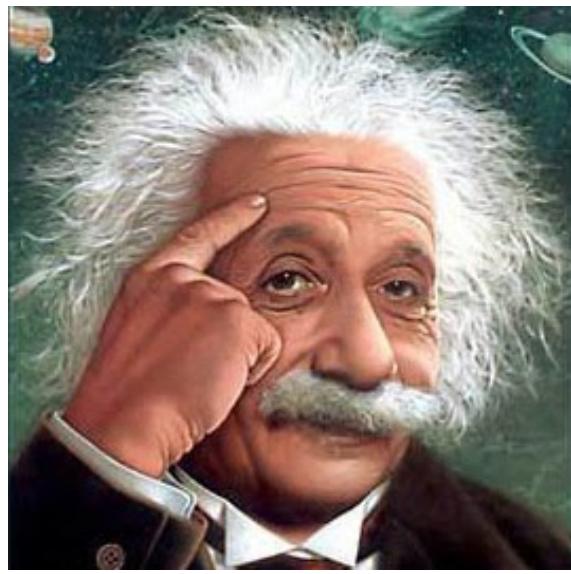
Vishal Kataria

**Founder of Aryatra | Business Process Consultant |
Productivity Geek |**

Problem solving has a synonym in the corporate world today – fire fighting. Up to 70% of employees' time at work is spent fire fighting. Thus they spend more than 6 hours out of 9 in a day grappling with problems which should not exist. What a waste of productivity! Imagine what organizations can achieve if hundreds (or thousands) of employees get these 6 hours daily (or 30 hours weekly) to work on something constructive!

The concept of problem solving in most companies today is flawed. "If it isn't urgent, worry about it later," is the mantra. Eventually, the ignored problem becomes so massive that it calls for – you guessed it – fire fighting. This behavior is so deeply entrenched in most organizations that it has become a culture.

Many of you may be nodding while reading this. But how should we combat it? Well, here are 3 quotes from Albert Einstein. 3 principles which helped him achieve mammoth levels of success. 3 principles which can help you revamp the way your team functions and addresses problems.



Albert Einstein

1. "It's not that I'm so smart, it's just that I stay with problems longer."

We don't want a problem to stay around for long; we want to get rid of it as soon as possible. Hence most of us jump into resolution mode immediately. Each person – to shine brighter in front of his boss – becomes an expert on solving it. The meeting room echoes with dialogues like "listen to me", "I know what to do" and "this is how we'll do it". But these employees fail to realize that the

proposed resolutions are merely quick fixes. The problem will rear its ugly head again. So what should employees do? Well, read on.

2. “If I had an hour to solve a problem, I’d spend 55 minutes thinking about the problem and 5 minutes thinking about solutions.”

This is arguably the best piece of advice Albert Einstein has given us. The more time one spends understanding a problem, the more effective the resolution. Techniques like [5 Whys](#) and Fishbone allow people to get to the root cause of the problem, and take corrective measures to ensure it never occurs again. Ask Paul O’Neill who turned an ailing Alcoa into one of corporate America’s heavyweights by [simply addressing one core problem](#) – worker safety. Don’t look for solutions immediately; take time to comprehend the gravity of the issue at hand. Keep redefining the problem until you get to the root cause. The solutions you and your team devise will actually save you and your team a lot of fire fighting. And for all you know, the resolutions may open up new business avenues for you.

3. “Logic will get you from point A to point B. Imagination will take you everywhere.”

Edward de Bono points out in [Lateral Thinking](#) that too often we spend time measuring how right or wrong a solution is. But you can’t dig a hole at a different location by digging the same one deeper. Be prepared to consider all options, no matter how relevant or irrelevant they are to the current scenario. And this concept isn’t only applicable to problem solving. It can be used in [designing, engineering and all other fields](#).

I have been in the corporate world long enough to admit that these concepts are not easily accepted. Most employees immediately jump into the fire and end up running in circles. However, when my team has implemented these concepts, they have served us well. I’d also like to hear your thoughts. What do you think can be done to improve problem solving in the corporate world? And how will it help? Do mention your views in the comments section. You can also [follow me on Twitter](#).

Recommended by Gerd

I came across an article: “How Silicon Valley hooks us!” in the weekly magazine pTHE WEEK. We have subscribed to this magazine for a few years and wouldn’t want to miss it. It is like a “Reader’s Digest” of daily news and events with original reports and comments and certain additional features pertaining to politics, finance, books, movies, cartoons, health, travel and lots more. The recommended article is from a feature called “The last word”. This is a two-page article usually taken from a longer piece published somewhere else! Good reading!