



Shark's Teeth



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March, 2002

Spring is in the Air

President's Letter

Dan Emblidge, W2HQ

Well here we are into March now. The Amateur Radio season was kicked off in fine fashion by the Lancaster Amateur Radio Club with their "first of the season" Hamfest. K2FA had a fine showing with three of its principal officers present. Congratulations to Neil WB2CIR for winning a door prize. Some FRS type communicator. Good for him, it made the trip from State College, PA worthwhile. It was nice to finally meet my Elmer's Elmer. It was a good time. The socializing was fun. I met several faces from

the past. ARES RACES members on their never ending recruiting mission. For which I commend them on their perseverance. QRP'ers on their mission to find parts that will enable them to transmit as near as possible to that unfathomable no WATTS. The guys with their tables full of their treasures. "One mans treasures, is another mans junk". The refreshments were plenty and as I heard from our Trustee and his son they were very good. Sorry to say that I walked away having made no purchases. But I had a good time.

The WEB page is progressing. Subtle changes here and there. But activity none the less. The homepage is now an .ASP (lots to learn about this yet). We now have a link to the DXZONE and a rating system. Check it out and vote on our WEB page.

The Greek restaurants on the corner of Sheridan and Military are calling out our call, "K2FA - - K2FA - - K2FA.....". They are wondering when we as a club are going to get together for a sit down meeting. Plenty to discuss. Field day, shirts, hats, contests, web page, etc. Besides all that we should get together for a breakfast and some chit-chat.

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Editorial

Spring is in the air. Unfortunately some antennas are not. The recent ice storm gave everyone an opportunity to test their emergency preparedness. While quite a bit has been written and discussed about backing up your ham rigs, there has not been as much concern on keeping the house that the shack is in warm, lit, dry, safe and comfortable.

In our case, we lost power for 4 hours and then 24 hours. This was the longest we had ever been without power. We used the fireplace to keep warm, the cigarette lighter extension cord to watch the 12 volt TV, and the 700 watt inverter to run a fan and a 1/12 HP utility pump to keep the basement dry. Until this latest weather related disaster, this equipment was plenty to hold us over. This time it wasn't. We were unable to back up the refrigerator, the sump-pump, or the furnace. Using the utility pump required set-up and supervision. The fireplace kept the first floor of the house warm enough; but just barely. I had to set the alarm on my watch to wake me up every hour and a half to add more wood to the fire and check the water level in the sump. Our neighbors to the south ended up with 4" of water in their basement.

We used the HT to listen to the emergency services and I could have operated 160m to 70 cm if necessary. But we would have gotten cold and run out of fresh food without our refrigerator in only another day.

After a family discussion it was decided that we probably should invest in a generator and transfer switch. Our 12 volt back up strategy worked fine for the 4 to 6 hour power

outages that had been the norm but was inadequate for the longer term.

You should probably review how your emergency plan held up and take the time now to adjust it as you feel necessary. An additional tool that you may find interesting is The Emergency Email NetworkSM. Their URL is:
<http://newsemergency.com/EMENHome.htm>

This service will send a message to your text capable pager, cell-phone or computer email account notifying you of important weather and other bulletins.

From ARRL

FCC REDESIGNS AMATEUR SERVICE WEB SITE

The FCC has redesigned its Amateur Radio Service Web site and changed the URL <<http://wireless.fcc.gov/services/amateur/>>. The new layout makes it easier to find information on topics most requested by amateurs, including licensing, amateur exams, filing an application, changing an address or using the Universal Licensing System (ULS). The refurbished site also provides links to recent Amateur Radio-related news from the FCC.

"The new design is a part of the Wireless Telecommunications Bureau's continuing effort to meet the needs of the Amateur Radio Service operators as identified in focus groups, letters, phone calls, and e-mails," the FCC said in a news release.

The new design clusters FCC public notices, news releases, and other official documents affecting Amateur Radio operators on the right side of the page. On the left side of the page, the new navigation scheme displays information on the Amateur Radio Service, the sequential call sign system, licensing and vanity call signs as well as amateur-related communications policies such as reciprocal agreements. The site also offers links to information on the limited federal preemption known as PRB-1, the Part 97 Amateur Service rules and the Wireless Telecommunications Bureau and ULS sites.

The site, launched on February 20, includes a search engine for the entire FCC Web site <<http://www.fcc.gov>>. Direct questions or comments concerning the FCC's Amateur Radio Service Web site to Bobby Brown, babrown@fcc.gov, or Jennifer Bush, jbush@fcc.gov. For information concerning the Amateur Radio Service, contact Bill Cross, bcross@fcc.gov; 202-418-0680.

Be Careful What You Wish For (One Hams' Lament)

Pete Vetter, KF2U

When my wife and I purchased our home 11 years ago, one nice feature we enjoyed was the 18' pool in the backyard. As any pool owner can attest, they can be a lot of work. So 10 years and 2 liners later, I convinced (read bamboozled) my 2 sons that if they let me take the pool down, I would build a hockey rink in its place. Living near Buffalo, NY, the climate is more than adequate for such an undertaking.

So, one day during the Christmas recess, my son Matt and I proceeded to build the rink. This was 2 days after the infamous 7' snow storm. I wondered, for a bit, what my neighbors were thinking as they watched me snowblowing the backyard grass.

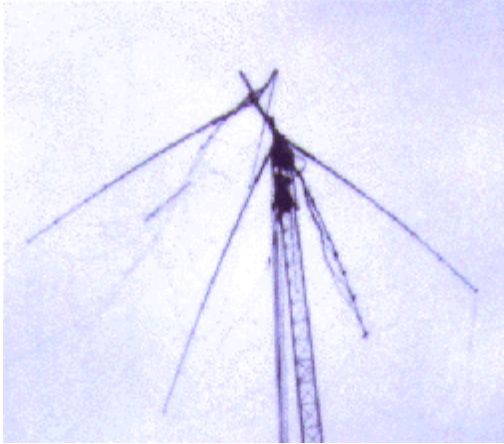
My first attempt failed miserably. But I learned from my mistakes. And after a thaw 2 weeks later, I rebuilt it bigger and better. Complete with a 2x10 frame and a 1 piece 6-mil plastic liner, it looked awesome. We filled it and waited for the temps to drop.

Finally, one day I came home from work to find Matt running from end to end on the



Before

rink. It was ready! He put on his skates and invited his buddies over for the inaugural hockey game. Ten minutes later, the ice cracked. @\$%&*. After that, we sent prayers and offerings to the hockey gods for ice. I remember thinking "I wish we could get some ice in the backyard".



After

So on January 31st, our prayers were answered, sort of. The temps dropped again to just below freezing. This was accompanied by sleet and freezing rain. I woke up to find everything covered in a thick layer of ice, including my 2-element quad. Well, fiberglass spreaders + Ice = Pete off the air. Like I said, be careful what you wish for.....

Did You Know?

Mike Bucklaew, KA2KQP

Solid state laser diodes are one of a kind. If the diode fails, it normally will retain its diode properties. The lasing properties will no longer function.

The word LASER--at least where Laser Diodes are concerned-- is an acronym for Light Amplification by Stimulated Emission of Radiation. Not to be confused with a PHASER which is science fiction weapon. The laser diode is constructed with a three-leaded header. Mounted on the header is a monitoring photodiode. A photodiode is a

PN junction specifically designed to detect light. Above the photodiode is the laser diode chip where the laser beam is emitted. This chip is bonded sideways with equal amounts of light emitting from the top and bottom. The purpose of the photodiode is to monitor the light coming from the bottom of the laser diode chip.

A Laser Diode's color is dependent on what the wavelength of the emitted light is, just like for LED's. Laser diodes are capable of emitting visible and infrared (IR) laser beams. The most popular visible laser operates at a wavelength of 660nm. Infrared lasers include 808nm, 1310nm, and 1550nm that are primarily found in medical and telecommunication applications. When using infrared laser diodes, it is necessary to use a PIN photodiode. Since the human eye cannot see IR light, the PIN Photodiode can detect the IR light and has a fast response time for direct measurement of impulse output.

Laser Diodes are very sensitive to electro-static discharge (ESD), and will fail if extreme care is not used in handling them. Also, temperature can be a problem. As the temperature increases, the threshold current of the device also increases. Proper grounding and temperature control is recommended.

Antenna Modeling... KF2U Style

Pete Vetter, KF2U

I recently purchased EZNEC antenna modelling software. Written by Roy Lewellan, W7EL, EZNEC takes the guesswork out of antennas. Simply stated, it

accurately predicts antenna performance and characteristics.

The PC requirements are modest. A printable manual is available online. But I chose the learn on the fly method. A bunch of example antennas are included. So I started with a dipole. The virtual antenna is assembled using a 3-dimensional grid. Each piece of the antenna is referred to as a wire. For instance, the dipole consists of 2 wires. The wires are entered using x-y-z coordinates. These determine the length as well as the position of the wire. You can also raise or lower the height of the entire model.

Also included is a SWR calculator. This will also sweep a frequency range you enter. The resulting display shows the resonances in a plot. One really cool feature is the rescaling option. This allows you to automatically change the wire values to another resonant frequency. A multi-loop quad builder might find this feature handy.

One more neat thing is the Far Field Plot display. You can see the pattern in both azimuth and elevation at varying angles. The results are also displayed mathematically. I'm sure these can be interpreted by somebody, just not me.

So before you start hanging wire or riveting aluminum, take a visit to www.eznec.com. There is a downloadable demo version to try out.

Indices Explained

From hamradio-online.com

THE K-INDEX AND THE A-INDEX

Since the last century, special facilities have been established globally in order to measure the strength of the geofield. Each time a measurement set is taken, it is recorded and assigned a number from 0 to 9, which is called the K-index for that station at that time. The stronger the geofield, the higher the number. Because the geofield is so dynamic, it can change at any location within a matter of minutes. So, the more often measurements are taken, the better a picture we can make of its behavior. Early on, it was decided to do this every three hours, so each station produces 8 K-indices every day.

One problem with the K-index is that it is quasi-logarithmic. It doesn't change in a smooth, one-for-one, or linear, way. So, to make life a little easier, each K-index is converted to a near linear scale, which is called the a-index. The 8 daily a-indices are then averaged into one number, which is called the A-index. The A-index, then, describes geofield activity for a 24 hour period, and the K-index that follows is the geofield activity for the current three hour period. That's why WWV gives the time of day the announced K-index was taken, but doesn't for the A-index. The K and A indices broadcast by WWV and WWVH are taken at a station located at Boulder, Colorado.

Like the SFU, the K index should fall within a range of values for hams to be happy. It has been shown that a K-index range of 0 to 3 will almost always indicate smooth sailing

for HF work. Occasional K-indices of 4 indicate an unsettled geofield, and consistent K-indices of 4 or 5 suggest choppy seas ahead. Anything over 5 is a clear message to start up that popcorn.

SOLAR ACTIVITY

The first one given is the solar activity for the previous 24 hours. For the purposes of this report, solar activity is defined as the amount of transient surface activity that generates x-ray radiation. Since flares are the most common mechanism for x-ray emission, the solar activity report tells you about how many x-ray flares have occurred in the 24 hours previous to the report, and how strong they were.

Solar Flares

Flares are sudden eruptions on the solar surface that eject x-rays out into space. They can last for from minutes to hours. The most severe can last for several days. When the x-rays they produce arrive at the Earth, propagation can be severely affected. The report is based on the occurrence of the three most severe classifications of x-ray flares: C, M, and X. A class X flare is the strongest of the three. The classifications are as follows:

VERY LOW: x-ray events less than C class flares.

LOW: C class x-ray events have been seen and recorded.

MODERATE: up to 4 isolated M class events.

HIGH: 5 or more M class events, or 1 to 4 isolated M5 or greater events.

VERY HIGH: several M5 or greater events.

GEOMAGNETIC FIELD

The next report is the geofield activity for the previous 24 hours, given in 5 classifications based on the A and K-indices. They are:

QUIET -- A-index = 7 or less, K-index = 2 or less

UNSETTLED -- A-index between 7 and 15, K-index = 3 or less

ACTIVE -- A-index 15 or more, but less than 30, K-index = 4

MINOR STORM -- A-index 30 or more, but less than 50, K-index = 4 or 5

MAJOR STORM -- A-index 50 or more, K-index = 6 or more.

From this, you can see that a K-index of 4 means that the geofield may be doing you more harm than good. But it's always worth a try. Anything over 4 should tell you not to try too hard or for too long. Start thinking about that movie.

Propagation Predictions

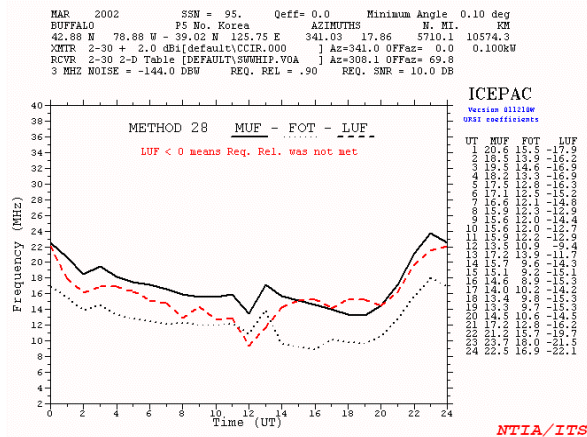


Mike Bucklaew, KA2KQP

This month I've added a few new DXCC entities to the on-line charts. There is supposed to be a North Korean operation this month so here is the P5 chart. Take a moment to look at it. Use the zoom button to make it bigger if you need to.

As you can see there are three lines on the graph. There is MUF, LUF and FOT. These acronyms stand for maximum usable frequency, lowest usable frequency and frequency of optimum transmission. Anytime you see red in the graphs you're looking at

bad news. I create these charts using a different set of assumptions than the typical ARRL prediction charts. I use simple



antennas (2 dBi gain), 100 watt power output, 10 dB signal to noise ratio and 90% reliability. Red means that the path doesn't meet the reliability. Contacts are still possible but signals will most likely be weak. It looks like our best shot is 20 meters around 1300 UTC.

Good luck and don't forget to look at the rest of the predictions on the web-site.

DX News

From NJDXA website

T48, CUBA.

Saturday March 2 through March 3
Don Fisher, VE3ESE, the radio club from the University of Oriente and the No-Name DX Group, will be operating as T48RAC (unconfirmed at this time) from Santiago de Cuba. They will be operating in the SSB contest March 2-3rd. Also, look for CO9NLA to be active now through March 14th. QSL via Don's home callsign VE3ESE.

5R, MADAGASCAR.

Monday March 4 through March 16
Bruno, F5DKO, will be active March 4-16th from some Madagascar islands. QSL via IZ8CCW: Antonio Cannataro, P.O.Box:360, 87100 Cosenza, Italy.

P5, NORTH KOREA

Tuesday March 5 through March 15
NOTE: Length of operation not known at this time.

XRØ, SAN FELIX ISLAND.

Tuesday March 12 through March 30
A radio amateur expedition to San Felix Island will be conducted March 12-30th, 2002, using the callsign XRØX. Lying 900 km northwest of Valparaiso, San Felix is a barren rocky island about 3 km across, with two small islets nearby. The expedition is being organized and led by Carlos G-Nascimento, NP4IW/CE3AQL. The San Felix Expedition Web site is:
<http://www.cordell.org/SFX>

H4Ø, TEMOTU PROVINCE.

Thursday March 28 through April 12
During the period from March 28th through April 12th, Nick, VK1AA, will be organizing a DXpedition to Temotu Province. The team will be active in CQ WPX Contest as Multi/Single and will be active on all amateur bands from 160-6 meters, all modes. You can visit their WEB page at:
<http://www.qsl.net/vk1aa/temotu>
All questions and requests can be sent to VK1AA at: watchman@tig.com.au QSLs are via VK1AA.

KH4, MIDWAY ISLAND.

Saturday March 30 through April 6

Jim/G3RTE and Phil/G3SWH will activate Midway Island on both SSB and CW between March 30th and April 6th. They have already secured the special callsign of W4M which will be used exclusively during their stay on the island. QSLs will be handled by G3SWH. Midway was ranked number 27 in Europe and number 55 world-wide on the "425 DX News Most Wanted DXCC Countries Survey in 2001" and number 89 on the ARRL list in 2000.

Contest Calendar

K2FA was active in the ARRL International DX CW contest. We submitted as a single operator, single band, low power, unassisted entry. Mike, KA2KQP operated as K2FA on 40 meters. He worked 44 countries and made 100 contacts. The score as submitted is 13,200.

Field Day is June 22-23 this year. Make sure you mark your calendars. There will be more Field Day information coming so stay tuned. Here is the March contest calendar:

ARRL Inter. DX Contest, Phone	Mar 2 -3
SARL Field Day Contest	Mar 9 - 10
RSGB Commonwealth Contest, CW	Mar 9 - 10
Great Lakes QSO Party	Mar 9 - 10
North American Sprint, RTTY	Mar 10
UBA Spring Contest, CW	Mar 10
Wisconsin QSO Party	Mar 10-11
Alaska QSO Party	Mar 16-17
YLISSB QSO Party, SSB	Mar 16-17
BARTG Spring RTTY Contest	Mar 16-18
Russian DX Contest	Mar 16-17
Virginia QSO Party	Mar 16-18
Spring QRP Homebrewer Sprint	Mar 25
CQ WW WPX Contest, SSB	Mar 30-31

Other Shark's Teeth

Mike Bucklaew, KA2KQP

I'd like to showcase some other sharks teeth in this issue.

The Maryland Geological Survey web site <http://www.mgs.md.gov/esic/brochures/sharks.html> is the source of this information. The title of their page is "Miocene Sharks Teeth of Calvert County".

The sharks teeth collected along the shore of the Chesapeake Bay between Chesapeake Beach and Calvert Cliffs in Calvert County are records of a far distant past when the climate, geography, and living creatures in this area were quite different from those of today.

Back in the Miocene Epoch, about 17 million years ago, the sharks that bore these teeth lived in the warm, shallow sea that covered southern Maryland. Luxuriant growths of sea algae and succulent aquatic plants that flourished here provided abundant food for marine life. Among the vertebrate inhabitants were seacows, whales, turtles, porpoises, rays, and sharks. The invertebrate population included ostracods (small crustaceans), clams, oysters, corals, sand dollars, and microscopic foraminifera. Along the margins of the sea were low, sandy shores and cypress swamps. Presumably a warm temperate climate prevailed similar to that of North and South Carolina today.

As generations after generation of these animals lived and died, and sank to the sea floor, they were covered by layers of sand and

silt that sealed them off and helped to preserve their skeletons. These fossiliferous deposits belong to the Miocene Calvert formation.

During the course of millions of years, the margins of this sea fluctuated gently and the climatic regime changed. Land surfaces exposed periodically were eroded, and streams and rivers carved new channels which



Fossilized Sharks Teeth (Not fossilized hams from 75 meters...)

altered the topography.

After the last great ice sheet receded and the sea level rose again, the lower reaches of the Susquehanna River and its tributaries were flooded. The present-day configuration of the Chesapeake Bay emerged, with the deposits of the Calvert Cliffs that were once sea bottom now standing 100 ft. above the water line. Fossil remains of animals from that ancient sea floor are now exposed as wind and water erode the cliffs, and represent the most

extensive assemblage of this period in the Eastern United States.

The teeth of extinct sharks most commonly found here belong to the following species: *Galeocerdo contortus*, and *G. triquetus* (Tiger Sharks), *Hemipristis serra* (Requiem Shark), *Oxyrhina desorii* (Mackerel Shark), *Sphyrma prisca* (Hammer-head Shark), and the Sand Shark, *Odontaspis elegans*. Teeth of the spectacular giant White Shark, *Carcharodon megalodon*, are found here too, but are rare.

From the great number of teeth that have been and are still found here, initially one wonders how so many sharks could have lived in a relatively restricted area.

There are several reasons for this abundance. First, sharks have an unlimited supply of teeth. No cavities, permanently missing teeth, or tooth aches for them! Shark teeth are not set firmly in the jaws, but in the gums, where they occur in layered rows. If a tooth is lost, it is gone but briefly, for another from the reserve layer moves forward to take its place. Therefore, one "full set" by no means represents the total tooth production of one shark. Also, recent studies indicate that the young of one common modern shark replace their upper teeth every 7.2 days, and the lower ones every 8.2 days! It is possible that this may have held true in fossil sharks.

Another factor may control the abundance of teeth. The predominance of bones of young and immature whales that have been recovered suggests that this was a calving ground. Many of these bones are scratched and scarred by the teeth of sharks. Thus, it

would appear Miocene sharks shared their descendent's predatory habit, and were attracted to this area by the young whales that made easy prey.

Hamword Puzzle

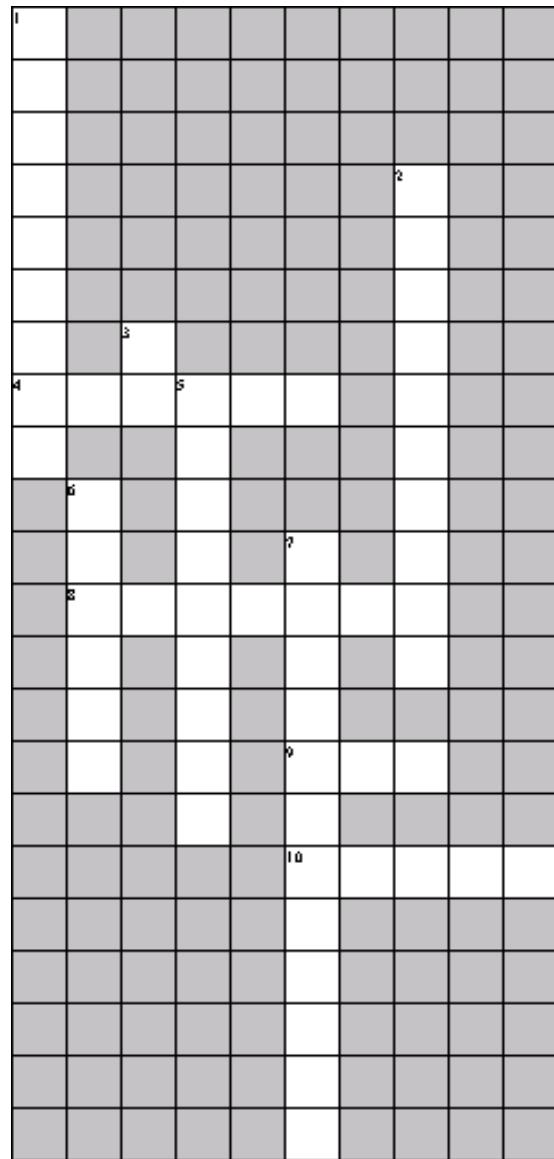
Across

- 4. RANKED NUMBER 27 IN EUROPE
- 8. _____ EPOCH, ABOUT 17 MILLION YEARS AGO
- 9. FUN FOR KIDS. HAZARDOUS TO HAMS.
- 10. TAKES THE GUESSWORK OUT OF ANTENNAS

Down

- 1. KEEPS THE BASEMENT DRY
- 2. CONVINCED
- 3. JUNE 22-23
- 5. MARCH 10 QSO PARTY
- 6. H40
- 7. KEEPS FOOD COLD

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