

The Ragchewer

January 2007

The monthly newsletter of the
Lancaster & Fairfield
County Amateur Radio Club

On the Web: www.k8qik.org
Send email to K8QIK@columbus.rr.com

Club Meetings :

1st Thursday of every month
at 7:30 pm at the club house.

Radio Night:

Every Thursday except the
1st Thursday at the club
house, 6:30 pm to 8:30 pm

VE Testing:

The third Sunday of every
even numbered month.
Register at 9:30 am and
testing at 10:00 am

Club House

Location:

On State Route 37 (Granville
Pike) next to Beavers Field.

Nets:

Mondays at 9:00 p.m.
147.03 MHz (+.6)
146.70 MHz (-.6) Alt. Freq.
443.875 MHz (+5)
Thursday at 8:00 p.m.
443.875 MHz (+5)
UHF linked system

Packet BBS 145.53MHz
K8QIK-1 BBS
K8QIK-2: Ohio53

Weather Spotter Net:

146.76 Repeater with 123Hz
tone Tuesday at 7:30 pm
Alt frequency 147.24 MHz

January Birthdays

Richard A. Lytle	W8THU
Robert J. Northrup	KC8PSW
Mark S. Urbine	KC8TUW
Gregory F. Shires	KC8OZP
Constance L. Snoke	N8LPC
Juanita R. Gaffney	KC8OYO
Edward L. Campbell	WD8PGO
Michael P. Hamilton	KC8LCY

Thursday Night Radio Night

Radio night is every Thursday at 6:30 p.m.
(except the first Thursday which is the club
monthly meeting). Work a little HF, make a
few DX contacts, maybe build something? How
about a hot cup of coffee and a few good
stories? We'll have them all waiting for you.

ARRL Membership

When you join the ARRL, or renew your
membership through the club, we retain \$15 for
each new membership OR lapsed membership
(of two years or more), and we retain \$2 for
each renewal. Please support our club, it doesn't
cost any more. Send or give all paperwork to
Treasurer with your money.

February VE Test:

The next VE test will be Sunday February 18th
at the club house on Route 37. Register at 9:30
a.m. and testing begins at 10:00 a.m. Prepare
yourself, take this test and upgrade! No code.

Free Swap and Sell

If you have anything ham radio related, you can
swap it or sell it here. List your items for free.
Give a price and how to contact you. Send the
list to K8QIK@columbus.rr.com

2006-2007 Officers

President:

Don Stephenson, WD8PCF

Vice President:

Scott Snoke, WD8IXO

Treasurer:

Ed Campbell Sr., WD8PGO

Secretary:

Robert Northrup, KC8PSW

Trustee:

John Hilliard, W8OF

Station Engineer:

John Hilliard, W8OF

Net Manager:

John Fick, KD8EEK

Activities Manager:

Kay Hanna, KC8HJW

Flower Fund:

Mary Travis, KD8EEI

Chief Cook and

Bottle Washer:

Charlie Snoke, N8KZN

Editor:

Jack Travis, AE8P
(740) 687-1985

January 4, 2007 Meeting Minutes

At 7:30pm meeting called to order by President Stephenson who led the pledge of allegiance.

There were 30 members and 2 guests present. Our guests were William Braun, K8ZCT and Robert Prince, KD8EXK

President Stephenson circulated two applications for their first review by club members.

Trustee John, W8OF swore in Scott Snoke, KD8IXO as our 2006/2007 Vice President, who had missed the December meeting where the 2006/2007 officers were sworn in.

Officer Reports

Secretary Report: Robert Northrup, KC8PSW

Minutes are posted in the Ragchewer. Motion to accept by Allan, KB8JLG and second by Ron, WA8GFO. Carried.

Treasurer's Report: Ed Campbell, Sr., WD8PGO.

Charlie, N8KZN gave the club financials for Ed. Motion to accept by John, W8AGS and second by Robert, KI8JM. Carried.

VP Report: Scott Snoke, WD8IXO

No Report

Trustee Report: John Hilliard, W8OF

John said he had sent the \$15 fee for our 3 repeaters to the Central Ohio Repeater Coordination Committee (CORCC) and that all was running smoothly for all our equipment.

Correction: In last months meeting minutes, it was stated "Robert, KI8JM requested the club put a small program on the 146.700 machine for CW practice to boost your speed and proficiency." And that John would install the program. As a correction, there is no program to install but anyone is encouraged to join the CW practice fun on Sunday evenings at 6:00PM to 7:00PM on our 146.700 repeater.

Committee Reports

VE Testing: Allan Sellers, KB8JLG

The next VE session will be February 18 at the clubhouse. Doors open at 9:30 AM and testing will

begin soon after that. Note that there was a good discussion about the FCC ruling that eliminates the 5 Word per minute requirement to access the HF bands. Once the ruling is printed in the Federal Register, it takes effect in 30 days.

Monday Night Net: John, KD8EEK

Jan 8-John, W8OF Jan 22-Gary, W8GTS

Jan 15-John, W8AGS Jan 29-John, WD8EEK

John reported there was a good turn out on Christmas day with 15 check-ins as well as an equally good turn out on New Years day.

Ragchewer: Jack Travis, AE8P

Jack said all is going well and is ready for the next installment of the "Chewer". Jack is still looking for local content, ideas, kit building info or home-brew activities. He also said he had taken home a number of the old scrapbooks and scanned the material for archival purposes. Jack is still dealing with a number of bad emails and snail-mail addresses. So if you know of a club member who is griping about not getting their "Chewer", then tell them to get with Jack and get it straightened out.

Submit your article, news item, cartoon, or other ham related bits of trivia to Jack at k8qik@columbus.rr.com.

Emergency Coordinator: Ed Campbell, WD8PGO

No Report. However, there is a training class at the Liberty Center for the new JIC and EOC centers. Training will be held on January 12, 2007 with a lunch provided.

Safety: Scott Snoke, WD8IXO

No Report

Station Engineer: John Hilliard, W8OF

John said everything as A-OK!!

Activities Manager: Kaye Hanna, KC8HJW

Kay thanked everyone who came out and participated in the celebration at the Ponderosa on East Main St in Lancaster. There were 33 folks present, members, wives, significant others, and young adults.

Flower Fund: Mary Travis, WD8EEI

There was \$15 collected for the fund and Ron-WA8GFO won half. Ron donated the money to the Radio fund.

Fund Raising: Kaye Hanna, KC8HJW

50-50 \$16.00 collected and Don, WD8PFC won the drawing and was given \$8.00

Old Business:

Charlie, N8KZN recognized Robert Prince for passing the Technician exam at the last VE session. Congratulations Robert!! His call sign is KD8EXK.

Allan, KB8JLG reported he had picked up weather sealed outdoor cabinet for use at the repeater site that he obtained from Anchor Hocking free of charge. He said it weighs about 300 pounds with all the doors and baffles installed but can be moved easily when these items are removed. It's a 19" rack type and will work very well to install the repeater. John, W8OF and others will coordinate with Allan to get it to the clubhouse so modifications and installing equipment can begin.

Griff, KG4IDG said he was still having problems linking with the 443.875 repeater on Thursday evening weather net that is run at 8:00 PM and covers SE Ohio, northern Kentucky and other areas. John, W8OF said there didn't appear to be a malfunction in the repeater itself but thinks it is in the hardware that makes the link.

Last month, Dave, W8EZE asked when the club was started. Jack, AE8P, while scanning club scrapbooks, discovered the club was organized on June 3, 1959 with about 21 members on the roster.

Roy Vickers who won the 50-50 raffle at the club's swap meet, has donated the proceeds back to the club.

Charlie, N8KZN thanks everyone who came out for "Radio Nite" on Thursday evenings for his or her participation with the food.

There was a concern voiced about the 147.030 repeater not dropping within reasonable time when the Medi-Care Net is running. It seems some of the operators are having problems with the repeater and causing it to time out. John, W8OF will look into adjusting the repeater to see if this can be cured.

New Business:

Allan, KB8JLG said there is interest in setting up a "No Code Theory" class for those wanting to get into Amateur Radio. This class will prep them to take the Technician level exam. Class could be offered on Tuesday evenings.

Robert, KI8JM asked the club if the "old timer" room (up stairs) could be turned into a radio room for newer hams to become more proficient at operating. Tom, KB8USK, a previous club president, said he had provided a number of "old radios" for the room and was instrumental in getting it set up as a museum. Good discussion followed as some of these radios are still in working order and useable but the room itself isn't really used, if at all. Ralph, W8BVH made a motion to appoint Robert, KI8JM as project coordinator and allow him to purchase materials, etc. Make it so! The motion was second by Griff, KG4IDG and carried at the vote. Robert will also be up grading the bench in the regular radio room as well.

Tom, KB8USK wanted to know if the club was going to participate in the 2007 Field day. Sounds like a good idea so planning will commence at the next meeting.

Charlie, N8KZN said there is a "basement clean out" scheduled for Saturday January 13, 2007. To help, be at the clubhouse at 8:00 AM. What doesn't go home with you will go to the dump so check it out maybe you can score some cool stuff.

Motion to adjourn was made by Tom, WB8USK and second by John, W8AGS. Motion carried. Meeting adjourned at 8:29 PM.

Respectfully submitted,
Robert Northrup, KC8PSW

E-mail Addresses

If you are currently receiving The Ragchewer via regular mail but have an Internet account, the Ragchewer can be sent to you and save the club some money. You'll also get your Ragchewer about a

week earlier. Send me your e-mail address and tell me to take you off the snail mail list. If you have a new email address, be sure to also let me know. Editor at K8QIK@columbus.rr.com

Upcoming Hamfests

January 14 is the 11th annual Sunday Creek Amateur Radio Federation hamfest in Nelsonville, Ohio. You can get more information at <http://www.scarfclub.org/>

January 28 is the Tusco Amateur Radio Club hamfest in Strasburg, Ohio. You can get more info at <http://noard.com/tuscoarc.htm>

February 11 is the Mid-Winter Hamfest in Mansfield, Ohio. You can get more info at <http://www.iarc.ws>

Tubes For Sale

If you need tubes for your boat anchor or TV contact Jeff Bell WD8JLI at 614-774-2973 or email at jbelle@imagearray.net he has a huge supply for most needs.

Weekly CW Practice

Bob Hughes, KI8JM and Gary Snider, W8GTS have started having CW practice over two meter radio every Sunday from 6:00 P.M to 7:00 P.M. The practice session will be on the 146.70 repeater. This is not for learning CW, but it is intended to improve your speed. Each session will start at the slowest speed and increase over the course of the hour.

The Wayback Machine #7

by Bill Continelli - W2XOY

OK, as you can probably guess, with all the recent attention on the Vanity Call Sign System, not to mention the half dozen calls that I've held in the past 27 years, this edition of "The Wayback Machine" is going to focus on call signs in amateur radio history.

Prior to 1912, getting a call sign was easy, just make one up and get on the air. Legend has it that's how the word "ham" came to mean amateur radio-the letters H-A-M were in fact the initials of the three operators of a powerful station in the early 'teens. With the passage of the Radio Act of 1912, the first licenses were issued. Call signs at that time for "private stations" (amateurs) consisted of a number followed by two (later three) letters, i.e., 1AW, 1TS, 8XK etc. Other countries adopted this system. This was adequate in the early, spark days of amateur radio, but as the shortwaves were developed, and CW became universal, problems appeared. Dave Sumner, Executive Vice President of the ARRL, and Trustee of NU1AW, the station of the International Amateur Radio Union, picks up the story...

"When transoceanic amateur communication started becoming commonplace in 1924, a problem immediately became apparent: call signs were all of the 'one numeral followed by two or three letters' format, with no built-in means of determining who was where. At first, an informal system of prefixes (called 'intermediates' at the time) was used by amateurs where 'a' stood for Australia, 'b' for Belgium, 'c' for Canada, 'f' for France, 'g' for Great Britain, 'j' for Japan, 'u' for United States, 'z' for New

Zealand, etc. The single-letter system was fine until it became apparent that Amateur Radio was spreading to too many countries for this system to accommodate.

"In January 1927 QST, a new intermediate list was unveiled as the work of the Executive Committee of the International Amateur Radio Union. The new list took effect at 0000 GMT (UTC) February 1, 1927. It was a two-letter system with the first letter indicating the continent (E for Europe, A for Asia, N for North America, F for Africa, etc.) and the second letter indicating the country (mostly following the old system). Thus, stations in the 48 United States used the intermediate 'NU.'

"The new system was quickly overtaken by events. The regulations adopted by the Washington International Radiotelegraph Conference later the same year included the allocation of a series of 'call signals' such as K, N, and W for the United States, and mandated that stations have a call signal from the series. The Washington regulations were to become effective on January 1, 1929, but August 1928 QST noted that Canadian amateur calls had changed to VE in April and September 1928 QST announced the effective date of October 1, 1928, in the United States for the W prefix (K outside the 48 states). Thus, US amateurs sported voluntary NU prefixes for just 20 months before they became Ws.

"The founding president of the International Amateur Radio Union was, of course, Hiram Percy Maxim, 1AW, who remained in that office until his death in 1936. The call sign NU1AW commemorates HPM and the IARU's creative, if short-lived, solution

to the problem of international identification of stations.

"As trustee of NU1AW it is my intention to use the call sign as a 'permanent special event station' operating in connection with World Telecommunication Day, significant IARU anniversaries, the IARU HF World Championship, and other events that will call attention to the contributions of the IARU to organized Amateur Radio."

(My thanks to K1ZZ for allowing me to reprint the above).

Thus, the call sign structure was set up for the rest of the '20's and the 1930's. Stations in the 48 States had a 1x2 or 1x3 call sign beginning with "W" and containing a numeral from 1 to 9. Stations in Alaska, Hawaii, or other US Possessions had a "K" prefix. Incidentally, note that I said 1 thru 9; this is because the numeral "0" WAS NOT available to amateurs at that time. As a result, the call sign districts had different boundaries than they do today; for example, the western sections of New York and Pennsylvania were in the 8th call district then, as opposed to the 2nd and 3rd today. Southern portions of New Jersey were part of the 3rd, rather than 2nd, call district.

When amateur radio resumed after World War II, the increased number of amateurs necessitated the addition of the tenth call district and the numeral "0". Except for the redrawing of the boundaries, things remained the same until 1951-53.

In 1951, the FCC eliminated the old Class A, Class B, and Class C licenses, and replaced them with the Novice, Technician, Conditional, General and Extra Class licenses. (What happened to the Advanced Class? "The Wayback Machine" will tell you in a future edition!) With this change came the first "distinctive" call signs. Novices, who at that time could only get a one year, non-renewable license, had a special 2x3 call sign with the letter "N" following the "W", i.e., WN2ODC, WN6ISQ etc. When they upgraded, the "N" would be dropped.

This system barely had a chance to settle in before the next change hit in 1953. Due to the increase in the number of amateurs, the FCC was running out of "W" 1x3 call signs. So 1x3 "K" calls began to appear in the 48 states, with the US possessions receiving 2x2 and 2x3 "K" calls, such as those issued today. Novice calls in the 48 states continued to have the distinctive "N" (such as KN4LIB) which disappeared upon upgrading.

Barely 5 years later, the growth of amateur radio, particularly in the 2nd and 6th call districts, caused another problem for the FCC, they were running out of "K" and "W" calls. So, in 1958, the FCC began issuing 2x3 "WA" calls, to be followed by "WB" when necessary. For some reason, Novices under this new system were given "WV" instead of "WN" as their prefix. The "V" would change to an "A" or "B" upon upgrading. (After only a few years of this, the FCC decided that their original idea was better, and went back to the Novice "N" prefix). With the uneven amateur population in the ten call districts, it took time for the "K" calls to run out in the other areas. As late as 1964, you could still get a "K" call in the 1st, 3rd or 7th call areas, while the 2nd and 6th districts were well into the "WB"s.

The 60's had some other call sign oddities. For a period of time, you could hold BOTH a Novice and Technician Class license simultaneously; the FCC gave you 2 call signs at once (such as WA/WN2ORS) and you used the appropriate call based on the amateur band and your privileges on it. The FCC also allowed you to have two calls if you maintained two homes in separate call areas; for example, Senator Barry Goldwater, K7UGA, also held K3UIG which he used while he was in Washington. (In theory, under this system, an amateur could hold four call signs if he/she had a Novice/Technician license and two separate addresses).

Except for the Novice and the distinctive "N", there was no way under this system to tell what class of license an amateur held. As older hams became Silent Keys and the number of available 1x2 calls slowly increased, the FCC instituted a program whereby those who held an Extra Class license for more than 25 years would be eligible for a 1x2. The length of time one needed to be an Extra was gradually reduced, until July 1977, when any Extra Class could apply for a 1x2.

There was one block of call signs that were unavailable to ANY amateur, regardless of license class. These were calls in which the suffix began with "X", such as W1XW, W3XCV, WB6XXK etc.. The FCC reserved these calls for experimental stations; for example, W2XB, W2XOY, W1XMN and KE2XCC were originally call signs of early TV and FM broadcast stations. While the FCC has relaxed their position on the 1x2 and 1x3 "X" suffix calls, the 2x3 call signs (such as KA6XYZ) are still reserved for experimental use.

By the mid 70's the 2nd, 4th, 6th and 8th call areas had run out of "WB"s. For a period of time, the FCC recycled older "WA" and "WB" calls that had been vacated, but when those ran out, they went to "WD"s. ("WC"s were reserved for and being issued to RACES/ Civil Defense stations.) Before the "WD" prefix could become popular, however, an incident occurred that would change the whole call sign structure.

In early 1977, an FCC employee was indicted for taking bribes offered by amateurs wanting special call signs. He was convicted and sent to jail. Partly as a result of this scandal, the FCC on February 23,

1978, adopted the call sign structure we have in place today. For 18 years, until the opening of the Vanity System, it had been impossible to request a specific individual or club call. Given the passionate love affair that some of us have with our calls, the FCC stands to make millions.

So, as you contemplate the call of your dreams, Form 610V in hand, take a moment to tune in NU1AW and work a piece of history. Meanwhile, "The Wayback Machine" is preparing for it's next journey to another moment in amateur radio history. I hope you're on board.

Scholarships for the 2007 - 2008 Academic Year

THE FOUNDATION FOR AMATEUR RADIO, INC., a non-profit organization with headquarters in Washington, D.C., plans to administer fifty-six (56) scholarships for the academic year 2007 - 2008 to assist licensed Radio Amateurs. The Foundation, composed of over seventy-five local area Amateur Radio Clubs, fully funds three of these scholarships. Eleven are funded with the income from grants. The remaining forty-two (42) are administered by the Foundation without cost to the various donors.

Licensed Radio Amateurs may compete for these awards if they plan to pursue a full-time course of studies beyond high school and are enrolled in or have been accepted for enrollment at an accredited university, college or technical school. The awards range from \$500 to \$3000 with preference given in some cases to residents of specified geographical areas or the pursuit of certain study programs. Clubs, especially those in Delaware, Florida, Maryland, Ohio, Pennsylvania, Texas, Virginia and Wisconsin, are encouraged to announce these opportunities at

their meetings, in their club newsletters, during training classes, on their nets and on their world wide web home pages.

Additional information and an application form may be requested by letter or QSL card, postmarked prior to April 30, 2007 from:

FAR Scholarships
P. O. Box 831
Riverdale, MD 20738

Applications are also available electronically upon request to Scholarships@Farweb.org

The Foundation for Amateur Radio, incorporated in the District of Columbia, is an exempt organization under Section 501(C)(3) of the Internal Revenue Code of 1954. It is devoted exclusively to promoting the interests of Amateur Radio and those scientific, literary and educational pursuits that advance the purposes of the Amateur Radio Service.

More Nikola Tesla – Part 2

In his work with the rotary magnetic fields, Tesla devised the system for transmission of power over long distances. He partnered with George Westinghouse to commercialize this system. Westinghouse had previously bought the rights to Tesla's polyphase patents and other patents for AC transformers. Experts announced proposals to harness the Niagara Falls for generating electricity. Against General Electric and Edison's proposal, Tesla's AC system won the international Niagara Falls Commission contract. The commission was lead by Lord Kelvin and backed by entrepreneurs (such as J.P. Morgan, Lord Rothschild, and John Jacob Astor). Work began in 1893 on the Niagara Falls generation project and Tesla's technology was applied to generate

electromagnetic energy from the falls.

Some doubted that the system would generate enough electricity to power industry in Buffalo. Tesla was sure it would work, saying that Niagara Falls had the ability to power the entire eastern U.S. On November 16, 1896, the first transmission of electrical power between two cities was sent from Niagara Falls to industries in Buffalo from the first commercial two-phase power plants (known as hydroelectric generators) at the Edward Dean Adams Station.

The hydroelectric generators were built by Westinghouse Electric Corporation from Tesla's AC system patent designs. Tesla's system designs alleviated the limitations of the previous DC methods. The

nameplates on the generators bear Tesla's name. He also set the 60 hertz standard for North America. It took five years to complete the whole facility.

With the financial backing of George Westinghouse, Tesla's AC replaced DC, enormously extending the range and improving the safety and efficiency of power distribution. Tesla's Niagara Falls system marked the end of Edison's roadmap for electrical transmission. Eventually, Edison's GE company converted to the AC system.

When Tesla was 41 years old, he filed the first basic radio patent (No. US645576). A year later, he demonstrated a remote controlled boat to the US military. Tesla believed that the military would want things such as radio-guided torpedoes. These devices had an innovative coherer and a series of logic gates. Mark Twain wrote Tesla over the demonstrations, though the military took little interest. Radio remote control remained a novelty until the Space Age.

At the age of 42, Tesla devised an electric igniter for gasoline engines. His designs are nearly identical to ideas which deal with the same process which modern internal combustion engines use.

Around 1899, Tesla began conducting research in Colorado Springs. He experimented with high-voltage electricity and the possibility of transmitting and distributing large amounts of electrical energy over long distances without using wires. He also conceived the science of telegeodynamics, now known as seismology, and explained that a long sequence of small explosions could be used to find ore underground and could create earthquakes large enough to destroy the Earth. He did not experiment with this as he felt there would not be "a desirable outcome".

In 1899, Tesla decided to move his research to Colorado, where he could have room for his high-voltage high-frequency experiments. After searching the country for a new location, Tesla chose Colorado Springs for his next series of experiments, primarily because of the frequent electrical storms and the thinness of the air (reducing its dielectric level), making it more conductive. Also, the property was free and electric power was available from the El Paso Power Company. Today electromagnetic intensity charts from the geological survey also show that the ground around his lab possesses a denser field than most of the surrounding area. Tesla reached Colorado Springs on May 17, 1899. Upon his arrival he told reporters that he was conducting experiments transmitting signals from Pikes Peak to Paris.

Tesla kept a diary of his experiments in the Colorado Springs lab where he spent nearly nine months. The diary consists of handwritten notes and date between June 1, 1899 and January 7, 1900. There are explanations (as seen in the photographs taken during this time) of his experimental work. It consists of 500 pages and nearly

200 drawings and is recorded chronologically as the work occurred.

Tesla, a local contractor, and several assistants commenced the construction of the laboratory shortly after arriving in Colorado Springs. Tesla established his lab on Knob Hill in Colorado Springs, (east of the Colorado School for the Deaf and Blind and one mile east of downtown). The primary purpose of the laboratory was to experiment with high frequency electricity and other phenomena. The Colorado Springs lab's secondary purpose was to research wireless transmission of electrical power.

Tesla's design for the lab consisted of a building fifty feet by sixty feet with eighty-foot ceilings. A one-hundred-forty-two foot conducting aerial with a thirty-inch copper-foil-covered wooden ball was erected on the roof of the lab. The design also implemented a roof that rolled back to prevent fire from sparks and other dangerous effects from the experiments. The laboratory possessed sensitive instruments and equipment.

The Colorado Springs lab possessed the largest Tesla Coil ever built, known as the "Magnifying Transmitter". This was not identical to the classic Tesla Coil. According to accounts, Tesla managed to transmit tens of thousands of watts of power without wires using the magnifier. Tesla posted a large fence around the coil with a sign, "Keep Out - Great Danger". Tesla's Magnifying Transmitter, at fifty-two feet in diameter, generated millions of volts of electricity and produced lightning bolts one-hundred-thirty feet long (forty-one metres). It was a three-coil magnifying system requiring alternative forms of analysis than lumped-constant coupled resonant coils presently described to most. The Magnifying Transmitter resonated at a natural quarter wavelength frequency. Tesla also worked with the magnifying transmitter in a continuous-wave mode and in a damped-wave resonant mode.

The Magnifying Transmitter produced thunder which was heard as far away as Cripple Creek. He became the first man to create electrical effects on the scale of lightning. People near the lab would observe sparks emitting from the ground to their feet and through their shoes. Some people observed electrical sparks from the fire hydrants (Tesla for a time grounded out to the plumbing of the city). The area around the laboratory would glow with a blue corona (similar to St. Elmo's Fire). One of Tesla's experiments with the Magnifying Transmitter destroyed Colorado Springs Electric Company's generator by backfeeding the city's power generators, and blacked out the city. The city had a backup generator and company officials denied Tesla further access to their feed if he did not repair the city's primary generator at his own expense. The generator was working again in a few days.

Tesla constructed many smaller resonance

transformers in his lab and discovered the concept of tuned electrical circuits. Tesla also developed a number of coherers for separating and perceiving electromagnetic waves. In his Colorado experiments, he designed rotating coherers. These were used to detect the unique types of electromagnetic phenomenon observed by Tesla. Tesla's rotating coherer had a mechanism of geared wheels that were driven by a coiled spring-drive mechanism, which was used to rotate small glass cylinders. These experiments were the final stage of years of work related to synchronized electrical tuned circuits.

These transceivers were constructed to demonstrate how signals could be "tuned in". Tesla logged in the diary on July 3, 1899, that a separate resonance transformer tuned to the same high frequency as a larger high-voltage resonance transformer would transceive energy from the larger coil, acting as a transmitter of wireless energy. This data was used to confirm Tesla's patent for radio during later disputes in the courts. These air core high-frequency resonate coils were the predecessors of systems from radio to radar and medical magnetic resonance imaging devices.

On July 3, 1899, Tesla discovered terrestrial stationary waves within the earth. He demonstrated that the Earth behaves as a smooth polished conductor and possesses electrical vibrations. He experimented with waves characterized by a lack of vibration at points, between which areas of maximum vibration occur periodically. These standing waves were produced by confining waves within constructed conductive boundaries. Tesla demonstrated that the Earth could respond at prescribed frequencies of electrical vibrations. At this time, Tesla realized that it was possible to transceive power around the globe. He also produced the effects that are now referred to as "free electron lasers."

Tesla conducted experiments contributing to the understanding of electromagnetic propagation and the Earth's resonance. He lit hundreds of lamps wirelessly at a distance of up to twenty-five miles (forty kilometres). He transmitted signals several miles and lit neon tubes conducting through the ground. He researched ways to

utilize the ionosphere to transmit energy wirelessly over long distances. He transmitted extremely low frequencies through the earth and portions of the ionosphere, called the Kennelly-Heaviside Layer, in his experiments. Tesla made mathematical calculations and computations based on his experiments and discovered that the resonant frequency of this area was approximately eight hertz. In the 1950s, researchers confirmed the resonant frequency was in this range.

Tesla in the Colorado Springs lab recorded cosmic waves emitting from interstellar clouds and red giant stars. He observed repeating signals conducted by his transmitter. He announced that he received extraterrestrial radio signals. Tesla stated that he received signals from planets in some of the scientific journals of the time. He believed he was receiving signals from outer space. The scientific community did not believe him, primarily because research of cosmic signals did not exist (what is known today as radio astronomy), and the community of science rejected Tesla's data. Tesla spent the latter part of his life trying to signal Mars.

Tesla left Colorado Springs on January 7, 1900. The lab was torn down, broken up, and its contents sold to pay debts. The Colorado experiments prepared Tesla for his next project, the establishment of a wireless power transmission facility that would be known as Wardencllyffe.

In 1900, Tesla began planning the Wardencllyffe Tower facility. In 1901, the construction began on land near Long Island Sound. The architect Stanford White designed the Wardencllyffe facility main building. Tesla's project was funded by influential industrialists and other venture capitalists. In June 1902, Tesla's lab operations were moved to Wardencllyffe from Houston Street. In 1903, the tower structure neared completion, although it was not yet functional due to a design error. In *Electrical World and Engineer* (March 5, 1904), Tesla reportedly determined the mode of ball lightning formation and produced them artificially.

Part 3 will conclude this story next month.

Items For Sale

Mosley Electronics TS33M Tri-band antenna. Suffered a main-boom failure but can be repaired easily. Antenna is disassembled but have all parts. \$40.

3-sided steel tower (unknown brand). Approx 30' tall in 3 sections. \$50.

Sierra, 10M-80M, screwdriver antenna. Early model but works great. It has stainless whip and all mounting brackets, hardware, switches and cabling. \$150.

Contact Robert Northrup at 740-438-9642 (mobile) or KC8PSW@arrl.net.

2007 Scheduled VE Exams

The Lancaster and Fairfield County ARC has scheduled VE exams on the following dates for 2007. Register at 9:30 am and testing at 10:00 am at the clubhouse on State Route 37 in Lancaster.

February 18, 2007
April 15, 2007
June 17, 2007
August 19, 2007
October 21, 2007
December 16, 2007

Regards, Allen Sellers KB8JLG

The FCC at Work

FCC cites Pennsylvania radio amateur for failure to ID (Jan 3, 2007) -- The FCC's Philadelphia Field Office has issued a formal *Notice of Violation (NoV)* to a Pennsylvania radio amateur for failure to identify in a timely manner. The Commission released the *NoV* to Andrew Ban, KB3GRK, of Feasterville, on December 20. The notice says that on September 12 and 13, 2006, an agent of the FCC's Philadelphia office monitored KB3GRK's transmissions on 439.850 MHz and observed that the operator failed to identify for nearly one hour in one instance and for

more than 20 minutes in the second. §97.119(a) of the Amateur Radio Service rules requires stations to identify "at the end of each communication, and at least every 10 minutes during a communication." The FCC has advised Ban that he must submit within 20 days a written statement addressing the alleged violations and action taken to preclude recurrence. The issuance of an *NoV* appears to be a departure from the FCC Enforcement Bureau's typical practice of addressing such alleged infractions with an advisory letter rather than a formal notice.

Coax Power Derating

Heat from direct summertime solar radiation on a coax cable can substantially lower its maximum power rating, because heat from the sun adds to heat from RF power loss. That problem can be avoided by installing a sun shield to protect a coax

transmission line from direct solar radiation. Coax sun shields should be designed to allow unrestricted air circulation entirely around a line, so heat from RF power loss can dissipate freely into the air.

Paul D. Dilliard, WA2IBT, SK

Paul D. Dilliard, 96, of Lancaster, passed away on Saturday Dec. 23, 2006, at Fairfield Medical Center.

Paul was a member of First English Lutheran Church, life member of Olivedale Senior Citizens and Mt. Pleasant Kiwanis. He retired from Anchor Hocking after 42 years as a chemist.

He is survived by his four children, Paul O. (Thelma) Dilliard of Lancaster, Carol A. (Paul) Oliver of Rushville, Susan I. (Robert) Rauch of Celina and John A. (Kathy) Dilliard of Helena, Mont.; eight grandchildren; 10 great-grandchildren; and sister Agnus Zacharas of Glen Falls, N.Y.

He is preceded in death by his wives, Julia, Helen and Thelma; and parents Oscar and Mary Dilliard.

The funeral was held at 10:30 a.m. Thursday December 28, 2006 at the funeral home. Pastor Karen Torrez conducted the services. Interment was at Maple Grove Cemetery.

Paul was a long time member of the Lancaster and Fairfield Amateur Radio Club. Paul was a regular on the Medicare morning net and enjoyed the contact with the outside world during his later years. Paul was known as a real gentlemen by those who had contact with him.

Antennas for Beginning Hams Part 2 of 2

By Max KO4TV

In last month's article, we discussed some things to beware of in extravagant claims by antenna manufacturers and vendors. This month, we will discuss various types of antennas used by Hams, and the relative pros and cons of each. Probably the antenna most widely used by Hams is the "Rubber Duck" antenna, used with almost all hand-held radios. From a standpoint of gain and efficiency, this is a horribly inefficient antenna!

Why, then, is it so widely used? The answer in one word is: "Convenience"! While the typical "Rubber Duck" has a net LOSS of several dB when compared with a half-wave dipole, it is nonetheless very convenient and compact. For comparison, a half-wave dipole on 2m would be about 38 inches long, and on 70cm would be about 13 inches long. Even a quarter-wave vertical antenna for 2m would be about 19 inches long, and while some hams indeed use a quarter wave on 2m portables, it is still somewhat bulky. So, is the "Rubber Duck" a good antenna, or a bad one? From a standpoint of convenience and compactness, it can't be beat! But, as an efficient radiator, it stinks!

For a base antenna, several choices are available. The most commonly used base antenna on 2m and 70cm is the old standby, the J-Pole. It is rugged, efficient, easily and cheaply constructed from readily available materials, and lightweight. Other commonly used base antennas are the "Ringo" (Registered trade mark) vertical, the quarter-wave ground plane, and the 5/8 wave ground plane. All of these are very satisfactory for working into repeaters and directly with mobiles. For more advanced operation, multi-element beams are available for use with a rotor and mast or tower. For operation with mobiles or repeaters, these beams should be vertically polarized. Some Hams who go in for D-X'ing on VHF or UHF used high-gain horizontally polarized beams.

When we decide to go "Mobile" on 2m or 70cm, we have a much better choice of antennas, and several very efficient antennas have been developed for mobile use. The most widely used mobile antennas for 2m and 70cm are the quarter-wave

dipole, the 5/8 wave dipole, and the J-Pole. The quarter-wave and the 5/8 wave must be worked against an effective metallic ground plane, usually the vehicle body. The J-Pole, while somewhat longer than either a quarter-wave or 5/8 wave antenna, does not need a ground plane, therefore it is well suited for use on fiberglass or plastic vehicles, which are becoming more and more prevalent these days. The quarter wave antenna for 2m is about 20 inches long, including mount. The 5/8 wave antenna is about 48 inches, and the J-Pole is about 60 inches. All of these antennas are readily available with either magnetic mounts or may be mounted by drilling a hole in the vehicle. Of course, the magnetic mount is totally useless with a fiberglass or plastic body, but these antennas may possibly be mounted using double-face tape or similar adhesive mounts.

Another possibility with smaller antennas is the "Through-Glass" mount, which entails using metal disks glued to the inside and outside of a vehicle window. While this is widely used with Cell-Phone antennas, it has not found widespread use with Ham antennas, due to the size and bulk of the latter.

The location on the vehicle has quite a bit to do with the success of an antenna. The best all-around location for coverage in all directions is in the center of the roof, but this is sometimes difficult if the vehicle is garaged or driven under parking decks at shopping malls, etc. However, many Hams, including this writer, enjoy considerable success with mounting antennas on the front or rear corner of the car. By using a simple Lshaped bracket, the antenna can be fastened to the hood or trunk lip of the vehicle with a couple of sheet metal screws, and will leave no holes visible from the outside when the antenna is removed. This method is especially suitable for J-Pole antennas, as it results in a lower overall profile while still keeping the main radiating portion of the antenna above the mass of the vehicle. There is also a special mount made that will clamp an antenna to the center of the trunk lid, but special care must be taken to assure a good ground to the rest of the vehicle body, or performance and noise pick-up will suffer.

An exasperated mother, whose son was always getting into mischief, finally asked him, "How do you expect to get into heaven?" The boy thought it over and said, "Well, I'll just run in and out and in and out and keep slamming the door until St. Peter says, 'For Heaven's sake, Jimmy, either come in or stay out.'"

More Ham Tips

Be sure the frequency (or "channel") is "clear" before you transmit. Think how you would like it if someone interrupted your conversation.

Recommendation: when you turn to a repeater or a simplex frequency, listen for at least thirty seconds before transmitting.

Using Q-signals too often is bad form. Although Q-signals have a very valuable place in Amateur Radio, they are not universally accepted on F.M. voice channels. Using them during EVERY TRANSMISSION is really annoying.

Recommendation: use Q-signals sparingly. Once in a while but not very often.

Using the phrase "clear and monitoring" is not really necessary. Neither term is required by the F.C.C. or anybody else. If you call another amateur, using his/her call sign and yours, and that person does not answer, it is not necessary to advise "clear." You have already identified your station and any other identification is superfluous.

Recommendation: use "clear" only to mean that you are shutting down operation and will not be there to answer any subsequent calls. Under normal circumstances, when you are finished with a contact but will continue listening, it is sufficient (and just right!) to merely say your call sign.

Contrasting Recommendation: If you attempt to contact someone and there is no answer, you can notify others that you are finished by saying, "KF6xxx clear," or "no contact, this is KF6xxx clear W6ABC repeater." This allows someone who may have been standing by to go ahead and make his or her call.

Be sure to learn the usage, protocol and/or policies of repeaters you are using. Just because a repeater is "there" does not mean that you are welcome to switch to it and use it for long, extended rag-chews. Some repeaters welcome newcomers, some do not. A sensible person does not want to spend time where s/he is not welcome. Even though your license allows you to operate on any frequency within the bounds of your license class, a wise amateur avoids "closed" repeaters and repeaters that are operated by small, unfriendly groups.

Recommendation: listen to a repeater for a while before you make a decision to use it. You might even ask someone on the repeater if you are welcome to use it for occasional conversations.

Using the term "for I.D." is not necessary. There

should be no reason to transmit your call sign other than to identify your station. Identification is required every 10 minutes during a conversation and at the end of a conversation or series of communications. Conversations need not come to a halt while you identify. ("Stand by, everyone, while I say my call sign.") Simply say your call sign once within 10 minutes.

Recommendation: while talking, say your call sign once every ten minutes. Don't say "For I.D., this is KF6xxx." Don't say "For license preservation purposes, this is KF6xxx" more than once or twice per year. Identify properly, but do not over-identify.

Contrasting Recommendation: if you hear someone say "for I.D.," they may be trying to gently remind you that 10 minutes have passed and you should identify your station. Take the hint and say your call sign the next time it is your turn to talk.

Long ago, F.C.C. rules required mobile hams to not only say their call sign, but to say where they were operating, giving both the city and the call sign area. You may hear some hams saying, "...mobile 6" or "...mobile 3" after their call sign. This means that they are operating "mobile, in call sign area 6" or "mobile, in call sign area 3." This is no longer required but it is sometimes good to know. When leaving their home state, some hams will keep track of what call sign area they are in, and say, "...mobile 7," or "...mobile 1," or whatever.

Recommendation: it's not necessary, but it's not wrong.

Certain types of jargon are easily recognizable as being "CB" terms. "What is your personal?" when you mean "what is your name?" "I'm on the side," when you mean you are "listening" or "monitoring." Although there is nothing "wrong" with CB, these terms are neither generally used nor appreciated on Amateur Radio frequencies.

Recommendation: avoid CB-style jargon and terms. Generally speaking, plain English is better: "my name is xxxx, what is yours?"

Different repeaters handle emergency communications in different ways. A general guideline is this: if you are on an unfamiliar repeater and you have emergency traffic, say so! Example: "Can someone help me contact the Highway Patrol?" or "I need help contacting the Fire Department." Asking "is anybody monitoring?" may sound like an attempt to start a casual conversation. On many

repeaters, you could be ignored. However, if you state that you have emergency traffic, people on many repeaters will drop what they are doing to help you. Note: if you are monitoring a repeater and someone asks for emergency assistance and you cannot help, BE SILENT! There are few things stupider than someone breaking in to say that they would help except that they forgot the codes, or that they left their radio with the Touch-Tone (tm) pad at home, or that their home phone is busy so they can't make the call for you.

Rcommendations: If you have emergency traffic, say so immediately.

If you can help, please do.

If you cannot help, do not transmit.

In this day of scanners, scanning mobile radios, scanning portable radios, dual-, triple- and quadruple-band radios and multiple radios in the car or shack, you could miss making contact with someone because your radio is scanning several channels or bands. If you know that the person you are calling is sitting next to the radio waiting for you, you can make your call very simple: say his/her call, then your own. However, if your friend has a scanning radio or listens to several radios, it is possible that he/she could miss your call. You should call twice: say the other station's call twice, then your own. Pause for a half-minute or so and try again. It might also be a good idea to try again in 4 or 5 minutes, in case the called person's scanner was stopping on a long, drawn-out conversation. And if you know that the called station is listening to more than one frequency, you can call and say "on [such-and-such] repeater" to give them a hint as to which microphone to pick up or which band to select.

Rcommendation: call twice.

You may hear people using the term "73," meaning "best wishes." There is no "s" in the salutation "73." (Other hams may use the term "88," meaning "love and kisses." Typically used between husbands and wives.) These shortcuts were developed years ago as a way to communicate common thoughts quickly. You will hear others saying "73s" and "88s" (wrong!) You might even hear someone saying [cringe!] "threes and eights and all those good numbers!" Yecch! Negative!

Proper usage would be similar to this:

Voice: "OK, Dan, seven-three and I will talk to you later. (pause) WA7AII."

Voice: "73 for now, WB6KHP clear."

CW: "W2EOS de K8JW CUL OM 73 SK."

CW: "N6xxx de KB6xxx 73 88 SK."

There is no specific requirement for keeping logs of the use of your amateur radio station except for International Third-party Traffic. However, a good way to keep track of your communications is to use a Log Book, available at some amateur radio dealers.

One method is this: make an entry in the "date" column for each day you operate your station. Each time you contact a "new" station, make entries for call sign, name, frequency, mode and any other information you think necessary or interesting. You probably have no need to make log entries for people you talk to every day, with the possible exception of logging emergency traffic that you may handle for others.

Sometimes while talking to another station, it is necessary to ask the other person to "stand by." This may be caused by (a) a driving situation needing immediate attention to avert a crash, (b) a spouse or child walking into the "shack" with a message, (c) placing your order at a drive-up window, etc. The proper response, when requested to "stand by," is silence. Generally it will only take a moment and the other station will be back. If you feel it necessary to say something, then say "[call sign] standing by." If you respond to "stand by" with a long, drawn-out acknowledgement, it serves no purpose and the person asking you to "stand by" is not listening anyway.

Keep in mind that when you are operating in a noisy environment, you do not have to be able to hear yourself talking. There will be those instances where you are helping with emergency communications for a disaster, or communications support for a parade, or you are at an airport or other noisy place. If you shout into the microphone loud enough to hear yourself, you are distorting the signal so badly that the person on the other end may not be able to hear or understand you. Instead, practice speaking into the microphone in a normal tone. It can be very difficult to operate under these conditions (loud background noise), but it is a skill that you would do well to learn.

One of the most important things for new hams to learn is to "K-H-T." That is "key, hesitate, talk." You must consciously learn to push the microphone button, pause slightly, and then begin speaking. If you push the button and speak simultaneously, the first word or the first part of a word may be cut off. This does not facilitate effective communications. Hopefully, if you learn to do it correctly from the first

day, it will become subconscious and you will do it automatically. If this is the case, you will earn the respect and admiration of your peers. If not, you will be forever labeled as a sub-standard operator.

Try to keep your language polite. Profanity and

discussions of bodily functions should be off limits - not because of government rules, but because it's the right thing to do. Generally, other hams and their family members do not want to hear conversations that are not of the "G-rated" variety.

If Noah Was Still Alive

It is the year 2007 and Noah lives in the United States...

The Lord speaks to Noah and says: "In one year I am going to make it rain and cover the whole earth with water until all is destroyed. But I want you to save the righteous people and two of every kind of living thing on the earth. Therefore, I am commanding you to build an Ark."

In a flash of lightning, God delivered the specifications for an Ark. Fearful and trembling, Noah took the plans and agreed to build the Ark. "Remember," said the Lord "You must complete the Ark and bring everything aboard in one year."

Exactly one year later, a fierce storm cloud covered the earth and all the seas of the earth went into a tumult. The Lord saw Noah sitting in his front yard weeping. "Noah." He shouted, "Where is the Ark?" "Lord, please forgive me!" cried Noah. "I did my best but there were big problems. First, I had to get a permit for construction and your plans did not comply with the codes. I had to hire an engineering firm and redraw the plans. "Then I got into a fight with OSHA over whether or not the Ark needed a fire sprinkler system and floatation devices.

"Then my neighbor objected, claiming I was violating zoning ordinances by building the Ark in my front yard, so I had to get a variance from the city planning commission. "I had problems getting enough wood for the Ark, because there was a ban on cutting trees to protect the Spotted Owl. I finally convinced the U.S. Forest Service that I needed the wood to save the owls. "However, the Fish and Wildlife Service won't let me catch any owls. So, no owls." "The carpenters formed a union and went out on strike. "I had to negotiate a settlement with the National Labor Union. Now I have 16 carpenters on

the Ark, but still no owls.

"When I started rounding up the other animals, I got sued by an animal rights group. They objected to me only taking two of each kind aboard. "Just when I got the suit dismissed, the EPA notified me that I could not complete the Ark without filing an environmental impact statement on your proposed flood. They didn't take very kindly to the idea that they had no jurisdiction over the conduct of the Creator of the universe.

"Then the Army Corps of Engineer demanded a map of the proposed new flood plain. I sent them a globe.

"Right now, I am trying to resolve a complaint filed with the Equal Employment Opportunity Commission that I am practicing discrimination by not taking godless, unbelieving people aboard!

"The IRS has seized all my assets, claiming that I'm building the Ark in preparation to flee the country to avoid paying taxes.

"I just got a notice from the State that I owe some kind of user tax and failed to register the Ark as a recreational water craft." "Finally the ACLU got the courts to issue an injunction against further construction of the Ark, saying that since God is flooding the earth, it is a religious event and therefore unconstitutional.

"I really don't think I can finish the Ark for another 5 or 6 years!" Noah wailed.

The sky began to clear, the sun began to shine and the seas began to calm. A rainbow arched across the sky.

Noah looked up hopefully. "You mean you are not going to destroy the earth, Lord?"

"No," said the Lord sadly. "The government already has." AMEN

Albert Einstein

"I am often asked how radio works. Well, you see, wire telegraphy is like a very long cat. You yank his tail in New York and he meows in Los Angeles. Do you understand this?"

Now, radio is exactly the same, except that there is no cat."

Attributed to Albert Einstein

Samuel F. B. Morse

(There are many worthy items of interest in the article "Inventor Samuel F. B. Morse--His Perseverance Helped Revolutionize 19th Century Communications" by Michael Richman in the 06 January 2000 Investor's Business Daily. Notably, Morse intended that his code be copied by a machine that would mark a paper tape with dots and dashes that would then be manually transcribed into letters. [Such a machine was used by the Dutch Railways in Indonesia, by the way.] While Morse practically starved to death eking out a living as an artist, his dedication to his concept ultimately yielded success.)

When Samuel F. B. Morse (1791-1872) wasn't teaching art at New York University or painting a portrait, he devoted his time to making a crude model of a machine that would transmit messages over a wire--a telegraph. Having only sparse resources, he used a handmade battery and an old artist's canvas stretcher to hold the model together. Too poor to buy insulated wire on reels, he bought cheap wire in pieces and soldered them together. He then wrapped the wire--bit by bit--with cotton thread for insulation. He used old clock parts to move a paper tape across the frame where the messages were to be recorded.

He then used a swinging lever to support a recording pencil and a pole piece of an electromagnet. As the electromagnet activated the

swinging lever, the pencil traced a line on the paper tape that corresponded to the received signal pulses. Morse then devised a combination of dots and dashes--the "Morse Code"--for each letter of the alphabet.

Morse learned about electricity while studying art at Yale University. He covered one room of his dorm room with a drawing he named "Freshmen Climbing the Hill of Science" portraying "humble youths crawling toward the pinnacle of knowledge".

While Morse's crude instrument worked in his workshop, he pondered whether this magnetic effect could be produced at the end of a very long wire. In 1832 he was assured that electricity would pass instantly through any known length of wire. However, his first attempt with just 40 feet of wire was unsuccessful. It was suggested that he use more than one battery cell and, with the use of 20 cells, in 1837 Morse successfully tested the telegraph over 10 miles of wire that was wound on reels.

Initially no government officials were interested in the telegraph, but after lobbying Congress three more times, he was given \$30,000 for a 40-mile line between Washington and Baltimore. On 24 May 1844, Morse unveiled his telegraph and transmitted the historic words, "What hath God wrought!"

Antenna Pruning By The Book

By Dick AF8X

I expect most of us have calculated the length of a ½-wave dipole for the various bands using the formula: 468 divided by frequency in MHz—cut it a bit long to be sure it wouldn't need to be lengthened, then had to prune it to the desired frequency. At least that's how I have always done it.

My procedure was to use the radio to check if the antenna was resonant somewhere on the band. Usually, because I cut it long, it would be resonant at or below the bottom of the band. I would then lop a piece of wire off each end, go back inside, recheck for resonance, go back out and chop a bit more off and recheck. This back-and-forth chop and check, chop and check, would go on until I achieved resonance at the point desired. I've been doing this for years, and then about a year ago I was leafing through an antenna book where I found the following information.

To calculate the frequency change per unit of length of the ½-wave dipole:

Example: 80 meters 3.5 to 4.0 MHz

1. $L = 468 / 4.0 \text{ MHz} = 117 \text{ Feet}$

2. $L = 468 / 3.5 \text{ MHz} = 133.7 \text{ Feet}$

3. Difference in length $133.7 - 117 = 16.7 \text{ Feet}$

4. Frequency difference: $4000 \text{ kHz} - 3500 \text{ kHz} = 500 \text{ kHz}$

5. Calculate freq per unit length: $500\text{kHz} / 16.7 \text{ Ft.} = 30 \text{ kHz per Foot}$

Isn't this neat? You can figure just how much to cut and only do it once. By now you are probably saying, "Well duh, everyone knows that." I know this shows some ignorance on my part, but honest, I knew all this stuff, I just never thought to apply it. My hope is that if anyone else has been doing it the hard way as I was, this will serve as a reminder that a little brainpower can reduce the amount of brawn needed on most projects.

Morse Code, A Fading Signal

By Miguel Helft

It may be the ultimate S O S - Morse Code is in distress.

With thumb and forefinger barely touching the two metal ends of a Morse paddle, a ham operator unleashes a stream of dits and dahs.

The language of dots and dashes has been the lingua franca of amateur radio, a vibrant community of technology buffs and hobbyists who have provided a communications lifeline in emergencies and disasters.

But that community has been shaken by news that the government will no longer require Morse Code proficiency as a condition for an amateur license. It was deemed dispensable in part because other modes of communicating over ham radio, like voice, teletype and even video, have grown in popularity.

While the decision had been expected, some ham radio operators fear that their exclusive club has been opened to the unwashed masses - and that the very survival of Morse Code is in question.

"It's part of the dumbing down of America," said Nancy Kott, editor of World Radio magazine and a field representative for the Centers for Disease Control and Prevention in Metamora, Mich. "We live in a society today that wants something for nothing."

A woman in a mostly male world, Ms. Kott is one of about 660,000 licensed ham operators in the United States and is the American leader of Fists CW Club, an organization that calls itself the International Morse Preservation Society. (An "open fist" was the hand position typically used by telegraph operators when sending Morse, which is sometimes called Continuous Wave, or CW. And in ham radio slang, someone who sends fine code is said to have a good fist.)

Within 48 hours after the Federal Communication Commission's move last month to drop the Morse requirement, a discussion on www.eham.net ran more than 380 messages and 57,000 words long, the equivalent of a short novel. The postings were divided roughly evenly between those lamenting and praising the commission's decision.

"CW is just another mode and should not be afforded any special priority over others," wrote K4UUG, who like many radio aficionados identified himself online using his radio call sign. "Proficiency should not be required for those who do not wish to

use the mode."

As part of its decision to eliminate the Morse requirement, the commission made essentially the same point.

Inside a hilltop trailer above Stanford University in Palo Alto, Calif., a couple of veteran coders seemed to be taking the commission's decision in stride earlier this week. In a room cluttered with electronic equipment, they translated the dits and dahs that beeped in the background at dizzying speed, the chatter between someone in Canada, VE6NL to be precise, and someone off the coast of Antarctica, VP8CMH.

"It's a bit like a foreign language," said W6LD, whose real name is John Fore, a securities lawyer at Wilson Sonsini Goodrich & Rosati, a prominent Silicon Valley firm. "You learn it and it's fun to use."

With thumb and forefinger barely touching the two metal ends of a Morse paddle, W6NL, a k a David B. Leeson, unleashed his own stream of dits and dahs with the ease of a virtuoso, joining the global conversation. "I fell head over heels for amateur radio when I was 4 or 5 years old and heard Morse Code signals from afar at the station of a 14-year-old," said Mr. Leeson, 69, a consulting professor of engineering at Stanford. "I still remember the thrill."

The thrill turned into a hobby, and the hobby turned into a career in technology. In 1968, Mr. Leeson founded California Microwave, once a thriving telecommunications equipment company but now defunct. Now radio and Morse are just for fun, said Mr. Lesson, who is faculty adviser to the Stanford Amateur Radio Club, which once counted William R. Hewlett and David Packard as members.

Mr. Leeson and Mr. Fore are both active in radio contests, 48-hour competitions in which hams try to contact as many other hams as possible, often using Morse. Mr. Leeson has a station in the Galapagos Islands, where he goes several times a year with his wife, Barbara (K6BL), for contests. They once contacted as many as 17,000 other hams in a weekend. Mr. Fore, who is 50, and got his first license when he was 10, has a station in Aruba.

They embody the kind of utility-free passion for Morse that the futurist Paul Saffo said would ensure its survival.

"Freed from all pretense of practical relevance in an age of digital communications, Morse will now

become the object of loving passion by radioheads, much as another 'dead' language, Latin, is kept alive today by Latin-speaking enthusiasts around the world," Mr. Saffo, a fellow at the Institute for the Future, wrote in his blog.

Morse Code was first devised in the 1830s for use with the telegraph. It later became an essential part of civilian, maritime and military radio communications. But the military has largely abandoned its use in favor of newer technologies, and the Coast Guard stopped listening for Morse S O S signals at sea during the 1990s.

The F.C.C. first lifted the Morse Code requirement for entry-level licenses in 1991. It later dropped proficiency requirements for higher-level licenses to five words a minute, from 20. After international regulations stopped mandating knowledge of it in 2003, it was only a matter of time until Morse Code was no longer required in the

United States. The requirement will formally be phased out sometime this year.

The demise of the Morse requirement, however, could be a boon for ham radio itself. After the F.C.C.'s decision, the American Radio Relay League, an organization representing ham radio operators, said demand for information about radio licenses surged from about 200 in a typical weekend to about 500.

"We are very pleased to see that," said David Sumner (K1ZZ), the league's chief executive.

That is no consolation for the most avid defenders of Morse.

"There is something magical about being able to put two wires together and start going dit-dit-dit dit-dit," said Ms. Kott, or WZ8C. "We are just going to have to get on the air and do what we do and hope for the best."

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FCC to Drop Morse Testing for All Amateur License Classes

In an historic move, the FCC has acted to drop the Morse code requirement for all Amateur Radio license classes. The Commission today adopted a Report and Order (R&O) in WT Docket 05-235. In a break from typical practice, the FCC only issued a public notice at or about the close of business and not the actual Report and Order, so some details -- including the effective date of the R&O -- remain uncertain. The public notice is located at, http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-269012A1.pdf.

Also today, the FCC also adopted an Order on Reconsideration, in WT Docket 04-140 -- the "omnibus" proceeding -- agreeing to modify the Amateur Radio rules in response to an ARRL request to accommodate automatically controlled narrowband digital stations on 80 meters in the wake of rule changes that became effective today at 12:01 AM Eastern Time. The Commission said it will carve out the 3585 to 3600 kHz frequency segment for such operations. Prior to the long-awaited action on the Morse code issue, Amateur Radio applicants for General and higher class licenses had to pass a 5 WPM Morse code test to operate on HF. The Commission said today's R&O eliminates that requirement for General and Amateur Extra applicants.

"This change eliminates an unnecessary regulatory burden that may discourage current Amateur Radio operators from advancing their skills and participating more fully in the benefits of Amateur Radio," the FCC said. The ARRL had asked the FCC to retain the 5 WPM for Amateur Extra class applicants only. The FCC proposed earlier to drop the requirement across the board, however, and it held to that decision in today's R&O.

Perhaps more important, the FCC's action in WT Docket 05-235 appears to put all Technician licensees on an equal footing: Once the R&O goes into effect, holders of Technician class licenses will have equivalent HF privileges, whether or not they've passed the 5 WPM Element 1 Morse examination. The FCC said the R&O in the Morse code docket would eliminate a disparity in the operating privileges for the Technician and Technician Plus class licensees. Technician licensees without Element

1 credit (ie, Tech Plus licensees) currently have operating privileges on all amateur frequencies above 30 MHz.

"With today's elimination of the Morse code exam requirements, the FCC concluded that the disparity between the operating privileges of Technician Class licensees and Technician Plus Class licensees should not be retained," the FCC said in its public notice. "Therefore, the FCC, in today's action, afforded Technician and Technician Plus licensees identical operating privileges."

The wholesale elimination of a Morse code requirement for all license classes ends a longstanding national and international regulatory tradition in the requirements to gain access to Amateur Radio frequencies below 30 MHz. The first no-code license in the US was the Technician ticket, instituted in 1991. The question of whether or not to drop the Morse requirement altogether has been the subject of often-heated debate over the past several years, but the handwriting has been on the wall. A number of countries, including Canada, no longer require applicants for an Amateur Radio license to pass a Morse code test to gain HF operating privileges. The list has been increasing regularly.

The FCC said today's R&O in WT Docket 05-235 comports with revisions to the international Radio Regulations resulting from the International Telecommunication Union (ITU) World Radiocommunication Conference 2003 (WRC-03). At that gathering, delegates agreed to authorize each country to determine whether or not to require that applicants demonstrate Morse code proficiency in order to qualify for an Amateur Radio license with privileges on frequencies below 30 MHz.

Typically, the effective date of an FCC Order is 30 days after it appears in the Federal Register. That would mean the Morse requirement and the revised 80-meter segment for automatically controlled digital stations would likely not go into effect until late January 2007.

The ARRL will provide any additional information on these important Part 97 rule revisions as it becomes available.

Antenna Investment - The Case for Wire Antennas

By Al P. LaPlaca, W2WW

Most modern transceivers cover nine bands, some ten bands, and at least two cover eleven! But the average amateur limits him/herself to either putting up a triband yagi and being content with operation on only three bands, and/or a multiband vertical to include the WARC bands and putting up with limited bandwidth operation on the lower frequencies. By the time one's done buying all of that "educated" aluminum (and a tower and rotor for the beam) the wallet is well over \$1,000 lighter. Such is the cost of modern antenna technology!

I seriously question whether all of that investment in an antenna farm is really worth it for the average ham. Sure, it probably is for the serious ("World Class") Contester or Dixer, but for the rest of us, I think it's financial overkill. When I first got on the air, nearly 50 years ago, most hams were having thousands of wonderful hours of operating enjoyment, and working plenty of DX without having had to spend half a month's pay (or more!) for antennas. And it's still being done today by some, as witnessed to by the number of G5RV and similar type antennas one hears being used on the bands. While some may find this hard to believe, wire antennas do work. And, when homemade, are very inexpensive. Even if one goes first class and buys pre-assembled, packaged wire antennas the cost is approximately one-tenth (or less) than that of the average triband beam . . . and that single wire antenna will operate on any band that your transceiver will, if you use a transmatch. The addition of a transmatch will also allow you to operate on any frequency in any band and have the rig always looking into a very low SWR. No worries about setting element dimensions for CW, midband or SSB portions for a particular band. Just turn a knob or two on the transmatch and watch the reflected power drop to near zero (or nearly so) Watts. It's a nice feeling and a smart way to operate.

Let's continue on the subject of cost for a moment. Truth #1, copper wire is far less expensive than aluminum tubing. Rule #1, shop the ham flea markets for such things as insulators, ladder line (or windowed twinlead) and good-quality (strong and UV resistant) rope (for antenna tie-offs and support). What kind of wire are we talking about? Copperweld or stranded copper wire should be used for coaxial fed wire antennas. Firstly, because it can better

support the weight of the coax and secondly, because of detuning due to length change). Coaxially-fed antennas are generally single-band affairs (although a 40M dipole works very nicely on 15M as well) and the SWR limitations of coax are such that the antenna should be dimensionally stable. It should not stretch with time and weather.

The case of a multiband wire antenna fed with ladder line (or windowed twinlead) is quite a different story. The antenna dimensions are not all that critical (any reactance introduced by gradual lengthening of the antenna with time can easily be dealt with by twisting those knobs on the transmatch). Solid copper house wire (the larger the diameter, the better – look for #10 or #12 gauge) is fine for this type of antenna and can be obtained in quantity (500-foot spools), for example) in any home-improvement outlet store and some hardware stores, for less than you would imagine. You can make a great many antennas (and their replacements, too) from a 500-foot spool of wire. Think about it. Leaving the plastic insulation on the wire when you make your antenna protects the copper from the effects of weathering. Good ceramic insulators are fairly cheap too, especially if one carefully shops the ham flea markets for them. And 450-Ohm window line is about one eighth the cost, per unit length, of coaxial cable. By the way, that 450-Ohm figure is quite nominal. I purchased a 500-foot roll of "450-Ohm window line" at the Dayton Hamvention some years ago and at home carefully measured and calculated the impedance; it worked out to be 444-Ohms. Close enough. It really doesn't matter much with tuned feeders!

And now a word about transmatches. As far as I'm concerned there should be (at least) one in every shack. It should be installed in the coaxial line segment between the SWR (or power) meter and the antenna. Besides affording the opportunity to keep the rig's output seeing 50-Ohms, the transmatch provides harmonic attenuation, and lessens the possibility of front-end overload or intermodulation distortion from very strong out-of-band signals. Most available transmatches these days are single-ended affairs, and provided balanced output through an internal 1:4 voltage balun. True balanced output transmatch designs are available for home brewers in the amateur handbooks. Flea market shoppers can look for Johnson Matchboxes; the smaller of which

(the so-called “275 Watt” unit) will handle up to about 750 Watts of output power on CW and SSB. For higher power outputs the so-called “kilowatt” Matchbox will handle up to about 3 KW on CW and SSB. Another balanced-output commercial transmatch is the old Harvey Wells Z-Match, if you can find one! If problems are encountered when using balanced feedline output from a conventional transmatch (with its internal voltage balun), it’s usually a good idea to switch the unit into single-ended output mode and use an external 1:4 current balun. Current baluns are available from The Radio Works and others. Check the ads in the ham magazines. The current baluns force the currents in each side of the line to be equal (or nearly so).

Several companies are currently marketing what they call the “universal antenna,” which is a dipole between 134-feet and 136-feet long (I told you the length wasn’t particularly critical) fed with 100-feet of 450-Ohm window line. Prices are under \$40, a good buy. But even so, with careful shopping around

for parts and doing it yourself, you can have the same antenna for one-quarter the price (or less). This is true for the G5RV, inverted-vee, windom, delta loop, loop skywire, or whatever. They are all commercially available models.

As I alluded to in the beginning of this article, a great deal of DX was worked through the years before we entered the “era of fancy antennas” we’re in now. And simple antennas are still being used, and enjoyed, by a goodly number of amateurs. In the winter 1998/1999 months I worked DXCC (actually a total of 115 countries) on 10M, using only 12 Watts and a G5RV inverted-vee with the apex at 60 feet. So, I know, first hand, that a beam is not absolutely necessary “to work anything”. Also, the wire antennas are much more “neighbor-friendly” than massive configurations of steel and aluminum.

So at least try a wire antenna, for a change. I think you’ll be very surprised at the way it works and come to appreciate its other virtues as well.

Who is Ham Radio, and Why do I do this?

By Anonymous

At first blush, it seems like it is very obvious who ham radio operators are. They are, of course, people who operate ham radios! (“Radios in the amateur service” if you are the FCC). But that doesn’t get us too far. Is someone who spends most of his time building equipment or thinking up new antennas “doing” ham radio? Last night, there were 7 or 8 of us on SARA’s 2-m repeater W0JH, but only two of us were talking into microphones attached to radios - the rest were on EchoLink. Were Skip and I the only ones on ham radio? What were the other people on if it wasn’t ham radio?

OK, so radio *per se* isn’t a requirement to be doing ham radio. Huh? The ARRL emergency preparedness course stresses that if we need to use other media, from telephone to semaphore, to get the message through, then we should do so, as part of our ARES activity. Hmmm, does that mean that the rest of the family is doing ham radio when they’re on the phone? You can see that this is going nowhere fast. Pretty soon, we’re going to end up saying that if it

sounds like, behaves like and functions like ham radio, it is ham radio. This is not too helpful, and highly subject to individual interpretation. But I think that is the key - ham radio is individuals performing actions that are, to them, related to ham radio. Though this is circular, it probably is as close to closure as we’re going to get. It’s a little like saying “I don’t know if it’s art, but I know what I like.” Maybe that’s enough... Accommodating all these definitions without forcing anyone to participate in any particular definition is one of SARA’s strengths. Some of us are interested in emergency preparedness; some in public service through events or programs like HandiHams; some in ragchewing, contesting, DX or traffic; some in building, modifying, analyzing, restoring and trading equipment; some in SSB, some CW, some slow scan and some in digital modes. I don’t think there’s a single one of us who’s involved in all of these activities all the time - there just couldn’t be, there’s too much to do!

Murphy’s Law – The Secret

By Vern, KØLVS and Dan, KG6PQA

“If anything can go wrong – it will!”. Murphy. Everyone knows Murphy’s Law. You don’t just hear

about it on Field Day, but also around the workplace, on the news, even on the Cooking Channel. While the principle of the law has been around since the

first caveman dropped a stone axe on his foot while whacking away at a tree trunk. Murphy's Law has only been documented since the Oxford English dictionary defined it in 1958.

Most folks have assumed that Murphy was a fictional character, but Hugh Rawson's recent book *Unwritten Laws, the Unofficial Rules of Life*, presents irrefutable evidence that Captain Edward A. Murphy Jr unwittingly became the namesake of the most frequently cited of all unwritten rules of life. George Nichols, an engineer at Jet Propulsion Laboratory in the 1940's tells the story this way: "I was project manager at Edwards AFB during Col J. P. Step's experimental research on the (rocket sled) track. (Captain Edward had become highly irritated when he discovered a technician had improperly wired a strain gauge on the rocket sled, causing serious delay

on the project) Murphy shouted, 'If there is *any* way to do it wrong, he will!!' I assigned Murphy's Law to the statement."

Since George Nichols coined the term in 1949, Murphy's Law has taken on a life of its own, spawning a myriad of alternate versions. Perhaps you have heard of some of these: If everything seems to be going well, you have obviously overlooked something. If two or more things can go wrong, the one that will go wrong is the one that will cause the most damage. If you play with something long enough, it will break. It will always break when you need it the most. Nature always sides with the hidden flaw. A dropped tool will fall where it will do the most damage. Then it will roll to the exact center under the vehicle you are working on.

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