The Ragchewer

February 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

February Birthdays

George Lambert	KB8USP
Candice Wright	KC8NQG

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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.

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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.

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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!

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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

Public Relations:
Allen Sellers, KB8JLG

Flower Fund:
Mary Travis, KD8EEI

Chief Cook & Bottle Washer:
Charlie Snoke, N8KZN

Editor:
Jack Travis, AE8P
(740) 687-1985

February 1, 2007 Meeting Minutes

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

There were 24 members and 1 guest present. Our guests was Jim Shyrigh, KC8JPZ

President Stephenson circulated two applications for their second review by club members and asked if any new applications were available for submission.

Officer Reports

Secretary Report: Robert Northrup, KC8PSW

Minutes are posted in the Ragchewer.

Motion to accept by Ron, WA8GFO and second by Dave, W8EZE. Carried.

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

Ed gave the club financials. Ed also noted the club received a donation in memory of Paul Dilliard, who passed away on Dec 26, 2006. A letter will be sent to his daughter, Carol Oliver noting the donation. Motion to accept by Robert, KI8JM and second by John, W8AGS. Carried.

VP Report: Scott Snoke, WD8IXO

No Report

Trustee Report: John Hilliard, W8OF

John reported that all was well with all equipment.

Committee Reports

VE Testing: Allan Sellers, KB8JLG

The next VE session will be February 18 at the clubhouse. Testing begins 10:00 AM. Allan stated the new FCC ruling that eliminates the 5 WPM code requirement will be in effect on February 23 and there will be a special "paper work only" night on Thursday March 8 at 7:00 PM for those who have passed element 3 and want to submit their documentation to upgrade to general class.

Monday Night Net: John, KD8EEK

Feb 5	John	W8OF
Feb 12	John	W8AGS
Feb 19	John	WD8EEK
Feb 26	To Be Determined	

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.

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

There is a CERT training class in March for 4 weeks on Thursday nights. Most club members received an announcement in the mail regarding the training.

Safety: Scott Snoke, WD8IXO

No Report

Station Engineer: John Hilliard, W8OF

John said everything is A-OK!!

Activities Manager: Kaye Hanna, KC8HJW

Kay said she has booked the Ponderosa on East Main St for our next Christmas party that will be held on December 15, 2007 from 6:30 to 9:30 PM. So mark your calendars.

Flower Fund: Mary Travis, WD8EEI

No report.

Fund Raising: Kaye Hanna, KC8HJW

$17.00 was collected and KC8MAZ won but was not present so the funds go back into the 50-50 and will be drawn next month.

Old Business:

Last month, Allan, KB8JLG reported he had picked up a weather sealed outdoor cabinet for use at the repeater site that he obtained from Anchor Hocking free of charge. Allan said it was too cold to work on the cabinet.

The question was asked if the 443 linking problem still existed with the SE Ohio/NE Kentucky net. John, W8OF stated he hasn't seen any problems and thinks the problem is with other stations in the net. Our repeater is functioning correctly.

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 stated the drop time was reduced to 3 seconds last year to better help those using it. It appears the problem, if any, resides with those using the net and not waiting until the repeater drops before keying up. If you key up before the repeater drops, you continue the previous QSO and will get to the time-out limit and get the funny little man laughing at you. So use proper radio procedures and you won't get laughed at, period.

Allan, Kb8JLG stated he has 6 people signed up to take the 8 week no-code theory class he's offering on Tuesday nights at 8 pm.

Robert, KI8JM reported that he and other club members are moving along on renovating the upper radio rooms. AS of this meeting, Jeff, WD8JLI will be procuring a new deck top and shelves; Ralph, W8BVH is working on new chairs; Bill- K8ZCT is correcting grounding problems and Robert, KI8JM is standardizing on a power-pole connector system to make it easier to connect your radio into the existing equipment. Robert also noted that he expects all this to cost about $300 including $75 for a newer power supply he has already purchased but didn't include the cost of chairs or grounding repairs. Jack, AE8P made a motion that $300 of club monies be made available to make this happen. The motion was second by Fred, W8FZ and carried.

President Don, WD8PCF asked for volunteers to head up the 2007 field day that was highlighted by past president Tom, WB8USK at last months meeting. After some discussion, Jim, KC8JPZ volunteered to head up the 2007 Field Day.

The basement clean up was a big success and a huge amount of "stuff" was hauled to White Oak Disposal.

New Business:

Jack, AE8P brought to the club's attention to drop Jason Lint, KB8JXR from club rolls as he has since left the US military and has taken a job in Japan and has let his Amateur license expire. Motion was made by Allan, KB8JLG and second by Griff, KG4IDG to drop Mr Lint. Carried.

Editors note: At this point there are several issues that are not included in the minutes. Corrections should be made at the next meeting.:

1 Decision by the membership to allow a choice of email or snail mail for the Ragchewer.
2. I believe Allen Sellers volunteered to be PR man for the club
3 We voted to have the money from the sale of misc. items by Jeff Bell $51+ to go to the radio fund
4 We voted to give a check for $30 from the general fund to Charlie Snoke for dumping the trash when we cleaned up the clubhouse.

There was discussion about a new member column that stemmed from the work that Robert, KI8JM and others are doing when Robert was asked to introduce his fellow team members and say a little about each one. Griff, KG4IDG volunteered to write a "New Member" column where he would interview the new members and send the info the Jack for inclusion in the Ragchewer.

John, KD8EEK asked if the club was interested in starting a "calling tree" to notify club members about an emergency or other issue that club members needed quick info. After a lot of discussion, it was decided to begin taking an attendance roster at each meeting. The roster will be used to create the calling tree. If you want to be included in the "tree", contact John at a meeting or Radio Night or on the 147.03 repeater.

The club voted Robert Prince, KD8EXK and William Braun, K8ZCT into the club. Welcome Robert and William!!

Motion to adjourn was made by Allan, KB8JLG and second by Griff, KG4IDG. Motion carried. Meeting adjourned at 8:22 PM.

Respectfully submitted,
Robert Northrup, KC8PSW

Upcoming Hamfests

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

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March 18 is the Toledo Hamfest and Computer fair in Maumee, OH. You can get more info at http://www.tmrahamradio.org

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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.

Items For Sale

Tubes For Sale - If you need tubes for your boat anchor or TV.

Contact Jeff Bell WD8JLI at 614-774-2973 or email at jbell@imagearray.net he has a huge supply for most needs.

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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

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Garmin GPS E-map and video on how to operate it. Has 1 3/4 x 2 1/4 inch screen. Very good condition - $100. Reason for selling is I have upgraded.

Contact Tom Moore at 740-681-9092, cell phone 740-503-9445 or snert1@sbcglobal.net.

Editors note: I have one exactly like this and wouldn't be *without it. It's great for getting you places and also out of directional jams.*

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Yaesu All Mode Transceiver FT - 847 Satellite Radio, 100 Watts on HF & 6 Meters, 50 Watts on 2 Meters and 440, with Astron SS-30M Power Supply and Serial Cable to allow for Rig Control . $1250.00.

Also have an Epson Stylus C66 Ink Jet Printer $40.00

Contact Gary Snider at 740-569-4732 or email at sniderfarms@copper.net

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The Wayback Machine #8

By Bill Continelli, W2XOY

Our Founding Fathers knew that the United States would have to enter into legal and binding agreements with foreign countries, thus in Article II, Section 2 of the Constitution, they gave the President the power to make treaties, with the approval of two-thirds of the Senate. Over the years, the Supreme Court has ruled that provisions of a treaty are constitutional and legally binding, even if the exact same provisions contained in a law not covered by a treaty would not pass the constitutional test.

Under the Radio Act of 1927, and the regulations issued by the Federal Radio Commission, amateurs were "in the catbird seat" (to use a popular phrase of the day). They had over 2700 kc of spectrum between 160 and 20 meters, plus another 15,000 kc at 5 meters. They had a Secretary of Commerce (Herbert Hoover) who was a strong proponent of amateur radio. Congress was supportive and sympathetic. Nothing could go wrong--or could it?

Yes it could. An International Radiotelegraph Conference was scheduled for Washington, D.C., on October 4, 1927. Here, participants from 74 nations would gather to hammer out an international treaty covering the entire known radio spectrum. Once this treaty was accepted by the Senate, it would become Law, and supersede anything contained in the 1927 Act. Although amateurs could count on the full support of the U.S. Delegation, we had only one vote, the same as any of the other 73 participants.

So how much support could we count on from the other countries? Sadly, not much. Democracy was still a foreign idea to most nations; many hovered in that gray area between Old World Monarchy and Fascism/Communism. Communications were a government monopoly. Individual private stations were feared; they could compete with the Government Stations, or they could be used in anti-government activities. This attitude was even present in the representatives from England and France. As for the other countries, many were blatantly anti-amateur radio. Germany, for example,

stated that private stations could violate "the rights of the State." Switzerland was on the record against amateur radio. Japan would tolerate amateurs, however they would have to use "phantom" (i.e., non-radiating) antennas. In other words, you could have a transmitter, you just couldn't radiate a signal!!!! One proposal would only give amateurs frequencies below 13 meters (above 23 Mc).

Fortunately, the ARRL and the International Amateur Radio Union (founded in 1925) were well aware of this hostility and had made detailed preparations. The IARU and the ARRL both had made presentations to the various delegations prior to the start of the conference. Support of the amateur community was also received from private radio interests and radio manufacturers. The ARRL and the IARU would both have delegates attending the conference.

And so, after the opening session, which was addressed by President Calvin Coolidge and Secretary of Commerce Herbert Hoover (who was also president of the Conference), the delegates divided themselves into subcommittees and began to work.

England, the European country most favorable to amateur radio, made it's first proposal: amateurs would be allowed the 150 to 200 meter band (1500 to 2000 kc) with a maximum power input of 10 watts. The ARRL/IARU delegates, K.B. Warner, H.P. Maxim and C.H. Stewart, as well as W.D. Terrell, who was Chief of the Radio Division in the Department of Commerce, indicated that this was unacceptable. The British then came up with a compromise position: amateurs would have the 150 meter band, as well as bands at 2.75, 3.66, 5.50, 11.00, 22.00, and 44 Mc. Except for the 1500-2000 kc segment, each band would be 100 kc wide. The total amateur allocations under the British proposal were 1100 kc, of which 900 kc was in the known usable spectrum below 15 Mc. This was a 60% reduction for American hams in the frequencies below 15 Mc, and a whopping 93% reduction when you counted our 4 to 5 meter band!

Nevertheless, many delegates urged the US and ARRL/IARU representatives to accept this proposal. They pointed out that it was far more generous than many countries were willing to give on their own. With the use of C.W. and crystal control, it was argued, there would be enough room for all amateurs. Many were afraid that if the British compromise wasn't accepted, a more restrictive amateur band plan would take it's place.

The ARRL/IARU delegates had one thing in their corner, however; the strong support of Secretary Hoover and the American Delegation. With that, they found the strength to (carefully) carry on. They were diplomatic, but they were persistent. Maxim, Stewart, and Warner proceeded step by step.

The 160 meter band was the first agreed on--1715 to 2000 kc. Next, it was decided that the remaining amateur bands would be at the 80-40-20 meter spots. How wide they would be was the next argument. On the 80 meter band, everyone was at a stalemate until it was suggested that the band could be 3500-4000 kc on a non-exclusive basis. This was accepted by all the delegates. Each country could decide for themselves how much of the 500 kc they would allocate to amateurs. Next on the agenda was 20 meters. The U.S. wanted 14,000 to 16,000 kc. There was no way any of the other delegates would agree. After much debate, the U.S. delegation realized that 400 kc was the maximum they were going to get, and acquiesced.

With 160, 80, and 20 out of the way (and the U.S. assured of at least adequate domestic and international allocations) the subcommittee turned to 40. The American delegation wanted 7000 to 8000 kc; the most any other country was willing to offer was 7000 to 7200. Germany, in fact, put a high power station on 7200 kc in order to thwart a larger amateur allocation on 40 meters. Back and forth the debate went, the other delegates finally offered 225 kc. Maxim and Stewart felt they had played their last hand and wanted to accept the proposal. Warner, however, still pushed for 400 kc. More debate followed. Finally, the other delegates agreed to 300 kc. Additional bands were set up at 10 and 5 meters.

When the dust had settled, the Conference had approved the following amateur bands: 1715-2000, 3500-4000, 7000-7300, 14,000- 14,400, 28,000-30,000 and 56,000-60,000 kilocycles. This was a 37.5% reduction in the frequencies amateurs had under the U.S. regulations, however, it was a vast increase for the amateurs of most other countries. Furthermore, the frequencies approved by the Conference established amateur radio under international law --something which had not existed before. Given the circumstances, this was a major victory for amateur radio.

Initially, there was some opposition by a minority of U.S. hams to the ratification of the Treaty. The ARRL and the vast majority of amateurs, however, supported it, knowing that a small loss in frequencies was insignificant in comparison to the international recognition now given to amateur radio. The Senate agreed and, on March 21, 1928, ratified the Treaty.

As a postscript, Herbert Hoover, the Secretary of Commerce who had always supported amateur radio 100%, was elected President of the United States in November 1928. Although most remember his administration as coinciding with the onset of the Great Depression, it was also the time of the greatest growth in amateur radio history. From the 1929 total of 16,289 to the 1933 count of 41,555, amateur radio grew 255% in 4 years. Before his death at the age of ninety on October 20, 1964, Hoover would live to see his son, Herbert Hoover Jr., W6ZH, elected President of the ARRL, and see an amateur running for President of the United States (Senator Barry Goldwater, K7UGA/K3UIG). Whatever

historians may think of his administration, hams will always remember him as a Friend to Amateur Radio.

Next time, "The Wayback Machine" will begin to explore the battle over the VHF spectrum in the mid 40's. Did you ever wonder what happened to TV channel 1? "The Wayback Machine" will have the answers.

LFCARC Welcomes New Members

By: Griff Warren KG4IDG

Club members who gathered for LFCARC's regular February 2007 meeting voted unanimously to induct two new members into the K8QIK clan.

The more senior licensee of the pair is Bill Braun K8ZCT. Bill is an Extra Class licensee who earned his first ticket back in 1961.

Club member, Bob KI8JM, introduced Bill to the group as (among other things) an expert in grounding systems. Before the meeting was gaveled into session, Bill was kind enough to examine ground connections at K8QIK. Bill made a number of observations and suggestions to better arrange RF and station grounds at the station.

It's no wonder…Bill is an Electrical Power Systems Engineer who's employed at Owens Corning. Bill and his wife make their home in Pickerington. They have two daughters.

I think that it's safe to predict that more than a few club members will be seeking Bill for some electrical "Elmering".

Welcome aboard, Bill K8ZCT.

Our second new member is Bob Prince, KD8EXK. Bob (AKA "New Bob") is a spanking-new Technician licensee who sat for his Element 2 exam at a recent VE session in the LFCARC club house.

A native of Columbus, Bob and his wife of eighteen years have recently been transplanted to the Lancaster area. They share their home with two Pomeranian dogs and a number of cats.

Beside Amateur Radio Bob's interests include reptiles of all kinds. In the past he has cared for collections of live snakes, turtles, lizards and the like.

Bob is a retired undertaker who is already quite "radio-active" on 2 meter FM.

So listen for KD8EXK on the clubs 147.030+ repeater. Enjoy a QSO with Bob and be sure to welcome him to the Amateur Radio Service and to our club.

Photos of Bill K8ZCT and "New Bob" KD8EXK were unavailable at Ragchewer press time.

Watch this column for brief biographical sketches of other new (and maybe not-so-new) LFCARC members.

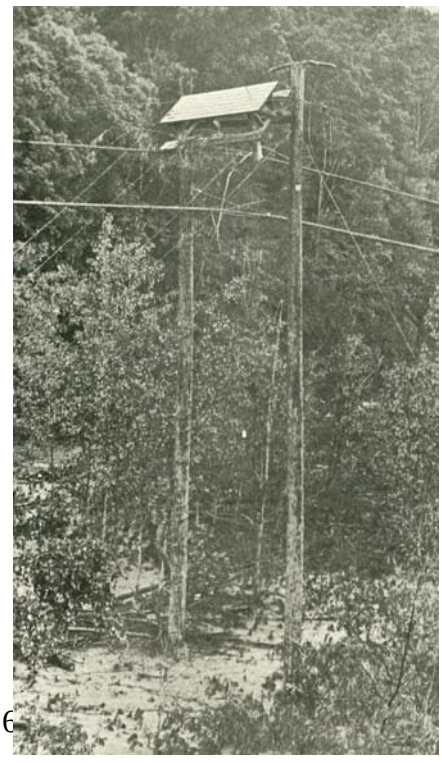
73 de KG4IDG Griff

Editorial

At the Thursday night radio club meeting, the question of our need for a calling tree was raised. I'm sure that Thursday night in Lady Lake, Florida there probably were many people who would have thought the same thing.

On Friday morning - less than 12 hours later their lives were changed forever. I hope they had a calling tree and a plan. They probably did not, at last count the death toll was 20+.

The statement was made Thursday night that there was always someone listening on the radio. Where were you at 3:15 a.m.? I'm sure a calling tree in Lady Lake, Florida might have saved some people if not their lives, at least they would have had an opportunity to save some personal effects. How many of you have actually been the victim of a major natural disaster? My wife and I have been and it made hurricane Katrina look like a sponge bath.



Yes, that is a picnic table on top of full sized telephone poles. The whole scene was unbelievable. The Army Corp of Engineers officially described it as a once in a thousand year flood. 38 months later we had a once in a 500 year flood. Yes it can happen any time and I want to be prepared, don't you?

Club House Cleanup

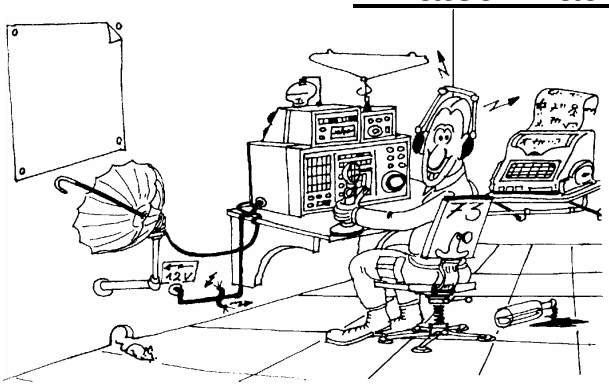
It was decided at our January meeting to have a club house cleanup. The date was set for Saturday, January 13 at 8:00am. Eleven braved the early morning hour to make short work of it. Mary, KD8EEI brought donuts to help get everyone started.

The basement was the worst undertaking and took around 2 hours to accomplish. In the end, Jeff Bell, WD8JLI took what was no longer needed but may have value and promised to try to sell everything at the Nelsonville hamfest on January 14th or on E-Bay if he thought it would bring a good price there.

After the cleanup, Allen, KB8JLG and Charlie, N8KZN had their trucks loaded and took the "junk" to the dump. The following people participated and should each be given a star for their efforts. Anyone who was there that I've forgotten, please let me know. All are listed alphabetically.

- ☆ Jeff Bell-------- WD8JLI
- ☆ Bill Braun ----- K8ZCT
- ☆ Paul Freshour - KD8DDD
- ☆ John Hilliard -- W8OF
- ☆ Bob Prince----- KD8EXK
- ☆ Allen Sellers -- KB8JLG
- ☆ Charlie Snoke - N8KZN
- ☆ Fred Stutske --- W8FZ
- ☆ Jack Travis ---- AE8P
- ☆ Mary Travis --- KD8EEI
- ☆ Larry Wright -- KB8AHK

Amateur Radio Club Is Organized Here



The following text is from the Lancaster Eagle Gazette, dated Monday, June 8, 1959:

The Lancaster and Fairfield County amateur radio club held its first meeting at Thomas Ewing Junior High School on last Wednesday. A constitution and by-laws were adopted by enthusiastic licensed amateurs.

Cloyde Smith, Civil Defense director for Lancaster and Fairfield County, spoke of efforts that are being made to provide key locations in Lancaster and Fairfield County with an emergency radio communications network which will be operated by club members affiliated with the radio amateur civil emergency service.

Temporary officers elected were: Robert C. Skidmore, president; Marcus H. Ricketts, secretary; Frank E. Bender, treasurer, Temporary officers will preside until the election of permanent officers which will be held at the August meeting.

Charles R. Houston, radio engineer at WHOK was elected Trustee for a period of three years. Mr. Houston will make application for the club to secure its own amateur radio station.

Future meetings will be held at 8 p.m. on the first Thursday of every month, the next meeting scheduled for July 2. Future meetings will be held at the new Civilian Defense headquarters located on the third floor of the municipal building, Lancaster.

All licensed amateur radio operators in Lancaster-Fairfield County area, and those persons interested in becoming amateurs may become members of the club. Those interested should contact Marcus H. Ricketts, secretary, OL3-5736. Charter membership will be open until the August meeting.

Following the business portion of the meeting Wednesday refreshments were served. Those who attended included: Robert C. Skidmore, Charles R. Houston, Eugene F. Loro, Jerry A. Larrabee, Donald Lama, Paul M Reed, Jacob M. Lemon, Stephen W. Miller, Charles J. Kennedy, Robert V. Dillon, Stephen P. Spires, Arnold T. Lybrook, George L. Webb, John A. Daugherty, Frank E. Bender, Marcus H. Ricketts, Don Fisher, Larry Coleman, Harold W. Reed, Harold L. Bickel, Kaye Lee Hartman.

The third and final installment of Nikola Tesla part 3 will be in the March Ragchewer. Sorry for the delay.

Ragchewer Extra

Lightning Safety Preparedness

By Glenn Field, KB1GHX
National Weather Service

Each year, about 400 children and adults in the United States are struck by lightning while working outside, at sports events, on the beach, mountain climbing, mowing the lawn, or during other outdoor activities. About 80 people are killed and several hundred more are left to cope with permanent disabilities. Many of these tragedies can be avoided. Finishing the game, getting a tan, or completing a work shift are not worth death or crippling injury.

Lightning often strikes as much as 20 miles away from any rainfall. There has even been a documented case of lightning striking 34 miles away from the rain in the thunderstorm. At least 10% of lightning occurs without any visible clouds in the sky, just blue sky. Many of lightning fatalities occur ahead of the storm because people try and wait until the last minute before seeking shelter. You are in danger if you can hear thunder. That means lightning is close enough that it could strike your location at any moment.

On average, 20% of lightning strike victims die, 80% survive, but 70% of them suffer serious long-term effects. Here are some lightning safety rules:

1. Postpone activities promptly and do not wait for the rain. Go quickly inside a completely enclosed building, not a carport, open garage, or covered patio. If no enclosed building is available, get inside a hard-topped metal vehicle. The steel frame of the vehicle provides protection if you are not touching metal.
2. Be the lowest point. Lightning likes to strike the tallest objects. If hiking in the mountains and above the tree line, you are the tallest object. Quickly get below tree line and get into a grove of small trees. Aside from this situation however, you should avoid trees. If you are in an open field, like a farm or a baseball or soccer field, you are the tallest object. Dugouts or gazebos afford little protection. If you cannot get to an enclosed building or vehicle, crouch down on the balls of your feet.
3. Keep an eye to the sky for darkening clouds and listen for thunder. If you can hear it, go to a safe shelter immediately.
4. Get off of bicycles and motorcycles. Do not lean on vehicles.
5. Water is a great conductor of electricity. Get out of the water if boating or swimming. Get off the beach. Do not stand in puddles, even if wearing rubber boots.
6. Avoid metal. Do not hold golf clubs, fishing rods, tennis racquets, or tools. Large metal objects can conduct lightning. Small metal objects, such as belt buckles, can cause burns.
7. Stay several yards away from other people. Do not share a bleacher or bench or huddle in a group.
8. Listen to NOAA weather radio. Find out if thunderstorms are in the forecast. Next, listen to hear any short term forecasts about thunderstorm activity. Also, listen for the warning alarm tone if activated for severe thunderstorms in your area, which produce damaging winds and large hail in addition to lightning strikes.

The science of a lightning strike: At any given moment there are 1800 thunderstorms in progress somewhere on the earth, which amounts to 16 million thunderstorms each year! Lightning researchers have a better understanding today of the process that produces lightning, but there is still much to learn about the role of solar flares in the upper atmosphere, the earth's electromagnetic field, and ice in storms. We know the cloud conditions needed to produce lightning but cannot forecast the location or time of the next stroke of lightning.

Lightning occurs in volcanic eruptions, intense forest fires, surface nuclear detonations, heavy snowstorms, and large hurricanes, but it is most often seen in thunderstorms. Thunderstorms form in air that is moist, unstable, and has a trigger that causes the air to rise, such as a cold front. Rising motions in the storm build the cloud to as high as 6 to 10 miles above sea level. Ice forms in the higher parts of the cloud. The ice particles vary from small ice crystals to large hailstones. There are a lot of collisions between the particles which causes a separation of electrical charges. Positively charged ice crystals rise to the top of the storm and negatively charged particles and hailstones drop to the middle and lower

parts of the storm. Enormous charge differences develop.

A moving thunderstorm gathers another pool of positively charged particles along the ground that travel with the storm. Positively charged particles rise up taller objects such as trees, houses, and utility poles. The particles can even move up you - have you ever been under a thunderstorm and had your hair stand up? If so, *you* may be the lightning target.

The negatively charged area in the storm sends out a charge toward the ground called a stepped leader. It is invisible to the human eye. When it gets close to the ground, it is attracted by all of these positively charged objects and a channel develops. You see the electrical transfer in this channel as lightning. There may be several return strokes of electricity within the established channel that you will see as flickering lightning. The lightning channel heats rapidly to 30,000 degrees or more and the rapid expansion of heated air causes the thunder. Since light travels faster than sound in the atmosphere, the sound is heard after the lightning. If you see lightning and hear thunder at almost the same time, the lightning is in your neighborhood!

Not all lightning forms in the negatively charged area low in the thunderstorm cloud. Some originates in the cirrus anvil at the top of the storm where there is a large positive charge. A strike originating in this area is called a positive flash. It is particularly dangerous for several reasons. It frequently strikes ahead of or behind a thunderstorm, away from the rain area, thus catching people by surprise, like a bolt from the blue. Positive strikes typically last longer, so fires are more easily ignited. Also, they usually carry a high peak electrical current which increases the lightning risk to an individual.

The medical aspects of lightning*:* The United States averages 73 reported lightning deaths per year, which makes it the second largest storm related killer, exceeded only by flash floods. A lightning strike can result in cardiac arrest at the time of the injury, but some deaths can occur a few days later if the person is resuscitated but suffered irreversible brain damage. Because this may occur days later, the news story may not make the newspaper or other media outlets. Thus, there is an under reporting of injuries and deaths from lightning. The figures more realistically are about 100 deaths per year nationwide.

How do lightning injuries affect people? Lightning tends to be a nervous system injury and may affect the brain and both autonomic and peripheral nervous systems. When the brain is affected, the person often has difficulty with short-term memory, multi-tasking, and can be irritable, easily distracted, and have a personality change. Survivors initially may complain of intense headaches, ringing in the ears, dizziness, nausea, vomiting, or other post-concussion types of symptoms. Irregular sleep patterns may occur. Seizure-like activity may occur weeks to months after the injury.

People who wake up after the injury often do not have the ability to express what is wrong with them and may become embarrassed when they cannot carry on a conversation. As a result they may isolate themselves and become easy to anger. Depression becomes a big problem. Survivors often become exhausted after only a few hours of work and may not be able to complete all required job tasks.

Another common, often delayed, problem for some survivors is intense pain. The pain may not be from headaches but in the back, perhaps from compression and disc injury from the intense muscle contractions which may throw a person several yards at the time of the injury. The pain may also occur in an extremity, as nerves begin to slowly regenerate. Decreased libido and impotence often are reported.

Anatomic testing, such as an x-ray, CT scan, MRI, or blood tests often show up as normal. Sometimes functional tests ordered are testing the wrong thing. An electromyogram, or EMG, measures only the motor fibers, which are seldom affected by lightning injury. Smaller pain carrying nerve fibers are not tested by EMG. Thus a normal EMG result can mean little for someone with pain. Likewise, the standard EEG primarily measures surface readings of the brain and misses seizure activity in several deeper regions. More useful is a functional test of how a person's brain is working, neurocognitive or neuropsychological testing. These tests are administered by a neuropsychologist familiar with literature in this area, not by a psychiatrist. These are pen and paper tests lasting 6 to 8 hours and test memory, IQ, organizational ability, etc. Lightning strike survivors usually have a characteristic pattern of deficits.

Help does exist for lightning strike survivors and physicians alike. For more information, go to **www.lightning-strike.org** or call 910.346.4708. More detailed information is also available at **www.lightningsafety.noaa.gov**

Ground Issues

Author unknown

What is Ground?

A ground is defined as a low-impedance electrical connection to earth. Also a common reference point in electronic circuits. All transmitting antenna systems need a properly functioning ground system to provide for proper operator safety and efficient radiation of the maximum amount of RF energy into the air.

There are three principle forms of ground, the last two more appropriate to operating in the mobile environment:

• **Power Line Ground**: is the ground you see at the power box where your home's electrical service is connected. It is required by law and serves to provide general, overall electrical safety for your building and property.

• ***DC Ground:*** **(Also called "Safety Ground")** is familiar to the amateur as the strap or wire placed from equipment to a convenient cold water pipe or ground rod to eliminate the hazard of electrical shock. In your car it is the wire you connect from the ground stud on the rear of the radio to the negative terminal of the battery, or ideally the engine block.

• ***RF Ground:*** is a low-impedance path for RF to reach earth and which is designed to *dissipate* rather than **radiate** RF energy. Generally, though not in all cases, the DC Ground and the RF Ground are served by a common connection. In an automobile this point is usually the car frame or chassis, the car body or engine block.

RF Ground and the Ground Plane

In the environment of the mobile antenna system many factors contribute to the radiation of an excellent RF signal, but none more than the quality of the RF ground. The RF ground represents the "unseen half" of your antenna system. The visible half is the whip or other radiating element. Failure to construct a good RF ground inhibits the efficiency of the system's radiation and can present danger to the operator through RF feedback.

In mobile installations, the chassis or body represents a *ground plane,* a common circuit return or reference point for your signal. The signal radiates outward from the radiating element and flows back to the radio via the ground plane. Then the polarity switches and this process reverses, back and forth, in synchronization with the transmitted sine wave.

You can see, then, that if the car itself represents half of the antenna, then it's pretty important that the connections to it be made solidly and properly.

In constructing an efficient antenna system for your vehicle always make sure that your frame or car body are at RF ground by connecting them electrically and physically with the engine block. The engine block acts like a terminal strip or "bus" for your car's electrical system: the negative terminal of the battery and all other electrical grounds are connected to it as the central meeting point. The engine, in turn, is bound to the vehicle chassis through the engine mounting bolts, *though not necessarily grounded!* In today's modern vehicles insulating elements, i.e., rubber motor mounts, are used to cushion vibration. At DC a solid path to ground exists, and even if this path should somehow fail, the car's body ground can act as a reserve. At *RF frequencies* however, an acceptable DC ground can sometimes present such a high impedance to your antenna system that it is, in effect, no ground at all!

To ensure your mobile antenna environment is at RF ground, simply bind the block to the chassis with tinned copper braid, as shown in the photos above. Use short runs so as to avoid introducing any inductive reactance which will impede the flow of the RF current to ground.

How Can I Tell if I Have A Good Ground?

Actually, it's usually a lot easier to tell when you don't! Here are some of the signs that the quality of your mobile's RF ground may be lacking:

• Difficulty or inability to tune to an acceptable SWR match with your manual or automatic antenna tuner. (Assumes you have confirmed in advance that the antenna is already resonant "off the system".)

• Noticing a waving up and down of the SWR reading on the meter during transmitting while the vehicle is in motion.

• Noticing that the radio is "kicking", (cutting out and turning itself off) during transmission, an indication of significant RF feedback.

• Getting an RF "bite" on the radio equipment or code key during transmission, an indication that excessive RF energy is feeding back from the antenna system or that the system is floating above ground potential..

Remedies require a review of how your antenna system is mounted to the car, specifically:

• Is there a good physical and electrical connection between your antenna's ground and the vehicle frame/body?

• If utilizing the body as the ground plane is there isolation from RF ground which may be causing the RF return path to float above ground potential?

• Do you have faulty shield connections along your transmission line?

• Are ground loops present in your system?

Based upon your assessment of the above, take action as necessary to clean up any weak points you uncover.

Ground Loops

Ground loops can be inadvertently created when ground connections on several pieces of equipment are connected in *series*, rather than to one single, centralized ground point. Ground loops happen in trying to economize when short on braid or through taking the "easy way out" while making quick connections.

As an example, visualize a station consisting of three pieces of equipment: a radio, amplifier and antenna tuner. Loops could very easily be created by connecting the ground connections of the radio to the amplifier, then the amplifier to the antenna tuner, and finally the antenna tuner to the ground stake. These series connections promote miniature loops (circuits) between each individual piece of equipment, allowing RF current to circulate at differing intensities, which are another source of radiated RF noise. As the ground circuits "float" above zero potential they never actually draw down to true ground (where, theoretically, zero RF current flows). A dangerous shock hazard to the operator can result, but is easy to avoid through good design practices.

To avoid ground loops, each of the three pieces of equipment should be tied to the *same* ground point. In this design, a run of flat tinned copper braid should be run from the ground terminal of *each individual piece of equipment* directly to the station's DC/RF ground. In the case of your home, this might represent your ground stake buried outside with, again, as short a run of flat tinned copper braid as is practical tying to it from the equipment.

Ground Loops in the Mobile Environment

In your vehicle ground loops are often unknowingly created as a consequence of frantic attempts to ground out noise sources by braiding "everything" one can think of to the nearest metal available. This is most likely when working under the hood to suppress noise in the antenna and power supply systems, but can also occur when your antenna is inadequately mounted to the frame/chassis. In reading the nature of the formation of ground loops above, you can see how, in braiding to the nearest available metal, series connections could very well have crept into your design.

Remember: if you are not at ground potential, RF currents may still be circulating within your ground system which may then be re-radiated as RF noise that can be received by the antenna system.

To eliminate any loops in your ground, the concept of applying a centralized ground point, as described earlier for a home station, applies to the mobile configuration as well. In adopting a single point for your vehicle, use the frame/chassis as your "ground stake", if you will. It is the common metal to all other metal points of your vehicle (though additional bonding techniques may ultimately be required), and provides an excellent ground plane for your vertical element to work against.

Just Who Did Invent Radio?

There's a lot of interesting history in the realm of radio and its child, television. The players include inventors, businessmen, performers, and lots of other people. Unfortunately, the vast majority of this information has not been made available to the masses!

Marconi

First of all, ask the average American, "Who invented radio?" If they know at all, the reply will usually be "Marconi." For most of my life, and that of my parents and grandparents, the inventor of radio has been, according to all the history books, Guglielmo Marconi, born in Bologna, Italy, on April 25, 1874. Marconi was the son of a very successful Italian businessman with extensive business ties to Great Britain.

Marconi was interested in wireless telegraphy (radio) from an early age, and conducted experiments on his father's estate starting in June of 1895. Later that year he was able to send messages up to one-and-a-half miles.

Seeing the commercial potential of

communications with ships, the 22-year-old Marconi went to England where, in 1896, he was granted his first patent on radio communications. Later, with the help of his father, Marconi contacted a number of influential British businessmen, and the Marconi Company was formed to develop wireless communications. Until about 1920, this company dominated the radio scene worldwide.

Lodge and **Fessenden**

However, several years before Marconi even started experimenting, as early as 1888, Oliver Lodge (later Sir Oliver), a professor at Liverpool University, was conducting experiments in wireless telegraphy. Lodge was granted a patent on his system (which, by the way, was the source of the receiving detector used by Marconi - the coherer) in May 1897. This patent was purchased by Marconi in 1911.

At the same time, a Canadian university professor (Western University) named Reginald Fessenden was experimenting not only with wireless telegraphy, but with voice and music transmission as well. Also, he was interested in the radio control of boats. By the mid 1890s Fessenden was transmitting voice and music from the shore to people aboard pleasure boats on the St. Lawrence River.

Dolbear

As you can easily see, both Lodge and Fessenden predate the experiments of Marconi but they were latecomers, for, in 1885, United States patent 350,299 had been issued to Amos Dolbear, a physics teacher at Tufts College. In fact, for a time, Dolbear was able to keep the Marconi Company from operating in the United States because of his patent for a wireless telegraphy system (which, by the way, was virtually identical to the system used by Marconi)! Later, the Dolbear patent was purchased by the Marconi Company, thus allowing them to use wireless in the United States.

Loomis

Dolbear was also late on the scene, for, as early as August 15, 1858, an American dentist name Mahlon Loomis was beginning a series of experiments in wireless telegraphy within the state of Ohio! With the interruption of the American Civil War, Loomis continued his work. In October of 1866 he sent signals between two mountaintops, about 15 miles apart, in the Blue Ridge Mountains. Senator Samuel Pomeroy of Kansas and Representative John Bingham of Ohio were present at this demonstration. Both men later gave much support on Loomis' behalf in the U.S. Congress.

In January of 1869, Senator Charles Sumner of Massachusetts introduced a bill into Congress to appropriate $50,000 (well over a million dollars in present day purchasing power) for development of Loomis' system. This bill languished in committee for two years, at which time Rep. Bingham introduced a bill to incorporate the Loomis Aerial Telegraph Company, giving it the right to issue up to two million dollars worth of stock. This bill stated that no money was to come from the U.S. Government (one of the reasons the original bill was stalled in committee).

In early 1873, President Grant signed the bill into law, and a few months later, on July 20, 1873, Loomis was granted U.S. Patent 129,971 for the invention of his system. Unfortunately, Loomis' company had gone bankrupt during the stock market panic of 1869, and he was never able to garner enough financial support to put the system into operation.

Although Loomis died in 1886, he left his mark in other areas. He was not only an inventor in the area of radio, but he also held a number of patents in the field of dentistry, including methods of making false teeth and specialized filling materials and methods. Some of his ideas are still being used today!

Patent Disputes

There are certain things to be noted about these early inventors. The first is that during this time period, patent offices would issue patents on working items only, either full-sized or models. Thus, Loomis, Dolbear, and the others had to actually demonstrate that their equipment worked! There was not patenting of ideas at that time.

Next, although most of the people involved were university types, they did not publish papers to the extent that papers are published today. Also, there was a lot of nationalism involved with something of such possible importance as communicating without wires.

Marconi had established a consortium of powerful British investors. Several of these were members of Parliament, and the rest were in a position to command the ear of that governing body. Because of this, both Lodge and Fessenden (Canada being a member of the British Commonwealth) were effectively silenced by governmental actions. The Marconi Company soon dominated the wireless (radio) scene.

From about 1900 until 1943, there were a large

number of patent rights battles in the courts of the United States and Great Britain. Little by little, Marconi's patent empire was voided until, just before his death in 1943, his latest patent was vacated in favor of **Nikola Tesla.**

In fact, Marconi's list of patent fights included almost all of the inventors and pioneers of radio communications. People like **deForest**, **Fleming**, and others were in an almost constant fight with Marconi and his company. Because of these lengthy patent battles, the British Government did not wish to aid those fighting against the British-based Marconi Company. Therefore, they insisted that Marconi was the inventor of radio. It is unfortunate that this misconception is still being taught today.

Marconi, through the efforts of his British company, did more than anyone else to commercialized radio. However, he really did nothing himself in the actual invention of the systems. Everything he used was invented by someone else, and was actually used in two-way radio communications before Marconi. In Loomis' case, the patent was issued before Marconi was even born!

Because the history books of the early 20th Century taught that Marconi was the inventor of radio, it is still being taught today. This is unfortunate, for there were, in reality, several true inventors (each with a different system type) who were communicating before him. But such is the work of the history text writer.

There are other such tales about grossly wrong history texts, but these can wait for another time!

Portable Ham Radio Operation

by Mark J. Neuman, KCØITP

A new facet to the Ham radio hobby is portable, and especially man mobile, HF operations. The explosive growth in this type of operation has been made possible by radios like the Yaesu FT-817, which is a small, battery operated, full-featured HF radio, that allows you to transport an HF rig just about anywhere with ease. Now I realize that you could have hauled your FT-100 or IC-706 into the field a long time ago, but these rigs, and the large batteries needed to power them, are not something I would want to carry for any great distance.

Once the FT-817 came out, many hams came up with a number of portable antenna concepts. One that seems to have taken hold is the “Buddipole”, which was invented by Bud, W3FF (see www.buddipole.com). This antenna can either be purchased or home brewed (www.qsl.net/w3ff), as I have done, out of PVC pipe and a Radio Shack antenna whip. This antenna can be broken down into short packable sections, which are then re-assembled at your operation site to provide a resonant dipole. This removes the need to bring along an antenna tuner. I made a number of design changes to my homebrewed Buddipole. First, I made it a full-length dipole for 10, 12 and 15 meters. Second, I made the 17 and 20 meters loading coils larger in diameter, in order to try to improve efficiency. Finally, I used threaded pipe ends instead of slip ends, which, in my opinion, strengthened the antenna and make it less likely to wiggle loose when used man mobile. I have been quite pleased with the performance of this antenna, and antenna performance is very important when operating QRP.

So now what do you do? Well, pack up your radio, a small battery if you want or need, your portable antenna set up, and take a hike, as short as the nearest picnic table or as long as the middle of the BWCA. At the other end, you assemble your antenna, hook it all up, tune to 18.157.5 or 14.342.5 (among other calling frequencies), and call CQ HFPACK.

What is HFPACK?? It is a group of hams interested in portable operations, including man mobile HF, that get a kick out of long distance low power operations from interesting locations. They can be found at www.hfpack.com.

I, for one, enjoy the great outdoors. Portable operations allow me to be radio-active in the field, or even on the picnic table on my deck. My portable set up consists of a Yaesu FT-817, a 7.5 amp hour gel cell battery, my Buddipole antenna, coax, and a Heil Traveler headset. All of this gear fits into a small gym bag. As a Boy Scout leader, I have had the opportunity to operate from a number of field locations, and I am looking forward to portable operations from the BWCA this summer.

So if you hear me calling CQ HFPACK, give me a shout (even if you are at home), and if you are interested in portable operations yourself I can be reached at kc0itp@tcrc.org. I am ready to share my experiences and ideas, and am always looking for a reason to go camping.

Personal Business

Reprint from February 2, 1957 Business Week

Editors note:

This article was found in the archives on the second floor of the clubhouse.

The term "broadcast" is mistakenly used several times in this article but remember it is against FCC regulations to "broadcast".

"Ham" radio makes plenty of sense as a hobby for you, for your wife, for teenage children. It's practical; it's a lot of fun and a lot more sociable than you might think; it can be surprisingly inexpensive; it even has a community service side that gives the hobby a solid, worthwhile purpose.

And all the mechanical ability you need, at least in the beginning, is about enough to properly operate a television set.

You can start in a small way with as little as $150 worth of factory made equipment and soon become a full-fledged radio amateur, broadcasting over short wave from your home. Hams duly licensed by the Federal Communications Commission include kids under 15, housewives, elderly people, and shut-ins who have found a way to have a circle of friends without going out of the house, and a great number of highly active business and professional people.

Among these last on the ham list are Harry F. Vickers, president of Sperry-Rand Corp.; Ernest Henderson, president of Sheraton Hotel Corp.; Clyde Hendrix, vice-president of Pillsbury Mills; Gen. Curtis E. LeMay, chief of the Strategic Air Command; and Herbert Hoover, Jr.

On the social side, you get to know fellow hams both in person and over the air and it's astonishing how airwave friendships last. You can join amateur radio clubs, local and national (for instance, the American Radio Relay League, West Hartford, Conn.). The clubs give you a chance to be very active.

As for service, you can take part in one of the ham "nets" that handle communications for the civil authorities in times of emergency or disaster.

Civil Defense, the Red Cross, and other outfits make wide use of the hams who were a big help in the Connecticut floods last year, and are now helping keep contact with the Antarctic expeditions.

Ham radio doesn't nail you to one spot, you can install it in your car or aboard your boat. Wherever you go in the U.S. by land or water, you're entitled to broadcast.

Getting started requires just two things: (1) a license, issued by the FCC in Washington if you pass an exam and (2) the basic equipment of the trade: a receiver, a transmitter, and an antenna. You can pick up minimum components for as little as $100. Or you can go high as about $2,600 for a packaged factory built station. More money means more power.

Your first FCC exam is for a Novice License. To qualify you have to send and receive Morse code at five words a minute and pass a routine written test. With your license, "call letters" are assigned to your station; you can go on the air with your gear for one year. Then you take a stiffer exam for a General License; the Morse code speed is now 13 words a minute and you need a bit more technical knowledge. But don't worry almost everybody who has gone this far passes. The General License is "permanent," which means it has to be renewed every five years.

You can get code practice from special beginners' sessions broadcast over short wave by the ARRL from West Hartford. So it's a good idea to buy your receiver when you start boning up for the test. Also, the chances are a ham club in your town gives code lesions for beginners.

For the written exams, get a booklet called "The Radio Amateurs License Manual," published by ARRL (50¢).

Ham equipment, buying it, operating it, maintaining it, is a big field. For a starter, here are a few ideas.

- Receivers. Most hams buy factory made receivers; there's a wide selection on the market in a range from $60 to $600. If you nose around in an electronics supply house, you may come up with a good used bargain.
- Transmitters. You can get a factory unit, or a do-it-yourself kit that will leave you with a finished looking assembly. Transmitters are rated by their power output, in watts. With a Novice License, you're limited to 75 watts; a general license entitles you to 1,000 watts. Under ideal conditions, a low power unit (costing as little as $30) can contact hams all around the world. Of course, you can do a much better job of broadcasting with a high power outfit (up to $2,000)
- Antennas. For good results, you need an outdoor antenna; attic setups are seldom efficient. A popular type is the straight wire antenna, like an old fashioned radio serial. Strung from house to garage, it can cost as little as $5. Ideally, the antenna should be higher than any obstructions – houses, trees, power lines. If this means you have to have a tower, the cost will run from $50 to $300.

Amateur television – very advanced stuff, electronically – is a possible ham sideline, though it's still mostly on a trial and error basis. Cost: about $200 and up. Radioteletype is another twist for advanced hams.

But for a common sense, beginner's start, write to the ARRL for the booklet, "How to become a Radio Amateur" (50¢).

Home Made Antenna Selection Guidance

By James R. Duffey KK6MC

I don't like the form idea for a couple of reasons; one, it unnecessarily complicates the antenna selection process, and two, it implies that the solution is unique, that is there is one best antenna for each situation. Often there are several antennas that would be applicable.

Having said that, I agree with the ham radio antenna literature, including the internet, is bewildering to the newcomer who usually just wants a simple question answered "What type of antenna should I put up?"

The old "Understanding Amateur Radio" put out by the league used to address this very nicely. This publication was sort of a novice handbook which served nicely as an introductorily technical reference; bridging the gap nicely between the less than practical knowledge obtained by studying to pass the Novice test, and the detailed ARRL Handbook covering nearly every facet of Ham radio. The antennas presented in Understanding Amateur Radio" were effective, worked well, needed little tuning, and were explained well. With all the new hams coming into Ham Radio it would be nice if the league would consider updating this or releasing a similar book. I think it would help to bring many of the newcomers up to speed.

With the lack of direction for beginners in mind, I have compiled a list of antennas that I suggest beginners try. I developed this for my ham fest talks so you may have seen these before.

In case some are interested they are:

Good antennas for Beginners:

1. Single band dipole or inverted Vee (depending on whether you have one tall support or two). These can be erected with little or no tuning. If tuning is needed, the direction to go is clear, if the resonance is too high add wire, if it is too low, prune wire. Most will work fine with OK when cut to formula.
2. Parallel dipoles for multiple bands. This is best limited to even harmonically related bands to reduce interaction. Tuning is harder than 1, but again if the elements are adequately separated an antenna cut to formula will usually work fine.
3. Single band quarter wave verticals supported by a fiberglass crappie pole such as the SD-20. A good ground is required, but again little tuning is required and it is straight forward.
4. A coat hanger special for 2 M and up for local FM work. These are inexpensive, can be built from easily obtained materials and will outperform antennas costing much more.
5. HF/VHF Cheap and easy Yagis. See http://www.clarc.org/Articles/uhf.htmThese antennas were designed by Kent Brittain, WA5VJB, are easy to build, require no tuning after being built, and can be built for less than $5 with easily obtainable parts using only hand tools. These antennas are only about 1 dB below the ideal gain for the boom length.
6. Quagis. These are also built from easily obtainable materials, require no tuning other than careful measurements, and have a gain within 2 dB or so from ideal . They are a good antenna to use if you are starting weak signal (CW and SSB) VHF work.

One or more of the above antennas should be applicable to nearly every newcomers needs. Bands from HF or UHF are covered. Antennas for the advanced amateur, or for those who have built the above antennas and are looking for a slightly improved, albeit slightly harder to build:

1. Loops, both horizontal and vertical. The standard formulas do not apply as closely as they do for dipoles, and achieving a 50 Ohm match needs some matching. None the less, they are good performers and most hams can easily get one going.
2. 2 element Yagis, either wire or tube. Wire antennas covering a fixed direction are cheap and provide good bang for the buck. Again, this antenna can be made to work with little if any tuning or matching. Cut to length they will usually work pretty good. If *Page 11 Volume 24, Issue 7 The LongPath* you don't have the means to raise and rotate a tube based Yagi, lots of fun can be had with a Yagi in a fixed direction. Such an antenna pointed at Europe, the Caribbean, Japan, or South Pacific will yield a lot of DX, particularly during a DX contest.
3. Center Fed Zepp. Implementation of the balanced feeder requires some thought and consideration, and the addition and operation of a tuner adds

some complexity, and cost. However the bang for the buck is hard to beat in a multi-band antenna. The Z match is a good tuner to use with this antenna.

4. Optimized 3 element or greater Yagis for VHF/UHF. The latest handbook has plans for these. They require careful construction and matching requires some careful measurements, but these will work nearly to theoretical expectations.
5. Long (greater than a wavelength) wires. These require some care in feeding (use an ell match) and need to be pointed in the right direction as long wires can be very directional.
6. Phased verticals. These require a good ground, and care needs to be taken to get the phasing right, but good performance in a limited space can be obtained.

All of these antennas are a good step up from the usual ham first antenna and can be built and erected with little fuss.

I suggest beginners avoid the following antennas. Not because they don't necessarily work, but because they present one or more problems that can be difficult for the beginner to deal with.

In other words, they require some fussing. The beginner could better spend this time operating.

1. The Windom or off-center fed antenna. These can have feedline radiation which can cause several problems. The feed-line radiation in these antennas can be very difficult to eliminate.
2. The G5RV. I am referring to the type which is fed with a combination of coax and a matching stub of balanced feeder. This antenna can have feed line radiation if fed without a balun, and excessive losses if fed with one. Without the coax it is essentially a center fed Zepp which is covered above.
3. The W8JK. This antenna has a low radiation resistance and can have significant losses if care is not paid to loss sources that can be neglected in other antennas: wire diameter, joints, and end insulators.
4. End fed random length wire. These can be tricky to feed, often resulting in RF in the shack on one or more bands. These can be tamed, but again the time and effort are better spent by a beginner on the air.
5. J-Pole and end fed Zepp. These have problems with implementing balanced to unbalanced transitions without baluns. This leads to feed-line and stub radiation. The coat hanger special is an easier antenna to build and as good a performer

I suggest that beginners build their own antenna rather than buying one. The ones I suggested are simple to build, only require hand tools and do not require tuning. The hardest skill required is soldering. Ron, KU7Y, says that soldering is not even required and suggests that good antenna wire connections can be put together with wire nuts. I have not tried this, but someone who is afraid to solder might try it.

These are my opinions. I don't suggest the above are unique solutions, but they work and they will work well in most situations.

For situations not covered above, such as indoor/restricted covenant antennas, or portable applications I could make up a couple of new lists that cover these situations, but there are others on the list better qualified to do so.

Asking the right question is as hard or harder than supplying the correct answer. I hope that this helps someone.

ON THE ROAD WITH APRS

William Bowden, KI7AO

Some of you old timers may recall that I wrote a column for the Feedback in the early 1990s entitled Northwest Notes. This is my first effort in a while, so.....

I first became attracted to APRS (Automatic Position Reporting System) last summer at our northwest amateur convention in Seaside, OR, at a seminar given by Dave - K7GPS (note that suffix). As ARES EC for Kittitas County, WA I saw the value of APRS for our SAR (Search and Rescue) efforts. So a number of us put together independent base, mobile and portable APRS stations, and last fall we tested our first APRS net. We're fortunate to have a nearby mountaintop digipeater (at 7000 feet) that covers most of our county. The Boeing ARS donated another digipeater that covers much of the rest.

In early winter we demonstrated APRS at a SAR gathering. Folks were impressed, with the

tracking, and the ability to send short emails. Now we're looking to equip our county mobile command posts with the system. We conducted our operations on a packet frequency, as opposed to the national APRS frequency, something I would recommend for any local emergency or ARES operation.

For myself I decided to take APRS on the road as we drove across country this winter, but I also wanted the HF capability. I settled on a Kenwood D700A dual band mobile, which has a built in TNC. For the GPS input I used the Magellan 315, because of its size and ease of use, virtually any GPS unit with a NMEA output can be used for APRS. Most "brand name" TNCs can also be configured for the system,

So how does the APRS system operate? Basically the GPS unit is constantly inputting the vehicles' position to the radio. At whatever interval I select, the latest position is transmitted by the radio on the national APRS frequency of 144.390 MHz. If my signal can be received by one (or more) simplex digipeaters, also operating on that frequency, then I'm in the system. If the digipeater or a subsequent digi is tied to a HF gateway, on 10.151 MHz, then I'm into the nationwide system, and can be seen on the national server, (along with thousands of other amateur base, mobile, portable APRS stations) and on a special web page map.findu.com/(callsign) that is available to anyone.

This web page let all our family and friends track us on our journey, so accurately that as we accessed our email from various stops across the country we were pleased to receive messages from all over telling us exactly where we were.

The web page provides a readout of the stations' location in plain English (e.g. 44.5 miles north of Yakima, WA) gives the exact latitude and longitude of the station, the speed (if the station is in motion) and how long ago the data was received. The station is also pinpointed on three maps of different scales. For amateurs with an APRS program loaded in their computers, there is a lot more data available, including altitude of the station, short textual messages sent with the stations' location report, email exchanges, and the ability to plot the station (represented by an icon) on a county, state, or national map, to save the stations' course or "track", rerun it, etc. Additionally the operators address, etc. can be accessed using an interactive callbook program taken from the FCC database.

WinAPRS (for Windows) program which I have in my home computer and laptop works with either the Precision Maps CD or DeLorme Street Atlas CD. I use the Precision system as it has better detail on the rural areas of Washington. WinAPRS, and other APRS programs (and maps) can be downloaded from a number of web sites. After paying a one time registration fee a "key' is provided so that you don't have to enter your unique parameters each time you open the program.

Even without a computer, there is a lot of info available. The small screen on my Kenwood D700A can send and receive emails and tell me the following about an APRS signal received - callsign, type (digi, mobile, etc) latitude and longitude, grid square, bearing/azimuth from me, miles from me and a short status message from the station. The Kenwood stores the 40 most recent stations received. Also I can access my own position, status message I'm sending, etc. Messages received for me are stored separately.

In order for my system to function properly, I have to preset certain values in the radios' APRS memory, such as:

MY CALLSIGN - KI7AO-9 (mobile),KI7AO (base), KI7AO-10 (digi), etc.

MY POSITION - lets me enter my latitude/longitude if I'm not mobile and/or not using GPS input

STATION ICON - selects from dozens of icons for base, mobiles, boats, etc.

PACKET PATH - normally RELAY, WIDE 3-3 as a mobile, meaning my signal can be relayed and/or repeated through three digipeaters

PACKET TX - how I want the packets sent, by the mike PTT, or automatically

TX INTERVAL - every 3 min, (mobile) or 30 min. (base) or some other time

STATUS MESSAGE - such as "monitoring 146.520" sent with reports

STATUS RATE - send the above with every position report, or every other report, every third report, etc.

PACKET SPEED - my GPS and TNC work at 9600 bps; the radio and TNC talk at 1200 bps

DIGI FUNCTION - whether I want to serve as a digipeater for other stations

BEEP FUNCTION - mine is set to beep only when I receive a message or a comeback (ACK) from a digipeater, so I know I'm into the system

AUTO MESSAGE REPLY - a short message which says that I'm mobile and can't respond to an incoming message right now

POSITION LIMIT - limits the distance that I want to receive signals from - very useful for a local or SAR net

As with all modern stuff, there are lots of other programmable functions that I haven't even learned as yet.

Well, I hope this has interested some of you. For more info on APRS there are a number of good web sites to check out:

www,aprs.net, www.tapr.org, www.nwaprs.net www.rutgers.edu/aprs.

Installing PL-259s The Right Way

By Dave Pruett, K8CC

I've been a ham for almost 37 years, and for all that time I've hated installing PL-259s on coax cable. Robust connector installation is crucial to building a reliable station, and as I've gotten older, I've come to realize that the key is doing it the RIGHT way. Like most hams, I've seen the diagrams and read the descriptions in the ARRL Handbook, but up until now never took the time to follow the advice.

I have since come to understand that there are five keys to reliable installation of PL-259s:

1. Use Good Connectors – With silver plated PL-259s available for $1 apiece at Nemal or at most hamfests, putting cheap or used connectors on a permanent cable for your station is false economy. I never buy regular plated connectors anymore, because it is much harder to get the plating to take solder. I have filed off the plating near the braid holes to expose bare brass beneath and found it to take solder well. Radio Shack PL-259s are useless in this regard, being made of steel which won't take solder if exposed.
2. Use Good Coax – In this context, "good" coax is defined as having a tightly woven braid with good coverage (i.e. very little of the center dielectric is visible). This is particularly important when attempting to tin the braid (see step #3 below). A tight braid traps the dielectric inside so that it doesn't seep through during tinning. Polyethylene dielectric is much better than foam in resisting heat and melting
3. Tin The Coax Shield – Tin the braid, just like they show in the Handbook, which offers two advantages: first, it prepares the braid to make connection to the connector shell, and second, it simplifies the task of trimming the braid and center dielectric
4. Use The Correct Tools To Make Cuts - A plumber's tubing cutter will make cuts that are consistent and square to the center axis of the coax. Use the cutter to make initial "grooves" in the outer jacket and tinned braid, then finish the cut with a sharp razor knife. "Sharp" is the key here; the blade should be almost new.
5. Use The Right Soldering Iron – For many years, I relied on the typical 100/140W Weller soldering gun to install PL-259s. While this worked well for tinning the braid, and for soldering the center conductor, soldering the shield (even when properly tinned) through the access holes seldom resulted in a totally trustworthy connection.

A big improvement in my PL-259 installations came when I acquired a 250W "Black Beauty" soldering iron. This bruiser weighs several pounds, is over 14" long with a tip that's 5/8" in diameter. With that much mass heated with 250 watts, soldering the braid through the PL-259's access holes is no problem. In fact, I've heard of people heating the iron in their workshop, unplugging it and carrying it outside and still able to make the connection!

Soldering irons this massive are not something you'll typically find at your local hardware store or Radio Shack. Fortunately, MRRC's own Pete Michaelis, N8TR buys them quite often at garage sales or fleamarkets, cleans them up and re-sells them. Pete was the source for the iron I have, and if I recall the price was in the $25-35 range. Check with Pete to see what he has "in stock".

With the right tools, your coax connections will be more reliable, which prevents failures at inconvenient moments. In recent years I'd taken to the "K9TM cable postulate"; that is, "Life is too short to make your own cables". The consequence was that I'd taken to buying pre-made cables from companies like Cable XPerts. But now that I have the right tools and the right procedure, installing PL-259s on coax cables is no longer dreaded, but is almost fun. And it's a highly useful skill when you need to make specialized cables for your next big array.

Waterproofing RF Connectors

Author unknown

Waterproofing RF connectors is a concept many amateur radio operators fail to recognize. When you're dealing with weak signals or a repeater system with a dynamic range of 140 dB, that Radio Shack education just doesn't cut it.

There are a lot of different ways to protect and waterproof your RF connections, some actually work!

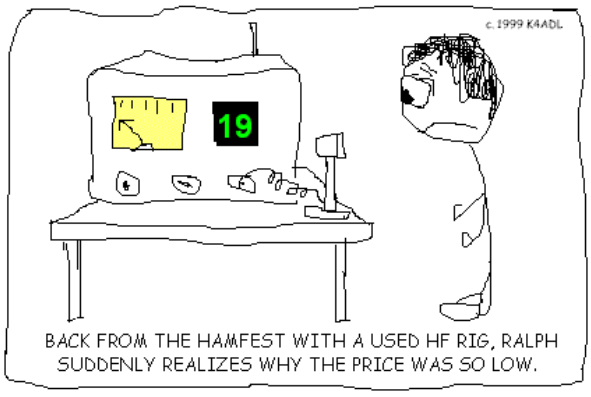
Just because you've been doing something wrong for 30 years doesn't mean it's right!

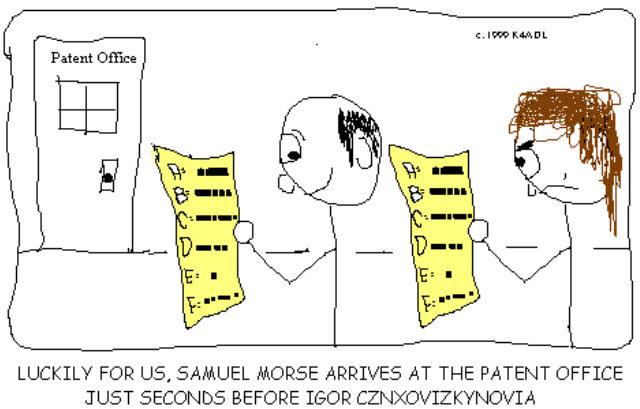
1. Wrap the entire connection once (or twice) with 3M Scotch Super 88 or 88T PVC electrical tape. Super 88 is recommended over Super 33 or the other crap because of its ideal temperature characteristics and the fact it's 20% thicker. Be sure to allow a significant overlap of each turn. It's also to best to wrap the tape up to connector, or the opposite way of intended water flow. This is done to prevent the electrical tape from wicking water in. You'll want to do this for each tape layer, if possible. Also, on the last turn, don't pull the tape hard, just leave it loose and press it down. This will help prevent it from unwrapping.
2. Make sure there are no air cavities or openings in the tape! Where there is air, there will be water.
3. Next, wrap the entire connection once (or twice) with 3M Scotch 2242 rubber electrical tape. Pull the tape so hard that it turns from black to gray, and wrap it tightly around the entire area previously covered with Super 88 electrical tape.
4. Wrap the entire connection once (or twice) again with a layer of Super 88 electrical tape, just like in step one.
5. That's it! A fully waterproof seal with the ability to remove the tape layers using nothing but a utility knife.
6. If you put CoaxSeal directly on a RF connector, I will hunt you down and shoot you.
7. If you put CoaxSeal directly on a RF connector, I will hunt you down and shoot you.
8. If you put CoaxSeal directly on a RF connector, I will hunt you down and shoot you.

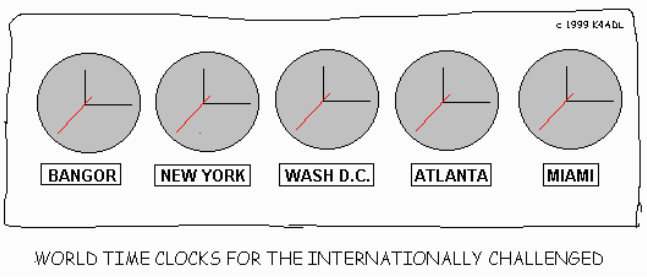
It's often recommended that you spray clear-coat type sealants (Scotch-Kote) on your connection to make it waterproof. This is O.K. to some extent, but not recommended as an end-all solution. These sealants contain acetone and other chemicals which can eat the rubber gaskets in N and Heliax connectors, along with the outer covering on some types of coax. They also break down in ultraviolet light (sun light), the sealant will then flake off. If you do need to use that type of sealant, for whatever reason, cover it with Super 88 electrical tape.

You can use spray clearcoat type sealants to waterproof non-critical connections, like to avoid dissimilar metal electrolysis, or in areas where it is just to hard to reach. Be sure to check the connection at least once a year though. If you do need to use Coax- Seal, please apply a layer of electrical tape to the area first.

RF connections are somewhat waterproof to begin with, but wrapping the connection will help prevent the connection from coming loose due to vibration. If the connection will be underground, you may want to apply Plasti Dip spray-on coating over the final tape layers. It is better to be cautious and waterproof your connections on the ground in the summer than to stand around like an idiot in January wondering why nothing works. (Green Bay Professional Packet Radio Tech Bulletin #1)







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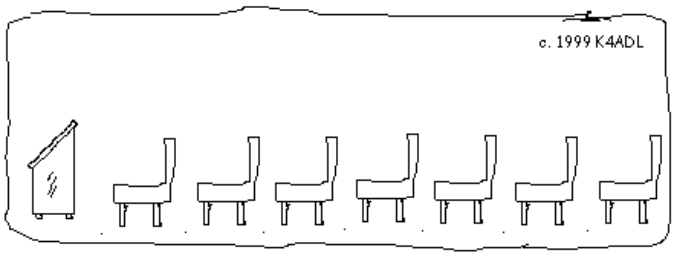

ANNUAL MEETING OF THE TRUCKERS' CB-QRP CLUB

How Not To Teach Your Dog About Electricity

Mr. X called his telephone company to report that his telephone failed to ring when his friends were calling. On a few occasions when it did ring his dog would always moan before the phone rang. The telephone man spent the afternoon working on Mr. X's line. He climbed a nearby telephone pole, hooked in his test set and dialed the subscriber's phone. The phone didn't ring right away. But then the dog moaned loudly and the telephone began to ring.

After climbing down from the pole, the telephone repairman found:

- The dog was tied to the telephone system's ground wire via a steel chain and collar.
- The wire connection to the ground rod was loose.
- The dog was receiving 90 volts of signaling current when the phone number was called.
- After a couple of such jolts, the dog would start moaning and then reliving himself on the lawn.
- The wet ground would then complete the circuit, thus causing the phone to ring.

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