



CAARA Newsletter



AN ARRL AFFILIATED CLUB

APRIL ISSUE- 2009

President's Corner

by Curtis AA3JE

WOW! What a great month of March. Things are hopping, (suitable Easter metaphor), at the club. We had a great class on the



K3 receiver early in the month, then a strong contest showing, followed by the astounding Stan Stone's Technician Class (14 of 14 passed), the Hamfest at Pigeon Cove Circle, and the first two of our new General class graduates.

I am amazed, and I am especially gratified that all of these events took place under the supervision of each event's champion. A "champion" is a member of the club who gets an idea (e.g. "Let's have a hamfest", "I think we need to do more to train new hams", "more CW please"). They then come to me or to a Board member and ask why "the club" does not support the activity. When told that such things need a person who will coordinate and manage the activity, they step forward, volunteer, and things start happening.

This is the way of a successful non-profit. CAARA is not my club, it's not the Board's club, It's YOUR club, and the club will support your idea to the extent our finances and members allow.

Er. um. That is.....

Well there is no way to say it delicately. We need some more fund-raising ideas. The hamfest raised about \$500, but we really want to hold some more events and programs. So if you find out that you have some tax refund money coming, please consider a \$5 or \$10 donation to CAARA. We are on a roll, and if we all chip in, we can have better programs. So if you have cash, consider a donation. If you don't have cash, consider being the champion of a fund-raiser. We have 14 new hams this month, lets get some programs to put those new licenses to work.....

CAARA thanks all involved in the Tech in a Day course.

CAARA gives Stanley Stone-W4HIX a big thanks for his hard work at getting 14 new people into the ham ranks. He completely headed this up on his own.

We all give thanks to Bob Quinn WV1A for all his help in setting up the VE test

session. Curtis Wright AA3JE, Briggs Longbothum AB2NJ and Dean Burgess KB1PGH assisted in the test session.

Curtis, AA3JE, said that this is the first Tech course the club has had in years. **See page 9 for more details.**



Ross Burton W1RAB pictured proudly with his wife Pam Burton who had just passed her Technician license at the Tech in a day class.

CAARA Newsletter

Cape Ann Amateur Radio Association

6 Stanwood Street

Gloucester, MA 01930

CAARA Newsletter is a monthly publication of the Cape Ann Amateur Radio Association (CAARA). It is the policy of the editor to publish all material submitted by the membership provided such material is in good taste, relevant to amateur radio and of interest to CAARA members, and space is available. Material is accepted on a first come, first serve basis. Articles and other materials may be submitted by internet to Jon at k1tp@arrl.net. If possible, material should be in Word format. Material may also be submitted as hard copy to Jon-K1TP or any Club Officer.

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Jon Cunningham-Editor
K1TP

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Welcome to CAARA:

CAARA, an ARRL affiliated club, operates the 2 meter W1GLO repeater on 145.130 MHz with antennas located on the Cingular tower in the Blackburn Industrial Complex in Gloucester Massachusetts. It has an average effective radius of 60 miles, and serves Eastern Massachusetts, Cape Cod, Rhode Island, Southern New Hampshire, and maritime mobile stations. CAARA also operates the W1GLO repeater on 224.900. The W1RK 443.700 repeater with antennas located in Magnolia is owned and operated by club member Ralph Karcher and it too is available for club use.

The Association is one of the few amateur radio clubs that has its own clubhouse. Located at 6 Stanwood Street in Gloucester, it includes a permanent HF station with rotating beam and vertical antenna along with a 2 meter packet station and 2 meter voice and 220 MHz transceivers.

Amateur radio exams are held on the second Sunday of each month at 10:00AM at the CAARA clubhouse. Anyone who is considering a new license or an upgrade, is welcome to test with us. There is no pre-registration necessary. Contact the head of our VE team Bob Quinn if you have any questions about monthly testing.

Monthly member meetings are held on the first Wednesday of each month at 7:30 PM except for July and August.

Each Sunday evening at 9:00pm, the club operates a 2 meter net on 145.130. This is an open and informal net which disseminates club news and prepares operators for emergency communications work. All are invited to check into the net as club membership is not a requirement.

On Thursday February 26th CAARA held an open house for the North Shore/Cape Ann Emergency Preparedness Coalition. This coalition includes 15 Local Boards of Health and other health departments including the American Red Cross and FEMA. CAARA's President Curtis Wright AA3JE led a presentation which included how North Shore ARES responded during the last December ice storm as well as what Amateur Radio is and how it can be utilized during a health care emergency. After that there was a morse code demonstration upstairs held by Rick Maybury WZ1B. At the end many of these health care professionals signed up for the Tech License in a day course which was led by Stanley Stone W4HIX on Saturday March 7th at the Lanesville Community Center. 73's Dean KB1PGH



Testing Tips-How to accurately check resistors on board

Usually when a resistor fails they either increase in value or open up at all. You can check the resistance of a resistor with an ohmmeter. If the resistor is in circuit, you will generally have to isolate the resistor so you are measuring only the resistor, not other components in the circuit. Always be aware of possible back (parallel) circuits when performing in-circuit resistance measurements.

As a repairer, most of the times we want to troubleshoot and solve problems as fast as possible thus removing all resistors from the board and check the resistors one by one will take up a lot of our precious time. There has to be a simple way to check resistor on board.

Using an analog meter to check resistor on board often produced a wrong reading. This is due to the reason that the output from the analog meter is from 3 volt to 12 volt. The voltages are quite high and it can trigger the semiconductor devices around the resistors such as diode, transistor and ICs. Do you know that semiconductors only need voltage of 0.6v in order to conduct. Since the output voltage from the analog meter is higher than the semiconductors, checking the resistor in circuit won't give you an accurate reading!

In order to measure resistors while it is still in circuit, you need to get a digital multimeter that has the output of less than 0.6v. This is to avoid conducting the semiconductor devices around the circuit that you want to check. Currently I'm using the Greenlee digital meter that has output around 0.2volt. Though it cannot give me a 100% accurate result at least it can help me to speed up my troubleshooting job. Why not 100%? This is due to that some circuit has resistors that are directly parallel to each other.

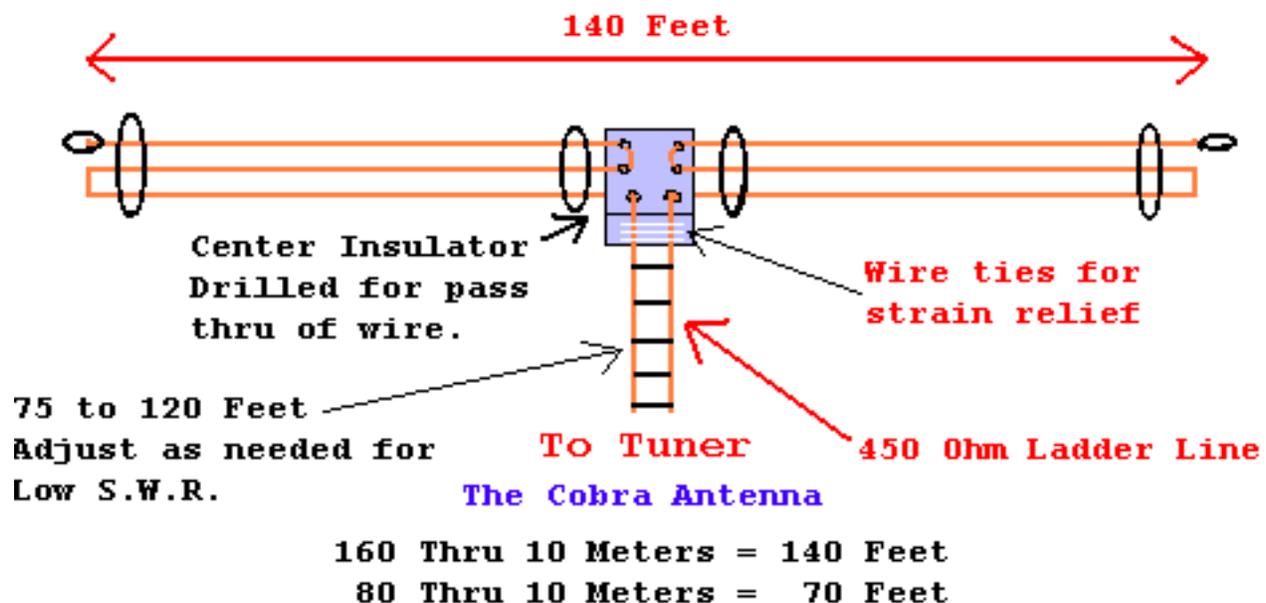
Testing time- If you connect your digital meter leads across a resistor in a circuit and it measures higher than it should, then you know the resistor is either open or has gone up in value. Other circuit components cannot possibly increase the value of a resistor; any parallel circuit could only make the resistance reading lower. In rare cases, sometimes an uncharged capacitor can cause the measurement higher than it should be.

Only through more practice will make you know when you should remove the resistor and check it off board.

WEEKEND PROJECT: BUILD THE “COBRA” ANTENNA

My friend Joe-K1JEK manufactures his own version of the “Cobra Antenna” (K1JEK.COM) and it is sold at HRO but if you are of the experimenting type, it is very easy to build and you will be surprised at the results you can obtain over a cut dipole....Check reviews of the antenna at QTH.COM. All the wire can be found at DAVISRF.com, Radio Shack, Wireman, etc.- Jon K1TP

The original Cobra antenna designed by W4JOH can be built as an all band hf antenna covering either 160 thru 10 meters or 80 thru 10 meters and is built using standard insulated wire of about 14 gauge and fed with 450 ohm ladder line down to the shack into a tuner. It got it’s name from the S shaped configuration of it’s multi-conductor elements. It performs on it’s primary and harmonic operating frequencies as a standard ladder-line



fed doublet.

The close spaced wire elements on each leg introduces two added resonant responses BELOW the antenna’s fundamental operating frequency.

The 140 foot version (80 meters) in picture also resonates at about 2.8mhz and also on 160 meters. A standard dipole at 1.9mhz is about 246 feet total compared to 140 feet in the Cobra!. This fact alone makes this an ideal antenna for restricted space on the TOP BAND!

The half sized version, 73 foot (40 meter) also covers 60 and 75 meters!

All band operation has been reported in the original article to be excellent! (With a tuner of course).

This antenna design extends the coverage compared to a G5RV both in bands and performance. On its primary and harmonic operating frequencies, tests show no discernible difference in signal strength between a Cobra and a regular full-sized doublet or dipole.

On its sub-bands bands where the Cobra is physically “short”, efficiency is somewhat lower than for a full-

sized dipole.

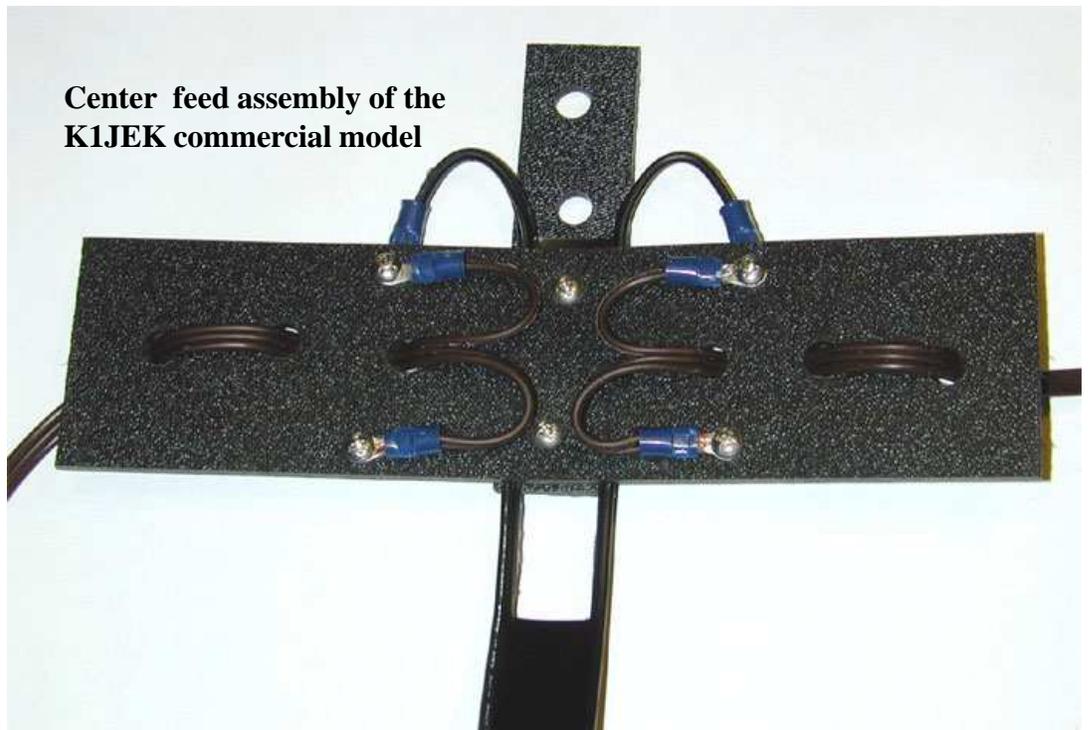
If you do the math, you will see that there is actually about 420 feet total wire across the top of the antenna on the 80 meter version, (210 feet per side), and about half that on the 40 meter version. The flattop and lead-in length were strictly determined by the physical limitations of the antenna farm and this project is a result of those limitations and the idea of compressing or folding the wire back on itself to fit the antenna farm. (No formulas were given in the article), but they seem to be this:

$1/2$ of total known length / frequency = multiplier for formula below:

$210 / 3.750$ (band center) = 56 (unknown multiplier)

So $56 \times 3.750\text{mhz}$ (band center) = 210 feet per side. Which is exactly what he used per side.

Note: "This formula is mathematically correct in solving for the unknown **assuming** the lowest band center frequency was used, but may not be what was used in the original antenna experimentation if any formulas were used at all! The original author, W4JOH, may have arrived at the lengths strictly by experimentation and found them to work well."....



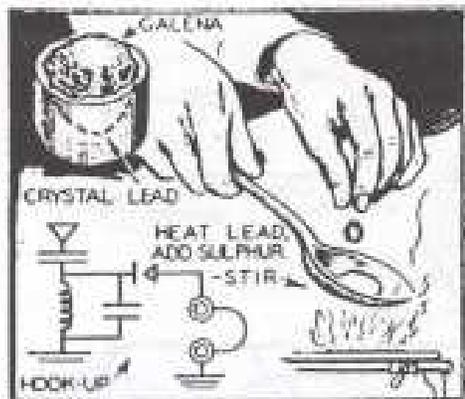
Keep in mind that there are actually 3 conductors connected

in series per side and folded back on each other..... or another way of saying this is that there is one continuous length of 210 feet per side in the 80 meter version connected to one side of the ladder line and the same on the other half. Because the Cobra antenna is a balanced load, it is recommended to install a 4:1 current-style balun at the station end of the feedline (many external tuners provide a built-in balun). Ladder-line feed may have to be trimmed for lowest SWR, but using about a 100 foot length seems to make for easier tuning on all bands. Extra feedline should be suspended in loose coils and not in a tight roll.

A 4:1 balun possibly could be installed at the antenna, then fed with 50 ohm coax to the radio, BUT, it is not known if this would upset any characteristics of the original design.

Experiment!

Heat LEAD and SULPHUR to Make RADIO CRYSTALS



CRYSTALS of the galena type, used extensively a few years back for crystal radio receivers, can be made in a few minutes by radio experimenters. Only a small piece of lead and about a gram of sulphur are needed. Place a piece of lead about the size of a pea in an old teaspoon, heat until the lead melts, then add one gram of sulphur and stir the mixture with a piece of wire. Allow to cool, and use the resulting black metal exactly as you would a crystal.—C. K. Jones.

The good old days!

Here are a couple of pics of the March 4th members meeting. Dave Robertson KD1NA did a presentation of the Elecraft K3 Radio which he built in a kit form. He explained the inner workings of the K3 which included a short video of its construction. He also demonstrated on a projection screen the signal handling capabilities of the K3 which is handled completely digitally inside the radio.

Elecraft's state-of-the-art K3 transceiver offers a unique combination of ultra-high performance *and* affordability.

Both 100-watt and 10-watt (upgradeable) models are available. Starting at under \$2,000 for the 100-W assembled model (K3/100), the rig is comparable in both features and performance to transceivers listing at up to six times its price.



In a first for the industry, the K3's identical main receiver and subreceiver each feature a **high-dynamic-range, down-conversion analog architecture**. This allows Elecraft to provide roofing filters with bandwidths as narrow as 200 Hz, while up-conversion designs have roofing filters typically 3,000 to 15,000 Hz in width. Unlike some competing down-conversion designs, the K3 also provides 6-meter coverage, as well as continuous tuning from 0.5 to 30 MHz. Each receiver has its own bus-switching mixer, narrow ham-band front-end filters, 32-bit I.F. DSP, low-noise synthesizer, and up to five crystal roofing filters.

Crystal Radios have played a large part of where most of our electronic technology is, today. There's a definite thrill involved, when a kid makes their first radio, hears it working, and experiences the sound coming from the headphones. I can certainly remember my first set, which was a crystal radio. Was about the age of ten, and built a set from a Cub Scout manual. I'll never forget the experience, and the thrill!

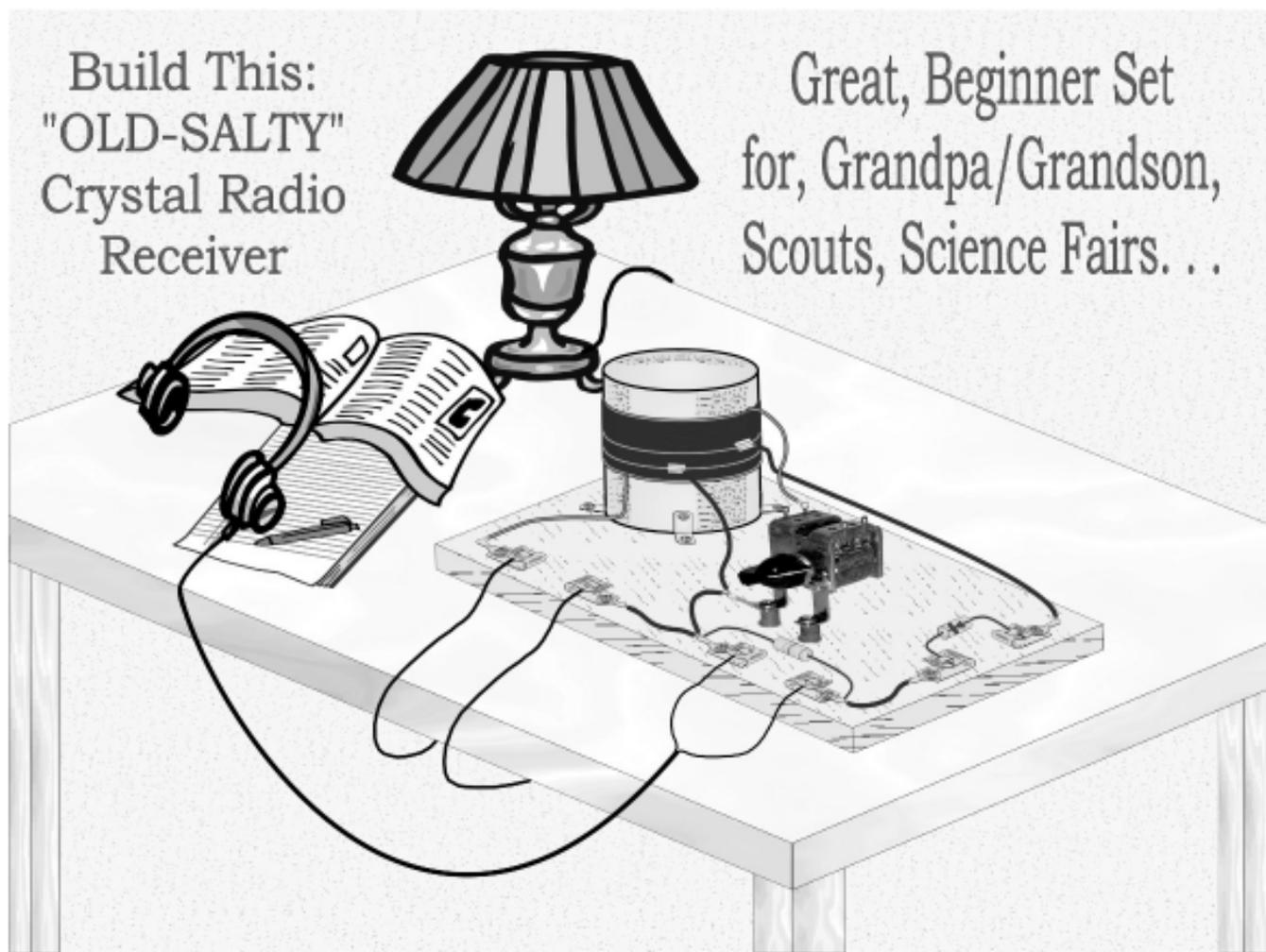
The set, featured in this article is simple, but is also a fine performing set. Few parts are needed, and robbing a salt box from the kitchen cupboards will provide necessary parts for building this set. The set is constructed on a standard piece of 1" (3/4" actual) x 6-1/2" x 8-1/2" Pine board, or any similar material, commonly found in any building supply or craft store.

The set does require some sort of antenna, which would preferably be a "long-wire", above the houses' roof-line, and 50' to 100' long. Don't let this discourage you, as many things will work as an antenna. Aluminum framed windows, wire strung along the top of curtain rods, metal gutters and down-spouts, etc. This is where a fellow can get creative and try many things. Also, a good "Earth Ground" is also needed. This can be obtained by connecting to metal house-pipes, or a ground rod, which can be obtained from any

electrical supply company. Rather moist soil, provides a better ground, than with very dry ground. This is another area of experimentation, in finding what works best.

Before continuing, the best book that I highly recommend for easy and very direct reading is: "Radios That Work For Free". This book may be obtained from several sources, but easily obtained From: www.peeblesoriginals.com, as all the parts and wire needed for this project. If you do-not see the items in the site, e-mail and you will be quickly quoted a price, etc. for the necessary parts, book, or kits you are seeking.

The first, and most difficult item to construct for this set is the coil assembly. Cut-out the top and bottom of the salt box. Measure-up, from the bottom-end of the box, 2-1/2". Punch 2-small holes, about 3/8" apart, side-by-side. Measure up, from the 2-small holes, 1-3/4" and punch 2-small holes, the same as the first two. Thread the end of the 22ga. magnet wire, though the first two holes and leave about 5", from the salt box. Now, proceed to wind the wire, in a clock-wise fashion, as closely and snug as possible. When the first 12 turns is reached, then slip a small piece of cardstock material (approx. 1/8"x 1/2"), under the 12th turn. Proceed for another 12 turns, repeat the process with the cardstock. Finish winding the coil's total of 61 turns and thread the wire through the holes, leaving 5" as before.



Build This:
"OLD-SALTY"
Crystal Radio
Receiver

Great, Beginner Set
for, Grandpa/Grandson,
Scouts, Science Fairs. . .

At the two places on the coil, where the wire was placed over the top of pieces of cardstock, scrape-off as much insulation as possible. Tin these two wires with solder-iron and rosin-core solder. Cut two pieces of hook-up wire, one about 5", and the other, about 4". Strip and tin one-end of both pieces, and solder the 3" piece to the first tap, and the 5" piece, to the second tap. At the lower-end of the coil assembly, punch 3-evenly spaced holes around, about 3/8" from the bottom. Attach 3-"L" brackets, with 3/6-32 x 3/8" machine screws and nuts, as shown. Mount the assembly to the board with 3/#6 x 1/2" sheet-metal screws, as shown below.

Attach 2-angle brackets to the variable capacitor, with 2/6-32 x 1/4" screws, and 2ea. flat-washers, between brackets, and capacitor's frame. See illustration, below. Mount the variable capacitor, to the board, with 2-#6 x 1" sheet-metal screws, 2ea. spacers, and 2ea. flat-washers, and a solder-lug, as shown below.

Attach the 6ea. Fahnstock clips to board, as shown below, with 6/#6 x 1/2" sheet-metal screws, and 6ea. solder-lugs.

Wire the set as shown, making certain to remove the insulation on the coil wires and tin them well, at the ends. Keep all wiring as direct and short as possible.

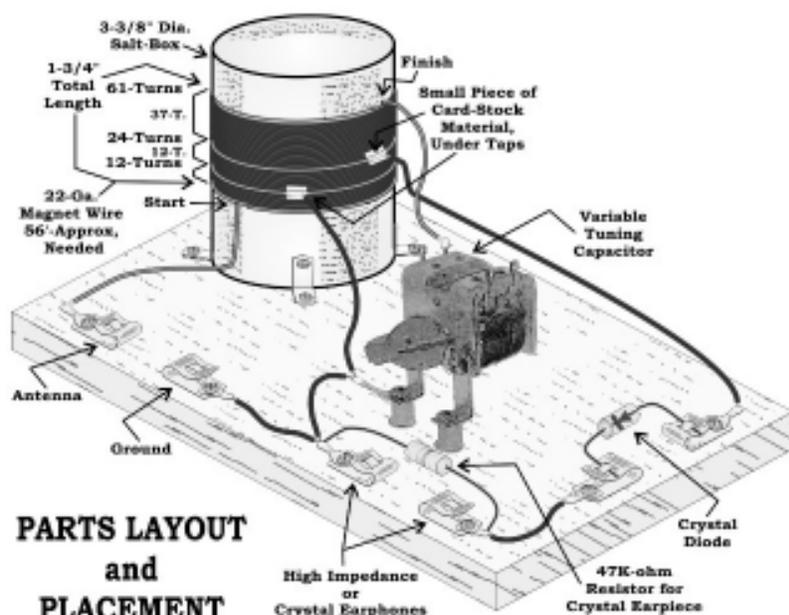
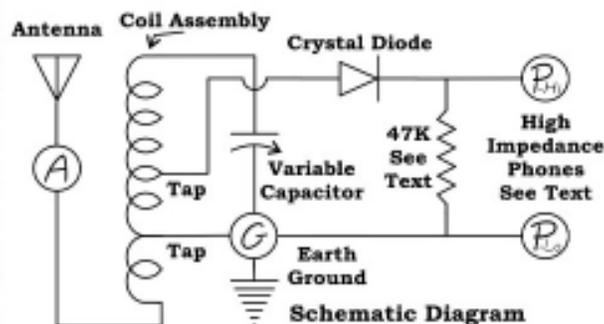
The 47K resistor across the "phones" terminals is only needed, when using Ceramic/Crystal earpieces, or Piezo type earphone elements. This resistor is not necessary, if using, high impedance phones, like 2K to 5K dynamic-type phones. "Walkman-style" phones will not work.

Carefully place the crystal diode in the clips, as below, and this completes the set's assembly. Re-check all work and wiring, then proceed to hooking-up the set, and testing/operating your set. This is where the fun starts!

As previously mentioned, an antenna and ground necessary to operate this set. Ideally, the antenna will be a wire 50' to 100' long and as high as possible. Insulated at both ends, and then a lead-in wire, thin well insulated, also. The ground is found with many cold-water pipes, heating radiators, that are not gas, ground rod that can be obtained from electrical supply. Do-not use gas pipes. Alternate antennas can be aluminum-frames, on windows, doors, etc. . . gutters down-spouts that are metal, etc. Many times, just a string hung around the top of window curtains will work. There is fine information in "Radios that Work For Free" as previously mentioned. The main thing is, experiment, and seek information that is readily available on the NET, libraries, etc.

Connect your earphones, as shown in the diagram below, and start having fun in the wonderful world of radio building and listening. Resources of assistance

- <http://www.peeblesoriginals.com/>
- <http://www.schmarder.com/radios/index.htm>
- <http://theradioboard.com/rb/index.php>
- <http://www.crystalradio.net/>



PARTS:

1 - Germanium, Crystal Diode

- 1 - Variable Capacitor, 400pf-Max.
- 1 - Pointer Knob
- 2 - "L" Brackets, Variable Cap.
- 2 - Spacers, #6 Clearance, Var. Cap.
- 4 - Flat Washers, #6, Var. Cap.
- 2 - Sheet-Metal Screws, #6 x 1", V.C.
- 2 - Mach. Screws, 6-32 x 1/4", V.C.

- 1 - Salt-Box, 3-3/8" Dia.
- 3 - "L" Brackets, Salt-Box
- 3 - Mach. Screws, 6-32 x 3/8", S.B.
- 60' Magnet Wire, 22ga.

- 6 - Fahnstock Clips, #6
- 7 - Solder Lugs, #6
- 9 - Sheet-Metal Screws, #6 x 1/2"
- 2' Hook-Up Wire, 22ga, Coated
- 1 - Baseboard, 5-1/2" w x 8-1/2" l x 3/4" thk Pine, or similar material.

High Impedance headphones, or Ceramic Earpiece, See Text.
 1 - 47K Resistor, 1/2W, Cer. Earpiece

Suitable Antenna & Ground, See Text.

CAARA Tech-in-a-Day a big success!



Marlene Piazza walked through the door of the Lanesville Community Center, determined to get her amateur radio Technician license that day. She had tried studying the ARRL Ham Radio License Manual on her own, but more often than not, fell asleep after a few pages. As Health and Safety Coordinator for the American Red Cross in Beverly, she was determined to learn everything she could, and with the delivery of a new truck later this month would come a pair of radios. She thought this could be the day she

would finally get her ticket.

On March 7th, CAARA conducted its first Tech-in-a-Day program at the Lanesville Community Center in Gloucester. Students came from as far away as Lynn and New Hampshire for a highly compressed day of studying to pass the FCC Element 2 examination. Fourteen students attended the course, ages ranging from 13 to over 60 years old. The course consisted of six one-hour sections, each covering approximately 65 questions. Students were told to read the question and only the correct answer, which was indicated in bold. Very little lecture was conducted—this was a self-study program. Any tricks or associations were encouraged to memorize the largely unfamiliar material. After 45 minutes, students were directed to get up and move around for 15 minutes and enjoy some of the snacks and beverages that were provided. The next session started on the hour and the cycle was repeated. Three sections were held in the morning and three in the afternoon.

It was a warm day for March, so it was possible to get out and walk from the community center to the Plum Cove Grind for a bite to eat. By this time, the students really appreciated the break and fresh air. After the sixth session in the afternoon, the Element 2 exam was conducted by the CAARA V.E.'s, Bob Quinn, WV1A; Curtis Wright, AA3JE; Briggs Longbothum AB2NJ; Dean Burgess, KB1PGH; and Stan Stone, W4HIX.

All 14 students passed the exam with several getting perfect scores. Leslie Milne, MD from the Lanesville Emergency Action Program and Pam Burton, wife of club member Ross Burton both passed with flying colors. Margaret Whittaker, Cape Ann Emergency Preparedness Coordinator were also in attendance, and Marlene Piazza passed her exam. Club member Jennifer Cormier took her Element 3 exam and passed, advancing her license to General. In all, eight women and seven men attended the training session.

Stan Stone developed and conducted the course from reports of similar courses that have been conducted around the country. Dean Burgess arrived early and helped coordinate the day's activities. The reported passing rate is 85%, so when 100% of the CAARA Tech-in-a-Day students passed, it was a great thrill. Two students joined CAARA on the spot, and several more expressed an interest.

The challenge now will be to engage these new hams so that they actually get on the air. Follow-up e-mails have already gone out to congratulate them and encourage them to drop by the clubhouse on Sunday mornings for coffee, donuts and plenty of free advice.

The Tech-in-a-Day program will likely be repeated in the fall, or sooner if there is demand for it.

CLUB CONTESTERS



Mark, W1MAW: First licensed in 2006, ham radio and shortwave radio has been an interest of mine for many years. My QTH is in Beverly Massachusetts about 500 ft. from the ocean, which gives me a clear path to Europe for DX contacts.

Because my job allows me the ability to work from home, I always seem to have the radio on in the background letting me jump in when propagation allows.

I am a member of the North Shore Radio Association and an officer of the YCCC (Yankee Clipper Contest club).

Equipment: Radios: Yaesu FT-2000D (HF), Yaesu FT-1000 MP Mark V(HF), Yaesu FT-847(Sat work), Yaesu FT-897D, Yaesu FT-101, Yaesu FT-101E, Yaesu FL-2100B Linear Antennas: Cushcraft-R8(HF), Cushcraft-5-element(6M), Cushcraft- MA5B, Cushcraft-10 element(2m/70cm), 40 meter G5RV



PAUL-KA1GIJ FROM READING, MA operating the contest at the club

CAARA SPONSORS ANOTHER CONTEST AT THE CLUB



The ARRL International DX Phone contest worked at the Clubhouse with Nat Henrickson NG1Z working 20 meters with a 500 watt amplifier and Paul Anderson KA1GIJ working 40 meter phone-this contest started Friday, March 6 at 7 pm and lasted until 2400 utc Sunday, March 8. The group logged 443 contacts!



The official 2009 ARRL Field Day Web page is up and running. This page includes a summary of available resources, with links to Field Day forms and rules, logos and reference links. The page also includes a quick link to the map-based Field Day Station Locator where users can search for public Field Day sites. "Field Day is the largest on-the-air operating event," said ARRL Field Day Manager Dan Henderson, N1ND. "The event draws tens of thousands of radio amateurs to the airwaves over a single weekend." This year, Field Day is June 27-28. ARRL WEB ADDRESS: <http://www.arrl.org/contests/announcements/fd/>

2009 CAARA FIELD DAY preparation has begun and a strong turnout is expected. Jim-W1DDX will be contacting all members by email with dates of Field Day meetings to be held at the clubhouse. This is a great event to meet new club members, get on the air and try a new mode, and enjoy some good food.

WAS and DXCC? CAARA has worked over 34 states and 50 countries in the last few contests held at the club. All members are welcome to visit the club and use the club station and log new states and countries. Help the club earn the ARRL WAS and DXCC 100 certificate!

SIMPLE ELECTRONIC KEYER BY N1HFX....This would be a fun club project at a meeting or Sunday Morning

Serious CW operators know that a paddle is the way to go to make CW easy and fun. But along with the paddle, a certain amount of electronics is needed to produce the necessary dots and dashes. This circuit in figures 1a and 1b is a simple keyer which can be built for as little as \$6 with some junk box parts. Although this circuit is not a true iambic keyer, it is capable of producing perfectly sounding CW. To make construction easy, all parts are available off the shelf at any Radio Shack store.

The circuit in figures 1a and 1b uses a quad NOR gate chip and a dual-D flip-flop chip. Two of the NOR gates are used as the clock generator and the frequency is determined by C1, R1 and R2 which sets the keying speed. This clock signal is fed into Pin 3 of IC 2 which is the dot flip flop. Nothing happens at this point until the dot paddle is grounded. When the dot paddle is depressed, Pin 1 of the flip flop changes states for as long as the dot paddle is depressed. When the dash paddle is grounded, this in turn causes the dot paddle to be grounded also through Diode D1. This starts the dash cycle which continues until Pin 13 of IC-2 changes state again. Diode D2 keeps the dot paddle low until the dash cycle finishes. Pins 1 and 13 of each flip-flop form the output to transistor Q1. Because Pin 1 is not always high during the dash cycle, Diodes D3 and D4 form an OR gate to keep Q1 turned on during a dash cycle.

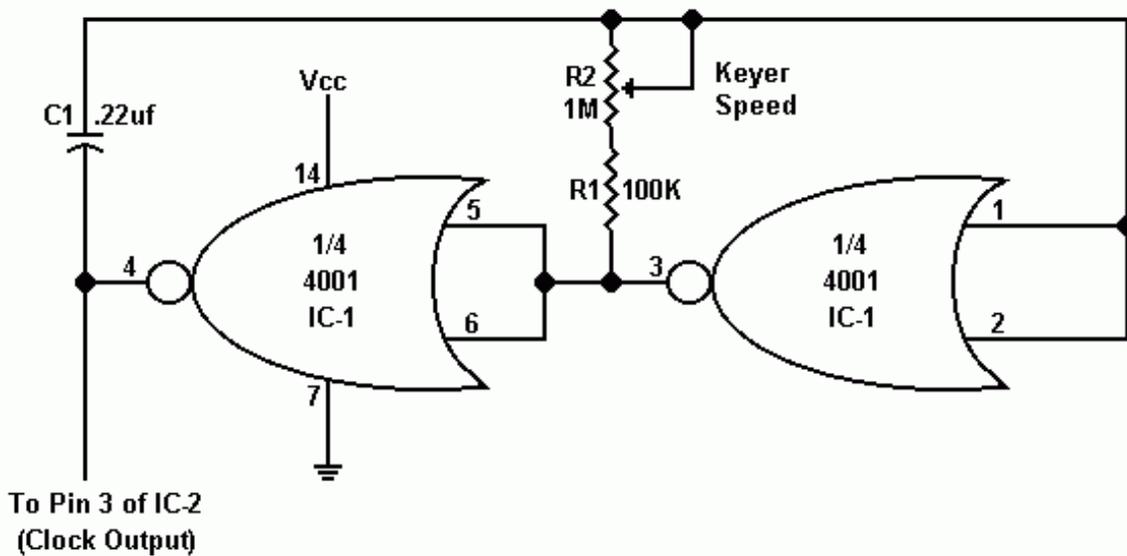
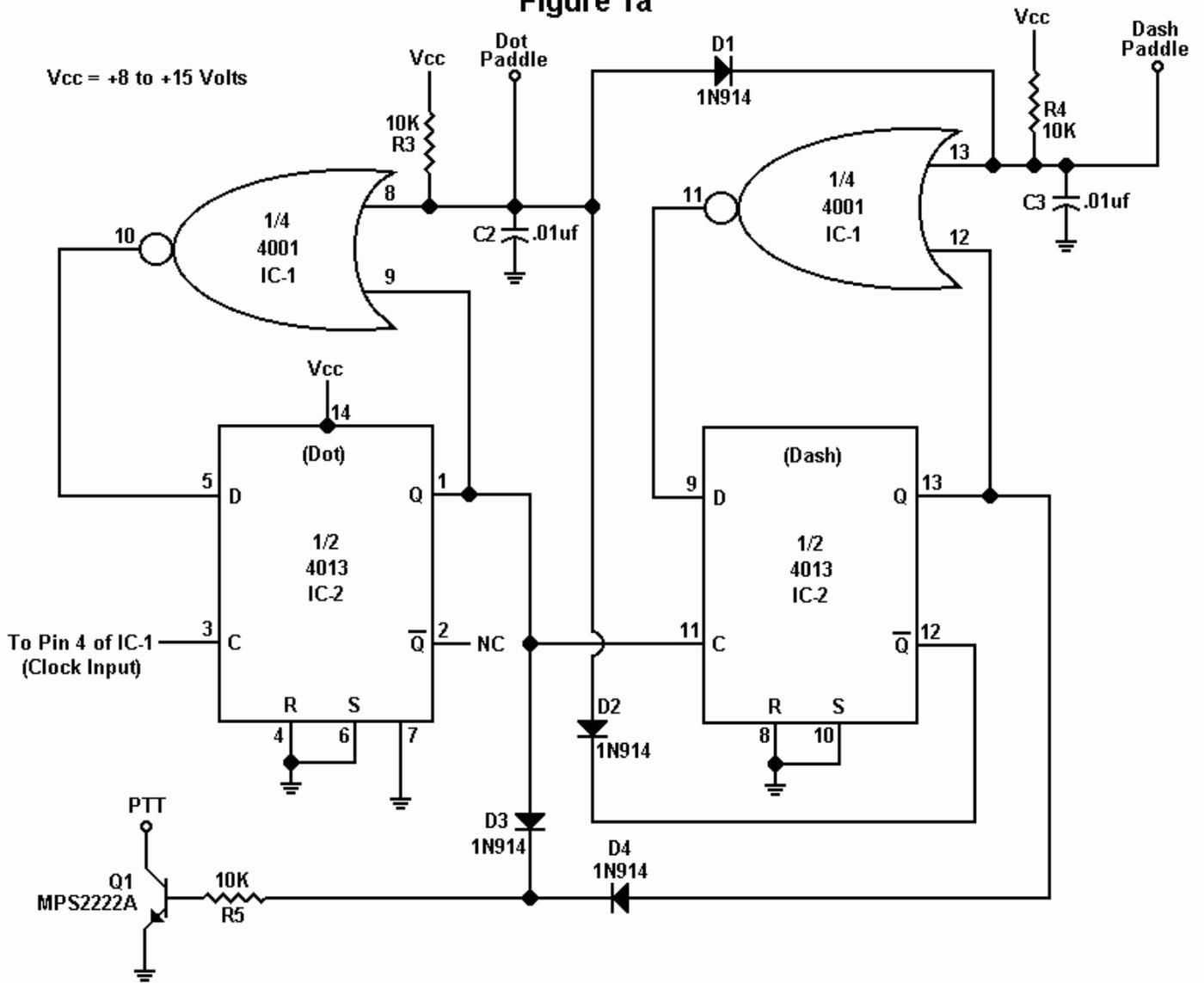
This circuit has one anomaly which operators should be aware of. The dash paddle always has priority and attempts to squeeze the paddle (both dot and dash depressed) results in a continuous stream of dashes. This means the operator must release the dash paddle before depressing the dot paddle. Experienced CW operators will have no problem with this circuit but sloppy high speed operators will need to refine their sending since it is not as forgiving as a Curtis chip.

This circuit uses CMOS chips which require special handling to prevent static charges. IC sockets are highly recommended. The circuit requires very low power and can be powered from 8 to 15 volts. A 9 volt battery should last several months meaning an on/off switch isn't needed. No weight control is provided because experience has shown that it is often misused by operators causing code which is difficult to copy. A shielded enclosure is required and capacitors C2 and C3 should be soldered as close to the paddle jack as possible to keep RF out of the circuit. This circuit was constructed on a Radio Shack multipurpose pc board (RS 276-150) and no printed circuit board is available for this project.

Parts List

R1	100K resistor, ¼ watt 5% tolerance (RS 271-1347)
R2	1 Meg potentiometer (RS 271-211)
R3,R4,R5	10K resistor, ¼ watt 5% tolerance (RS -271-1335)
C1	.22 microfarad capacitor (RS 272-1070)
C2,C3	.01 microfarad capacitor (RS 272-1065)
D1,D2,D3,D4	1N914/1N4148 or similar diode (RS 276-1122)
Q1	2N2222A or similar NPN general purpose transistor (RS 276-2009)
IC-1	4001 quad NOR gate (RS 276-2401)
IC-2	4013 dual D-type flip-flop (RS 276-2413)

Figure 1a



CAARA'S FIRST ANNUAL FLEA MARKET A FINANCIAL SUCCESS FOR THE CLUB.



Photo on the left: Hank-W4RIG collecting at the door. Photo on Right: Sandy and Bill running the kitchen, Mark enjoying a drink.





Photo on the left: Joe-K1JEK of Cobra Antenna and Bob-W1GJU who was the co-founder of the famous Hosstraders Flea Market Photo on the right: Our fearless club President, Curtis-AA3JE at work.



April 2009 Contests

SARL 80m QSO Party	1700Z-2000Z, Apr 2
SP DX Contest	1500Z, Apr 4 to 1500Z, Apr 5
Missouri QSO Party	1800Z, Apr 4 to 2400Z, Apr 5
JIDX CW Contest	0700Z, Apr 11 to 1300Z, Apr 12
EU Spring Sprint, CW	1600Z-1959Z, Apr 11
Georgia QSO Party	1800Z, Apr 11 to 2359Z, Apr 12
SARL Hamnet 40m Simulated Emerg Contest	1200Z-1400Z, Apr 12
Holyland DX Contest 0000Z-2359Z, Apr 18	
TARA Skirmish Digital Prefix Contest	0000Z-2400Z, Apr 18
ES Open HF Championship	0500Z-0859Z, Apr 18
Michigan QSO Party	1600Z, Apr 18 to 0400Z, Apr 19
EU Spring Sprint, SSB	1600Z-1959Z, Apr 18
Ontario QSO Party	1800Z, Apr 18 to 1800Z, Apr 19
YU DX Contest	2100Z, Apr 18 to 1700Z, Apr 19
Run for the Bacon QRP Contest	0100Z-0300Z, Apr 20
SP DX RTTY Contest	1200Z, Apr 25 to 1200Z, Apr 26
Helvetia Contest	1300Z, Apr 25 to 1259Z, Apr 26
QRP to the Field	1500Z, Apr 25 to 0300Z, Apr 26
Florida QSO Party	1600Z, Apr 25 to 2159Z, Apr 26
Nebraska QSO Party	1700Z, Apr 25 to 1700Z, Apr 26

Brazilian satellite pirates busted

For years, several suspected Brazilian radio hams have been using several US satellites for their communications, of course, in an illegal way.

But recently 39 persons were busted, with some arrested and a lot of homebrew equipment seized by the Brazilian authorities.

This week, mid of March, a man was arrested in Unai in the NW of the Minas state under the charges of homebrewing rigs to get through some military US sats like FleetSat-8 and UFO.

The rest of the Brazilian guys are all licensed ham radio ops and had antennas towards those sats and were often heard on many frequencies, even here in Europe.

The operation, under the name of "Operation Satellite" was held by the Brazilian federal police and the US Department of Defense which reported the almost exact location of each pirate.

The suspected may go to jail for a period of 2 to 4 years.. it all depends of the local laws in Brazil. Beside the guy that built the rigs, there are more than 20 suspects in the states of Minas Gerais, Goias, Tocantins, Mato Grosso do sul, Mato Grosso and Santa Catarina.

This kind of satellite piracy is popular in Brazil. Since many years when they tried to use homebrew rigs transmitting on the uplink of those US military sats, activate them and therefore being able to communicate through the huge Brazilian territory.

How to decode shortwave data streams: Turn strange bleeps on the airwaves into text and pictures

Have you ever tuned into shortwave radio bands? If so, you might have come across some strange-sounding periodic signals, from rhythmic bleeps and gurgles to scratching sounds.

If you guessed that they were some sort of data transmission, you're right. But who transmits them, and why? In this guide, we'll show you how to use your [PC](#) to decode these mysterious signals and enter the world of data on the airwaves.

You'll soon be able to decode radio teletype signals, interpret Morse code, unscramble radiofax transmissions of weather charts and watch colour slow-scan television (SSTV) images form.

Recognizing the modes

We're going to use [MultiPSK](#) to decode data signals from a radio. This package supports various types of data transmission, but if you don't select the correct ones it won't be able to interpret them, so you need to be able to recognise some of the key modes by ear

To help out here, we've prepared samples of several data modes including: Morse 25 WPM, RTTY 50 baud, Fax 120 LPM 288 IOC and SSTV Robot 2. By listening to these samples, you'll find out what Morse code, radio teletype, radiofax and SSTV transmissions sound like when you tune them in on a radio.

You can download the samples here:

Morse 25 WPM http://mos.techradar.com/audio/shortwave_audio/Morse_20wpm.wav

RTTY 50 baud http://mos.techradar.com/audio/shortwave_audio/RTTY_50_baud_sample.wav

Fax 120 LPM 288 IOC http://mos.techradar.com/audio/shortwave_audio/RTTY_50_baud_sample.wav

SSTV Robot 2 http://mos.techradar.com/audio/shortwave_audio/SSTV_Marti_2.wav

Although there are lots more data modes, these four are the ones that we'll be concentrating on in this guide. If you want to get a feel for how some of the others sound, MultiPSK can also encode data (for example, typed text) into audio files. Do this and have a listen to the resulting files if you're curious about other modes.

Introducing MultiPSK

First, you need to learn how to use MultiPSK. You can use your sample data files to get to grips with it. This is easier than decoding live radio signals, as you won't have to cope with the interference and varying signal strengths that you'll encounter on the airwaves. To use MultiPSK on live data, you would need to connect the audio output of your radio to the line or microphone input of the soundcard in your PC.

To provide a close approximation of this, use a patch cable to loop the soundcard's line output to its input. After doing this, if you play back a sample file using a media package, that signal will be recognised by MultiPSK. Start up MultiPSK and you'll find that it opens with the Configuration screen displayed.

We can accept the default settings for now, so click on the 'RX/TX Screen' button towards the bottom left. This will take you to the screen we'll be using for decoding data.

In the block of controls in the upper-right corner, click on the 'CW' button (CW stands for Continuous Wave and is a term that radio amateurs use somewhat inaccurately to refer to Morse code). Now try playing back the Morse code sample file.

You'll notice that the 'waterfall' display in the centre of the screen, which was previously showing very little,

suddenly bursts into life. This display shows a graph of audio frequency against time, and is used for selecting a signal to decode.

Before you can do this, however, you'll need to adjust the Windows audio level ('Start | All Programs | Accessories | Entertainment | Volume control') until the Level display in the centre top of the MultiPSK screen shows a value just short of 100 per cent and the adjacent Over (overload) display doesn't show green.

Once the audio level is correct, play back the Morse code file again. When you see a red line appear in the waterfall display, click on it to select that signal for decoding. The text represented by the Morse code will appear in the large text area at the bottom of the screen. Having mastered Morse code, you can now do the same with the other three sample files.

There are a few differences, though. With Morse code, MultiPSK can figure out how fast the data's being sent and adjust accordingly. With many of the other modes, you have to specify certain parameters. With RTTY, for example, you have to select the correct transmission speed – the sample provided is 50 baud. And with HF Fax, you have to select values for LPM (lines per minute) and IOC (index of cooperation).

For the above sample file, use 120 and 288 respectively. The other difference concerns what you see in the waterfall display. Morse code uses a simple on/off modulated signal, which means that it appears as a single frequency in the waterfall display. RTTY, on the other hand, uses two frequencies to represent binary ones and zeros, while Fax uses a pair of frequencies to represent black and white components.

The upshot of all this is that many signals appear on the display as two lines, even though only one is being transmitted at once. It makes a difference which of the lines you click on, so if nothing sensible seems to happen, try clicking on the other one.

Radio teletype (RTTY)

In terms of decoding live data, RTTY is probably the easiest mode to use. First, you need to set up your short-wave receiver, ideally with a decent external antenna, and connect its line output (or headphone output) to the line input or microphone input of your soundcard.

RTTY is transmitted slowly to cope with the varying atmospheric conditions encountered on the shortwave bands: it's not uncommon for RTTY streams to be transmitted at 50 baud, which is 50 bits per second (and you thought that old dial-up modems were slow at 56kbps per second!). However, the encoding is a predecessor to ASCII, and it uses only five bits per character. This gives it a clear speed advantage over 7-bit or 8-bit ASCII, but it requires the use of Shift symbols to switch between letters and figures.

Even then, the character set contains only numerals, upper-case letters and a limited set of punctuation symbols.

Now tune in to an RTTY transmission. One of the most consistent signals you'll find is the German Weather Service in Hamburg on 7.646MHz. Try decoding it in MultiPSK (50 baud). This and other similar radio stations around the world transmit weather forecasts for nautical use. You'll also find that RTTY signals are plentiful on the amateur bands, but there is a difference. The weather stations transmit information for reception by anyone who happens to be listening.

Radio amateurs, on the other hand, exchange information with the stations they've established contact with, so it's basically a dialogue. When listening on the amateur bands you may be able to hear both sides of the exchange. Often, however, you'll only hear one station (probably the one closest to you), and there will be a period of silence while the other station responds.

Morse code

Morse code differs from the other types of data transmission in several respects. Although it can be generated automatically, as a relic of an age before electronics it can also be sent by hand and received by ear. This is how it's often used on the amateur bands. The upshot of all this is that the timing of the dots and dashes and the spaces between them won't be perfect, and the automated decoding of hand-sent Morse is quite a challenge.

MultiPSK does a pretty good job, but it sometimes makes mistakes an experienced human operator wouldn't. It also tends to try to interpret radio noise as Morse, so you'll often see garbage in the received text window when no Morse code is being received.

Another difference is that Morse code signals occupy a very narrow bandwidth, so you might see several of them in the waterfall display. If so, you'll be able to flip between them.

Finally, because Morse is slow even compared to RTTY (30 words per minute is considered reasonably fast), abbreviations reminiscent of text messaging and various coding systems are used. In time, you'll learn to interpret Morsespeak, but you might struggle at the start. Morse is no longer used commercially, so you'll only find it in the amateur bands.

HF Fax and SSTV

HF Fax and SSTV modes deal with the transmission of pictures rather than the transmission of text.

Without going into all the mind-numbing details, let's just say that Fax is used for black-and-white images – normally line diagrams such as weather charts – while SSTV is used for colour photographic images. Both modes are slow, with images taking several minutes to be transmitted.

As with RTTY, this is to allow the data to be transmitted within the limited bandwidth and poor conditions of fading and interference often present in the shortwave bands. Two stations that gave us good signals were GYA (the Joint Operational Meteorological & Oceanographic Centre, which broadcasts from Northwood, England) on 4.610MHz, and DDH in Offenbach, Germany on 3.855MHz (also on 7.880MHz).

These stations transmit weather charts that are used for shipping. Neither station transmits continually, so you might have to wait for a transmission to start.

One quirk of Fax transmissions is that the image is sometimes skewed; it may be shifted horizontally so that the left-hand edge of the image is not at the left-hand side of the window in MultiPSK. The six Slant buttons ('///', and so on.) and two Shift buttons ('<' and '>') that appear in Fax mode can be used to correct these distortions.

SSTV is used almost exclusively by radio amateurs. There are a few spot frequencies in each of the amateur bands that tend to be used for this mode. Lists of frequencies are available, but in our experience one of the best is 3.733MHz (also try 3.730MHz).

A group of French radio users convene here each morning from about 7.30 to 9.30 to exchange images. We were able to receive several good quality pictures from the group.

MultiPSK - Windows freeware multimode program by F6CTE that supports BPSK31 QPSK31 PSK63 PSK63F PSK10 PSKFEC31 PSKAM CW CCW THROB 4 bauds THROBX RTTY SITOR-AMTOR-NAVTEX FELD HELL PSK HELL HF FAX SSTV FILTERS <http://www.dxzone.com/cgi-bin/dir/jump2.cgi?ID=8464>

May NEAR-Fest Information

NEAR-Fest hours of operation are 9:00 AM Friday May 1st 2009 through 3:00 PM Saturday May 2nd 2009. Admission tickets are \$10.00 valid for both days. The price is reduced to \$5.00 at 6:00 AM Saturday. Children and young people under 18 years of age do not require an admission ticket. For a summary of all ticket and pass prices please see:

<http://near-fest.com/index.php?topic=368.msg1136#msg1136>



Tickets and passes will be on sale at major New England hamfests and the M.I.T. Flea Market.

All persons 18 years of age and over entering the Fairgrounds require an admission ticket or pass. All vehicles entering require a Vehicular Pass. Young people under 18 are admitted as our guests. ID and proof of age may be required. However if they wish to be eligible for a door prize they may purchase a ticket. You may purchase additional admission tickets for more chances for winning door prizes.

Tailgating or Inside Parking: passenger automobiles, vans, pick-em up trucks, etc are \$10.00. RVs, Motorhomes, Campers and Trailers are \$20.00 (\$10.00 Tailgating Pass PLUS a \$10.00 Camping/RV Pass). The \$30.00 “camper hookup” fee that was levied by the Fair Association prior to October 2007 has been abolished.

There are no additional sellers fees for individuals wishing to “tailgate” and no limit on selling space (within reason). Commercial flea market vendors fees will be assessed \$10.00 per 10' space. If you are not sure if you are a “commercial vendor” you probably are. Contact our Commercial Exhibitions Manager, John, k1jjs@near-fest.com for more details.

There is plenty of free parking just outside the gate. Please consider buying an inside parking pass even if you don't plan on selling because it allows you to park inside the 'Fest and helps support NEAR-Fest's future endeavors.

Due to popular demand we are pleased to offer overnight camping/parking facilities at the Fairgrounds Thursday night. Join us for the pre-hamfest festivities. However this area is not located inside the tailgate area so

this does NOT entitle you to early setup & shopping. Thursday night camping is available at \$20.00 regardless of the type of vehicle. The camping area opens at 3:00PM. There is NO overnight parking permitted in the Fairgrounds parking area before 6:00AM Friday morning.

Regarding pets: We discourage bringing your animal buddies but often it isn't an option for some folks and we do understand. Dogs must be on a leash at all times and owners are required to "stoop and scoop" so that any evidence of their presence is removed immediately.

Once again I am asking everyone to leave their old computer CRT monitors and non-electronic goods at home. Remember, you are required to remove all unsold items from the Grounds when you leave. It is our responsibility to return the Grounds to the Fair Association in PRISTINE condition. We take this responsibility VERY SERIOUSLY and we monitor the grounds constantly.

Anyone found trying to conceal or otherwise attempting to get rid of "junk" or garbage will be advised in no uncertain terms of our policy. Repeat offenders run the risk of being seriously embarrassed before being permanently ejected from the Fairgrounds. Once you're out you're never back in!

Finally, I reiterate the now-standard Caveat and Warning:

The Fairground Committee rules clearly state:

1. NO ALCOHOL IS ALLOWED ON THE PROPERTY. The Town of Deerfield has a "No Open Container" by-law. According to the Deerfield Police Chief, violation is an "arrestable offence".

2. NO OPEN FIRES!!!! (ZERO TOLERANCE!!!)

This is clearly stated in our Contract with the Deerfield Fair Association we signed in order to rent their Fairgrounds to hold this event. All persons intending on cooking outdoors must read the policies regarding same as to what equipment is acceptable and what is not. Ignorance is NO excuse. Read the rules regarding outdoor cooking and smoking inside any of the buildings:

<http://near-fest.com/index.php?topic=348.0>

Any questions or comments relative to the above should be addressed to the NEAR-Fest Sergeant-at-Arms, W1PRA, Paul DePetrillo. w1pra@near-fest.com. One of Paulie's most valuable talents is that he can explain anything to anybody in terms that individual will understand.

73,

Mister Mike, W1RC

Wanted: Tower, tower sections- Please contact Jon-K1TP at k1tp@arrl.net