



# The Parasitic Emission

Volume 36, Number 1

Supporting Amateur Radio Activity in Cameron, Clearfield, Elk and Jefferson Counties

January 2010

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## On The Air

by Joe Shupienis, W3BC

**W**E HAVE already completed the first 10% of the 21<sup>st</sup> century. Another decade has passed into our log-books. As we enter the 2010s—the teens—we note that the Quad-County Amateur Radio club has been active now in **five decades!**



In April, the QCARC celebrates its 35<sup>th</sup> birthday. As we embark on our 36<sup>th</sup> year, *The Parasitic Emission* will take a look back at where we came from, and a look ahead at where we might be going.

The history of any organization is filled with trivia and treasure, and I have been looking at both

with an eye to sharing the best with you.

Speculation about the future is, well, *speculative* after all, and so any guesses we may make about the future will be entertaining at best, and laughable at worst.

I feel it is important to honor the memory of those early members who contributed their time and efforts to build the QCARC into a viable organization in the early days. Some of us are still around, but sadly many are now silent keys. Each month, *The Parasitic Emission* will pay tribute to one of those early visionaries who believed that the value of a healthy amateur radio club to the hams of our area was well worth the unselfish effort needed to create it, build it and maintain it. They gave freely of themselves for the greater good, and for the existence of the club today we owe them a huge debt of gratitude.

The first of these QCARC *Trailblazers* to be so honored is my Elmer, Jim Albert, K3TFL. If there was any amateur radio activity going on in our area in the '60s and '70s, you could bet that Jim was involved—and likely was the instigator! I've never met a more active supporter of ham radio activities than good, ole "Tuffel".

— . . . —

This month offers a wealth of operating activities. Most notable locally is the annual Punxsutawney

Groundhog Day special event operation. This year, it will be held on Saturday, January 30<sup>th</sup>. The station will be set up at the Punxsutawney Airport where the Punxsutawney Area Amateur Radio Club has antennas and an amateur radio station (K3HWJ) set up. I plan on bringing some of my HF contest station equipment to provide a big signal, and hope to spend some quality mic time handing out QSOs for the very nice QSL Certificate they send out each year.

Your support is needed, too. If you can spend a couple hours operating or logging at the event site, please let Club President Mike, N3HBH know. Even if you can't attend, tune in and make a contact or two. The time is 9:00 am to 4:00 pm, Saturday, January 30, 2010. Frequencies are 7.240, 14.240, 146.715 repeater, and 147.39 repeater.

You can have a lot of fun in a short time in the [North American QSO Party](#). If you're new to **contesting and want to get your feet wet, this is the contest for you!** The playing field is level—the maximum power for any station is 100 watts. Single operator stations may only work 10 hours of the 12.

### In this issue...

- *Club Connections – News from all over*
- *Basic Concepts: Engineering Your Studio*
- *QCARC Trailblazers: Jim Albert K3TFL*
- *Go Digital the Easy Way*

The CW contest kicks off at 1:00 pm on Saturday, January 9, and ends 12 hours later at 1:00 am Sunday. The SSB contest is Saturday, January 16 from 1:00 pm to 1:00 am Sunday.

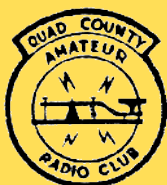
The very next weekend, VHF operators get the chance to show their stuff. The [ARRL January VHF Sweepstakes](#) will warm up the bands above 50 MHz from 2:00 pm Saturday, January 23 until 11:00 pm Sunday the 24<sup>th</sup>.

Don't forget to kick off the new year with the annual [ARRL Straight Key Night](#). Listen and laugh as CW "operators" try to make QSOs with straight keys, bugs, and even bare wires.

I'll see you... *On The Air!*

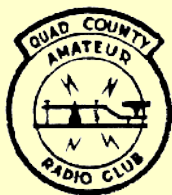


Affiliated Club



# Club Connections

# 2



## The Quad-County Amateur Radio Club

*Serving Cameron, Clearfield, Elk and Jefferson Counties since 1975*

The January meeting of the Quad-County Amateur Radio Club will take place at the Clearfield 911 Center at 7:30 pm, Friday, January 15, 2010.

The monthly Breakfast will be at Billy's Burger Land in Clearfield on Saturday, January 9<sup>th</sup> at 10:00 am. RSVP to Lars, SM7FYW/W3 by Thursday, January 7<sup>th</sup>.

## **Behind the Gavel**

**by Doug Rowles, W3DWR**

**T**HERE ISN'T A whole lot to report on this month. The Christmas Dinner was held on the regular December meeting night. Since there was nothing pressing to act upon, there will be no minutes for this issue.

Speaking of the dinner, we had seven people in attendance; five turkeys and two hams. One of the hams actually had a license to prove his status. Included were a crisp tossed salad and a plate of home made cookies for desert.

I learned a new trick a few weeks ago. The emails of the entertaining type that I receive are usually accompanied by a few paragraphs of email addresses indicating where they had been before they got to me. I didn't like having to pass all that junk along if I decided to forward a message.

This is what I discovered. When you hit the forward button, the entire email is able to be edited.

- Hold down the left mouse button and highlight all those old addresses.
- Then right click the mouse and with the cursor on the highlighted portion, click on delete.

Away go all those addresses. This also shows that you can teach an old Doug a new trick.

Travel and celebrate the holidays safely .



## Punxsutawney Area Amateur Radio Club

*Serving Punxsutawney and Jefferson County*

The January meeting of the PAARC will be held at the Presbyterian Church, Findley and Union St, Punxsutawney at 7:00 pm, Tuesday January 12<sup>th</sup>. Free coffee and donuts will be served after the meeting.

## **Annual Punxsutawney Groundhog Day Special Event Station**

**T**HE 2010 PUNXSUTAWNEY Groundhog Day Special Event Station, K3HWJ will operate on Saturday, January 30, 2010. Hours of operation will be from 9:00 am to 4:00 pm. Frequencies will be 7.240 and 14.240 on HF, and the 146.715 and 147.39 repeaters.

The station will be set up at the Punxsutawney Airport. Join us on the air, or stop by the airport for a visit.



## Elk County Amateur Radio Association

*Serving Elk and Cameron Counties*

The January meeting of the ECARA will be held at the Elk County 911 Center, US 219 south of Ridgway on Sunday, January 17<sup>th</sup> at 1:30 p.m. Free coffee and donuts will be served after the meeting.

## **Net Schedules**

QCARC	1900 Sunday	147.315
Cifd Co ARES	1945 Sunday	147.315 T 173.8
ECARA	2000 Sunday	147.000
PAARC	1930 Monday	147.390 T 173.8

## **Shorts**

Tom, W3KWT, has accepted the position of Assistant EC for Clearfield County Amateur Radio Emergency Services (ARES).

## Basic Concepts of Amateur Radio: YOU Are the Chief Engineer (Part 2)

by Joe Shupienis, W3BC

**U**NLIKE BROADCAST radio stations, we amateurs usually combine our studios and transmitter plants in the same room. In fact, many times they exist in a car—or even the palms of our hands!

In practical terms this simplifies some parts of the radio art, and complicates others. For example, we don't have to put much thought into how to get our

audio to a remote transmitter. We can usually just wire it up. But because our radiated RF signal is very close to our operating position, we can experience problems with RF leakage into microphone circuits, and computer-controlled systems.

There are some best practices that have been in use for many years by the radio industry, which we should try to incorporate into our own stations for better performance and more comfortable operating. Let's separate “studio” issues from “RF” topics.

Take a look at your “Studio.” That's right, I want you to think of your hamshack or operating position as a studio. Good studio design requires us to address several major issues: Safety, comfort, ease-of-use, and isolation. These items are interrelated, and changing one affects the others. Take your time. Haste makes waste.

### Safety First

Someday, somebody might get tired of my harping on this subject, and will jeopardize *my* safety by taking a swing at me! But it's still worth discussing.

Perhaps the most pressing safety concern in a hamshack is electrical. Virtually everything in the shack uses electricity, and some equipment uses quite a bit. The dangers of ignoring this can result in fire, shock or electrocution. None of these are very much fun. Make sure the electrons all go where you want them to, not where they can cause problems.

Not far behind is what I call “Gravitational Safety.”

Much of the equipment we use is heavy. Sometimes the operator is heavy, too (present company excluded, of course!) You should really make sure that all the stuff piled up on the operating desk is not so heavy the desk may break. Many of us use shelves or “hutches” and pile heavy equipment at heights above our heads. One errant tug on a cable can bring a large rig tumbling down, and Murphy's Law predicts that it will land where it can do the most damage. Imagine the damage if an 80 lb [AN/ART-13](#) dropped on your instep!



*If your shack looks like... well, a **shack**, your operating will be less than pleasant. Clean it up and you will enjoy your hobby better!*

Boat anchor collections have been known to reach sufficient mass to break through floors and into the living room. XYLs almost universally express displeasure with such events.

Finally, remember that any time you try to mix water and electricity, the results are very bad. Regardless of the convenience or the “nice view,” putting the rigs near a window which could be accidentally left open could lead to the destruction of the equipment. Not to mention

turning a pressed-wood desk to mush, allowing the rigs to plummet to the floor, possibly with enough kinetic energy to punch through to the living room, once again leading to the expressing of displeasure as we have seen above.

### Convenience and Necessity

Go to your shack and sit in the operator's chair. Does it hurt? Does a sharp spring poking you? Do you have to sit “just so” to keep the chair from morphing into an ejector seat? Does it creak and squeak and groan every time you breathe?

Do you find that you get a stiff neck after operating for an hour or two? Or a sore back? Perhaps the chair and equipment are placed so you have to twist to an odd position while operating.

While sitting in the chair, see if you can reach the key, microphone, and every knob of every radio without having to stand up or stretch across a pile of books, magazines, tubes, burger wrappers, and trays of small parts which tumble and cascade to the floor with your every move.

Is there a half-eaten chicken rotting in a drawer under a pile of old *Parasitic Emissions*?



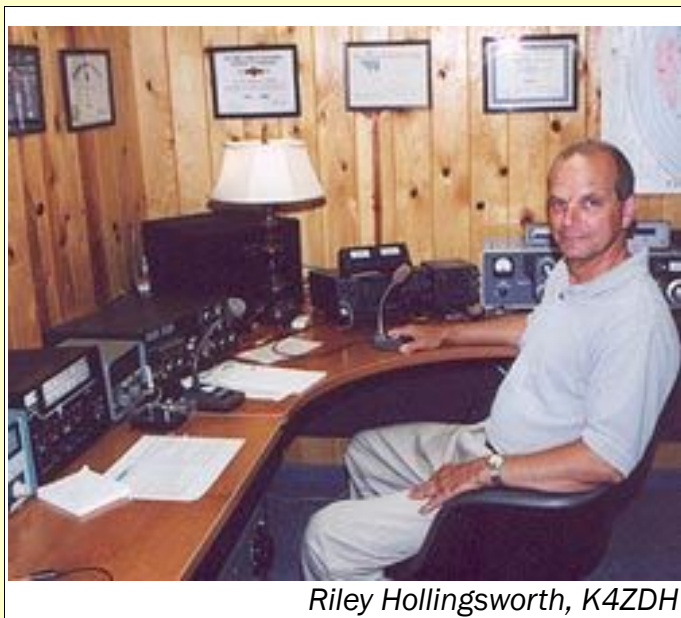
Do you feel like you have to run through an obstacle course just to get in and out of your shack? There is help. You might not have to rent a Bobcat. If you make a policy to cart more stuff out of the shack than you cart in, much of the problem will eventually go away.

The goal of cleaning up and organizing is to rearrange the equipment and the operating position so that you can operate effectively and comfortably. Having “a place for everything and everything in its place” comes in handy when you hear that rare Grid or DX station.

Neatness counts. See if any of these stations inspire you:



W4THU



Riley Hollingsworth, K4ZDH

These are two examples of “ergonomically designed” stations. Notice how everything is within arm's reach, with the most important radios front and center. Also the operating area is well lighted, and clutter is at a minimum.

Both stations feature modern and vintage gear.

## Isolation: The Solitary Life

“Isolation” means many things. In your studio it means that outside noises don't get in and inside noises don't get out. Sure, the wall to wall racket of a RTTY contest might be music to your ears, but other members of your household may consider it even worse than that time the boat anchor collection fall through the living room ceiling.

Conversely, if the grand-kids think it's fun to chase Ole Rover through the shack, flinging the surface-mount project you were about to solder to the four corners of the shack, you may fail to see the humor.

So it's easy to see that “isolation” can keep everybody happy. The goal is to keep what belongs in the shack in the shack, and keep out what doesn't belong there. This can include sounds, smells, light, electricity, RF energy, and yes, people—and even Ole Rover.

Sound proofing the shack can be problematic, but we don't have to be perfect. A typical wall made of studs with drywall on each side is actually pretty quiet. A basement shack can benefit from a simple suspended ceiling. If the room is reasonably quiet, sound absorption techniques will provide more benefit than additional soundproofing.

A carpeted floor will reduce noise in the shack surprisingly well. Clap your hands while sitting at the operating position and listen for ringing echoes. If you hear any, some plush draperies or thick, fabric wall hangings will help eliminate such “slap-back” echoes.

A ceiling fan turning slowly is silent, but can make the shack much more comfortable. A smaller fan turning faster can provide the same amount of airflow but causes a very annoying noise level.

Now that you have fixed the acoustic noise, it's time to look at electrical noise. Harsh raspy buzzing can keep you from receiving weak signals. Often such noise is generated in your own house. To prove this you need to run your rig on battery power and shut off the master switch to your house. If your noise floor drops several S-units, you're going to have to play “radio detective” to find and fix the problem.

Light dimmer switches are notoriously noisy. The quietest ones I've found are made by Lutron. Other “usual suspects” are TVs by GE, RCA and Thompson with noisy power supplies—on or off; cheap computer network hardware; and (O sweet irony of ironies) the government-recommended **Compact Fluorescent Replacement Lamps!**



## Shorts

If you have photos or stories of interest to hams in our area, please share them with us. Send them to:

[submit@parasiticemission.com](mailto:submit@parasiticemission.com)

If you have questions or comments for the editor, please send them to:

[W3BC@parasiticemission.com](mailto:W3BC@parasiticemission.com)

Remember the new deadline: The last Monday of the month before publication.

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You don't have to be a "professional" writer to write for *The Parasitic Emission*. We will print whatever you send us. We will be happy to correct and polish your article if you so request.

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This issue contains 6,673 words with 13 pages of original content. There's still room for yours!

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If you know of someone who might like to receive a copy, please send their email address to [subscribe@parasiticemission.com](mailto:subscribe@parasiticemission.com) and we will add them to our list

RF Isolation goes for what our signal can do to the outside world. Thanks to Cable, Satellite and Digital TV, the days of TVI are pretty much behind us. But other consumer equipment doesn't fare as well. Home stereos continue to act like giant crystal sets. Cheap, Communist-Chinese telephones are almost as sensitive as our best receivers.

And now for my favorite: **touch lamps!** When I first got on the air after moving to suburban Pittsburgh, I noticed many touch lamps by the curbs in a 200-300 foot radius from my antenna on the next garbage day. A year later, when I got an amplifier, garbage day saw many more touch lamps over a 1-3 block radius! They can't help it—it's just the way they're made.

Perhaps your shack is in the car. The same principles apply: Safety, comfort, ease of use and isolation. Since a picture is worth 10,000 words, I will leave you to study the picture below, which speaks volumes about safety, demonstrates the real necessity of comfort, exemplifies ease-of-use and shows once and for all that some hams could really benefit from isolation in a nice, quiet, well-padded room with big locks on the door!



**J**IM ALBERT, K3TFL was passionate about life. He energetically pursued the hobby of amateur radio, and his contagious enthusiasm and sparkling wit inspired and entertained countless hams in the DuBois area and beyond. Many hams in our region who were first licensed in the '60s received Jim's help in getting their licenses. He was always in the middle of one project or another (radio and otherwise), and his home was a popular gathering place for hams, tinkerers and deep-thinkers, young and old. A true "polymath", it was easy to compare him to the likes of Benjamin Franklin or Leonardo daVinci.

After serving in China with the US Army Signal Corps during the Second World War, he completed his teaching degree and returned to his hometown of DuBois as an art teacher and commercial artist. He obtained his Conditional class amateur radio license in the late '50s and became active on the air with homebrew, kits, war surplus and commercial rigs.

Jim made friends easily and was always part of whatever ham radio activities were taking place. He taught Novice code and theory classes and helped many of us get our licenses. He organized annual Field Day activities on a hilltop near his home in Clear Run, and made it to most of the hamfests from Butler to Rochester to Warren and Milton. He never went alone—he always had a carload of fellow hams on those trips, and each trip was an adventure! In later life he bore a distinct similarity in appearance to actor Pernell Roberts, then starring as TV's Trapper John, M.D. At the 1980 Dayton Hamfest, people stared, pointed and asked him for photos and autographs.

In 1969, he accepted the position of Commercial Art instructor at the newly-opened Jeff Tech in Reynoldsville, where he created the school logo and drew the "Vo-Tech Viking" mascot. He took a sabbatical leave to work with the Vocational Education Department at Penn State, developing competency-based instructional curricula for art, and for technology preparation courses of study. He provided pen-and-ink illustrations for much of the courseware being developed there. He rigged up a quarter-wave vertical with a 4-radial ground plane on a Hustler® mobile mast and attached it to the rear bumper of his bright yellow Pinto. He commuted between DuBois and State College daily, amazing, amusing and baffling the truckers with his "Mobile base."

An inveterate experimenter, he was quick to try out new technology, or to discuss new ideas—often well into the wee hours! Of course, when other hams saw how much fun he was having, we jumped on the bandwagon too. This led to all kinds of activities, in the DuBois area, such as 2-meter FM simplex, and then repeaters, contests and even to forming the club. He was a big supporter of the Quad-County Amateur Radio Club, and provided much encouragement and guidance. He hosted the first two Field Days in Clear Run, and was a fixture at every Club meeting, banquet, contest, and outing he could attend.

He contributed artwork to the Parasitic Emission, most notably the comic strip series, Clem and Orville, which had far too short a run. He planned to continue the series after retiring from teaching, but health issues began to catch up with him. He became a silent key in 1985 at the age of 60.



**Y**OU CAN'T escape it—no matter how hard you try... Amateur radio digital communication is here to stay. Now you can fold your arms, squint your eyes, thrust your chin in the air and say, "I'll never use 'computer communications'—It's not Amateur Radio," or you could try to open your mind and learn something new.

The biggest problem facing most of us is not that the technology is too much for us to handle, instead, it is probably **FEAR**. We're afraid it's too complicated, too expensive, too hard to set up, too much to learn... The list can go on forever.

What we need is someone to show us how easy it really is to get started, and give us some helpful hints and encouragement. Keep reading, and I'll try to do just that!

## How it works

To use digital modes, most hams use a computer with a sound card, a computer program, a transceiver and a device to connect the radio to the sound card. Let's see how you stack up so far...

- **Computer?** Check (You're reading this!)
- **Transceiver?** Check (Obviously!)
- **Program?** (If you need one, you can download one for free!)
- **Interface?** I'll show you how to build one. Keep reading.

OK, so far, so good. In fact, emergency communicators in our Western Pennsylvania Section are experimenting with a system called NBEMS, which doesn't require the interface—you put an HT near the microphone and speakers of a laptop computer and “acoustically couple” them. Results are surprisingly good. In fact this is all that is needed for VHF and UHF FM simplex and repeater digital modes.

On the HF bands, however, the FCC and your fellow hams take a less than friendly view of acoustic coupling. For one thing, every bit of background noise is transmitted, causing QRM to other QSOs. Besides, the sound of Junior chainsawing the legs off your china closet might slightly reduce your ability to copy weaker signals.

Fortunately, all these problems can be solved with a \$15 visit to Radio Shack. Keep reading for a full do-it-yourself project, as well as some ready-made product suggestions.

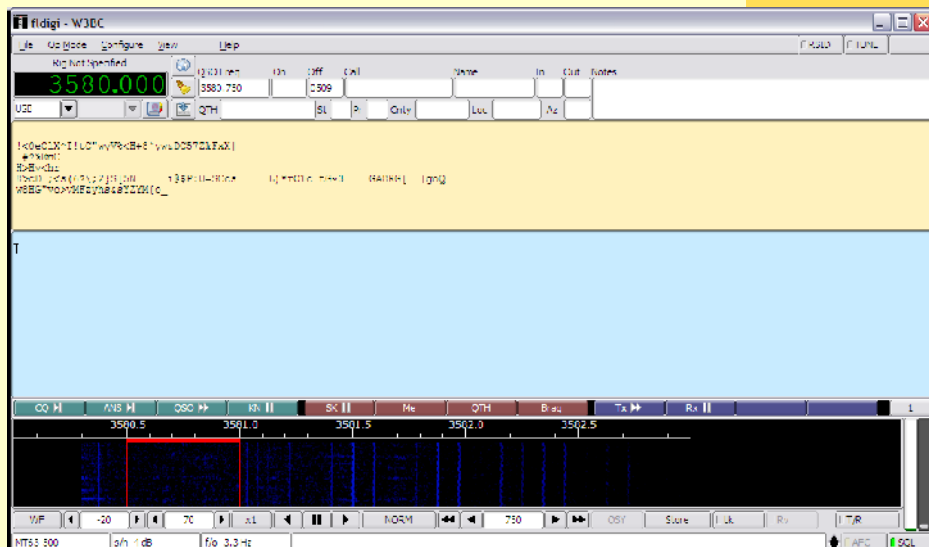
## First Things First

The easiest way to use digital modes is by using a computer program and a computer. The NBEMS (Narrow Band Emergency Messaging System) emergency communications package is standardizing on the *FLDIGI* package. There are other software packages too, and many of them are free of charge to amateurs. (One of them may be better suited to your needs, but you'll have to experiment and try them out to find out for sure.)

So to keep it simple, let's use FLDIGI to start out. [You can download it by clicking here](#). Once you download the program, you have to install it. I'm pretty sure a smart ham like you knows how to do that. If you're not sure, please Read The “Friendly” Manual you can find [here](#)!

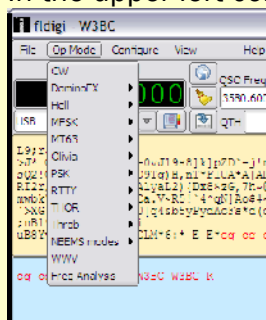
Now that you have installed the program, let's try it out. Click the “Start” button, then click “All Programs”, then look for “Fldigi” and point to it. Another box pops up that says Fldigi-something-something-blah-blah... Point at it and you get a bigger box with all the sub-programs. Click on the one that just says plain old “Fldigi”.

The program should start and look something like this:



Looks scary, doesn't it. Well, never mind. Here's how to show it that you're the boss.

In the upper left corner, look on the menu bar for “Op\_Mode” and click it. Now pick a mode we are all familiar with: **CW!**



Below the yellowish block is a big, light blue block. Click once on the blue block. Then type in some text like:

CO CO CO DE W3BC W3BC K

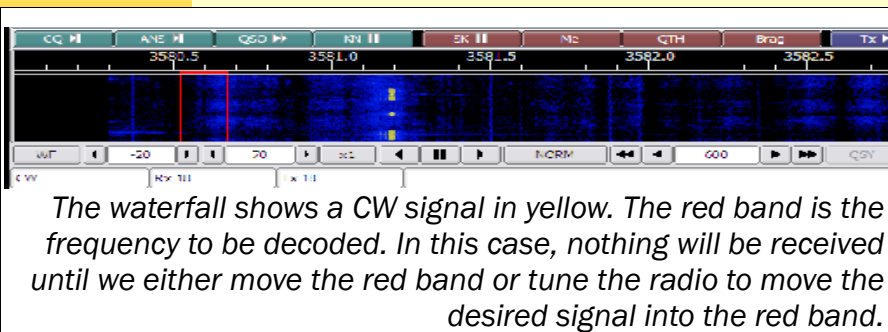
and press the dark blue “Tx>>” button at the bottom right of the blue block, and perk up your

ears. WOW! It sends Morse Code!

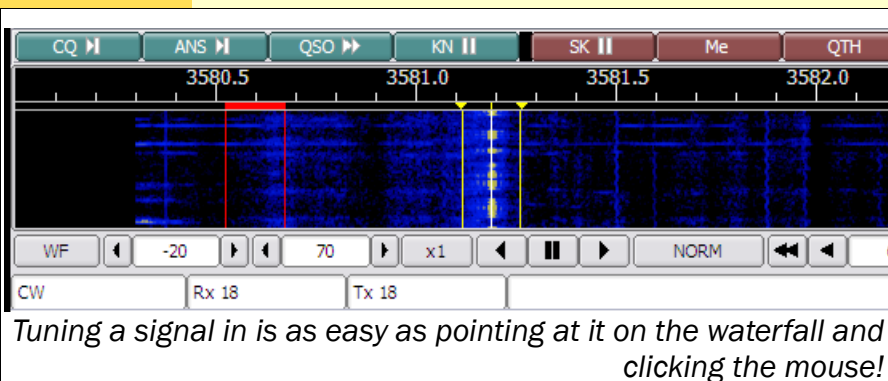
Go ahead and try some other modes. RTTY 45 baud is standard 170 Hz shift Amateur Baudot. Are the wheels turning yet?

At this point, if you were to put your microphone next to the computer speaker, and transmit (on an appropriate frequency) someone else would be able to tune you in and copy your **DIGITAL** transmission! You're halfway there! Of course the other half is that they would likely send something back, and you're not ready for that yet.

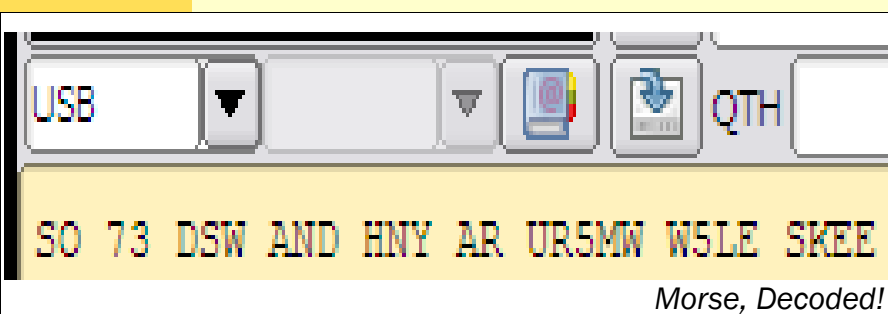
Let's learn how to receive. Dial up some CW on 40 meters—there's ***always*** some CW on 40 meters—or use any other active band and select CW from the Op\_Mode menu. Look in the “waterfall” and see if your computer's microphone is “hearing” anything.



Let's tune that signal in and see what happens:



And like magic, here is the result!



If ***this*** doesn't get your wheels turning, ***nothing*** will! If your shack is quiet (*isolated*?) you could set your radio to USB, and start making CW QSOs to your heart's content. (But it's really better to use an interface.)

## The Finer Points

A common source of confusion is how to set up your radio. Generally, you will set your HF radio to **UPPER SIDEBAND**, regardless of the band or mode. Remember that the computer is doing the detection and filtering. In essence you have turned your old rig into a fancy-schmancy “Software Defined Radio.” Your computer will make the decisions about what it hears and what it rejects. You point out the signal you're interested in and select the mode, and the computer does the rest.

At first, it's a good idea to tune around and listen to digital signals and try to decode them. It is helpful to know where to find them. CW will obviously be found everywhere in the “CW subbands,” but for the sake of convenience, and sometimes by regulation, the other modes will be clustered at specific frequencies. RTTY would be the next mode to experiment with, as it's pretty easy to pick out by ear.

Frequency	Mode	Frequency	Mode
1.838	PSK-31	1.800-1.820	RTTY
3.580	PSK-31	3.590+	RTTY
7.035	PSK-31 DX	7.080	PSK-31
7.090	RTTY	10.142	PSK-31
14.070	PSK-31	14.080	RTTY
18.100	PSK-31	21.080	PSK RTTY
24.920	PSK RTTY	28.120	PSK

After that, you can move on to PSK-31 which is an extremely popular mode. In the 3 kHz bandwidth that is used by a single SSB transmission, there is room for as many as 20 simultaneous PSK-31 QSOs!

There are many other modes, and all are worth your while to experiment with. The MFSK modes allow you to send not only text, but pictures too! Olivia is popular for weak signal experimentation, and you can often get 100% copy from stations you can't even hear!

## Warnings and Gotchas

- Before transmitting, know your bandwidth! Most modes are CW-band approved, but some available modes are wider than 1,000 Hz and are **NOT PERMITTED** in the CW subbands!
- Keep your power low, and your audio clean. Unless your transmitter is rated for 100% transmit duty cycle, you could burn out the finals. CHECK YOUR MANUAL! Most HF digital operators use 50 watts or less.



Reduce your mic gain such that the output meter reads a little less than it does on CW with the key down. Overdriven audio is distorted audio and the harmonic content is guaranteed to cause severe QRM to many other QSOs. Be nice!

- When you first start out, listen to your transmitted signal with a good receiver or ask a fellow ham to check your signal to make sure it sounds clean. The “Acid test” is to set the receiver to “AM” and if you hear strong audio tones, it means you're distorting and as a result transmitting on several frequencies. Don't act like a “Freebender,” turn your mic gain and RF output power DOWN until the distortion goes away.
- Microsoft® Windows™ (and other operating systems) often make sounds for various events. If you don't want people to laugh at you, make sure that you don't transmit “You've got mail!” in the middle of your PSK QSO. Not only does it mark you as a lid, but it's not legal.
- All radios drift, some more than others. Since the narrow-band digital modes are frequency sensitive, let your rig warm up until things stabilize. Modern rigs with TCXO technology will be ready after a minute or two, while classics from the '80s and '90s should be given 20-30 minutes. It is even possible to use tube rigs if you keep your transmissions short. Operating at less than full power will produce less heat, causing less drift.
- Less is more. Just like your mic gain, only use “just enough” volume on your radio. Too much makes the waterfall get all yellow and red. There should be a good bit of blue, with the signals showing bright yellow. A lot of red means too much volume.

The “Nomic” model is their entry-level unit, the “Pro” is for the serious Digital mode enthusiast, and the “Plug & Play” model allows you to easily control your rig's frequency, band, mode, etc. with your computer and appropriate software, such as *Ham Radio Deluxe*

West Mountain Radio has a [nice comparison chart](#) of their equipment and other competing products. It's worth a visit.

### A home-made Computer/Rig Interface

Ladies and Gentlemen, without further ado, we present a rig interface you can build yourself. I designed it to be small and flexible. It will work with a variety of rigs, simply by making a special cable for each of them.

As a bonus, it allows you to plug in a high-quality dynamic (Heil) or broadcast-grade condenser microphone, or computer headset and use its electret microphone with your rig for good, clean audio and the convenience of headphones. If you heard me during the PA QSO Party, you know what it sounds like.

### Parts List

- 1.0uf/35v Tantalum Capacitor (RS 272-1434)
- 2.2K/.25W Film Resistor (RS 271-1325)
- J1 – RJ-45 Female surface-mount (RS 279-0411)
- J2,3 – Stereo mini-jack 3.5mm (RS 274-0249)
- J4 – 1/4” inline mono jack w/cable (RS 42-2376) (Cut cable to fit)
- P1 – 8-pin Mic Plug (RS 274-025)

### Direct Connection Interfaces

The secret to a clean, reliable operation is to interface the computer and transceiver directly. You can purchase ready-made equipment to do this, or roll your own. The most popular commercially built interface is the West Mountain Radio “[Rig Blaster](#).”





Open the RJ-45 case, Loosen all the wires and straighten them out. Be careful—they are very fragile. Replace the orange and white wires under the two screws closest to the RJ-45 connector.



Using a 7/32" drill, enlarge the mounting hole farthest from the RJ-45. Drill a new hole symmetrically in line with it. Deburr the holes so that the threaded shafts of the stereo jacks fit through easily.

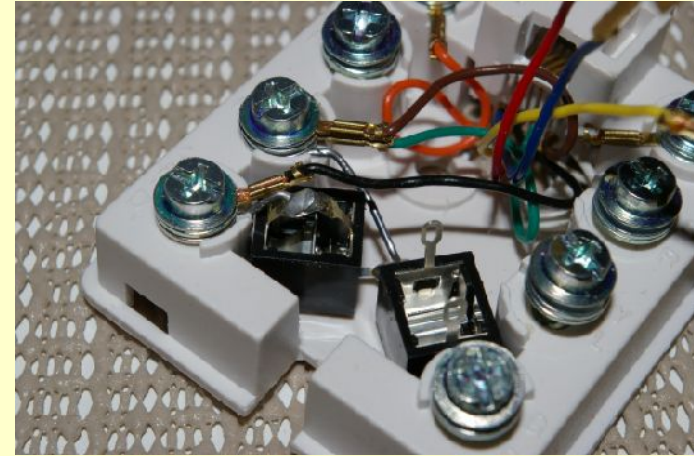
Mount the jacks diagonally, with their ground tabs touching.



Solder a wire to the ground tabs. Place the other end of the wire around the screw labeled "BL" (second from bottom left.) Place the green and

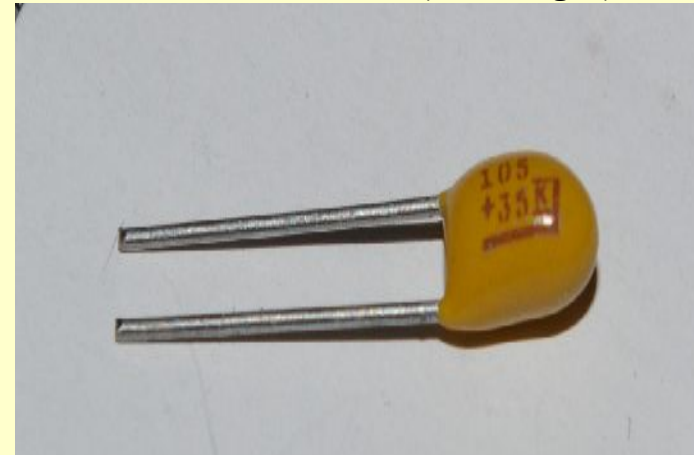
brown wire connectors under the same screw and tighten.

Bend the tip and sleeve tabs of the left-hand jack together. Solder a wire to them. Wrap the other end of that wire under the screw labeled "RD" (at the bottom left.) Place the black wire connector under the screw and tighten.



[ ] *Receive Audio wiring is now complete.*

Bend the tip tab of the right-hand jack and place it under the screw labeled "GR" (bottom right.)



Form the leads of the capacitor to fit under the two lower screws on the right hand side. Place the lead closest to the bold underline printed on the capacitor case (the bottom lead in the above picture) under the screw marked "GR" (bottom right) and tighten the screw.

Place the other capacitor lead under the screw marked "YL" (second from bottom, right.) Place the yellow wire connector under the "YL" screw and tighten. *[Keep your dirty mind to yourself! - Ed.]*

Route a 2,200-ohm resistor between the ring tab of the right-hand jack and form under the screw labeled "BR" (second from top, right hand side.) Keep the leads long enough to allow the resistor to remain clear of other wires and connectors. Place the resistor and the blue wire connector under the "BR" screw and tighten. Solder the other end of the resistor to the sleeve tab of the right-hand jack, and dress the leads.

[ ] *Transmitter audio wiring is now complete.*



## Transceiver Connecting Cable(s)

Now, you have to make up a cable for your particular transceiver. You will need a short, “{CAT-5” standard ethernet cable. You can find these for 3 or 4 bucks, pretty much anywhere. You probably have a box of them in the drawer, right beside the rotten chicken...

If your radio is an Icom 706, 703 or 7000, you are now done. Plug the cable into the mic jack and have fun. (On the 7000, you'll have to get the received audio from the radio's headphone jack.)

For other radios, you'll have to wire up a plug to match the cable to your radio. All three major manufacturers use the same 8-pin mic plug, but **each one puts different wires to different pins.** I suppose they believe they have good reason to do so, but it sure complicates things for people who write how-to articles!

First, clip off one end of the ethernet cable. Then, disassemble the connector, and slide the shell over the newly-cut end of the cable. If you forget to do this, **you** might express displeasure.

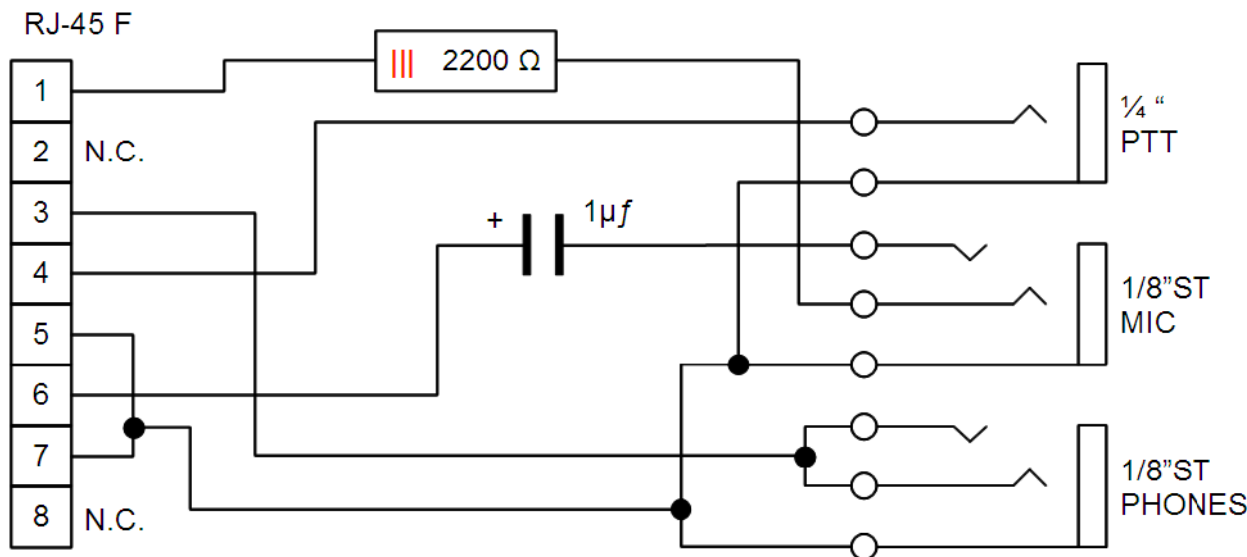
Carefully strip the outer jacket of the cable to reveal the twisted pairs of wires. Carefully fan them out. They are VERY fragile, so easy does it!

If you want to wire in the optional PTT jack, cut the female jack from the headphone extension cord, approximately 8"-12" from the end. Carefully strip the coaxial end, and place the shield under the “BK” screw (2<sup>nd</sup> from bottom left) and the center conductor under the “OR” screw (2<sup>nd</sup> from top left) along with the red wire connector.

Route the wire with the jack out through the slot, and reattach the cover.

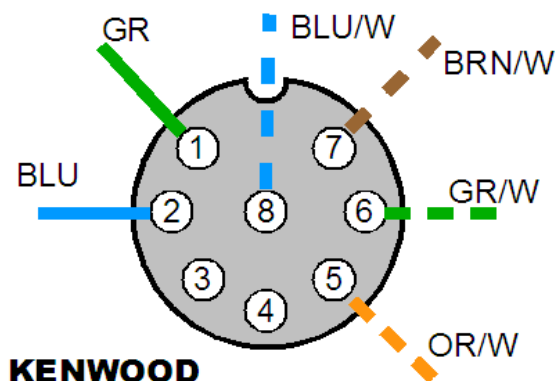
Mark the jacks on the bottom Tx and Rx so you know which is which.

[ ] *Sound card interface box is completed.*



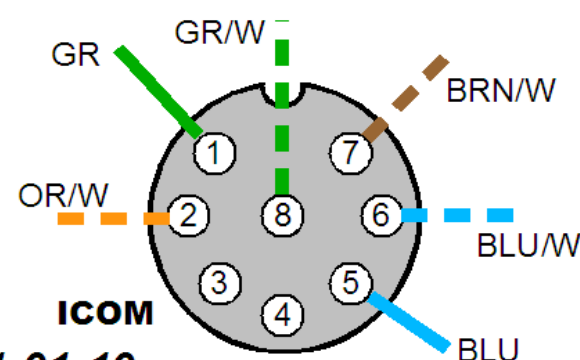
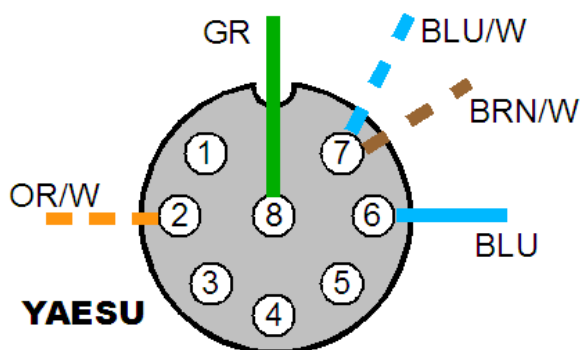
C1 – 1.0uf/35v Tantalum (RS 272-1434)  
 R1 – 2.2K/.25W Film (RS 271-1325)  
 J1 – RJ-45 Female surface-mount (RS 279-0411)  
 J2,3 – Stereo mini-jack 3.5mm (RS 274-0249)  
 J4 – 1/4" inline mono jack w/cable (RS 42-2376) (Cut cable to fit)  
 P1 – 8-pin Mic Plug (RS 274-025)

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RJ-45 M

1	OR/W - +8V
2	
3	GR/W - SPKR
4	BLU - PTT
5	BLU/W - GND
6	GR - MIC
7	BR/W - MIC GND
8	



**REVISED 01-01-10**

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Once you have stripped the ends by 1/8 inch, you can start soldering according to the above chart. I have tried to make it as clear as I could. The views I drew are on the solder side of the connector, so it should be a simple matter to wire correctly.



The Kenwood and Icom cables include the receiver audio, if the radio supports it. Most do, but vintage rigs may be different. Yaesu does not include the audio output on the microphone cable, so you have to plug the headphones or the soundcard into the headphone jack.

I have also drawn and labeled the wires in use so you can use your radio's manual to wire up its own plug if none of the other diagrams are of use.

## Putting It On The Air

Whether you are using a headset or the soundcard, you can hook up a footswitch or use a straight key for the PTT signal. If your radio has VOX, I really recommend using it instead. Since the digital mode signals are full volume, a low VOX *Sensitivity* setting along with a relatively short VOX *Delay* will work best. You will need to tweak the settings to get it to work "just right."

If the sound from the speaker bothers you, you can plug something into the headphone jack. On some radios, this will cut off the sound to the mic jack. If that happens, You'll just have to plug the receiver audio cable into the headphone jack.

If you make cables for two different radios, say a Kenwood and a Yaesu, be sure to label them! Otherwise you could possibly damage your radio or at best be confused when things don't work.

With under \$20 and a half hour of building, you too can join all the digital mode fun!



# January 2010

## Regional Amateur Radio Activities

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
<b>27</b> 12:00am» Stew Perry Top Band Challenge (cont.) 7:00pm» QCARC 2-meter FM Net 7:45pm» Clearfield County ARES Net 8:00pm» Elk Co ARA Net	<b>28</b> 7:30pm» Punxsutawney ARC 2 Meter Net	<b>29</b>	<b>30</b>	<b>31</b> 7:00pm» ARRL Straight Key Night	<b>01</b> 12:00am» ARRL Straight Key Night (cont.) New Year's Day	<b>02</b> 1:00pm» ARRL RTTY Roundup
<b>03</b> 12:00am» ARRL RTTY Roundup (cont.) 1:00pm» ARRL Kids' Day 7:00pm» QCARC 2-meter FM Net 7:45pm» Clearfield County ARES Net 8:00pm» Elk Co ARA Net	<b>04</b> Parasitic Emission Submission Deadline 7:30pm» Punxsutawney ARC 2 Meter Net	<b>05</b>	<b>06</b>	<b>07</b>	<b>08</b>	<b>09</b> 10:00am» QCARC Breakfast 1:00pm» NAQP CW
<b>10</b> 12:00am» NAQP CW (cont.) 7:00pm» QCARC 2-meter FM Net 7:45pm» Clearfield County ARES Net 8:00pm» Elk Co ARA Net	<b>11</b> 7:30pm» Punxsutawney ARC 2 Meter Net	<b>12</b> 7:00pm» Punxsutawney Area ARC Meeting	<b>13</b>	<b>14</b>	<b>15</b> 7:30pm» QCARC Meeting	<b>16</b> 1:00pm» NAQP SSB
<b>17</b> 12:00am» NAQP SSB (cont.) 1:30pm» Elk County ARA Meeting 7:00pm» QCARC 2-meter FM Net 7:45pm» Clearfield County ARES Net 8:00pm» Elk Co ARA Net	<b>18</b> Martin Luther King's Birthday 7:30pm» Punxsutawney ARC 2 Meter Net	<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b> 2:00pm» ARRL January VHF SS
<b>24</b> 12:00am» ARRL January VHF SS (cont.) 7:00pm» QCARC 2-meter FM Net 7:45pm» Clearfield County ARES Net 8:00pm» Elk Co ARA Net	<b>25</b> 7:30pm» Punxsutawney ARC 2 Meter Net	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b> 5:00pm» CQWW 160m CW	<b>30</b> 12:00am» CQWW 160m CW (cont.) 9:00am» K3HWJ Groundhog Day Special Event
<b>31</b> 12:00am» CQWW 160m CW (cont.) 7:00pm» QCARC 2-meter FM Net 7:45pm» Clearfield County ARES Net 8:00pm» Elk Co ARA Net	<b>01</b> 7:30pm» Punxsutawney ARC 2 Meter Net	<b>02</b>	<b>03</b>	<b>04</b>	<b>05</b> 7:01pm» 10-10 Winter - SSB	<b>06</b> 12:00am» 10-10 Winter - SSB (cont.)

SUBMISSION DEADLINE IS THE LAST MONDAY OF THE PRECEDING MONTH.

[submit@parasiticemission.com](mailto:submit@parasiticemission.com)

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