

APRIL 2006

THE MONTHLY NEWSLETTER of the SANTA CRUZ COUNTY AMATEUR RADIO CLUB

SHORT SKIP



Key Clicks, Bandwidths and Beyond

If you have used CW during Field Day and like events you know that QRM from Key Clicks can be a big problem. Key clicks are due to sidebands often evident up to several kHz from the carrier of a transmitting station. What is wrong with the following logic? "Key clicks are bad, key clicks result from sidebands therefore sidebands are bad". Clearly the key word "some" is missing.

Any ARRL handbook will show that when you key a transmitter to send Morse, RF energy is created either side of the carrier. In fact those sidebands carry information that our brains need to recognize dots and dashes. The issue is how much sideband energy is optimum to carry information and avoid interference.

The name Fourier must have surfaced in your vocabulary by now because of his early proof that waveforms comprise some collection of sinewaves that is dependent on the waveform complexity. In the case of CW, turning the carrier on and off is like modulating the amplitude of our carrier with a square wave. A square wave is a complex waveform and its components result in upper and lower sidebands in a manner similar to AM and SSB voice modulation. The rate of off-on-off transitions of the square wave (code speed) determines the frequency separation of the sideband components and the rise and fall times of the square wave determines their strength and bandwidth.

ARRL lab tests of HF radios include data on the radiated spectrum created by CW keying. The March issue of QST page 63 shows that sideband energy for the FTdx9000 is 60 dB down about 1 kHz from the carrier. If you neighbor is a contester with 1 kW output and a 10 dB gain antenna his sidebands are equivalent to a QRP station radiating 0.01 Watts. If you are experiencing splatter from this radio then it is probably not the result of incorrect keying but other problems at his end or your RX is saturated by his carrier.

Don't be too hasty in laying blame.

If you have followed this far you understand that to control the extent of sideband energy we need modify the rise and fall times of the keying waveform and that is precisely what is done. Beyond this line of enquiry the cheese gets a little bindy as they say (probably in Minnesota). The optimum rise and fall times advocated by the ARRL for control of sidebands is 5 msec but this is based on sending at a rate of 60 word per minute, a necessary bandwidth of about 150 Hz and non fading circuits. I don't know about you but that doesn't apply to me. Also if you look closely at the QST review mentioned earlier, the waveform transitions look more like 1 or 2 msec and yet the spectrum looks great.

ARRL handbooks have long included a chart produced ages ago by the CCIR that relates keying speed, rise and fall times and bandwidth, moreover it distinguishes between fading and non fading circuits. Now assume that all HF circuits are subject to fading and you can send at 12 wpm. Referring to the chart you will see that your rise/fall times should be in the order of 15 msec and your occupied bandwidth will be about 60 Hz. Note that the slower code speed reduced the required bandwidth as Mr. Fourier predicted. It is curious to note that the CCIR recommends more sideband energy for fading circuits compared to non-fading circuits. Recall that sideband energy is important to our ears and with frequency selective fading a little more bandwidth is justified even though more noise comes along with it.

Now compare our 12 wpm 60 Hz wide signal with the extremely narrow bandwidth techniques used at LF typically around 136 kHz. This is a very challenging environment indeed as antennas are very inefficient and noise levels are exceptionally high. Here the focus is to reduce the bandwidth to an absolute minimum to exclude noise. Our 12-wpm code is equivalent to a 5 Hz fundamental

so the first pair of sidebands requires only 10 Hz. In striving for the very best SNR our "Lower" friends use very low CW rates of 1sec/dot (1 Hz bandwidth) and 3 sec /dot (0.33Hz) and in so doing improve their SNR by 10 dB and 14.8dB respectively relative to 12 wpm. I have yet to hear code at such speeds and bandwidths.

Such narrow bandwidths are only feasible using digital filters that are constructed using DSP and here is a curious point. Some very experienced Hams using DSP -based noise reduction in their sound cards insist that their techniques can recover very weak signals from the noise only if they have a wide-band (24 kHz and above) on which to operate. So here is the paradox— we need the signal to remain in a narrow band and noise to be low but for DSP de-noising to work well evidently the noise needs to be in a much wider band than the signal. The title of this piece includes the word "beyond"— resolving this puzzle is currently beyond me. Stay Tuned

Ron W6WO

Ready for Summer BBQ



Jeff AE6KS adjusts 2.4GHz antenna mount on roof of K6BJ repeater building

CLUB MEETING FRIDAY APRIL 21, 7:30 P.M.



3/18

It was good to have Art WF6P and Myron K6RRU join us and the session differed from normal in two respects. Kathleen our Treasurer KI6AIE came up with the bright idea of preparing the issues of Short Skip for mailing and saving the postage for those who were present. This practice is well worth while and no doubt will be continued.

The second innovation was that VP Pat AA6EG connected from Auburn via SKYPE to Peter's AB6WM's laptop via the Wi-fi hot spot. It worked quite well at this end Pat given the local QRM.

An item of interest was W8FLL's fine micro-ammeter. Sensitive meters have many applications including a field strength indicator, use for measuring low levels of power and as an external display of Power, SWR, Modulation and signal strength available in a FT857-D. Peter recalled that he had published an article "New life for old meters" I think that he said back in the 80's. Ron W6WO supplied the mystery item and Vic AE6ID as usual came close. It was a direct conversion RX with quadrature I-Q outputs for use with sound card software such as a recent, and very welcome, program called Winrad by I2PHD. Check it out and play with the WAV files of EME CW !

Jim N1IPP always enjoyed the CAKE sessions and posed a question from his home QTH in Boston. "What are the prospects of hams adapting cell-phones for our use?" This is a tricky one. It goes against the grain to say "impossible" but given the density of consumer electronics and lack of design information the general feeling was that the effort involved wouldn't be justified, someone is sure to prove us wrong !

Hamstop.com was mentioned as an outlet for Ham gear that was new to me. A question was raised about the ability of the Club HF radio, (Icom 701) to support remote control. This needs checking out.

At a previous CAKE session the question of the conductivity of metal oxides came up. The following statement surfaced in a book on lightning protection. "Silver is the only conductive oxide and copper oxide is an insulator". This was not a surprise, silver of course is widely used to reduce skin-effect losses.

Ron mentioned that he will be absent for quite a long period and Kathleen volunteered to keep the CAKE sessions alive.

3/25

We were pleased to welcome David White WN5Y (visiting from Texas). Others present (in no particular order) were Chris KG6DOZ, Allan KC6VJL, Ron W6WO, Reed KG6RQH, Frank N6FW, Dave W8FLL, Carol KD6ZXL, Alan KM6VV, Kathleen KI6AIE, and Cap KE6AFE.

W8FLL brought his Elecraft XG1 and his 14.075 MHz W1AW receiver. KI6AIE brought her Electroluminescent Receiver (ELR) for its second appearance at CAKE, along with a frequency counter built by WN5Y for use with the ELR (which he designed and built). The combination stabilizer/LED readout is based on the PIC16C62A-10 by W7AAZ, copyright 1998; it has an 7-digit LED display and is on the Ham-Pic List web site. KI6AIE also showed off her new automatic antenna changeover relay home-built in an Archer switcher box.

An antenna for the internet access project (6dBi about 12" square panel) was inspected by W6WO (who is now off in W4 land). Before he left, though, W6WO gave W8FLL a book on lightning protection to pass along to Bob K6XX.

Other items discussed included two businesses dealing in ham equipment: Ham Guy in San Jose and Ham Stop in Los Gatos (which is also on eBay) and the availability of a 60 AH gel cell battery available from www.bgmicro.com at 555 N 5th St., Garland, TX.

Special thanks to Chris KG6DOZ for taking notes at this session!

--Kathleen KI6AIE

W8FLL's CAKE Mystery Item



Come to the next CAKE meeting to solve the mystery.

90th Anniversary Topic

As I was listing to the club net tonight, thought what a cool time to try out my new forum then to use it to discuss the K6BJ 90 Anniversary. I have posted a topic on the forum for this discussion at

<http://www.hamspage.org/forum/index.php?showtopic=16> . Just Register as new user name and post away ! its 100% free. Have fun happy posting

—73, Joe KG6NRI

<http://www.joeprager.com>

Computer Recycling

Computers, televisions, and other electronic devices will be accepted for recycling on April 29 from 9 AM to 3 PM at the California Grey Bears lot, 2710 Chanticleer Avenue, off Soquel Drive by Sutter Hospital. This event is open to residents and businesses countywide. For more information call Lynn or Ronnie at 479-1055 or visit the Grey Bears web site at www.greybears.org.

Happy Valley School Rail Fair

We are looking for a brave soul or two to come and run a station at our Rail Fair for about 200 minutes (8:00- 2:00) this May 25, 2006. We will have ten activity stations to provide a hands on environment for 20 minute intervals - 10 times in a row. We will provide lunch.

You will need a working knowledge of telegraphs, morsecode, and any materials you think necessary. We will provide a working telegraph system complete with doorbell ringers to hear the difference between long and short code. Bob Wolbert came last year and did an excellent job.

Please call (831) 429-1456 during school hours, and ask for Bebe or Dan McGuire if you are interested. Thank you!

WA6KUL, SK

Chester Earl Goody, 80, of Yuba City died March 30, 2006, at his residence. Born in San Leandro, he was a Yuba-Sutter resident for seven years, previously living in Santa Cruz for 62 years. He retired as an auto mechanic after 40 years. After serving with the U.S. Army during World War II in the Pacific, he returned to high school and graduated in 1962 from Santa Cruz High School. Many years a member of the SCCARC.



By Art Lee WF6P

CHATTER

Was tuning around the 40 mtr band this morning and heard some really nice, crisp, clear CW. He was sending CQ so I gave him a call, asking him to QRS. He cut his speed to something comfortable for me. Turns out that the Op was using a computer coupled remote to his HF rig. He was seated in an easy chair in his living room. He also had control of a remote auto tuner which switched antennas for him. Nice. I told him that my "remote" when changing antennas was to go out, barefoot in the snow, onto my deck. I pick up the loose end of my coax to my 80 mtr ant and drag the cold, wet, length through my patio door. I wipe off the connector with a towel and screw it into my ant selector switch. Seems like his way is better.

I was surprised one Monday net night when I tried to reach Del Smith, KD6KXD or Ralph, W6ENE. I wanted to borrow Del's sextant. I missed Ralph when he signed off, but Jeff Liebermann, AE6KS, responded, offering me the use of his beautiful Tamaya Model MS-833. (How many people have a sextant in their inventory?) Jeff brought it down to his shop for me and I picked it up, plus the Sight Reduction Tables for Marine Navigation and Birney's Noon Sight Navigation. My reason for needing this was a possible trip over the briny deep to Hawaii. Not feeling totally safe with only GPS (lightning strikes, etc.), I wanted to refresh myself on my celestial navigation skills. Here follows a cute story: my son Randal, N6UZI, is a skilled aircraft navigator, retired from the US Navy. I would have him bring me back up to speed. We broke out the various charts and tables and started the step-by-step procedures needed for plotting. He admitted that he was a bit rusty on celestial as modern navigation is strictly via satellite and computers. We made it through the exercise with me recalling all the info I needed to find our position at sea. When I mentioned local apparent noon, he said, "Dad, at 350 knots, we don't wait around for the sun to be directly overhead!" OK, at 5 knots on a sailboat, we could go below for a nap to await the arrival of that important noon shot.

As it turns out, I won't be going on the trip. Although the boat I would be crewing on is a top-of-the-line, brand-new Hunter 46 sloop

Ham Radio in Post Katrina Reports

Ham radio received positive mentions in post-Katrina reports from the US House of Representatives and the White House. References to the Amateur Radio Emergency Service (ARES), the Military Affiliate Radio System (MARS) and the HF digital e-mail system Winlink 2000 appear in "A Failure of Initiative"—the final report of the Select Bipartisan Committee to investigate the preparation for and response to Hurricane Katrina (see <<http://www.arrl.org/news/stories/2006/02/17/2/>>).

"Like all levels of government," noted the 364-page report released February 15, "the National Communication System (NCS) "was not able to address all aspects of the damage to the communications infrastructure of the Gulf States."

MARS was cited for its role as part of the Shared Resources High Frequency Radio Program (SHARES), a federal emergency communication system. The report says that "within days" of Katrina's landfall, NCS called upon more than 430 SHARES stations across the US to, among other things, assist first responders conducting search-and-rescue missions by relaying information to government agencies, by relaying logistical and operational information among FEMA EOCs in Georgia, Mississippi and Louisiana, and by handling health-and-welfare messages between volunteer agencies in Georgia and the American Red Cross national headquarters.

"Additionally, the NCS coordinated the frequencies used by the nearly 1000 Amateur Radio Emergency Service (ARES) volunteers across the nation who served in the Katrina stricken area providing communications for government agencies, the Red Cross and The Salvation Army," the report continued. "Emergency communications were conducted not only by voice, but also by high-speed data transmissions using state-of-the-art digital communications software known as Winlink."

The report further noted, "In Mississippi, FEMA dispatched Amateur Radio operators to hospitals, evacuation centers, and county EOCs to send emergency messaging 24 hours per day. According to the report, radio amateurs at airports in Texas and Louisiana "tracked evacuees

and notified families of their whereabouts," while the Red Cross "deployed Amateur Radio volunteers at its 250 shelters and feeding stations, principally in Mississippi, Alabama and Florida."

The Salvation Army, the report pointed out, operates its own system of Amateur Radio volunteers known as SATERN (Salvation Army Team Emergency Radio Network). "During the Hurricane Katrina response and recovery effort, SATERN joined forces with the SHARES program and received over 48,000 requests for emergency communications assistance utilizing federal frequencies made available via the SHARES program," the report noted.

"A Failure of Initiative" asserted that the loss of power and the failure at various levels of government "to adequately prepare for the ensuing and inevitable loss of communications" hindered the hurricane response "by compromising situational awareness and command and control operations."

The White House report, "The Federal Response to Hurricane Katrina: Lessons Learned" <<http://www.whitehouse.gov/reports/katrina-lessons-learned.pdf>> released February 22 also cast Amateur Radio in a favorable light--in its Appendix B, "What Went Right."

"Amateur Radio Operators from both the Amateur Radio Emergency Service and the American Radio Relay League monitored distress calls and rerouted emergency requests for assistance throughout the US until messages were received by emergency response personnel," the report said. "A distress call made from a cell phone on a rooftop in New Orleans to Baton Rouge was relayed, via ham radio, from Louisiana to Oregon, then Utah, and finally back to emergency personnel in Louisiana, who rescued the 15 stranded victims."

The report also points out that Amateur Radio volunteers were on duty at the National Hurricane Center, the Hurricane Watch Net, Waterway Net, SKYWARN and the Salvation Army Team Emergency Radio Network (SATERN).

—From ARRL Newsletter on ARRL Web site at <http://www.arrl.org>

with a stateroom for each crewmember, it would still be a long trip. Probably 22 days out, and another 22 days back. Maybe it would be just a little too much fun for too long a period. The boat is fully equipped with all the latest electronics and good stuff: EPIRBS, radar, GPS, autopilot, water maker, solar, wind-driven and diesel generators, life rafts, etc. I did help bring the boat down from Alameda to Moss Landing and it handled beautifully. We never got the HF set up where I could keep skeds with Donna, AB6XJ. The Marine SSB was programmed for Sail Mail and computer email hookup, plus vital Marine weather frequencies. With plenty of other sailing tasks at hand, we didn't have time to delve into the 1" thick operator's manual for reprogramming procedures.

I enjoy the monthly CAKE meetings at GiGi's Bakery. It is well attended by club members, both new and old, interested in the technical side of ham radio. There are always a couple of show-and-tell objects for us to play with and discuss. We can depend upon Dave, W8FLL, to entertain us with a few jokes and to bring something from his vast collection of toys. (Don't however, admire it too much or he will present it to you as a gift!) We will all miss Ron, W6WO, as our self-appointed leader, mentor or guy-in-charge, but his place is being filled by the very capable Kathleen, KI6AIE, our club Treasurer. Hope to see you there on Saturday, April 8th. Come on down and enjoy the coffee. The food is good too. They serve breakfast and lunch.

SCCARC Board - 2006

President	Christopher Angelos	KG6DOZ	688-3562
Vice President	Pat Barthelow	AA6EG	
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MONTEREY BAY REPEATER ACTIVITY

Santa Cruz	K6BJ 146.790- PL 94.8 Santa Cruz
County ARC	KI6EH 147.945- PL 94.8 Watsonville K6BJ 440.925+ PL 123.0 Santa Cruz • SCCARC Net Monday 7:30 PM 146.79- /147.180+ /440.925+ linked • SCCARC 10 Meter Net 28.308 MHz USB Monday 7:00 PM
San Lorenzo	WR6AOK 147.120+ PL 94.8 Ben Lomond
Valley ARC	• SLVARC Net Thursday 7:30 PM
Loma Prieta RC	WR6ABD 146.640-(PL 162.2) • LPRC Net Tuesday 8:00 PM
Naval Postgraduate School ARC	K6LY 146.97- PL 94.8 / 444.700+ PL 123 (Linked) Monterey • NPSARC Net Wednesday at 8 PM on K6LY/R • Monterey ARES Net Wednesday 7:30 PM K6LY 146.970- (PL 94.9)
ARES Nets	SC County Wide ARES Tuesday 7:15 PM on AB6VS 440.550- W6WLS 147.180+ AE6KE 146.835-(Linked repeaters / PL 94.8)
Followed directly by	• SLV ARES W6JVS 146.745-(PL 94.8) & WR6AOK 147.120+(PL 94.8) on alternate Tuesdays • South County ARES K6RMW 147.00+ (PL 94.8) • LPrieta ARES AE6KE 146.835- / AB6VS 440.550+ (Linked /PL 94.8) • Santa Cruz ARES K6BJ 146.79- / (PL 94.8)
	• Newline (Ham News) Broadcast Wednesday at end of NPSARC Net • Santa Clara Valley Section Traffic NET Tuesday 9:00PM 146.640- (PL 162.2)

FOR MORE INFO SEE: <http://www.k6bj.org/freq.html>

SCCARC Calendar of Events

SCCARC Meeting	Friday	April 21
SCCARC Board Meeting	Wednesday	April 26
Rm. 1 7:30pm Dominican Main Bld.		
Short Skip Deadline	Monday	May 8
SCCARC Meeting	Friday	May 19

MONTHLY MEETINGS.

The SCCARC Meets at 7:30 PM, on the THIRD FRIDAY of the each month (except December). Meetings are at Dominican Hospital, 1555 Soquel Drive, Santa Cruz.

SHORT SKIP

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HAVE YOU MOVED OR CHANGED YOUR PHONE NUMBER OR EMAIL ADDRESS?

If any of your contact information has changed in the last year, please notify me right away by return email or by phone (476-6303) in order to have your current information printed in this year's Club roster. If you're not sure what information we currently have, I'll be happy to check it for you.

Thanks very much.

—73, Kathleen-Kathleen McQuilling
KI6AIE ex-WN6KVH(831) 476-6303