

November 9, 2015

Updated October 26, 2017

These are the ideas, concepts, and attempts to reduce SO2R issues at KØZR

Other Ideas

- Unhook fluorescent light above Cheryl's car
- Take pictures of noise spectrum on a) Orion and b) spectrum analyzer
- Put dummy load on tower on 20 MHz antenna
- Put Kenwood radio at base of vertical and transmit on 3.5; listen on XM240 radio at inside radio
- Wireless speed/light controls on family room and study fans
- How to eliminate concern over PIMs generated in cables? Run different RG-213 cable to vertical and transmit with Kenwood?

Already Checked

- Unhook door bell and indoor intercom system
- Check outlets in the gazebo; Fan control in gazebo
- Unplug dehumidifier
- Went into attic and pounded around on the exhaust pipes for the furnace, exiting the roof
- Repaired the temperature sensor in the gazebo; clear water deposits which could have provided rectifying action
- Went around family room and kitchen with DF on 10m. Signal bounced around quite a bit but nothing striking found
- Went around family room on outside, around the gazebo and kitchen windows with DF and Spec an on 10 m; nothing found.
- Disconnect copper strap ground inside the utility box?
- Unhook all wired smoke alarms
- Disconnect 10 ga wire to utility box. Hook up 12 ga and run new 14 ga to tower; DONE
- Disconnect all GFIs
- Disconnect UPSs from the wall
- Disconnect copper strap ground
- Grounded vertical antenna
- Remove all peripherals from the two radios
- Disconnect dimmer controls: Adam's room, dining room
- Disconnect fluorescent lights in work shop and the water treatment system
- Disconnected rotator from lightning protection and rest of system in utility box
- Disconnected surround sound speakers AT the speakers
- Disconnect washer and dryer
- Power down entire house
- Disconnect all cords from the Sony monitor
- Disconnect weather station at top of tower; remove "arm" and cables

- Finish 10m DF antenna
- Unplug weather station "in the wall"; took battery out as well
- Check levels with tower entirely down
- See if (7,14) interference is roughly in the same direction, 85°
- Pull breakers for whole house surge protectors "out", not just turned off.
- *Contact N4ZR – no help*
- Transmit 14 MHz on inv V and see what direction yagi peaks up on 10m; still ~ 85°
- Disconnected motion detector light in storage room
- Noticed when breaker 5 from the bottom of right breaker box was switched "Off", tone of harmonic changed some. This was on 160/80 but did not occur on 20/10. Disconnected EVERYTHING associated with TV, stereo, speakers, Comcast, etc to no avail. Disconnected basement speakers. Believe what I heard on 160/80 may be due to coupling into the wiring from the antenna overhead. Disconnected AM antenna too; no change. Disconnected UPS as well from wall; no change
- No sign of RFI near family room ceiling fan. Probe ceiling fans for harmonics; did use current RF sniffer loop
- Pounded on exhaust pipe for furnace on the roof – no change
- Checked on/off switch in gazebo; is just a normal switch
- Pounded around on I-beams and duct work in basement; no difference
- Disconnected phone in family room
- Unhooked and unplugged Cheryl's computer
- Took batteries out of both CO₂ detectors; no change
- Disconnected FM antenna amplifier and cables, as well as unplugged from the wall; no change
- Disconnect Comcast box and cables
- Disconnect router/switch, including taking cables off
- Redid all connections for 40 – 10m on the tower at ~ 20 ft level
- Took both Highlander and Tacoma to end of driveway to see if any change; NONE
- Disconnected yard light near the utility box. Took out the halogen bulbs
- Redid ALL the outlets in the family room, opting for screw connections rather than "friction locks"
- Broke family room circuit in two, putting entertainment electronics on subbox circuit and remainder of family room on original circuit
- Placed multiple ferrite beads on circuits inside circuit breaker boxes and specific outlets that were sensitive (upstairs hallway, MBR)
- Placed more RF chokes on wires/cables of station with no impact
- Installing 80m delta loop near tower and vertical antenna has wideband noise disappear, but 2nd harmonic on 7 MHz is +40 dB now. Turning entire house off has no impact. Something with battery back-ups?
- Dropped Inv-L antenna; made no difference
- Remove halogen lights on new garage
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Amended Oct 26, 2017

- Placed 4" OD MIX 31 cores on cables leaving each amplifier; no impact
- Placed 4" OD MIX 31 cores on power line going into main station UPS; no impact
- Placed six 2.4" OD MIX 31 cores on DC power lines to radios, radio power supplies, accessory power supplies; no difference
- Removed tarnish/paint from all mating surfaces of both radios, wattmeters, power supplies, antenna rotator
- Placed 4 2.4" OD MIX 31 cores on "hot" wire of breakers showing greatest influence on the RFI. Two of the breakers emanate a 60/120Hz buzz with these toroids in place. Current draws in the wires are only ~ 1-3 amps so clearly not core saturation, etc.
- Powered station from power generator independent of the entire house – no difference
- With entire house powered down, radios in study running off UPS, second harmonic is "present" but has NO 60/120 Hz raspiness; signal is strong but very narrow.
- Unplugged every wall-wart in the house, all the UPSs to no avail
- Circuit feeding refrigerator, microwave and some of living room – used screw connections on all outlets instead of the friction locks
- Unplugged lights to china cabinet – rheostat...
- When entire house powered down, second harmonic is still very sensitive to whether or not the antennas are pointed at the house. Something seems to have "power" and is able to generate clean harmonics when entire house is powered down
- Placed four beads on thermostat wire entering basement furnace control PCB – no impact
- Placed a four-turn, MIX 31 core, on another wire bundle in the basement furnace going to the humidifier unit – no impact
- Placed 15 or 20 amp Corcom line filters on
 - o Garage openers in main house (2)
 - o Garage door opener in new garage
 - o Basement furnace control board
 - o Attic furnace control board