

Craighead Electric COOP
Technical Support

Jussi Eloranta
25 Lawrence Rd 1319
Black Rock, AR 72415
805-304-6229
eloranta@aa6kj.hopto.org

Radio Frequency Interference Complaint (9/24/2026)

I am reporting radio frequency interference (RFI) problem(s) observed at my property:

25 Lawrence Rd 1319
Black Rock, AR 72415

This RFI largely prevents AM radio reception in this area and interferes with FCC licensed radio operations. I request that Craighead Electric takes the necessary steps to eliminate the RFI problem, which is further described below.

The RFI covers the AM broadcast, 160 meters (1.8 MHz) amateur radio, 10 meters (28 MHz) amateur radio, and citizens band (CB; 27 MHz) frequencies. This makes, for example, listening of various AM broadcast stations very difficult and it severely degrades these FCC approved radio communications. It very likely also disrupts VHF radio communications (e.g., emergency services) near these RFI sources. The following characterizes the RFI source(s) and outlines the steps to eliminate them. The preliminary RFI location data suggests two separate origins.

1. Elimination of possible local RFI source: The noise is present when power to my property is switched off and the radio was operated using battery power. Furthermore, the radio was also disconnected from the power grid ground. Therefore, the RFI originates from outside my home and property. The neighboring houses are about 1000' or more away from the radio equipment and antennas, which eliminates most consumer electronics as potential RFI sources.

2. Characterization of the RFI: The noise level at the above mentioned location on the 160 meter band is S6 - S7 (around -90 dBm for 3 kHz bandwidth) on inverted-L vertical antenna and is present nearly at all times (see Sec. 7 for documentation). This level of noise prevents the use of this frequency allocation for FCC licensed amateur radio operations. Frequency analysis of the "raspy noise" on AM mode yields the main component as 120 Hz and its multiples (240 Hz, 360 Hz, ...) but also occasional low intensity 60 Hz (and multiples). The 120 Hz is characteristic of power line noise where arcing takes place at the positive and negative wave crests of the AC current ($2 \times 60 \text{ Hz} = 120 \text{ Hz}$). The weaker 60 Hz component can originate from asymmetric arcing events (or some other source). The noise is broadband but exhibits some weak intensity minima in its frequency spectrum. The spacing of the minima is approx 0.3 MHz and can arise from standing wave pattern forming along the offending power line segment.

Based on this hypothesis, the RFI emitting power line segment may have length of approx. 1500'. The length is defined between two points where the power line impedance changes rapidly (e.g., line end, transformer, line turning). Note that the noise is very weak on the 80 meter amateur radio band, so it is mainly interfering with AM broadcast and 160 meter amateur radio bands. The intensity of the RFI is most often highly unstable (i.e., varies rapidly in time), which is typical for electrical arcing events. The presence of RFI depends on the weather: hot, humid and windy weather tends to make it worse whereas cooler weather and rain makes it go away.

There is another weaker source of RFI that can be heard mostly on the 10 meter band (approx. S1 - S2; -120 dBm over 3 kHz bandwidth) , which also has the same 120 Hz and multiples "raspy" signature. The occasional 60 Hz and multiples components are weak but slightly more intense than observed for the 160 meter band RFI.

3. Direction finding of RFI: I have four directional receive antennas for the 160 meter amateur radio band (90° beam width), which are oriented northeast (NE; 40°), northwest (NW; 300°), southeast (SE; 120°), and southwest (SW; 220°). The relative noise intensities on these antennas are: SE (highest), NE, SW, and NW (lowest). This suggests that the RFI source is SE from my property. Since NE is slightly stronger than SW, the RFI source is slightly north from SE (i.e., SE - E sector). Due to the strong front-to-back of the antennas, the noise is nearly non-existent on the NW antenna. Such a span of directions over the east sector is expected if power lines act as long wire antenna transmitting the noise. The observation of the noise level dropping off on 80 meters band suggests that the noise origin is located far away to the east from my property (more than a few hundred feet, likely thousands of feet or even miles).

The antenna heading from my property to the 10 meter band noise source is approximately 30 - 40 degrees and based on its frequency characteristics is located closer to my property than the 160 meter RFI source. It also appears to radiate to a small extent from the power line that runs along the north side of my property (conducted power line noise).

4. Locating the exact source of RFI: The first power line and residential houses to the east from my property are located along Highway 115. Driving and following that power line while monitoring car AM radio set on empty frequency showed no RFI even though the line runs very close to the road. This search started at Lawrence 214 Rd and ended at Lawrence 144 Rd. Next starting from Highway 115 driving along Lawrence 224 Rd, no major RFI is observed until the last one mile stretch of the road before reaching Lawrence 214 Rd (Clear Springs Rd). The power line on Lawrence 214 Rd was just upgraded and is not likely the source of RFI. Note that there is still small RFI source on Lawrence 214 Rd within about a half mile from highway 115 (likely arcing transformer; car AM radio observation) but there appears to be no correlation with this source

and the one observed on the 160 meter band at my property (see Sec. 7). It can, however, be heard on the 10 meter band at my property, so the broken equipment must be located and repaired. Whether the line noise observed on Lawrence Rd 224 correlates with the 160 meter RFI at my property is currently unknown. This location is approximately 2.4 miles east (90°) from my property, which is consistent with the direction finding data. While the RFI is present on AM radio in this area, I have failed to find the exact location using a handheld 120 MHz AM radio around the power poles because most of the lines in that area are located on private land (with animals, fences etc.) and I cannot get near the poles to test them. Furthermore, I do not have the knowledge of the exact locations of the power lines in that area and most poles do not seem to have the identification tags (required by Arkansas law), so reporting them would be difficult. This means that I cannot proceed locating the RFI source beyond what I can observe with the equipment on my property and using portable radios on public roads. Only Craighead Electric knows the locations of the power lines and has access to them. Finally, it should be noted that the power line in question has many sections that are far away from the public road (inaccessible to me), and it is entirely possible that there are additional RFI sources on those sections closer to Highway 115.

5. Request to Craighead Electric: Since the observed RFI prevents the use of FCC licensed radio services, I am requesting that Craighead Electric will investigate this RFI issue and take the necessary steps to repair the defective equipment (i.e., arcing equipment that produces RFI). Normally, I would assist in locating the RFI source exactly but, as stated above, it is not possible for me to do so in this case. If Craighead Electric does not have RFI engineers who can investigate the issue, there are outside services who can perform such work (e.g., rfiservices.com). If needed, I am willing to help locating the RFI source further together with Craighead Electric engineers but using a professional RFI location service would be the most effective approach. Based on my observations described above, the search should start at the crossing of Lawrence 224 and 214 Rds and proceed along Lawrence 224 Rd towards Highway 115 (160 meter band noise) and on Lawrence 214 Rd near Highway 115 (10 meter band noise). Note that there is a high-voltage transmission line approx. 5 miles to the east of my property, which may also be responsible for the 160 meter band RFI.

6. Federal law on RFI: FCC Title 47 CFR Part 15 states that “Even though incidental emitters do not require individual equipment authorization, federal rules mandate that **they must not cause harmful interference** to licensed radio services (such as amateur radio or emergency communications).” This means that the utility is legally required to take prompt, reasonable steps to locate and correct the source of the noise. Furthermore, arcing power lines can cause unexpected service failures and even start devastating fires as we have seen in California in recent years. For more more in-depth explanation of power line RFI, see the ARRL web site: <https://www.arrl.org/power-line-noise>

7. Log of observations:

The 10 meter band RFI is present at all times. Weather conditions do not considerably affect its strength or other characteristics but there is some intermittency in its intensity over time. The 160 meter band noise is more dependent on weather and a detailed observation log is included below (with some notes also on 10 meter band RFI).

8/31/2026: Clear Springs Rd work still ongoing. RFI intensities on BOG receiving antennas during day time (1.811 MHz on AM/3kHz, dry weather, some wind, 98 F) based on 15 s averaging:

SE: -112 dBm (day) vs. -100 dBm (evening)

NW: -122 dBm (day) vs. -101 dBm (evening/QRN)

SW: -118 dBm (day) vs. -102 dBm (evening/some QRN)

NE: -116 dBm (day) vs. -107 dBm (evening; RFI most audible)

The level of noise is -112 dBm to -122 dBm = 10 dBm (1.5 S-units).

RFI intensity on inv-L antenna (omni directional) during day time (1.811 MHz on AM/3kHz, dry weather, some wind, 98 F) based on 15 s averaging: -95 dBm.

Noise floor increase day vs. evening after sunset is -95 dBm vs. -84 dBm. Note that the evening noise floor is still affected by atmospheric noise at this time of the year.

9/1/2026: 160 meters AM/3kHz day time -94 dBm. Dry weather, mild wind, 100 F. Very unstable. Possibly switching on/off rapidly when slowing down waterfall display (possibly individual arcing events). Clear Springs Rd work ongoing.

9/2/2026: 160 meters AM/3kHz day time -94 dBm. Dry weather, mild wind, 100 F. Very unstable. No change. Clear Springs Rd work ongoing.

SE: -115 dBm (day)

NW: -126 dBm (day)

SW: -118 dBm (day)

NE: -116 dBm (day)

Noise heading between 40 and 120 deg, so approx. 80 degrees.

9/3/2026: 160 meters AM/3kHz day time -95 dBm. Dry weather, fair wind, 100 F. Extremely unstable. Short periods of RFI off. Very erratic. Clear Springs Rd work ongoing.

9/4/2026: 160 meters AM/3kHz day time -92 dBm. Dry weather, fair wind, 104 F. Continuous, no gaps like yesterday. Clear Springs Rd work ongoing.

9/5/2026: 160 meters AM/3kHz day time -93 dBm. Dry weather, fair wind, 104 F. Continuous, no gaps like yesterday. Clear Springs Rd work ongoing.

9/6/2026: 160 meters AM/3kHz day time -96 dBm. Dry weather, fair wind, 104 F. More unstable (morning @ 9am). Clear Springs Rd work ongoing. Got heavy rain and after that the noise was gone (likely b/c lightning masks). 10m seems to be gone too.

9/7/2026: 160 meters AM/3kHz day time -92 dBm. Dry weather, little wind, 96 F. Very unstable. Possibly some occasional additional structure on the wideband noise. 10 meter noise is back.

9/8/2026: 160 meters AM/3kHz day time -94 dBm. Dry weather, little wind, 100 F. Brief strong noise on 6 meter (330 degree beam heading); possibly the pole at the entrance to my property (keep eye on it but haven't heard it again).

9/9/2026: 160 meters AM/3kHz day time -94 dBm. Dry weather, little wind, 100 F.

9/10/2026: 160 meters AM/3kHz day time -93 dBm. Dry weather, little wind, 95 F. Power was cut to this area likely due to Clear Springs Rd. line work. No change in RFI, so it is not coming from the area where the power was cut. Radio on battery power. Clear Springs Rd complete and noise is still there. So is the 10 meter noise (about 40 deg heading). AM radio also shows noise @ Clear Springs Rd (the church end).

9/11/2026: 160 meters AM/3kHz day time -110 dBm. **Heavy rain**, 70 F. Radio on battery power. **No noise** (lightning not masking the observation). Some time after rain had stopped, the noise came back. Before it came on constant, there were intense bursts of noise.

9/12/2026: 160 meters AM/3kHz day time -96 dBm (average). Still very damp after night (morning). Temperature 80 F. Noise very unstable. Short periods of no noise. Noise on 10 meter band may also show the similar instability as 160 meter band. Clear Springs Rd was quieter than usual (car AM). Later in the evening seems weaker and was also weaker at Clear Springs Rd.

9/13/2026: 160 meters AM/3kHz day time -94 dBm (average). Somewhat humid morning. Temperature 75 F. Noise unstable but nearly continuous. Strongest on SE (120 deg) BOG antenna and weakest on NW (300 deg).

9/14/2026: 160 meters AM/3kHz day time -96 dBm (average). Temperature 97 F.

9/15/2026: 160 meters AM/3kHz day time -100 dBm (average). Lowest ever measured (morning). Temperature 89 F. But increased to -95 dBm later in the day.

9/15/2026: 160 meters AM/3kHz day time -95 dBm (average). Temperature 94 F. Sometimes missing the beat. Later in the afternoon -90 dBm & very unstable.

9/16/2026: 160 meters AM/3kHz day time -98 dBm (average). Temperature 98 F.

9/17/2026: 160 meters AM/3kHz day time -95 dBm (average). Temperature 95 F.

9/18/2026: 160 meters AM/3kHz day time -90 dBm (average). Temperature 94 F.
Very strong.

9/19/2026: 160 meters AM/3kHz day time -89 dBm (average). Temperature 98 F.
Very strong.

9/20/2026: 160 meters AM/3kHz day time -100 dBm (average). Temperature 76 F (morning). *Power outage earlier in the morning (around 5am). Now power is back and no noise. And couple of hours later (when band closing), the noise floor dropped even further down -105 dBm.* However, the noise starts creeping back up around 9:30am but still lower than it was. Now -98 dBm. As a side note 10 meter band also seems quieter. In the afternoon we are back at the usual levels -95 dBm (1:30pm). *Noise off again at 4:45pm!*

9/21/2026: 160 meters AM/3kHz day time -100 dBm (average). No noise. The noise starts gradually growing when outside temperature increases. Now weak at -100 dBm but can be heard. Temperature now outside is 86 F. Drove by the Church end of Clear Springs Rd. The local noise there is present but no RFI present on 160 meter band at my property. Thus Clear Springs Rd is NOT the source of the 160 meter band noise.

9/22/2026: 160 meters AM/3kHz day time -100 dBm (average). No noise. Cool morning after rain. Still cool at noon and no noise. Around 4pm (76 F + some sunshine) the noise is starting to come up. Erratic & large jumps. 5:15 the noise is at the usual level (-88 dBm; temperature 75 F) but still occasional short off periods. Still going on at 6pm (73 F). Continues 6:30pm (72 F).

9/23/2026: 160 meters AM/3kHz morning (8:30am) -83 dBm (average). Strong noise. Cool morning around 63 F. No rain but quite windy. Sunny day. Noise present all day.

9/24/2026: 160 meters AM/3kHz morning (8:30am) -86 dBm (average). Normal level noise. Cool morning around 63 F. No rain.