

Electric Fence Noise

A Step-By-Step Procedure

An electric fence can generate radio noise, even if it is in otherwise good working order. This noise is not normal however and it almost always can be corrected. In many cases, this noise is caused by a portion of the fence that may fail as the spark causing the noise weakens the wire. Whenever noise from an electric fence causes harmful interference to a licensed radio service, Part 15 of the FCC rules require the fence operator to correct the problem or cease operation of the fence. Fortunately, in most cases, a little maintenance is all that is required. Let's now take a closer look at the problem of unwanted radio noise from an electric fence, and ways to find and fix it.

Virtually all radio interference originating from an electric fence is caused by a spark or arcing across some fence related hardware. The noise can interfere with radio and television reception and propagate for a considerable distance. In some cases, the noise can disrupt radio reception for a radius of over a mile from the fence. The interference is most noticeable on an AM radio and typically heard as a "tick-tick-tick" sound. This is a somewhat unique characteristic of electric fence noise.

Fortunately, correcting most of these problems is typically a relatively easy and simple process. Many cases can also be corrected at no cost. For example, it is unlikely for the fence charger to be the culprit and require replacement. Troubleshooting electric fence noise typically involves locating the offending spark gap and correcting it. **Bad splices in the fence wire and gate hooks are two of the more common problems associated with electric fence noise.**



Figure 1.

Figure 1 - Electric-fence controllers are not often a source of noise. It is more likely that electric-fence interference is caused by a problem on the wire itself.

Vegetation can also be a problem. A typical scenario is results noise that will cyclically come and go. First, the weeds grow until they reach the height of the fence. Once a plant makes contact, a short can occur and noise is generated. After a while, the plant burns back and breaks the connection. The process doesn't repeat until the weed recovers and grows up to the fence again.

It is also possible for an insulator to go bad, and thereby allowing the fence to arc to one of the fence posts. This is more likely if the problem changes with weather, either getting better or worse when it rains.

It is unlikely (but possible) that the problem is an arc or other defect inside the fence controller. Since most problems occur along the fence wire and related hardware, the fence wire can act as an antenna and radiate the radio noise generated by the arc. A filter, such as a brute-force AC line filter, will only help filter noise being conducted in to and radiated by the AC power lines. In the case of the fence however, such a line filter will unlikely be of much if any help. **The only solution in most cases is to find the source of the arc and correct the defect causing it.**

Here is a step-by step approach to troubleshooting a noisy electric fence:

1. Visually inspect the fence for obvious defects. Remove or cut back any problem vegetation and replace any broken hardware. Look for and take note of potential problem areas such as splices, gate hooks, turnbuckles and similar hardware. Rust or corrosion at these points is often an indicator that the splice or gate hook is making radio noise. In some cases you may be able to hear the spark by ear.
2. Confirm the presence of the noise with an AM battery powered portable radio. If you have one, a radio capable of receiving the aircraft band can also be used. Because of its shorter wavelength, aircraft band frequencies can in some cases be used for troubleshooting purposes. The noise occurs in short bursts in tempo with the fence charger.
3. Unplug the fence charger to verify the noise goes away. Also confirm the noise also goes away at the affected radio or television receivers -- *especially if your neighbor is involved*. If it does not, there may be additional sources of noise causing the problem.

(Note: There are electric blankets and heated mattress pads that cause a pulsed noise, similar to an electric fence. Products made Perfect Fit generate noise even when turned off. These devices must be unplugged from AC power in order to eliminate the noise.)

4. With the fence controller disconnected from AC power, remove the fence connection to it. Confirm the noise goes away. If it does not, you may have a bad charger. A brute-force AC line-filter (1) may help in this case. If not, try replacing or using a different charger.

5. Again remove power to the fence charger. Add a short length of fence wire to the charger. Several feet should be adequate. Insulate the wire as appropriate to ensure that arcing cannot occur. It must not come in contact or be near anything that could result in an arc. Spare antenna insulators may serve temporary duty for this test. Turn on the charger and confirm the noise does not return. If the short "fence" wire appears to radiate noise, you may need to replace the fence charger. Fortunately, this is not a typical case.
6. Remove power to the charger and reconnect the fence wire. If there are multiple sections, connect one section at a time and turn on the charger. Make note of which fence sections generate - and do not generate -- noise. This will help narrow down the search. Reconnect all portions of the fence and turn on power.
7. Walk the perimeter of the fence while listening with the battery portable radio. If you have an aircraft band receiver with a telescoping antenna, use the minimum length of antenna necessary to hear the noise. You may be able to further isolate the problem by carefully observing the signal strength of the noise. It will increase as you approach the source. This is not always a reliable test with an AM broadcast receiver however.
8. Turn the radio level down and listen for faint audible sizzling at any and all suspect areas of the fence. Arcing may also be visible. (This may be especially noticeable at night.) Splices and hardware, such as gate hooks, in fence sections known to be causing the noise require particular attention. Any areas that look corroded, pitted or frequently fail are particularly suspect. (The spark can eat in to a conductor.) See Figures 2 and 3.
9. Remove power from the charger. Clean and resplice all areas of the fence identified in step 8. It is important to ensure good electrical contact in all fence circuit connections. Gate hooks may require replacement but may be jumpered as a test or temporarily solution to the problem.
10. Restore power to the fence. If the noise does not go away, repeat steps 8 and 9 as required. As a last resort, try placing a jumper across all connections with short clip leads. Identify problem areas by removing the jumpers one at a time until the noise returns. Turn off the fence each time you handle a jumper in order to avoid risk of shock. Correct each problem area as soon as you find it. (Clip leads are short wires with alligator clips at each end. They are available at Radio Shack.) Alternately, you can redo all splices after careful cleaning of the wire. Steel wool or a wire brush may be helpful for cleaning connections.
11. Restore power to the fence charger and verify the noise is no longer present. If your neighbor is involved, be sure to have him or her check the affected radio or television receiver.
12. Additional information may be obtained from the ARRL's Web page on [electric fence noise](#).



Figure 2.

Figure 2 -- Gate hooks are a potential problem. They often become corroded where they contact the wire, resulting in an arc or spark. The result is a "spark" transmitter, hooked up to the longwire "antenna" fence. The arc creates radio noise and ultimately wears there the wire -- a problem for the fence owner as well as anyone affected by the radio noise.



Figure 3.

Figure 3 -- Splices can also create problems, especially if they are between two different types of wire. Splices should be mechanically secure, lessening the likelihood of poor contact, sparking and wire failure.

Notes:

1. A "brute-force" AC line filters can help eliminate a radio signal from getting to and being radiated by power-lines. While this is rarely the problem, it may help in some cases.
2. If the device draws less than 300 watts (about 2.5 A), try using a Radio Shack catalog #15-1111. If not, some of the filters sold by Industrial Communications Engineers can handle higher current. More information is available [on line](#).