

## Minimize RFI in your Home and Shack

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RF energy in your home can cause many problems with the RF immunity-insensitive appliances that are common today. And ham gear operational problems can also occur when RF is present on your control, DC power, and coax cables.

What causes RFI in the home and shack? One way is from RF on the coax shield caused by antenna/feed-line imbalance, like feeding a balanced antenna with an unbalanced line. But most RF-in-the-home problems are probably due to the high energy fields than occur from close antenna proximity to your home, and higher power operation. Since many hams live on small city lots with antennas located close to the house, and 30% of hams use an HF amplifier at least occasionally (according to a recent ARRL poll), the in-home RF environment may be very high. Following are simple things I've done to minimize RFI in my home and shack. Maybe some of these ideas can help you as well.

First your home should have a coax entry panel which should provide AC ground, RF ground, and lightning protection for your coax and any wiring coming into your home. My entry panel (Photo A) is just a 4" x 4" outside outlet box with an aluminum cover containing three UHF coax feedthrough connectors connected to separate ICE 303/U surge suppressors ([www.iceradioproducts.com](http://www.iceradioproducts.com)). The upper-right section of the photo also shows my DC and rotator wire homebrew lightening/transient suppressor (an ICE 348B may be a better choice for you). A 6-gauge copper cable connects to the aluminum box, which then connects to a buried ground rod/radial system. This same ground also ties into my home entry AC ground as required by NEC code using 6-gauge copper wire.

Inside my shack I have a 4" x 4" outlet box mounted in the wall with three feed-through UHF coax connectors mounted on the aluminum face. Short coax cables connect between the inside and outside boxes. The inside outlet plate also serves as my single point ground where all individual pieces of equipment have their own ground wire connecting directly to this single point. A single-point ground system helps eliminate RF ground loops in your shack. However, you still have all those pesky coax cables and RCA cables (and more) running between all your equipment, which can still lead to RF ground loops. Therefore I place inexpensive snap-on RF chokes on all DC and control cables in my station, and RF isolators at my transceiver and amplifier outputs. These chokes are available from [www.radiodan.com](http://www.radiodan.com) with several different inside diameters. A direct link to RadioDan's choke page is [www.radiodan.com/Henry/parts/RF\\_chokes.htm](http://www.radiodan.com/Henry/parts/RF_chokes.htm). The idea is to wrap several turns of the cables and control wires through the snap-on chokes, so different ID chokes are used to accommodate diameter differences in small wires and cables. I recommend starting with 4-5 each of the snap-on ferrites shown in the parts list. Believe me, you'll use them all!

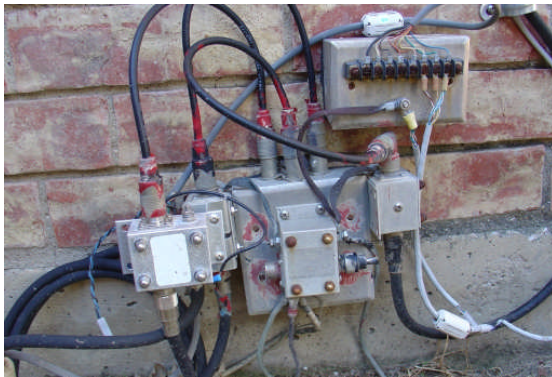
My main power supply in my shack is an Astron SS-25. I modified my SS-25 to bring out an Anderson PowerPole-terminated cable which wraps through one of the snap-on ferrites. This cable terminates in a MFJ-1106 for power distribution. Photo B shows my power supply hook-up. Photo C shows other cables with snap-on ferrites.

While the above techniques minimize RFI problems in the shack, how about the other electronic devices in your home? I had RF getting into my telephones and intercom system when using my amplifier. And the problem was bidirectional - I also had RF hash from my home-theater subwoofer's switching power supply that was wiping out 30 meters! The answer was to use RF snap-on ferrite chokes with at least two turns of telephone cable right at the telephone. Next I added snap-on chokes to the cable entering each intercom speaker in my home. And finally I added RF snap-on chokes to the AC and coax cables on my powered sub-woofer. The result? I can now operate with my 600 watt ALS-600 amplifier with no problems using either my Butternut vertical located about 30 feet from the house, or my MFJ-1775 rotatable dipole mounted about 10-feet above my roof. And the powered subwoofer 30-meter RF hash is also gone.

Will these ideas solve your RFI problems? This will vary based on your power levels, antenna proximity, and the specific electronic devices in your home. However, these ideas will almost certainly reduce your problems – hopefully to a manageable level.

Table 1 – Suggested Parts for Solving RFI Problems

<u>Description</u>	<u>Source</u>	<u>Price ea.</u>
0.24" ID Snap-On ferrite	RadioDan RCT-2/2W/2T	5/\$10
0.40" ID Snap-On ferrite	RadioDan RCT-4/4W	4/\$10
0.50" ID Snap-On ferrite	RadioDan RCT-3, RCT-5	3/\$10
Lightning Arrestor	ICE 303/U	\$46



**Photo A:** Entry panel w/ICE arrestors.



**Photo B:** Astron SS-25 power supply with snap-on ferrite & MFJ-1106.



**Photo C:** Other cables with snap-on ferrites.