



[How cops are finding "grow ops" with AM radios](#)

[Kenneth Wyatt](#) - March 10, 2015

One of my colleagues, Kit Haskins, alerted me to the following article: "How cops are catching grow ops with AM radios". As a long-time EMI engineer, the headline certainly caught my eye. The article was posted by Keith Graves on his blog (PoliceOne.com) in February, 2014. Graves is a police sergeant in the San Francisco area and he described how police were starting to use AM radios in their vehicles to locate illegal indoor marijuana "farms". These "grow ops" are using arrays of large 1000W high pressure sodium or metal halide lamps, driven by electronic ballasts. Most of these ballasts are imported from China and the manufacturers of these have apparently made no attempt at complying with FCC emission standards. Consequently, they produce large amounts of radio frequency interference (RFI). This RFI has become a major nuisance to local radio amateurs and other users of the radio spectrum, as it can completely obliterate communications. In the meantime, the article has "gone viral" among the police community. While they realize not every source of RFI is a grow op, they do use the technique as "one of their tools".

Related to the article above, in September 2014, [I visited the headquarters of the American Radio Relay League \(ARRL\)](#) in Newington, CT, where I had a chance to meet with their lead RFI investigator, Mike Gruber. Gruber was well aware of the issue to amateur radio operators and shared the ARRL's formal complaint to the FCC, dated March, 2014. Prior to their complaint, Gruber also conducted extensive testing on three of these electronic ballasts and the conducted emission data clearly shows peaks as high as 100+ dBuV (50 dB over the limit) in the range 6 to 8 MHz, with lower peaks at 14, 18, and 21 MHz. There are also high peaks covering the AM broadcast band, and that's where the police tune their radios in order to detect the use of these ballasts. The interference from these sources has been received as far away as 2,500 feet, nearly half a mile.



Figure 1 - RFI lead engineer with the ARRL, Mike Gruber, standing behind the table where conducted emissions testing was performed.

Amateur radio operator, Tom Thompson, of Boulder, CO, has located five of these grow ops in his own neighborhood and has published an article on direction-finding (DFing) these RFI sources. The article, *Locating RF Interference at HF*, was published in QST Magazine, November 2014. He's since developed large filters that appear to work moderately well in minimizing the emissions. While the FCC is aware of the interference and the fact many of these ballasts even have fake "FCC" stickers, they've not enforced the regulations as of yet.

There's an amusing blog posting from an anonymous writer on "Big Buds" (a marijuana growers web site) describing the "other side" of the controversy. Apparently Comcast was investigating RFI to other cable subscribers around his home and nearly found out about the writer's grow op. After some realization as to what was transpiring, the grower moved to a different location. So the issue is becoming known by both the police and growers. I wonder whether the growers will pressure the manufacturers to produce quieter ballasts?



Figure 2 - A close up photo of three typical electronic ballasts.

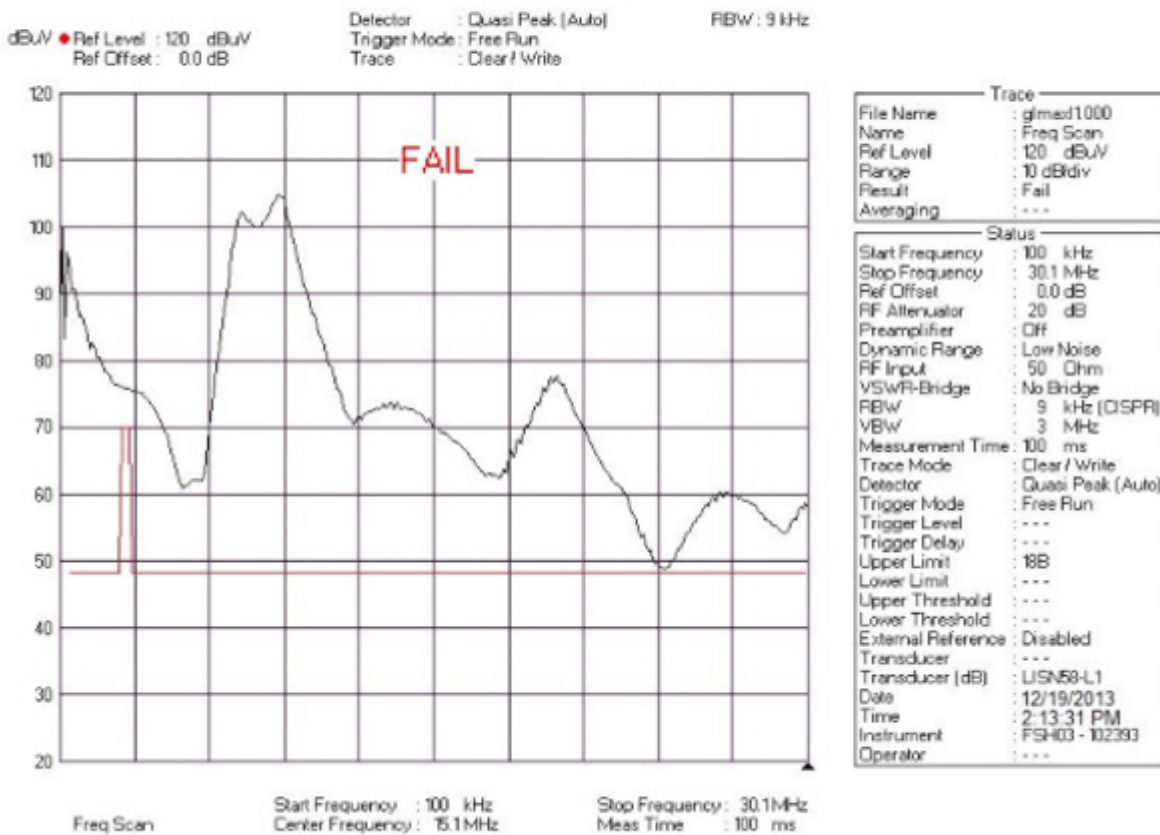


Figure 3 - An example of a large 1000W 'grow lamp'.

Lumatek LK-1000

Maximum Power Setting

0.10 to 30.1 MHz



Phase to Ground

Figure 4 - One of several similar conducted emission tests on the Lumatek electronic ballast by the ARRL. The frequency range is 0.10 to 30.1 MHz. The red line is the limit for the FCC Part 18 test. The peak around 6 to 8 MHz is 50 dB over the limit (Image courtesy ARRL).

These grow ops, both legal and illegal, are proliferating widely around the U.S., especially in the states of California and Colorado. There are also various reports of this interference worldwide. Apparently, the FCC has known about this issue since September 2011, according to the date on their warning letter to users of these grow light ballasts (see References below). Perhaps if more users of the radio spectrum complain, they'll take some action? Guess I'm not going to hold my breath. In the meantime, the police continue to use RFI to locate and prosecute these marijuana farms.

References:

[How cops are catching grow ops with AM radios](#) (PoliceOne.com, 2/4/14)

[ARRL to FCC: "Grow Light" Ballast Causes HF Interference, Violates Rules](#) (3/14/14)

[Pot growers' lights interfering with ham radio chats](#) (Coloradan, 6/5/14)

[Hydroponics Digital Ballasts & Comcast Almost Busted this Marijuana Grower](#) (Big Buds Magazine,

unknown date and writer)

[Grow Light Electronic Ballasts](#) (W0QE.com, Larry Benko)

[Pot-Growing Lights Are Interfering with Local Radio Waves in Colorado](#) (Yahoo Tech, 6/6/14)

[Ham Radios Assist Police in Catching Indoor Drug Growing Operations](#) (Interference Technology, 2/11/15)

[FCC form letter to users of electronic ballasts](#) (dated 9/12/11)

[ARRL test report](#) (dated 1/28/14)