

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)
)
Expanding the Economic and Innovation) Docket No. 12-268
Opportunities of Spectrum Through Incentive)
Auctions)

**COMMENTS OF
RONALD J. BREY**

I hereby file my comments to the above referenced Notice of Proposed Rulemaking. My primary concerns are ensuring the maximum service possible for viewers of over-the-air (OTA) television. I have been an OTA TV viewer all my life. I use two rooftop antennas with rotors. One antenna is 30 years old and the other 20 years old. Each antenna was one step down from the top of the line in its day. Dating back to my childhood I have observed considerable propagation and interference scenarios. At my present location of 27 years, I have observed analog and digital TV reception quality and reliability from full power TV stations 10, 55, 75, and 85 miles away. I have also observed Class A and low power TV stations and particularly their interference to full power TV stations. In addition to being a viewer, I was a part-time projectionist (they used to have those) at a full power TV station when I was in college. I was also a chief engineer of AM and FM radio stations in the late 1970's. My theoretical background comes via a master of science degree in electrical engineering from the University of Illinois, Champaign-Urbana.

STATEMENT OF PURPOSE

As I read the Notice of Proposed Rulemaking many thoughts and feelings come to mind. My numerous paragraphs may be laborious to read, but there is an emotional aspect to television service from the viewers perspective that goes beyond the dollars and megahertz. I hope to convey that the auction and repacking is both a right brain (feeling) decision and a left brain (thinking) decision. The decisions go beyond mere numbers. Lifestyles are pitted against each other here. But unlike the digital realm where life is a one or a zero, decisions can be made that result in a reasonable compromise. I hope in the following discussion that my experience may lend some insight into some issues facing OTA TV viewers and unlicensed wireless microphone users.

GENERAL DISCUSSION

I realize that OTA TV viewers are in a minority. However, we are not just numbers in the Nielsen book, we have faces and lifestyles. Changes to our OTA TV experience should not be taken lightly, and that appears to be the intent of Congress. For the impoverished, unemployed, and underemployed, OTA TV may be all they can afford. For others, it is all they need, and it is easy to understand. Yet for others, it is the signal quality and reliability. For Internet TV viewers, OTA TV may be just the ancillary service they need at the right cost.

The OTA TV viewers may appear behind the times in technology and strangely frugal in an era of overspending. Our apologies to the gross domestic product. We enjoy the highest

reliability. Friends in Rockford, IL, lost their cable TV (and Internet) connection right at the time Hurricane Sandy hit and were unable to watch TV as the areas of the East Coast where their children live was ravaged by the storm. The shame is that with a rabbit ears antenna, they could have had TV in short order. Our household only loses TV when a TV station loses power (or the tower—it's happened) or we lose power. The more equipment between the program source and the viewer, the less reliable and lower quality the signal. When I look at a 1080i picture from an OTA TV station, I know I am getting the best picture quality and the highest reliability, short of Blu-Ray. And while enjoying these benefits I am not paying a multichannel video programming distributor (MVPD) to provide more programming than I need. I am confident that my wife and I are not the only ones to quickly hit a steep slope of diminishing returns when it comes to tacking on more channels than just the major OTA networks. Giving the benefit of the doubt to OTA TV in forming repacking policy is not necessarily a bad thing.

It does amaze me that so soon after converting full power TV stations to digital that the “wolf” is at the door again asking for more spectrum. Granted like subdivisions gobbling up farmland, this is the cheaper way to go. New technologies need spectrum, no argument. However, it probably goes without saying that modulation and compression schemes are going to have to make quantum leaps because even if all the TV spectrum were relinquished, it would not be enough. Someone will fill the space. But if mobile network companies, after chasing off the broadcasters, turn around and offer a broadcast model, like OTA TV, to solve spectrum problems, it would be like a large retailer coming into a market with very low prices to drive the mom and pop stores out of business, at which time the large retailer controls the market and the pricing. Hence, to keep competition alive and well, I advocate trying to keep open as many programming options to as many people as possible. That means thinking in terms of optimizing service while reclaiming spectrum, not just maximizing spectrum reclamation to the point where in the process of picking the meat off the carcass, the bones come with it.

In the repacking of the OTA TV spectrum has anyone given any thought to accommodating the next change in modulation or compression for TV? With changes coming fast and furious in digital formats, how does OTA TV accommodate those without additional spectrum? Do white space devices preclude a geographic solution to an alternate transmission channel as in the analog to digital conversion? Is orthogonal modulation possible on the same carrier? Or is additional spectrum going to be needed for duplicate transmission or channel splitting? Wrapped up in that may be changes that could save more spectrum space later on. A more robust modulation system could make OTA TV less susceptible to white space interference. I live in gray space relative to Chicago. I receive Chicago TV stations significantly beyond their predicted noise-limited contour, and white space devices will probably wipe out that reception. A modulation scheme that could reject interference from white space devices might allow tighter spacing between the band users. A bit less aggressive repacking now might help save more spectrum in the future.

An aspect of this whole process that perplexes me is that the geographic areas needing the most wireless network bandwidth are the same geographic areas with the highest density of television stations. These large population centers probably have the highest levels of OTA TV viewership. In these areas the value of remaining stations may increase remarkably if other stations give up bandwidth, making it very advantageous to be the last man standing. If the pie has fewer slices, each piece of the pie is worth more, and the pieces may add up to more than the whole of the pie. So why are stations in those markets going to offer spectrum unless the offer is too good to refuse?

Meanwhile is the auction even going to entertain the idea of buying back a marginal, lone station in a geographic area with a surplus of mobile network bandwidth? Service to the public should probably preclude accepting any bid from the lone station. I have relatives living in a rural area where the only full service TV station pulled the plug. So auction or not, stations like that may go off the air. A translator is the only OTA TV left. If that goes, the relatives will probably wind up borrowing even more DVDs from the local library for their TV of the future. They have no cell phones because they do not need them or at least it is not cost effective. The “let them eat cake” of going to a satellite MVPD won’t sit well with them. They do have Internet service and maybe that can provide TV in the future, but not for now. In general, Internet TV is not an option for some people in underserved areas either due to economics, a fear of Internet hackers and viruses, or lack of desire to deal with technology that is constantly changing. My conclusion, low power TV has a place, particularly in underserved areas, and needs to be preserved. Fortunately in the underserved areas, there should be plenty of spectrum for both TV and mobile broadband.

I am a little chagrined since we specifically purchased a TV last year with 1080i resolution. If no OTA TV stations in our area provide that service because they gave up some bandwidth, some of the money spent for highest OTA resolution has been negated. We do not own a device like a Blu-Ray player that uses the higher resolution..

COMMENTS TO SPECIFIC NPRM PARAGRAPHS

I make reference to specific paragraphs in the Notice of Proposed Rulemaking by using the ¶ symbol followed by the paragraph number.

¶13. The transition to digital OTA TV certainly did not help the market share. Repacking the spectrum will not help again, which will play into the hands of the mobile broadband players. On the other hand, as stations have gotten their feet on the ground after the digital transition, I have seen more and better use of the secondary channels in our local market. It has actually gotten exciting to wonder what might come next, if the stations hang onto their bandwidth.

The very people who are unlikely to benefit from wireless networking devices are the ones mostly likely to be impacted by the loss of OTA TV. When I talk to these people, my heart just goes out to them because the OTA TV road is going to get bumpier. My favorite experience was talking to a retired farmer in his mid to upper 80’s, who went to the houses of his friends to set up their digital-to-analog converter boxes for them. They are not giving up.

¶ 14. There seems to be an inference that only viewers solely relying on OTA TV matter in the discussion. Some cable TV companies have service bundles set up to penalize a customer who only wishes to subscribe to high speed Internet. Economically we have a high speed Internet package with basic TV that costs less per month than Internet alone. We get counted as cable TV subscribers, even though we are primarily OTA TV viewers.

I have seen reports of OTA TV usage increasing during the poor economy. That is logical for the least expensive source of TV, a nice option to have. I have also seen a report that cable TV subscribers peaked two years ago and the downward trend is expected to continue. Some “cable cutters” are using a combination of Internet TV and OTA TV. There is still life left in OTA TV..

¶ 48. Living in a market with four full power stations, I would hope that footnote 88 would preserve all four stations. However, some limitations on the amount of spectrum that could be shared or relinquished would seem in order. Capability for two program streams per station

would seem a reasonable minimum standard, if one would be at least 720p or 720i. Obviously if all four stations elected to retain their full bandwidth, it would preserve the maximum number of available program streams and help offset there being only four stations in the market. The full bandwidth would also give the stations more ability to implement new technologies for the public.

¶ 49. The conversion to digital TV resulted in an unfortunate overlapping of contours of RF (radio frequency) channel 19 in Chicago and RF channel 19 in Madison, WI (more in the next paragraph). This has made it very difficult to separate the two stations. I gather this occurred because there was no other way to do it, but I question whether OET Bulletin 69 used overly aggressive assumptions in its methodology. Hence, I would be concerned that OET Bulletin 69 might create more untenable situations. Repacking should also be used to rectify those problems, not increase them.

With repacking the Commission needs to address the confusion of many TV tuners that determine the viewer's channel selection by either the actual RF channel or the identified (ID) channel. For instance, I have a problem with RF channel 21 from Chicago and RF channel 20 from Madison, WI, which identify as 20 and 21 respectively. This problem repeats itself for other channels in those two markets. If the tuner recognizes the Chicago channel, it will not recognize the Madison channel, and vice-versa. Tuners should be required to offer the option of using either the RF channel or ID channel when setting up a tuner's directory of stations and adding to the directory. Similarly we have a TV set that will pick up both RF channel 19 from Chicago and RF channel 19 from Madison, WI, however, when the TV antenna is turned to Chicago, the TV displays the station ID information as Madison. With repacking I suspect more of these situations may occur, and TV manufacturers may need to be mandated to produce smarter TV tuners.

¶ 50. TV viewers are stakeholders and for the most part do not even know there is going to be an incentive auction.

¶ 85 and 86. In all fairness to the viewing public, stations willing to relocate from UHF to VHF should be able to specify high band VHF (7-13). And not all low band VHF (2-6) channels are inherently equal. Channels 4, 5, and 6 have lesser amounts of environmental noise and ionospheric skip interference. But channel 6 might have spacing problems with FM stations. Channels 2 and 3, in that order, suffer from the greatest environmental noise and ionospheric skip interference from stations 500 to 1200 miles away.

The Commission should be very careful about increasing power levels in the low VHF band because it will increase the ionospheric skip interference in many parts of the country. This would be somewhat akin to the "Local" channels on the AM band, where coverage is limited at night more by other stations on the channel via ionospheric skip than by the loss of signal due to the inverse square law.

Some OTA TV viewers have purchased outdoor antennas for channels 7 through 51 or one for UHF only. If even one station in a market moves to a low VHF channel those viewers are typically going to require a new antenna or the addition of a separate antenna. The viewers are not only going to have a much more expensive and unwieldy antenna, but the performance of the low VHF antenna is typically going to be significantly less than a high VHF antenna with respect to gain and directivity. Even the rabbit ears antennas have to be bigger for low VHF.

¶ 87 and 88. The proposal of allowing TV stations to accept more interference, totally ignores the public service nature of OTA TV. There is more than money at stake. The

broadcasters are supposed to be using their spectrum to serve the public. To cut off some TV service to a certain number of citizens to make it more lucrative to the broadcaster and the forward auction bidder, and make the process easier for the Commission seems to be wanton disregard for people who are left out of the loop in the process. If the Commission is going to allow OTA TV viewers to lose service, then the Commission needs to mandate that cable and satellite TV providers offer TV channels à la carte to make up for the loss of individual stations. In other words, if a viewer initially has access to three OTA TV stations, and due to the broadcaster's voluntary acceptance of increased interference that number is reduced to two, why should the viewer be forced to buy a package of channels from a multichannel video programming distributor to replace that one channel?

In the changeover to digital TV, I lost more service than I gained. The theoretical replication of analog service did not work out like it should have. Massive amounts of computing power will not correct for imperfections in the model; some of the coverage and interference levels will be off target. Therefore, some extra margin in interference levels by specifying lower levels of interference gives more tolerance for error. The recovery from errors is expensive.

¶ 91. Regarding repacking in general:

A less than optimum situation exists with freezing facilities at Feb 22, 2012, levels, in that it precludes build out to the maximum ERP to which a station might be entitled. The digital conversion resulted in a hodge-podge of ERPs for stations in the same market. Ultimately room should be left for parity. A current broadcaster may care less, but the viewers might be the beneficiaries under a new broadcast owner. In practice, rather than going to convoluted extremes to squeeze out the last fraction of a MHz for mobile broadband, a little buffer room might better satisfy the intent of Congress to do no harm than to establish a potentially unsalable piece of spectrum.

If in the reverse auction process, spectrum opens up that is not usable for mobile broadband, it would seem appropriate for broadcasters to be able to bid on that in the forward auction if unusable spectrum does not nullify the original acquisition and cause it to revert to the original license holder.

¶ 93. It states, "Commission rules define 'service area' as 'the geographic area within the station's noise-limited F(50,90) contour where its signal strength is predicted to exceed the noise-limited service level.'" The key element here is the word "predicted." A map of measured signal strength will often reveal that predicted versus actual is a big difference. And satisfactory signal strength can exist well beyond the predicted contour. This has been the case at my location. Hence the interference methodology followed by OET Bulletin 69 is going to result in more than expected casualties. (In the Bulletin I failed to discern how DTV antenna front-to-back ratios greatly exceed those of analog antennas when, as in my case, it's the same antenna. RF is RF. Were antenna designs supposed to improve?) The problem for the viewer is that they will not know they are going to lose a station until it actually happens. Therefore, I would recommend the most conservative approach to interference.

¶ 97. With regard to: "Thus, section 6403(b)(2) imposes significant technical constraints on the Commission's repacking authority under the Spectrum Act, and thus our ability to free up spectrum for mobile broadband." It's a tougher job, but the Commission should take pride in doing minimal harm.

¶ 101. Due to the digital conversion some TV stations were forced to accept a less than complete replication of their service area. If the repacking results in a change reversing the reasons for less than full replication, that station should be allowed to replicate its analog service area. In the case of RF channel 19 (ID 15) Madison, Wisconsin, I was told by an engineering staff member that due to a lack of palatable alternatives, the station was not able to replicate its service area in the digital conversion due to short spacing with RF channel 19 in Chicago. If a repacking change of either RF channel 19 station occurs, RF channel 19 in Madison should be allowed to re-establish its analog coverage area prior to the conversion. Hence, I believe that stations thus impacted by the digital conversion be allowed to propose alternative transmission facilities. This is an opportunity to rectify inequalities resulting from forced compromises of the digital conversion. This is contrary to ¶ 107 where instead of locking in the interference, I propose to mitigate it. In other words, clean up the problems rather than perpetuate them.

¶ 105-109. What matters to the viewers is different than what matters to the broadcasters. The broadcasters do not want to lose numbers of viewers; the viewers do not want to lose programming. If a viewer has been receiving ABC, CBS, NBC, and FOX networks, and loses one of those networks due to interference, that is not inconsequential. Similarly if a viewer's favorite programs run on an educational, independent or religious station, loss of that station is critical. The viewers should not be assumed to have discretionary funds to throw at the problem. Having to sign up with an MVPD or establish high speed Internet service (probably with lower quality video) to restore programming can be a major step function in recurring expense. As an example, if satellite reception is the only alternative available in a rural area, restoring favorite programs or a TV network might cost \$30 per month, which adds up to \$360 per year or \$3600 per decade, not a paltry sum. An argument that the viewer will receive many more stations via satellite only holds up if the viewer really needs those extra stations. The station I watch the most comes from 55 miles away, and its programming is only duplicated by a station 75 miles away, which is no longer receivable 24/7 due to the digital conversion and will no doubt be impacted by white (gray in this case) space devices. If the station 55 miles away is no longer receivable, I have incurred a major loss of service.

¶ 114. It seems to me that applications pending for new facilities or modification of existing facilities should be grandfathered into the repacking if the owners did or would have received construction permits. Although these applications should not receive consideration for the reverse auction, it is not the fault of the applicant that Congress passed its Spectrum Act when and how it did. Otherwise, to be fair the government should reimburse those applicants for expenses and damages for terminating applications in process. It will make matters more difficult, but it seems appropriate to attend to the legitimate desires of the applicants.

¶ 221. I have some knowledge of the use of unlicensed wireless microphones at a local community college theater. The theater is well attended. I asked the Director of the theater how the transition of his wireless microphones from upper UHF TV channels to lower channels had gone. He said the process went OK (as an outdoor theater a long off season mitigated the turn around time for equipment changes), but it had cost the theater \$33,000 to reconfigure the microphones for new frequencies. The theater has large casts (of volunteers) and uses many wireless microphones. I do not know the current frequencies of operation, but repacking could result in yet another change to their wireless microphone operating frequencies. The cost is not insignificant. The microphones are purchased with the risk of being a secondary service, but some semblance of stability would be welcome to those users. As long as the frequencies available for these microphones are reasonably interference free, what is most important to this theater is not having to change those frequencies for a long time. Considering the large number of microphones used, frequency stability of individual units may preclude field modification of the units. Field

modification of the frequency of operation also runs the risk of operation within impermissible channels.

Personally my son has an expensive wireless microphone rendered obsolete by the conversion of TV to digital. He bought the mike to be used for his DJ business when he was in high school. In this case changing the RF frequency was cost prohibitive. I would suspect there are a lot of discarded wireless microphones and owners that do not want to go through that again.

Sincerely,

/s/

Ronald J. Brey

6815 Academy Trl.
Rockford, IL 61107