

The
Broadcasters' Desktop Resource
www.theBDR.net ... edited by Barry Mishkind – the Eclectic Engineer

High Powered History

Growing Tower Farms in M/SP

Part 2 – A Good Idea That Just Did Not Work



By Steve Brown

[August 2015] The road to signal improvements in a market can take some curious turns. At the same time, it offers a look into stations grew in the market and, in more recent years, how consolidation-driven chess moves brought about the radio dial to which we listen today. This is the second in a series on the history of the tower farm in the Minneapolis-St. Paul market. Steve Brown continues.

In the first part of this series, we observed how the FM stations in Minneapolis and St. Paul began the migration from relatively lower antennas to the skyscraper sticks of an antenna farm. The process was not easy.

Not only did the stations have disagrements about how to accomplish the improvements but one of the projects, the Shoreview Telefarm, had a really rough start, the tower collapsing before it could be put into operation.





Pictures courtesy: Scott Todd

But the failure of that one tower did not stop progress – it just sort of caused a detour.

PLAN B

As with any project that entails major construction, including towers soaring to over 1300 feet, it is a story of engineers, consultants, lawyers, and – surprise! – a lot of money.

After the collapse of the Telefarm Tower, the local Minneapolis–St. Paul broadcasters did not wait for a replacement tower to be designed and built. Instead, the engineering community came together to seek a solution for the problems that stood in our way. Their time and effort was focused on building alternative sites to gain height and improve coverage

Four stations (later five) joined together to build a site on the top of the IDS building in downtown Minneapolis. The testing phase began

when the building was completed in the fall of 1979. Initially, each of the stations appeared to have increased coverage from their new 820-foot perch.

Then, as we noted in Part 1, just as the stations received their Program Test Authority (PTA), it was discovered they were causing severe interference, making some stations, including where I was working – WCCO-FM – unlistenable in downtown Minneapolis. At almost the same time, Murphy crashed our Marketon traffic and billing system. No one knew who owed what.

But before anything could be done, a strike was called by the IBEW, the union representing the WCCO Engineering staff. Solving the signal problem had to be put on hold.

DIAGNOSIS

Somehow the Marketron mess got straightened out and, after about thirty days, the strike got settled.

We techs at WCCO-FM now could start working with the other stations, especially those from Minnesota Public Radio (MPR) engineers, to try to figure out what was going on with the IDS located stations and what we could do about it.

Dan Rieder, MPR Chief Engineer at the time, arranged for a building-top monitor point about ½ mile from the IDS building where we lugged lots of RF test gear up too many flights of stairs to point a log periodic beam at the IDS site to confirm whether the intermodulation products coming from the plant there were within specs. Shortly thereafter MPR and WCCO-FM filed enough credible paper with the FCC suggesting the intermodulation levels were too high. The Feds then ordered the IDS stations to operate at half-power until the "problem" was resolved.

As it turned out, that half-power command stayed in effect until the Shoreview FM Group master antenna project lit up in August of 1992 – over a decade later.

SEARCHING FOR THE PROBLEM

If you have ever been involved in trying to find the source of intermod issues at a site with multiple stations with multiple owners, you know what an RF mess had landed in our laps.

Indeed, there was a lot of legal and technical shouting done from late 1979 for the next six or seven years.

Many Washington communications attorneys and consulting engineers were bankrolled by the controversy with enough money to put their children into the finest colleges. Over the next summers we lowly Minneapolis engineers from both sides of the controversy got to know each other well (and mostly liking each other) as we spent time, usually overnight, running tests devised by the engineering consultants to determine the cause of the interference.

George Werl, the CE at KQRS, one of the IDS-sited stations, did yeoman's work, providing us with detailed maps of the monitoring locations within the metropolitan Minneapolis area.

With those in hand, we began the process of driving around the Twin Cities in a caravan of cars, armed with various consumer models of FM radios to determine whether the interference was caused by a defect in the IDS transmitting plant that generated excess intermodulation products – or if it all was caused just by bad receiver design.

The tests at each location consisted of an engineer from each side of the controversy plus the FCC Field Office Chief wearing headphones and talking loudly to each other to determine the level of interference to each station as various IDS carriers were cut.

SEARCHING FOR AGREEMENT

Scoring was based on a 1 to 10 scale, and as one might suspect, things rapidly turned into a poker game.

For example, I might rate interference to my station as a 9 (bad) while the IDS-based engineer would rate it as a 2 (barely noticeable) and then the FCC chief would step in to see if that merited a carrier cut. It is my opinion (contested, no doubt) that both factors (real intermodulation and Receiver Induced Third-Order Intermodulation Effect, or RITOIE) contributed to the problem.

Unfortunately, one of the most frustrating parts of this quest to find the cause of the interference came not from the IDS stations, but from our own engineering consultant.

Our guy was an older fellow who had cut his teeth on the construction and adjustment of many AM directional arrays, but seemed mystified by FM interference and propagation. We joked at the time that he must have had a meeting with his financial people every Friday at lunch because before close of business he would call us to make some more work for us (and money for his firm) over the weekend.

FINDING AGREEMENT ELUSIVE

As mentioned, our consultant had his own version of "what to do about the interference problem," which did not necessarily match that of the other consultants and lawyers involved in the process.

The worst case happened one of those Fridays. The consultant phoned to announce that the way to tell if the interference was receiver overload or transmitted intermodulation products was to construct a shielded loop antenna, about three feet in diameter, and connect it to our Rhode and Swartz VHF field meter.

According to him, if we went out into the field with the loop and meter and oriented it on a parallel azimuth to our transmitter and then rotated the loop 90 degrees to our signal, then the only thing we should hear was the intermodulation products coming from the IDS building.

We tried to explain that FM signals were commonly reflected from many objects that did not, affect signals in the medium wave band. But it fell on his deaf (greedy?) ears. We spent the entire weekend enriching his coffers and trying in vain to prove his theory correct but, of course, nothing of the sort happened.

We dutifully filed a report on this, which took him more than a few more billable hours to analyze and finally conclude that "maybe the test procedure was flawed."

Meanwhile, the other engineers, consultants, and lawyers had other ideas – naturally – about what tests would show us how to fix the intermod problems.

SEND LAWYERS, GUNS AND *LOTS* OF MONEY!

Early on, we found ourselves traveling around the market in a caravan of six carloads of station engineers, managers, Washington D.C. attorneys, and engineering consultants. The stories of those tests are legion, but perhaps you will enjoy a few of them and appreciate what it said about the state-of-the-art in those days.

First of all, just getting that many people into the field had its own issues, since each participant wanted to see each test and how it impacted their particular station. Keeping track of all them and their gear was not easy either.

For example, after one exhausting night of listening and arguing our merry band retired to the Perkins Restaurant on Riverside Ave in Minneapolis around 5 AM for some grub. While there, thieves broke into the one vehicle that held all the consumer grade test radios and stole them, which threw a monkey wrench into the testing.

GOVERNMENT AGENTS

Another time, we pulled up to one of George Werl's monitor points in south Minneapolis around 2 AM. The test involved turning off var-

ious IDS station transmitters to see if the interference to MPR's KSJN and my WCCO-FM went away.

As it turned out, there was a raucous party going on at a house across the street from where we parked. After we jumped out of the vehicles and started setting up boom box radios on folding card tables and putting on headphones, one of our group noticed a constant toilet flushing sound coming from the party house – apparently, they were girding for a drug bust after they saw our caravan.

At any rate, we ignored the party people until one young man came out on the porch and yelled "Hey, are do you guys have anything to do with KQRS going on and off the air in the middle of a song?" KQ Chief Engineer George Werl yelled back in a very officious voice "Yes! We're testing radios for the Federal Communications Commission."

And then, the kid on the porch really pissed off George when he yelled back "Well, can you make KQ go away and never come back?"

PERILS OF HOME VISITS

A later phase of the testing was to visit homes of people who had complained about interference to see if anything short of replacing their radios could be done to solve the problem.

Of course, that introduced some new variables to the project.

One stop in a tony Kenwood neighborhood in South Minneapolis involved a team of three people – Del Dayton, an engineer from WAYL-FM, Roger Anderson, from the FCC St Paul office, and myself, from WCCO-FM.

We were met at the door by an attractive, trendy, young married couple who escorted us to the bedroom where the problem radio was located. Del and Roger immediately dove into the problem with the radio (coiling up the antenna and power cord) while I stared around the bedroom.

There were mirrors on three walls and the ceiling, and the headboard of the bed was lined with sex toys, lotions and potions. It seemed obvious to me these people were sexual athletes!

In short order, the radio was deemed unworkable and we left the house. Back in the car I exclaimed "wow, those folks have some interesting things in the bedroom!" and the other two guys, engineers to the core, said "What are you talking about? We didn't see anything interesting and we're sorry we couldn't fix their radio."

At another fancy house on East River Road one evening, the FCC rep had to look the other way. The problem receiver was located in the teenage son's bedroom and, as we looked at the radio, we all noticed a triple-beam balance scale, a large bag of what appeared to be pot, and some other drug paraphernalia on the teen's desk.

The man of the house who showed us the radio did not appear to notice anything out of the ordinary. In any event, no one mentioned anything about the stash.

WHEN THE HUSBAND RETURNS

Mark Durenberger and I (without the FCC referee) went to another home and were met at the door by another attractive young woman wearing a seductive outfit.

She proceeded to tell us "the problem radio" was in the master bedroom.

We went into the room, which was very small, and decided that the only way to check out the radio was to lie across the bed to reach the radio on a small night stand. The woman stood in the bedroom doorway, watching us crawl across the



bed to start coiling up antenna, power cord or whatever and was flirting with us.

While draped across the bed, we suddenly heard a door slam and her composure changed from flirty to officious: "Honey, I'm back here (in the bedroom) with the nice engineers who've come to fix the radio." She called, and shortly thereafter in walked the husband to find two burly engineers lying across his bed, looking up and smiling rather weakly.

I no longer recall if we fixed that radio, but I do know that shortly after that home visit we retired to a local watering hole to have a beer and a good laugh.

A COUPLE OF LEGACIES

The Great IDS Interference Controversy, which began in 1979 when we lit up the antennae in downtown Minneapolis clearly caused "egregious interference" to several other stations.

Unfortunately for everyone, after several years of testing and looking for answers, we were still at the same place where we started. And that led to a protracted battle that enriched several consulting engineers and lots of attorneys for the next 10 years – and solved nothing.

However it was not a complete waste. There were two lasting legacies from this period in Minneapolis-St. Paul FM radio history:

1. The acronym RITOIE, which is a shortened version of Receiver Induced Third Order Intermodulation Effect. Dan Rieder of MPR coined the phrase in the early 1980's and it seems to have entered the RF Engineering vernacular shortly thereafter.

2. We formed great friendships with our fellow engineers, and we all learned a lot about RF measurements.

STA'S PILED HIGH

At some point in the mid-1980's the licenses for all five IDS-located stations, plus the licenses for KSJN and WLTE, had expired.

Everyone filed timely renewal papers, as well as filing protests against everyone else's renewals because of interference or harassment or whatever.

For the next six or seven years, until late 1992, none of us were operating with a license. While the attorneys raged, the reduced power operations and STA's for everyone seemed to be order of the day.. The FCC did not really seem to care, waiting for the stations themselves to sort things out.

And so they did.

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In our next installment, we find out how the IDS-located stations finally solved their RF problems and got back to full power.

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Steve Brown, aka the Radio Ranger, is now retired from WCCO-FM and enjoys back-packing in the Land of 10,000 Lakes. He has agreed to share his memories as part of a series chronicling how FM radio learned to improve their facilities and maximize coverage in Minneapolis and St. Paul. You can email Steve at: radioranger@comcast.net

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Return to The BDR Menu