Digging Up the AM Radio Graveyard

A spook-tacular look at the six haunted channels

By Nick Langan ·

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A spooky Victorian graveyard. Credit: David Wall/Getty Images

Nick's Signal Spot is a new feature in which Nick Langan explores RF signals, propagation, new equipment and related endeavors.

It's almost Halloween, so what better time to do some grave digging?

I recently used the term "graveyard" almost unconsciously in a Radio World article. It's classic radio jargon, referring to the six most crowded frequencies in the AM radio band: 1230, 1240, 1340, 1400, 1450 and 1490 kHz.

What's behind the name? As Loyd Van Horn's DX Central explains, just as a graveyard contains a large number of graves in a small area, a graveyard channel has a large number of stations operating on the same frequency.

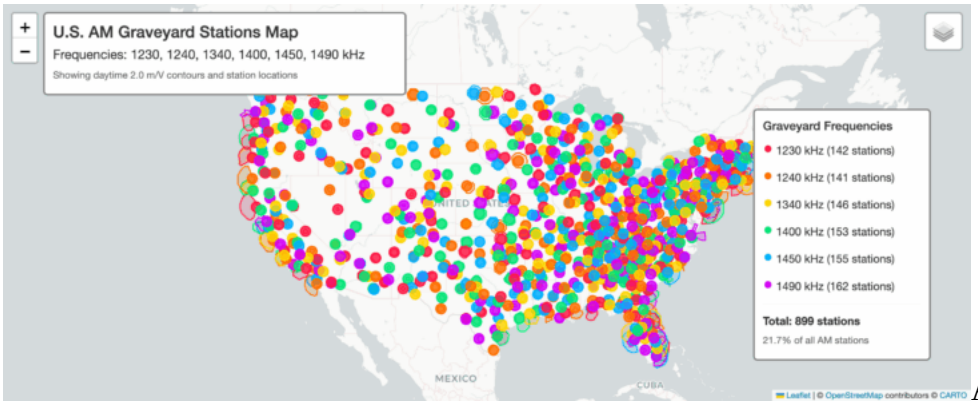
At night, this creates a truly spooky pile-up of stations, unless you are quite close to a transmitter of a graveyard station.

For an example, listen to this 2007 clip posted by JT Bullitt of a mix of signals on 1240 kHz at 1 a.m. local time.

As of data from this year, there are 899 graveyard U.S. AM stations, accounting for approximately 21% of all U.S. AM stations. 1490 AM has the most, with 162 U.S. stations.

Approximately 80% of the U.S. graveyarders run with 1 kW both day and night, which is the maximum amount of power the FCC allows for the stations it considers Class C AM frequencies.

I produced a map that shows the locations of these U.S. stations, based on their daytime transmitters and their daytime 2.0 m/V contours — or where their signal is projected to be strongest — from the FCC's data.



A map showing the location of the U.S. "graveyard" AM stations across the lower 48 states. Click for an interactive version.

How far does the graveyard harken back? And how far can these stations be heard?

The six haunted channels

The graveyard term itself appears to have originated from the long-distance reception community. As early as 1942, DX'er Norm Maguire in Albuquerque, N.M., remarked in the National Radio Club's DX News about the West Coast "graveyard" channels that stayed on all night long, including 1230 KGFJ(AM).

The six frequencies were formerly designated Class IV "Local" channels — as opposed to the "clear" channel stations that might be more familiar. The FCC described such a station as designed to render service "primarily to a city or town" and its adjacent suburban and rural areas.

This alignment resulted from the North American Regional Broadcast Agreement, adopted in Havana, Cuba, on Dec. 13, 1937, with Canada, Cuba, the Dominican Republic, Haiti, Mexico and the U.S. participating.

Prior to NARBA, engineer Mark Humphrey noted that the "local" channels were 1200, 1210, 1310, 1370, 1420 and 1500, limited to 100 watts. This was the result of the November 1928 Federal Radio Commission — the FCC's predecessor — reallocation.

The NARBA change mandated that local channels could operate with a maximum of 250 watts, both day and night.

AM engineering expert Ben Dawson noted that this was "back in the days before the employment of directional antennas and when propagation knowledge was pretty primitive." Consequently, the allocation standards for the use of those channels were "a bit more liberal than for the 'regional' and 'clear' channels."

This was particularly true for nighttime, Dawson said, since the stations were "nearly all allowed to operate with nighttime power the same as daytime, with no real even semi-scientific calculation of the night interference free service."

Frightening coverage

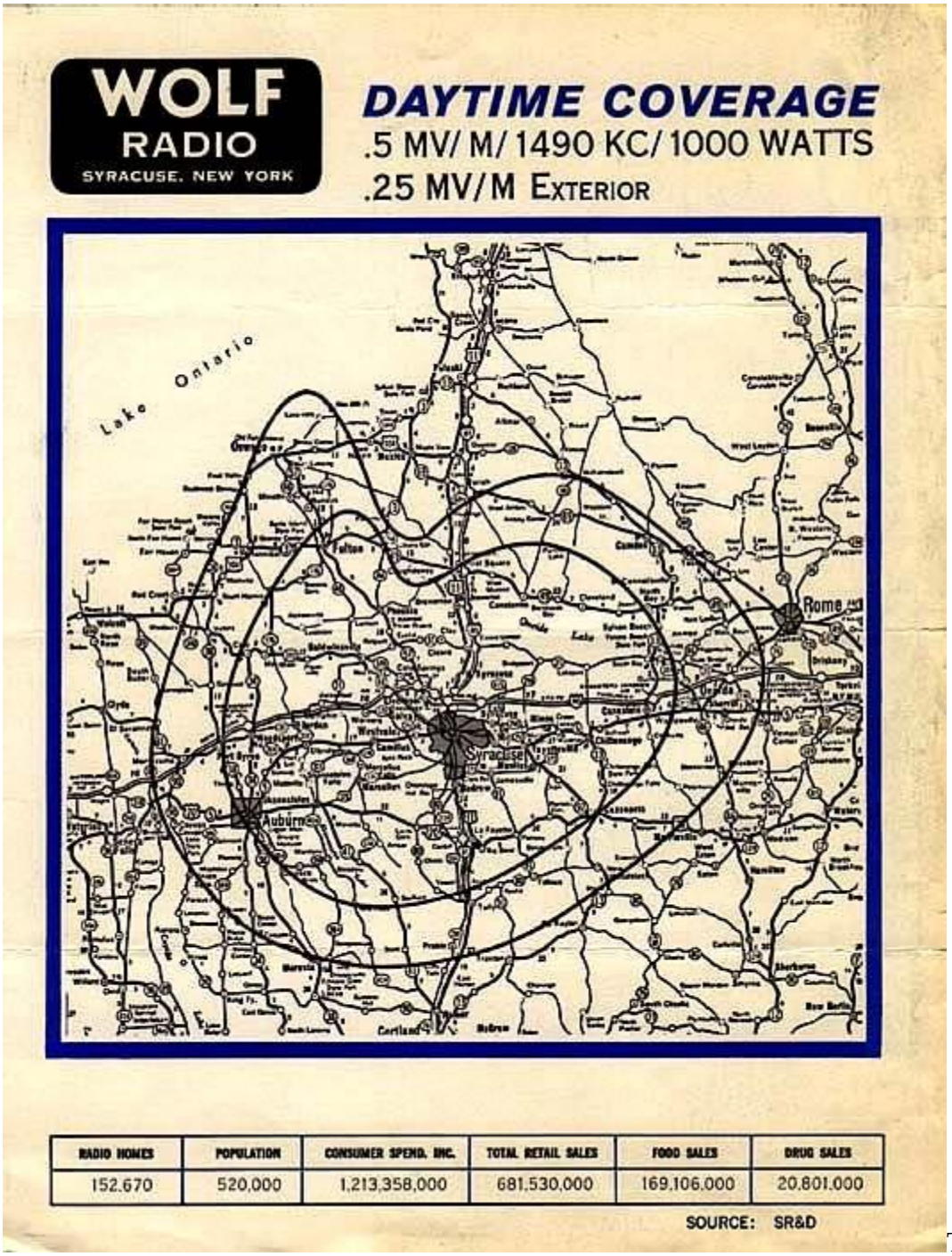
Interference for the "local channels" was a problem even in the early days. The 1929 report of the FRC noted "many channels" were "still overloaded." A total of 677 AM stations, or what were then known as "broadcast band" stations, were on the air on July 1, 1928.

To improve their signals, Humphrey explained that some Class IV stations invested in tall towers. Syracuse, N.Y.'s 1490 WOLF(AM), which began operations in 1940 at 1500 kHz as the city's third AM station, installed a 5/8 wavelength Lingo pole to make the best use of its limited power, Humphrey recalled.

A push to increase Class IV daytime power began in the late 1950s, particularly to overcome "noise" at night. An FCC docket included more than 150 separate comments, four-to-one in favor of power hikes, the Broadcasting Yearbook reported. The Community Broadcasters Association, representing approximately 500 Class IVs out of over 900 on the air at the time, argued that the FCC didn't go far enough to "come to grips with the economic plight" of low-power stations.

Ultimately, the commission recognized that Class IVs simply did not have enough signal strength to overcome urban and rural noise, as Dawson wrote for Radio World. In June 1958, the commission raised daytime power limits for the Class IV stations to 1 kW.

Humphrey noted that you'd find many ads for 1 kW transmitters in trade magazines published from 1958 into the early '60s."The Gates BC-1T, RCA BTA-1R and Collins 20V-2 were popular choices," he explained. "They could be powered down to 250 watts at night by reducing plate voltage by 50 percent — which caused plate current to drop proportionally, yielding 25% power output." Humphrey grew up in central New York and his nearby WOLF was one of the stations that took advantage of the provision.



The coverage area for Syracuse's WOLF(AM) from a 1960s photo, shown with a null toward CFRC(AM) in Kingston, Ontario, from WOLF's website.

As listeners moved from AM to FM approximately 50 years ago, "graveyard" licensees pushed for a night power increase to 1 kW. The FCC adopted the change in 1984, citing 177 comments in favor of a nighttime raise and explaining that higher power at night could help overcome existing reception problems.

Interference, by all accounts, only got worse as a result. Canada and Mexico followed shortly thereafter with nighttime power increases for the same frequencies and metropolitan areas steadily sprawled far beyond protected service areas — which Dawson argued were convoluted to begin with.

Scott Fybush summarized the band's interference far better than I could around the time nighttime IBOC on AM was being debated.

Still, that doesn't mean these signals can't travel lengthy distances.

Let's go trick-or-treating

1490 WVBG(AM) in Vicksburg, Miss., is a fairly typical AM graveyard operation, running a news/talk format. It operates with 1 kW both day and night. Mark Jones, the station's owner, said that typically at night, the AM has coverage radius of 10 miles.

In September, the signal was captured remarkably clearly in the Lapland region of Finland, approximately 4,700 miles away by accomplished medium-wave DX'er Jim Solatie.

Jones was astonished to receive Solatie's report, as he explained in an article published on the station's website about the feat. You can hear the remarkably clear legal ID that Solatie recorded.

What sort of witchcraft was at work here?

First, skywave propagation during the night, or the propagation of radio waves refracted back toward the Earth from the ionosphere, made the reception possible.

But Solatie wasn't just using an ordinary setup. He captured WVBG with an antenna wire over 3,000 feet long in length, pointed toward the U.S. East Coast. It is one of 14 antennas available at Aihkiniemi, described as the ultimate AM DXing base in Lapland.


In Lapland, Finland, the Aihkiniemi DX base in November 2020. Credit: Mika Mäkelainen

WVBG is now among the 439 different graveyard AMs Solatie has verified from the U.S. and Canada since 1996.

While Solatie's effots are prolific, he was quick to point out that Norwegian DX'er Odd-Jorgen Sagdahl and Finnish DX'er Hannu Niilekselä have even more verifications of AM stations from North America, some 2,700 receptions total, with about 600 each from the graveyard.

Medium-wave enthusiasts are quite fond of DX'ing these channels. The time of year and auroral activity can greatly influence reception. On nights with high auroral or Northern Lights activity, the skywave effect is diminished. As a result, graveyarders that might ordinarily be engulfed by interference can sometimes come in surprisingly clear.

Don't be scared

They're often small, and limited in coverage, but Humphrey noted successful AM graveyard operations in his native Empire State.

Proximity to the center of an urbanized area was and is still key, he said.

WOLF had lofty Arbitron ratings in Syracuse with a top 40 music format, which Humphrey recalled in the early 1970s while attending high school in nearby Baldwinsville. Its tower site is approximately a mile from the downtown Syracuse business district.

1230 WECK(AM), licensed to Cheektowaga, is another example he cited, with its transmitter west of the New York State Thruway close to Buffalo's population center.

Graveyarders like WVBG and WECK have also taken advantage of the FCC's FM translator provision, which comes in particularly handy at night. WVBG can be heard on 107.7 FM in Vicksburg. WECK operates three different FM translators in Lancaster, Tonawanda and Cheektowaga.

They may be plentiful. And trying to hear one after dark might be akin to hunting for a ghost.

But if you dig a little deeper, the AM graveyard isn't so scary after all.

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