

UNUSUAL ANTENNA SYSTEMS
by Cary Simpson

This is a series of discussions concerning broadcast station antennas that are not the ordinary type.

Included will be a section dealing with shared towers, where two or more AM stations make use of a common tower or towers. Next will be a section about stations using tall towers of the so-called "Franklin" or sectionalized type to get super-efficiency.

The opposite extreme will be discussed, with relation to some very old stations that are still using terribly inefficient antennas of the type that were in use back in the '20s and '30s, in some cases because they allowed other stations to encroach on their coverage so they can't improve their facilities.

Then, we'll discuss stations that deliberately put up inefficient antennas to enable them to squeeze into a very tight location. And, finally, a group of very unusual situations - stations that are Class III daytime and Class IV night. There are only four of them in the country.

And we'll end up with a station that has three directional patterns, not just one or two like most fulltime directional stations.

SHARED TOWERS

There have been several stories about the shared towers of the AM stations in Honolulu. A number of Hawaiian stations share the same antenna tower. Likewise, stories have been written in technical publications about Canadian stations that use the same towers, sometimes for complicated directional patterns.

The use of a common tower for two or more radio stations requires careful decoupling and isolation to avoid interaction. For example, WNEC-660 and WCBS-880, two 50kw clear-channel stations in New York City, share a tower located out in the center of a saltwater bay near "The Big Apple." The 521-foot tower effectively serves both of the stations, and it has been in use for well over 30 years.

Back in the days before the FCC ruled that common ownership of two AM stations in the same city was illegal, there were numerous combinations of this type. And, in many of the cases, the co-owned-and-operated stations used common transmitter buildings and towers. An example of this was Buffalo, NY, stations WGR-550, 5kw, and WKBW-1520, 50kw, which were both owned by the same firm, and whose tower systems even today use the same location. WILM-1450, Class IV, and WDEL-1150, 5kw DA-N, both operated under common ownership in Wilmington, Delaware, and one of the WDEL towers of its directional array was also used by WILM. This is not presently the case, since the stations are no longer under common ownership.

WBAP, Fort Worth (820 kHz, 50 kw) and WFAA, Dallas (570 kHz, 5 kw) share a common site. They had to move sites in the late 1960's, and both stations still are together. In the days before the FCC required companies to sell one of two stations owned in the same city, WBAP and WFAA jointly owned KGKO, Dallas, which operated on 570 kHz. WBAP and WFAA shared time on 820, and KGKO was fulltime on 570. When the "dupoly" rule required the change, a plan was inaugurated by which KGKO ceased to exist, and WBAP operated half of the time on 820, and the other half of their hours on 570. While WBAP was on one channel, WFAA was on the other.

Several years ago, the owners of WBAP paid the owners of WFAA to relinquish their half of the hours on 820, and WFAA is now operating fulltime on 570, while WBAP is fulltime on 820.

SUPER-EFFICIENT TALL TOWERS

A number of stations use "Franklin" or sectionalized antennas with insulators part-way up the tower. KDKA-1020, Pittsburgh, PA, 50 kw, uses a 718-foot sectionalized tower. Lightning ruined the insulator midway up the tower in the summer of 1977, and the station ran with a temporary "cage" antenna for several months while repairs were made. The doghouse was completely ruined by the same blast. WHO-1040, Des Moines,

Iowa, also uses a Franklin antenna, with a tower height of 737 feet. WOAI-1200, San Antonio, Texas, 50 kw, uses a sectionalized 532-foot tower. KSTP-1500, St. Paul, Minnesota (50 kw), utilizes a Franklin antenna during daytime hours and a directional antenna from a different site nearby for night hours.

Clear-channel stations aren't the only ones to use Franklin antennas. WNEF-1290, 5kw, Binghamton, NY, uses the WENG-TV (ex WNEF-TV) tower for a Franklin antenna, which delivers a highly efficient signal. WKY-930, 5kw, Oklahoma City, OK, uses a Franklin antenna for daytime, and a directional at night.

"LOCKED-IN" FACILITIES

Some stations were built many years ago and didn't keep their facilities updated, but allowed them to remain as originally built. As other stations were built on the same or adjacent channels, it became impossible for them to improve their facilities.

This is the case with stations such as KGPF (now KKT), Los Angeles, a Class IV station on 1230 kHz, which operates with a 60-foot inverted-L antenna and a rooftop ground. The station can't improve its facilities because stations have cropped up on adjacent channels as well as 1230. It went to 1 kilowatt but couldn't increase the tower height and efficiency.

KPPC, Pasadena, California, operates on 1240 kHz with 100 watts two days weekly, during which time other stations nearby must cut their power. KPPC has a 120-foot "T" antenna and a rooftop ground.

WCRW, Chicago, has an 85-foot tower, which is top-loaded, and a rooftop ground system. WCRW shares time on 1240 kHz in Chicago, and its coverage is much lower than the other two stations with which it shares time. WEDC has a 210-foot rooftop tower and WSEC uses a 513-foot rooftop tower, although WSEC must cut back its radiation to the same as it used to achieve when they used a 189-foot tower with rooftop ground.

KXA-770, Seattle (1kw limited-time, essentially daytime only), operates with an old-fashioned "T" antenna 116 feet long and a rooftop ground.

KIEV-870, Glendale, California, has been trying to improve its facilities for many years. They use a "T" antenna and a copper plate as a ground. It is very inefficient.

WSAJ-1340, Grove City, PA (100 watts), operates with a "T" antenna and a counterpoise ground system.

SHORT TOWERS TO SQUEEZE INTO A TIGHT PLACE

Some stations proposed a "short tower" to fit into a very tight allocation. KLID-1340, Poplar Bluff, MO, Class IV, uses a 100-foot tower to achieve a curtailed signal. WJBD, Salem, Illinois, uses a 110-foot tower on 1350 kHz, which is at least 40 feet shorter than other stations on that channel.

WENZ-1450, Highland Springs, VA, Class IV, uses a 100-foot tower to keep its 25 mv/m contour away from WLEB-1480, 5 kw in nearby Richmond, VA, just a few miles away.

At the upper end of the dial, a number of stations use short towers, which will increase the amount of skywave radiation, which should help DXers. Several examples are KAMX-1520, Albuquerque, NM, with a 96-foot tower; WELA-1530, Elizabeth, NJ, 103 feet; WVAB-1550, Virginia Beach, VA, 95 feet; KNSM-1580, El Dorado Springs, Arkansas, 90 feet; KDEX-1590, Dexter, MO, 98 feet; and KTTM-1600, Trenton, MO, 95-foot tower.

CLASS III DAY, CLASS IV NIGHT, AND A DA-3!

Class III stations are on the so-called "regional channels" and must sign off at sunset unless they utilize directional antennas to protect the other stations on their channel, as well as the few very-old stations that have always been non-DA at night. There are a few instances where stations have been permitted to operate on these regional channels with Class III facilities daytime, and then a very low power, non-directional at night, Class IV operation, just like the "local" channels, with no protection against interference at night.

Two stations operate with 1 kw day and 100 watts at night. They are WFPB-910, Middletown, Ohio, and KSOK-1280, Arkansas City, Ark. The granting of these two 100-watt-night operations resulted in a large group of daytime stations applying for the same facility, which would be much less expensive than a directional antenna. However, the FCC decided in 1948 not to consider any more of these 100-watters.

In addition, WCAN, Camden, NJ, and WJLK, Asbury Park, NJ, operate with 1 kw day and 250 watts night on 1310. These stations were placed on 1310 in an attempt by the FCC to end a monstrous time-sharing plan in which they, as well as WTNJ, Trenton, NJ, each operated a few hours every day. (WTNJ is now on 1300.)

WAMS-1380, Wilmington, Delaware, 5kw day, 1kw night, operates with three directional antenna patterns (one for night), two of which are used during the daytime hours, depending on which of the two "share-time" stations, WAWZ-1380, Zarepath, NJ, and WBNX-1380, New York, NY, is operating at the time. WAMS much protect each of them, and they are directionalized away from WAMS. WAWZ is much closer to WAMS than WBNX is.

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