

PRE-HISTORY: DETROIT'S EXPERIMENTAL AMPLITUDE MODULATION (AM) "APEX" STATION, W8XWJ

The history of FM broadcasting in Michigan ironically begins with an AM station, W8XWJ, which debuted on January 29, 1936; over five years before the first FM broadcasts were made in the state. This station, one of a dozen such "ultra-high frequency" stations on the air nationally and the only one licensed for experimental broadcasting in Michigan, was operated by WWJ in Detroit. These stations were called "APEX" stations. The term was explained in a December 1, 1935 article in *Broadcasting* as a station category similar to the more familiar "clear channel" or "regional" station types and referred to these AM stations—all experimental—operating between roughly 25 and 42 MHz. A February 1, 1936 article in the same publication clearly demonstrated that broadcasters really didn't have a business plan for what they would ultimately do with these high frequency AM stations but it does state: "...broadcast engineers are intensely interested in the new 'staticless' transmitting system applicable to the ultra-short waves recently demonstrated by Prof. Edwin H. Armstrong of Columbia University, inventor of the super heterodyne circuit. MAJ Armstrong's system, which RCA has been testing atop the Empire State Building in New York, employs 'frequency modulation' which can be utilized on the wide-band ultra-shorts but cannot very well be adapted to the relatively narrow-band intermediate waves between 500-1500 kc." Of course, as we will see in this study, while Armstrong would soon be evicted from the RCA facility, his subsequent experiments at Alpine, New Jersey caused increasing excitement among broadcasters and their interest in FM became aligned with their need to explore high frequency transmission and the unique challenges broadcasting on these "ultra-shorts" posed.

The challenges included mounting high gain antennas atop mountains and skyscrapers where they would be coated with ice and buffeted by winds and where the party was often strictly BYOP (Bring Your Own Power). A web site that discusses many of these challenges is the site of the historic East Coast Yankee FM Network, www.ggninfo.com/yankee1.htm. Also see the article in the January 27, 1947, edition of *Broadcasting* Magazine which summarizes points made by MAJ Armstrong at one of a series of FM clinics at Radio Engineering Labs (REL) presented to a gathering of about 100 radio engineers. (Note: FM was officially introduced to the world in November, 1935, through a paper written by Major Armstrong called *A Method of Reducing Disturbances in Radio Signaling By A System Of Frequency Modulation*).

APEX stations provided a means to understand and solve these problems. Given the fact that W8XWJ was never expected to be heard by anyone other than the experimenter daring enough to build a receiver capable of tuning its dizzying "ultra high frequency" (31.6 MHz !!), its first broadcast was a big production. (Note: it appears the main source for radios to receive these APEX frequencies was to build them, although I did find a web posting from William Fizette, K3ZJW, containing reference to a "Raco Super Clipper" radio that could be purchased fully assembled that tuned these frequencies). The experimental broadcasts of stations like W8XWJ foreshadowed in a fascinating way the high frequency transmitter's future role as a studio-to-transmitter link (STL) as well as future FM networks, where stations would link by receiving and rebroadcasting each other off the air. Based on splashy *Detroit News* accounts of the event, the inaugural broadcast of W8XWJ began when WWJ sportscaster Ty Tyson and *Detroit News* Aviation reporter James V. Piersol boarded the newspaper's airplane, "The Early Bird", and, while circling WWJ's new transmitter site under construction on 8

Mile at Myers, relayed a description of the site from the plane's on-board radio to W8XWJ located on top of the Penobscot Building. It was then received off the air from W8XWJ and re-broadcast by WWJ.

In April 1940, AM broadcasting on W8XWJ (by then operating at 42.060MHz, immediately below what would be the new commercial FM band of 43-50MHz) ended and the station went dark as it awaited a construction permit allowing it to retool for commercial FM operations. (Note: While a few APEX stations converted to experimental Frequency Modulation in the late 1930s, and while there were other experimental FM stations operating on these frequencies as well, such as Armstrong's W2XMN, the Detroit station only broadcast in AM—I make this point because W8XWJ is sometimes referred to as an FM station or as a pre-commercial call sign for W45D - like 8MK was for WWJ - and that is in error). The *Detroit News* kept its readers in the loop as it described how it began installing "special acoustical treated" studios and studio equipment designed for FM. Then on October 31, 1940, Detroit joined 11 other cities in receiving one of the first 15 commercial FM construction permits. Within three months that number would be 29 including one for a second Michigan station, also licensed to Detroit. A front-page article in the *Detroit News* on November 1, 1940, told the public about the FM license and indicated that the new station would carry commercials and would operate largely independently from WWJ, that is with separate and unique FM programming.

Interestingly, had the *Detroit Evening News* not been an initial applicant for an FM license, they likely would not have been Michigan's first FM broadcaster. That is because, as reported in *Broadcasting Magazine* on March 24, 1941 and *Radio Daily* May 9, 1941, just a few months after the first licenses were granted, a debate that is nearly as old as broadcasting itself began to rage anew. The FCC sought to study the effects of newspaper cross ownership of broadcast stations and froze for a time all FM licenses sought by newspapers (FCC General Order 79). Of course, by then the Detroit station had its construction permit and was preparing for test transmissions. By November 1940, it had installed the 3kw Radio Engineering Labs (REL) exciter (full power would be 50kw vertically polarized) and in December 1940, the station was assigned the call sign W45D (I discuss these unusual call signs later in this study). All that was needed was the government go-ahead to fire up the exciter and start test transmissions.