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Amateur, Shortwave, AM/FM/TV, WiFi, Scanning, Satellites, Vintage Radio and More

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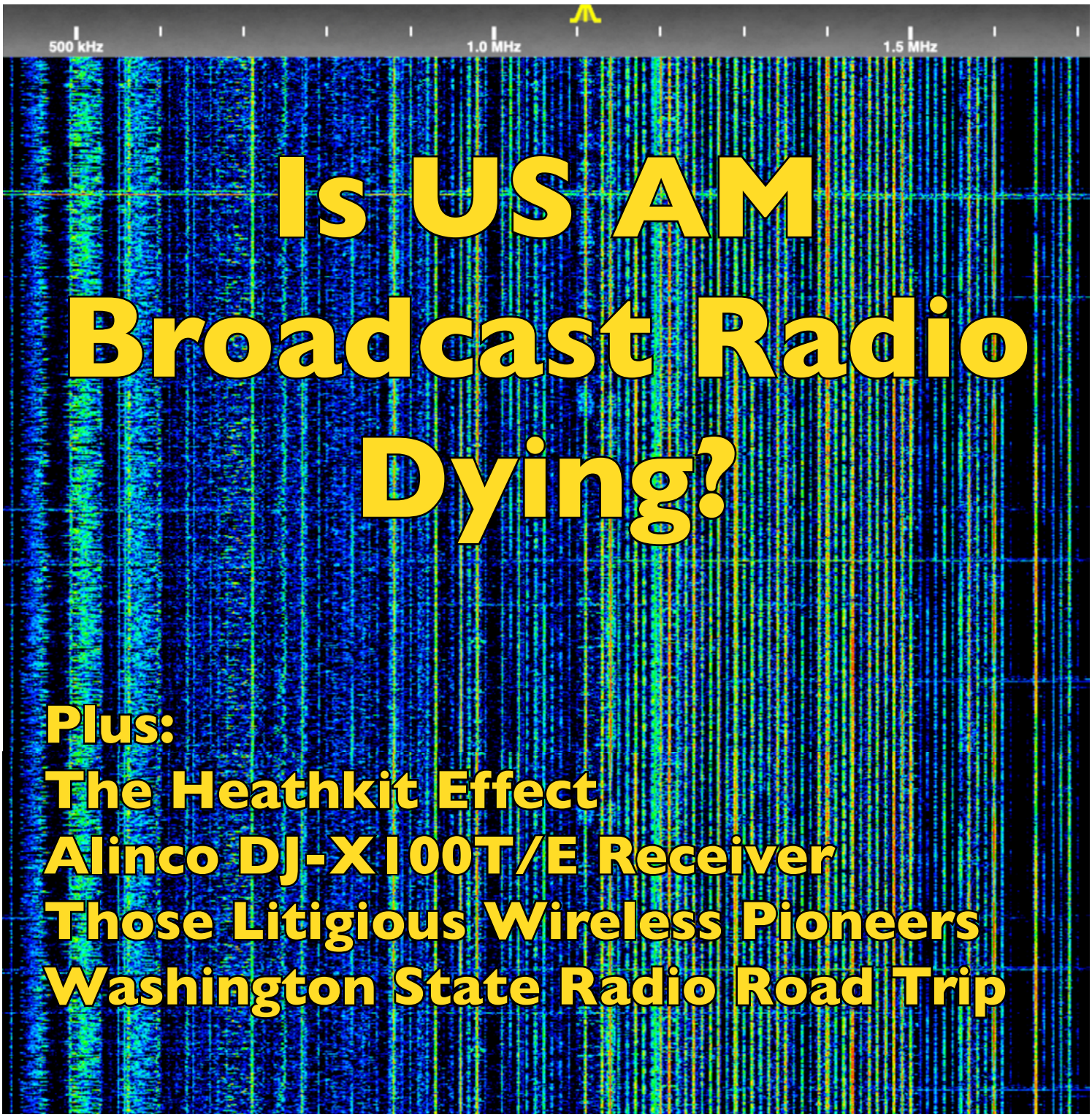

Is US AM Broadcast Radio Dying?

Plus:

The Heathkit Effect

Alinco DJ-X100T/E Receiver

Those Litigious Wireless Pioneers

Washington State Radio Road Trip

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On the Cover:

The US medium wave band as seen on a KiwiSDR receiver based in the National Quiet Zone in Monterey, Virginia, July 1, 2025. (KS4ZR photo)

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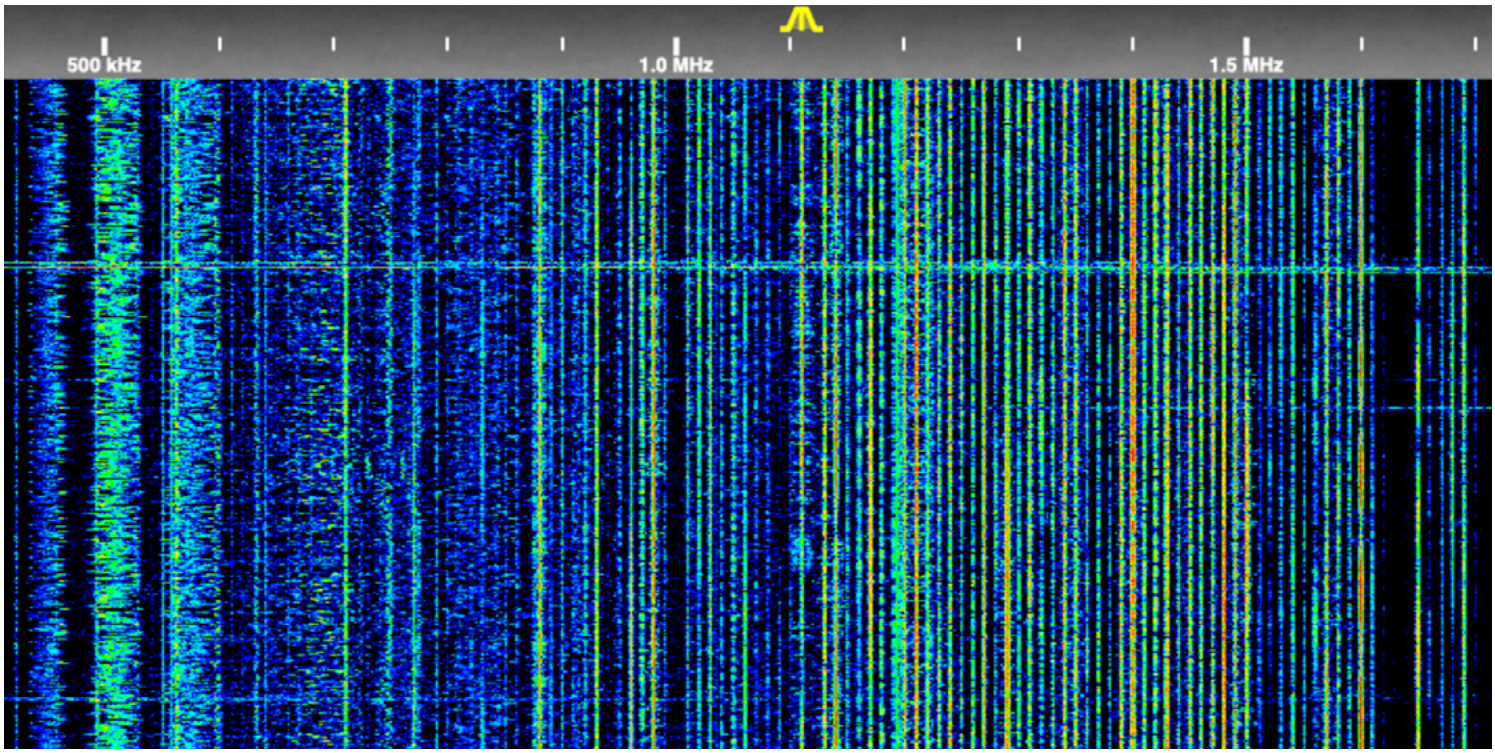


The US medium wave band as seen on a KiwiSDR receiver based in the National Quiet Zone in Monterey, Virginia, July 1, 2025. (KS4ZR photo)

Is the Death of US AM Broadcast Radio Exaggerated?

What We Know and One Key Thing We Do Not

By Frank M. Howell, PhD K4FMH

The famous Mark Twain line offered in a letter to a newspaper editor who published his obituary seems to crop up frequently. So many like to say what the future holds based on either some highly publicized single event or a short-term trend in observations. Then subsequent reality proves them wrong. We read and hear much about the demise of AM broadcasting in the U.S. The best available public evidence on the state of AM broadcast radio is that it is not dead but is simply changing, along with the entire broadcast media, including FM radio and terrestrial television. There is one key piece of data that is not public, but we need to know it to forecast AM radio's future in the U.S.

In the following study I look at three central aspects of the issue: the number of station licenses over time, the audience magnitude and media market patterns, and investments in that audience through advertising dollars. I additionally show how these national trends are shaped by multiple local media markets rather than being a homogeneous national pattern. As the reader will see, AM terrestrial radio is far from dead.

What we do not know from public data is ad revenue to AM stations by media market. Clearly, audience penetration ("reach") is related to ad revenue on a per-station basis. Nielson does not publish ad revenue specifically for AM radio, independent of combining it with FM radio, so that key outcome for AM radio viability is unknown to the public. My research here, however, shows no signs that the precursors to ad revenue—number of licenses or audience reach—is at a critical level nationally. I do find that there are signs of a market shakeout in some media markets which I identify in this study.

I will review the claims that AM radio is dead to identify the predicates used to justify the gloomy forecast. We will see that none are based upon generalizable data to the nation.

Claims that AM Radio is Dead

There are many claims that AM broadcast radio in the U.S. is dying or even outright dead. I hasten to say up front that so many who base their forecasts on short cycle rates assume that they will hold well into the future. They tend not to. See Kavanagh et al. (2021) for examples of why.

Here are some highlights illustrating the claims with the predicates used to justify them.

Highly publicized station closings. A highly publicized closing of AM stations by the author Stephen King led to numerous stories about the industry's demise, including a prominent one in the *New York Times*. "But now King, 77, is getting out of the radio business, having covered steady losses that the stations said had run into millions of dollars

over the years." (Taylor, *New York Times*, Dec. 3, 2024) This led to a spike in Google searches about Stephen King in the Business & Industrial category in November 2024 with cascading stories throughout various media outlets. (Analysis not shown here.) This is just one popular example of singular events shaping future prognostication about AM broadcast radio. We will see that it was more likely because his stations were in Bangor Maine, a weak media market for AM radio.

Over-generalized personal experience. Some base their forecasts on their "personal windshield," as I call the fallacy of using only what an individual observes as a window to the entire world without regard to larger sets of observations that reflect the views or behaviors of a much larger collective. For instance, a ham radio operator wrote an op-ed article in 2019 with this assessment:

"Today, my daily routine includes downloading the latest podcasts before my run, asking Alexa for the forecast, and catching up on the latest news throughout the day through streaming audio, often accompanied by video. Although I still own a shortwave receiver — in the form of a module in my ham radio transceiver — terrestrial AM radio is no longer part of my life. And I'm not alone." (Bergeron 2019).

As we will see below, Bergeron is not alone but he does not run in as large a crowd as his 2019 op-ed in a popular electronics magazine suggests.

He further says that the last stop for AM radio is in "mobile radio," but it will not last as automobiles are becoming internet hubs. His listening to radio during "drive time," he says, will soon go the way of shortwave listening.

Question of AM in automobiles. The political and regulatory debate over AM radios being in new automobiles is indeed a vibrant discussion. Congress has the "AM Radio for Every Vehicle Act" with provisions for the NHTSA to require new autos to have this capability. The logic of it flies in the face of those who say AM's time has gone as the audience is far from nil. In addition, AM radio has existed in a system involving national security and safety through the Emergency Broadcast System (Gitlin 2024).

This does not stop naysayers on the future of AM broadcasting. Jacobs Media wonders if it is enough to "save AM radio in cars" since "no technology, platform, or medium is safe when the automakers have the right of way. And they almost always do." (Jacobs 2024) Thus, some leverage the adage that the powerful always win as the fulcrum upon which they base their future vision.

Sentimentalism surrounding the AM medium. Some base it on sentimentalism, the first radio technology widely adopted over a century ago is difficult to see become passe. A popular photographer who also loves radio gave both a sentimental view buttressed with some observations about the industry:

"I get it. AM radio is a 100-year-old technology. FM is better. Satellite even better with no commercials. Some of my co-workers listen to podcasts on their way into work. Audacy, the third largest radio company in the US just emerged from bankruptcy. Auto manufacturers are talking about not even putting an AM radio in cars anymore. And I'm not sure how many commercials for ED drugs and tax relief it takes to keep paying the electric bills for a 50,000 watt AM transmitter. I don't think AM is dead, but it's certainly dying. And that makes me misty." (J.R. Smith 2024).

Another writer, this time a humor columnist, published an op-ed in a Maine newspaper with this palliative care statement:

"You had a great 100-year run, AM radio, and your demise is breaking my heart…Why? In part, because of the emergence of electric vehicles…It's regrettably true that the economic and cultural heyday of AM radio is well behind us." (Purcell 2024)

Miscellaneous Random Events. One of the most practical set of reasons to explain the celebrated closing of AM stations is by an online moderator of a forum called Radio Discussions. David Eduardo posts this summary:

"I can't cite a count because I don't think there is one. Stations turning in their license just tell the FCC 'No more.' The reasons may be a variety of things:

- Owner died, station was a one-man show and nobody in family wants it, and it can't be sold.
- Land is worth more than the station and moving would be too costly / hard to do due to zoning.
- Landowner terminates lease.
- Station is not profitable, and owner can't find a buyer.
- Catastrophic failure of equipment / fire at studios and not fully covered. Cost too great vs. potential profit.
- Battle of partners; station goes silent, and nobody manages to file necessary papers.
- FCC fine / short term renewal or other Commission issues make it to uncertain and owner just wants to get out."

As we will see below, specific radio markets differ, sometimes widely, in their use of AM radio. What causes a license cancellation in one market may simply not be a significant problem in another. This may vary greatly from one station location to another within the same media market as well. As David Eduardo wrote, there may be a variety of things that shape ownership of an AM broadcast station but there does not seem to be one single thing. This hardly portends for a nationwide death-and-dying scenario that one can put their finger on.

Long term perspective. The comments offered by Katie Thornton on a PBS interview gives a broader historical perspective, typically overlooked when considering, say, a popular author like Stephen King suddenly getting out of AM broadcasting:

"And I think really since the inception of broadcast, you know, popular broadcast radio, there have been sort of rumors of its death, rumors of the death of radio for almost 100 years now. People said that commercials on the radio were going to kill radio. People said FM would kill AM. TV would kill AM. The internet would. These are still, you know, they give AM a run for their money. But AM really

holds its own. It's still really influential." (Thornton 2023).

Very few of these claims have predicates that are based upon observable facts that rise to large groups of stations, their audience, or advertisers who invest their dollars in using radio to reach their desired market. Some point to aspects of local media markets that may shape AM broadcasting viability. I now turn to the best available public data on those elements of the issue where we will see quite a different picture and, perhaps, an alternate explanation.

Examining Key Elements of AM Broadcasting

If AM radio is truly dying, we would expect to see several things. The number of licensed AM stations would decline, especially by historical comparison as well as relative to FM stations. Many say FM offers superior fidelity to the listener and withstands the dreaded "static" of both households and autos (especially EVs). If conditions that inhibit AM broadcasting are the same for FM stations, then it is perhaps an issue for both modes of transmission. (That would mean that perhaps both AM and FM radio is on the decline.) Moreover, we would expect the trends in their respective license numbers be opposite over time such that FM is growing while AM is declining, if AM is losing out to FM broadcasting. In addition, we would anticipate that the annual fluctuations in AM versus FM station licenses to be much more volatile for AM than FM.

We would also expect the audience reach for AM radio to be in decline. If the audience share is not declining, then it is not an indication that AM broadcasting is losing its place in the media market. Therefore, ad revenue would be on the decline for AM as a result since audience reach is a driver for advertising cost. Unfortunately, there is no public source for ad revenue specifically for AM radio as it is universally reported for AM and FM radio together (see Taylor 2024). This is one key variable that we do not have available in this study.

Finally, these are national trends. Often national patterns can be driven by localized market change. We compare the available data on broadcast licenses for both AM and FM in Nielson's designated market areas (DMA) as well as the audience reach for them as recently published by Nielson (2023). We use these recent Nielsen data to see how the national data are influenced by a few local markets. If there are significant spatial patterns in license cancellations or audience reach among DMAs, then we may find that it is a media market shake-out where some markets are more challenging for AM broadcasters than others. Should these patterns also hold for FM broadcasting, our conclusion would be that these market conditions are not unique to AM radio.

Number of Station Licenses Over Time

Using FCC data, AM and FM stations licensed since 1922 through 2020 are in **Table 1**. The decadal rise in AM stations since 1922 shows the post-WW II boom, growing from 30 to 2,144 by 1950. The emergence of licensed FM stations began this year with 691. The key data point to emphasize is that the U.S. has had over four thousand AM stations in operation since 1970. It was the year 2000 when commercial FM licenses surpassed AM stations.

United States Broadcasting Station Totals

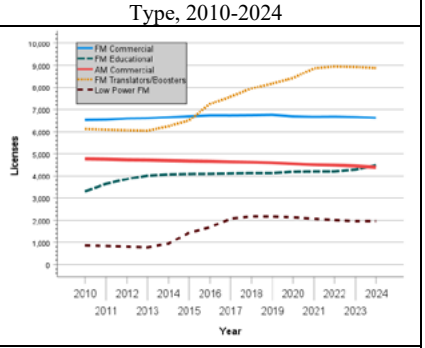
		FM		
Date	AM	Commercial	Educational	Low Power
1922	30			
1930	618			
1940	847		3 (Apex band)	
1950	2,144	691	62	
1960	3,483	741	165	
1970	4,288	2,126	416	
1980	4,689	3,390	1,156	
9/30/1990	4,978	4,357	1,435	
9/30/2000	4,685	5,892	2,140	
9/30/2010	4,784	6,512	3,251	864
9/30/2020	4,560	6,704	4,196	2,143

Table 1

The emergence of FM educational stations, also launched in 1950, has grown to be on par with AM stations (4,196 to 4,560). We will see that this license has continued to prove popular, especially with recent networks of non-profit, religiously oriented programming (e.g., Educational Media Foundation). When the FCC authorized low-power FM stations in 2009, their license base grew quite a bit as well.

Therefore, AM station licenses have indeed declined by about 400 from their peak in 1990. But let us look more closely in the recent decade or so. I have extended the time frame in **Figure 1** (below) upward from 2010-2024, the latest FCC station data available. Here is the take-home result regarding the number of station licenses. There are

Figure 1. Number of Broadcast Licenses by Type, 2010-2024



Source: https://www.radioworld.com/news-and-business/business-and-law/am-station-totals-continue-to-erode-in-the-u-s.

Figure 1

about 1,500 more FM stations than AM ones. But the trend is largely flat with only a slight downturn in the trend for AM stations. This is hardly in line with the personal windshield view based upon, for instance, Stephen King dropping his four AM stations in Maine. We will see that there is a local market explanation for AM stations in Maine not doing well in recent years. As has been the case since 1970, there are still over 4,000 AM station licenses on the books in the U.S. And while FM has grown slightly, it is largely also stable at around 6,500 stations over the past fifteen years. These patterns are not consistent with the fundamentals of AM station license cancellation widely across the U.S.

The most change involves the decided growth in FM translators/boosters and, to a lesser extent, low power FM licenses. FM translators rebroadcast a primary AM or FM station's signal on a different FM frequency, typically to expand coverage or fill in reception gaps. Boosters may be on the same FM frequency as their content-supplying FM station to enhance signal reception. While there is not an exact number, according to the FCC, one estimate is there were about 2,800 FM translators relaying AM broadcast stations in 2020 (Stine, 2020).

Yes, the FM translators do directly affect AM stations. Indeed, some writers, such as Dick Taylor, bunch all FM "signals" together to seriously shadow the size of the AM station market (Taylor 2024). But this same writer ends with a mantra that it is the content that matters so it is important to understand that an FM translator/booster that has programming originated by an AM station is still an AM station's content.

I do not bunch all FM licenses together as we do not have the data to ensure that we fully understand their connections to AM or FM-commercial stations. But if AM radio is in systematic decline, we should see predictable fluctuations in the number of licenses year-over-year.

In **Figure 2,** I present these data reconfigured as percent change from year to year (this necessarily omits 2010 as the original base year for change calculation). This set of trend lines puts the relative changes in AM vs other FM licenses into perspective over the fifteen-year horizon. They are relatively flat with FM growing on the positive size of the zero-reference line and AM on the negative. The most noticeable downward change, however, for AM licenses is from 2022-2024. Portending the future? Let us evaluate that after examining all the data.

The rise of educational FM stations started around 2013 and rose dramatically for the next few years, spiking in 2016 but having a secondary rise in 2021. Referring to Table 1, these licenses had already grown substantially from 1990-2010 so this trend is a continuation rather than a sudden growth spurt. In contrast, lower power FM experienced its rapid rise from 2013-2017 and has declined unto a period of loss since 2020. The greatest volatility in broadcast licenses in these data involve low power, translator FM operations, not AM or FM broadcasting *per se*.

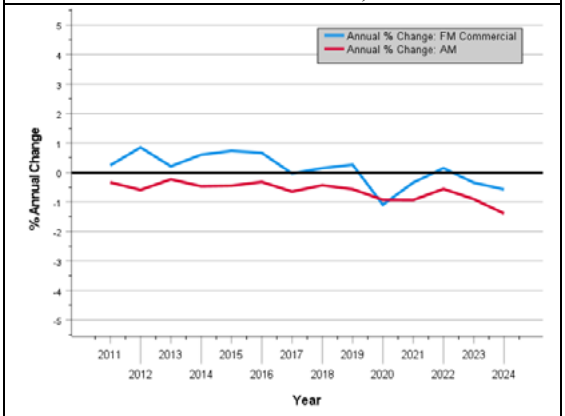
To further emphasize the fundamental pattern for AM

Figure 2. Percent Annual Change of Broadcast Licenses by Type, 2010-2024

Source: https://www.radioworld.com/news-and-business/business-and-law/am-station-totals-continue-to-erode-in-the-u-s.

Figure 2

Figure 3. Percent Annual Change in Broadcast Licenses for AM and FM Commercial, 2010-2024



Source: https://www.radioworld.com/news-and-business/business-and-law/am-station-totals-continue-to-erode-in-the-u-s.

Figure 3

broadcast licenses, **Figure 3** highlights just AM and FM commercial data for this period. The essential pattern here is that both AM and FM licenses have experienced loss since 2019. The losses of AM stations in 2020 onward parallel by those of FM licenses. In other words, FM broadcasting experienced its share of losses, too. This does not speak in favor of AM losing out to FM station gains. There will be more analysis of this comparison below.

In summary, AM station licenses have numbered over four thousand since 1970 as has commercial FM since 1990. The predicate that AM broadcasting is in a "dying phase" is not consistent with trends in the number of stations licensed. There have been small losses in AM totals, on the magnitude of 8.4% over the half century 1970-2024 period. There has been a 7 percent loss (168 stations), however, in the 2020-2024 period. This compares to annualized rates of 0.15% to 1.75% over the longer horizon so the recent losses are not trivial. But they do not represent death-and-dying unless they continue. Short-term rates, like those over a four-year period tend to not remain constant over longer horizons (Kavanagh

et al. 2021). We will see additional data on these prospects.

Radio Audience Levels

To reach an audience, there must be a means to receive the signal, whether it be in the household, automobile, or the famous portable radio. There have been changes in household receiver ownership, a measurement that has a long history. The data for 2008-2020 in **Figure 4** show that the average number of radios has declined. This shows a narrowing in the options for the radio audience but also may be a focus on the diversity of reception means as online streaming of content gains a foothold.

The average number of radios in the household dropped from 3.0 to 1.5 (or 50%) over this period. The significant growth of households with no radios grew from 4% to almost one-third (32%). This could be a transition to streaming of radio stations, but we do not know. The high end, with 4+ radios, declined in reverse, from about one-third to 10 percent. The core group of ownership (1-3 radios) went from almost two-thirds (64%) to 50 percent. Thus, the traditional vehicle for the radio audience in the home is in a period of market segmentation: the rise of no-radio households. I note that over two-thirds of households with persons age 12 and over own one or more radio receivers.

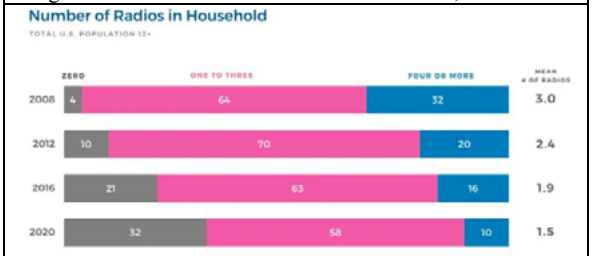
The audience level or "reach" is what drives station advertising revenues. The second facet of how well AM radio is doing is a leading indicator of future license numbers. There are several sources of data for radio and other media audience measurements. None are better known than Nielson, reported via Westwood One (2023), from the Fall 2022 survey. Here are some key results:

- 82,346,800 Americans listen to AM radio monthly. One out of three American AM/FM radio listeners are reached monthly by AM radio.
- 57% of the AM radio audience listens to News/Talk stations, the very outlets that Americans turn to in times of crisis and breaking local news.

These results show that there is a significant and substantial audience for radio, including AM stations heard at least monthly by over 83 million. This statistic registers one-third of Americans. Over half listen to AM News/Talk format stations, a critical source of emergency-related information and, importantly, local breaking news. The finding is that AM radio remains a key locally-oriented source of news, information, and entertainment.

There has been additional transitioning in audience shares, including (time-shifted) television. **Figure 5** contains average audience shares for radio and television. In the cash-cow 18-49 age demographic, radio was more than one-third behind television in 2018. By 2022, AM/FM radio had surpassed the television audience at 103% share versus TV, later rising to 112%. This was a surprising turn of events in the audience research arena. It is one that does not seem to favor AM radio dying, unless FM radio fully dominates that audience reach metric. This seems very unlikely given the

Figure 4. Number of Radios in U.S. Households, 2008-2020



Source: https://radioinsight.com/headlines/184900/infinite-dial-mean-number-of-radios-in-home-drops-in-half-since-2008/

Figure 4

Figure 5. AM/FM Radio Average Audience Versus Television in 18-49 Age Segment, 2022

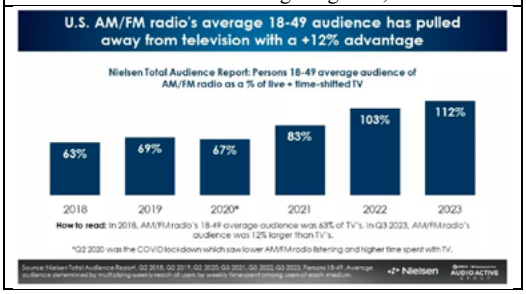


Figure 5

Figure 6. AM/FM Radio Average Audience Versus Television in 18-49 Age Segment, 2022

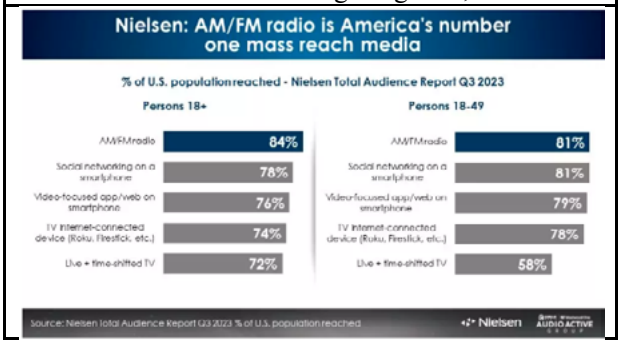


Figure 6

license data trends. It is unfortunate that most all these data on radio audiences do not break out AM from FM stations (Taylor 2024).

For those who subscribe to narratives about AM radio's demise, the Nielsen audience reach data continues to show one continuing element of this medium. Radio is America's number one mass reach medium (see **Figure 6**). It eclipses social networking, videos, internet-based TV streaming, and live (+recorded) TV. This is the case for all adults as well as the key 18-49 age group. While the other platforms do significantly get used, AM/FM radio holds the largest audience share. With the additional finding that radio has now pulled away from TV in audience reach, these results are at clear variance with the notion that AM radio is on its last mile (Jacobs 2023).

There are additional elements of how radio is consumed in today's media markets. The Musical Pursuits website has compiled a cadre of statistics regarding radio audiences, ownership, trust, and related topics. I have taken some highlights from their website that are relevant here:

- More Americans listen to the radio than use Facebook each week.
- 55% of Gen Z in the U.S. listen to AM/FM radio every day.
- Adults listen to 104 minutes of radio per day, 12.2 hours per week.
- Radio holds the highest share of collective trust across all advertising channels (Musicalpursuits.com 2025).

The findings among the Gen Z group are worth noting. While Facebook is one benchmark, the Gen Zers who listen or AM/FM radio every day are also in the face of a strong streaming behavior by this generation. All adults spend the equivalent of quarter-time employment listening to radio.

On the trust element, **Figure 7** (upper panel) shows the age patterns in media trust by platform. As noted by the source, it is a common belief that radio popularity is dying, and young people will never start listening to the radio. The data in Figure 7 show that this is simply not true. According to the Nielsen radio listening report, radio still commands the highest share of collective trust in advertising. This level is higher for the middle-age group (35-49) than the younger (18-34) or older (50+) segments. All are over 50 percent in this survey.

The reach of each medium (lower panel) may surprise those who subscribe to one of the predicates of AM radio's demise (AM and FM figures not separated). Well over three-fourth of adults listen to radio weekly. This is on par with television and various social media. It is substantially higher than various streaming audio sources.

An additional element of trust in radio involves the radio "personality" aired on the station. A survey by the Katz Radio Group (2022) found the following:

- 84% Would follow their favorite personality to a new station
- 80% Trust and value their favorite personality's opinion
- 77% Would try a brand or product recommended by their favorite radio personality
- 44% Favorite radio host makes them feel less alone

High levels of positive sentiment, or trust, are expressed toward a radio station's on-air personality. A significant amount of personal connection reduces felt loneliness among radio listeners. The element that radio provides through an on-air personality appears to be one type of "glue" adhering listeners to the platform. Since we observed very similar trends in AM and FM station licenses at a national level, it would be surprising if these trust levels were dramatically different for the two media, but we do not have separate data to test that possibility.

Figure 7. Audience Reach and Trustworthiness of Various Media Platforms by Age, 2024

Trustworthiness

Platforms	Trustworthiness Ages 18-34	Trustworthiness Ages 35-49	Trustworthiness Ages 50+
AM/FM Radio	54%	60%	51%
TV	51%	59%	51%
Apps & Websites	45%	53%	40%
Social Media	39%	43%	25%

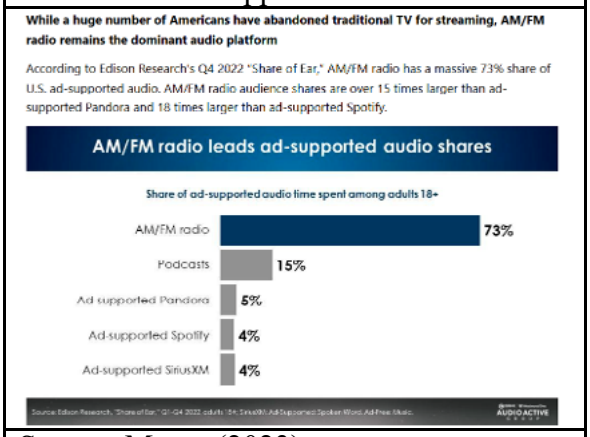
Reach

Medium	Weekly Reach Ages 18+	Weekly Reach Ages 18-34	Weekly Reach Ages 35-49	Weekly Reach Ages 50-64	Weekly Reach Ages 65+
Radio	88%	84%	90%	92%	85%
TV	86%	74%	88%	92%	93%
Social Media sphn.	81%	87%	88%	80%	64%
Streaming Audio sphn.	56%	71%	63%	50%	36%

Source: https://musicalpursuits.com/radio/

Figure 7

Figure 8. AM/FM Radio Share of U.S. Ad-Supported Audio



Source: Mayer (2023).

Figure 8

Advertising Trends

The narrative of AM radio's demise is largely that "nobody listens" anymore. The data on both licenses and audience reach make it clearly not the case. But what about advertising revenues? That ultimately drives the viability for maintaining an AM broadcast facility. We have publicly available national data for ad revenue but, unfortunately, not for smaller geographies, such as states or Designated Market Areas. I present the national picture here using the best data available in the public sphere.

The quarterly surveys of who is listening by medium adds a strong element of the continuation of radio (AM and FM) as an ad-supported audio medium. **Figure 8** presents the results of Edison Research's 2022 Q4 data on audio consumption in the U.S. (Mayer 2023). In fact, radio dominates podcasts, Pandora, Spotify and SiriusXM totaled together: 73% versus 28% (note rounding) among adults. Unfortunately, AM radio data are not separated as

Dick Taylor (2024) also laments. These results show that, while alternate media sources are a significant part of radio consumption, when it comes to ad-supported audio, AM and FM radio are the medium of choice.

Is it Nationwide or in Specific Media Markets?

I have examined national data on broadcast licenses, audience reach and beliefs, and ad revenue on the issue of AM broadcasting viability. There is no clear indication from the nationwide results supporting the narratives around AM radio dying. But often national trends reflect spatialized patterns among local areas. Studying the local areas frequently reveals that the problem is spatialized with some areas having far less viability than others. Perhaps that is the case with AM broadcasting. I now turn to analyzing state and designated market areas (Nielson's DMA) in a search for data that supports this potential set of patterns.

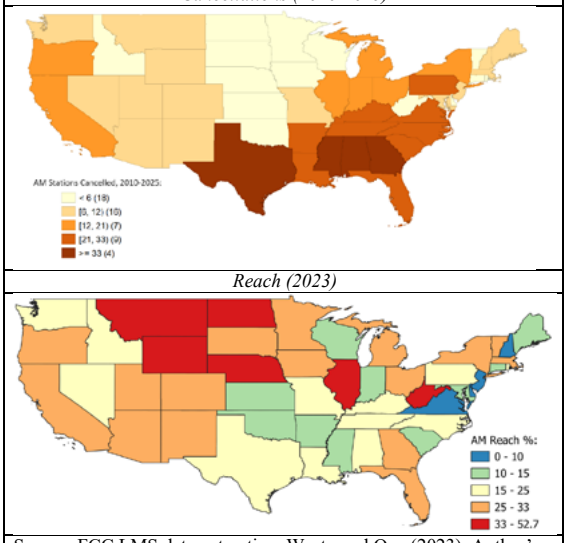
This analysis proceeds as follows. First, two state-level maps illustrating the loss of AM broadcast licenses (cancellations) and audience reach show where this medium is less viable over the 2010-2025 period. Second, using the FCC LMS Data System, I extracted all AM Broadcast stations with cancelled licenses (LICAN code) since 2010. These were geo-coded to the city and state. Nielson recently published a report with audience reach data for AM radio at both the state and DMA levels of geography. I used their GIS file for the DMA geography and database. Third, I analyze the DMA-level data for both geo-coded AM and FM broadcast license cancellations using GIS and spatial statistics. These tools allow me to isolate significant areas and clusters of DMA markets with higher or lower cancellations and reach. Moreover, I estimate the relationship that audience reach has with station loss at the DMA level of geography. Fourth, the continental U.S. (CONUS) results are presented alone since other states and possessions are geographically disconnected from the mainland and unduly influence the spatial statistics (Anselin 2024).

The state-level results in **Figure 9** (upper panel) show that the loss in AM broadcast stations is much higher in Texas and the Deep South (AL, GA, MS). The South lost more AM stations than many other regions. The upper Midwest had the fewest. Those states in the mid-range of AM broadcast loss include some of the largest media markets in the U.S., such as New York and California. Their respective states lost stations, ranging from 12 to 21. Those states losing the highest number surpassed 33 stations.

It is not surprising that the audience reach data (lower panel) show a general relationship with station license cancellations. The upper Midwest has over one-third of their adult population listening regularly to AM radio. This also includes Illinois and West Virginia. The states with the highest station loss, in the South, reach no more than one-quarter of their adult population, some much less.

These state-level data illustrate how local areas vary substantially from the national trends. I now turn to the same data on the market area (DMA) to see how local area markets fare.

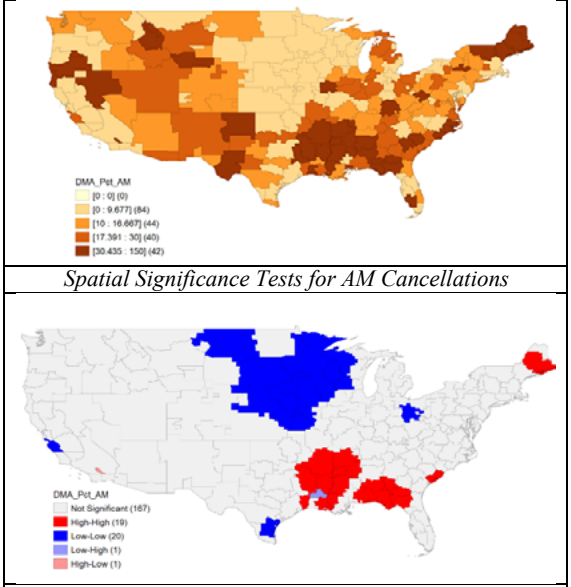
Figure 9. License Cancellations and Audience Reach of AM Stations by State, (CONUS Only)



Source: FCC LMS data extraction, Westwood One (2023), Author's visualization

Figure 9

Figure 10. Percent AM License Cancellations by DMA, 2010-2025



Source: Nielson (2023), author's calculations.
Note: High-High = high loss DMA with high loss DMA neighbors; Low-Low = low loss DMA with low loss DMA neighbors; contrasting spatial patterns with low-high, high-low.

Figure 10

The cancellations for both AM and FM licenses are displayed as quantile maps, where the percent of licenses for each mode are computed from the total number of respective licenses in the FCC database. The period 2010-2025 is used for the cancellations while the total number in 2025 is the base. Because there are dynamics in the number of licenses over the 15-year period, I opted to the end-time point as the base.

The two-panel **Figure 10** (above) shows these results.

The relative share of AM licenses lost over this period varies considerably as the upper panel illustrates. The lower panel identifies where these spatial groups are significantly clustered and on what basis they have in common. As suggested by the state-level data, the South has media markets that withstood some of the greatest losses of AM stations over the past fifteen years. But there are other locales that suffered, too, such as in Nevada and California and in the upper West. The one that must be emphasized covers Maine. The celebrated closure of author Stephen King's four AM stations led to a plethora of op-ed articles decrying the longevity of AM radio (Taylor 2024). However, as these data illustrate, the Bangor-Orono DMA is in a group of extreme Northeastern markets that suffered the highest grouping of AM broadcast stations in recent years. It does not demonstrate that the AM broadcast sky is falling nationwide.

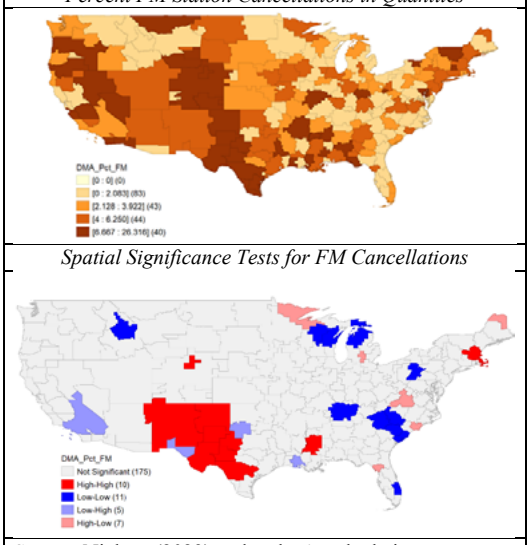
Because part of the predicates giving rise to the forecast that AM radio is dying is due to the superiority of FM broadcasting, **Figure 11** is a parallel analysis of what happened to FM full power broadcasting. (I do not analyze low-power or translator licenses here.) What I find is that FM broadcasting also has turbulence in some local media markets. They may well be due to terrain and distance in coverage (e.g., Colorado and California-Nevada mountain ranges). In fact, a number of local markets are dependent on AM radio (RBR-TVBR 2023) due to terrain restrictions on the FM broadcast signal footprint. But there are other DMAs experiencing the highest level of loss as well. Some of them are in West Texas and in the South.

The lower panel containing significance tests for clusters highlights the Southwestern cluster of higher losses. The Deep South cluster involving Mississippi had a significant share of FM station cancellations as well as the one for the Boston market. There are some DMA clusters with significantly low station cancellations surrounded by markets with similar patterns (e.g., North Carolina, Nashville, TN).

These comparative data for DMAs show that whatever conditions lead to a lack of radio broadcasting viability also affects the FM mode. The markets, however, are generally in different locations. Both AM and FM radio face challenges in some local media markets suggesting that it is not a national pattern if appropriate data and analysis evaluates the predicate(s) for assessing the state of AM radio today.

This brings up the connection of audience reach and broadcast license viability at the media market level. We would expect that lower audience reach in a market—that market just does not listen to AM radio as much as others—would be positively associated with more license cancellations. **Figure 12** contains a scatter-plot of that analysis with the correlation between them. There is a small positive correlation (r = .308. R2 =.095), much smaller than we would anticipate, so what are the conditions for such license cancellation levels? We have no data here to address that issue, only the possible predicates presented by Eduardo (2023) of a set of conditions idiosyncratic to each AM station.

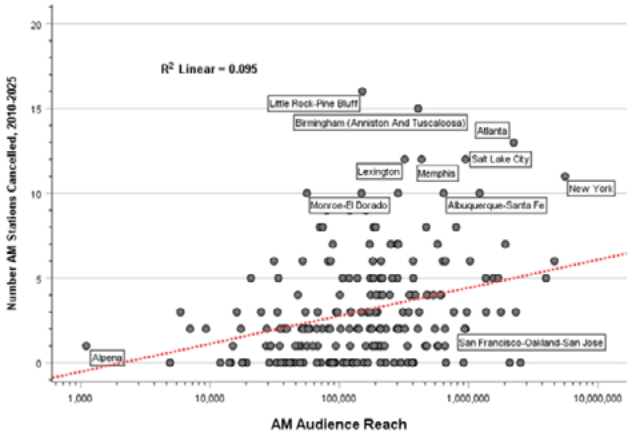
Figure 11. Percent FM License Cancellations by DMA, 2010-2025



Source: Nielson (2023) and author's calculations
Note: High-High = high loss DMA with high loss DMA neighbors; Low-Low = low loss DMA with low loss DMA neighbors; contrasting spatial patterns with low-high, high-low.

Figure 11

Figure 12. Scatterplot of AM Cancellations by Audience Reach for DMA Markets

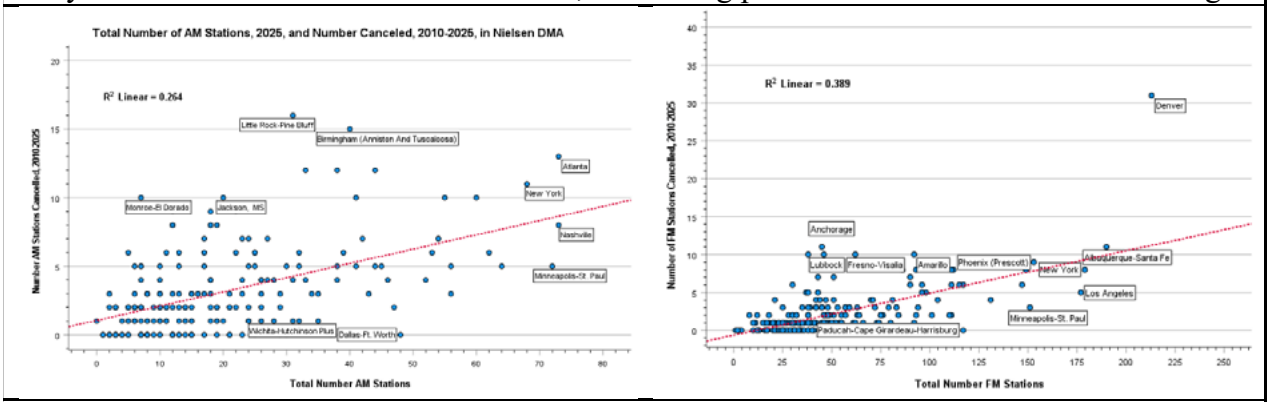


Source: FCC LMS, Nielson (2023) and author's calculations.

Figure 12

I have identified specific markets in this graphic with higher shares of AM license cancellations. These vary greatly over the range of audience reach. The largest DMA market, New York, had about 12 percent loss in AM stations while a moderate size market, Little Rock-Pine Bluff had about 16 percent, some four percent higher. The San Francisco-Oakland-San Jose DMA is a large market but had only about three stations loss. There are other comparisons labeled so the reader can further see how DMA-level audience reach measured recently by Nielsen (2023) is only modestly as-

Figure 13. Scatterplot of total number of AM stations (left) and FM stations (right) cancelled by total number of stations in the market, illustrating potential "shake out" in broadcasting



Source: FCC LMS data extraction; author's calculations.

Figure 13

sociated with station loss over this fifteen-year period. The individual stations, however, would be the data level for the key analysis but they are not publicly available. The major finding is that there are other conditions that led to the number of AM license cancellations in these markets besides audience reach.

Is There a Market Shakeout Instead of a National Crisis?

One final analysis that I present is based on the thought that what we could be witnessing is a business "shake-out" in specific media markets of both AM and FM broadcast stations (Analyst Prep nd). The life cycle of an industry is characterized as follows:

"Shakeout: characterized by slowing growth, intense competition, declining profitability, and a focus on cost reduction." (Analyst Prep nd).

The life cycle of AM broadcasting has observably slowed to historically small numbers of station losses. In larger media markets, we might expect the intense competition would lead to a decline in individual station profitability and the need for cost reductions if the market is "over built" for these factors. This might also apply to FM broadcast stations.

We showed that nationally, AM/FM radio is the number one ad revenue platform and audience reach has surpassed television. But this could also fit the scenario consistent with the emergence of new media platforms that attract smaller audiences. On the margin, these small audiences may push some local media markets to "shake out" with the stations holding the weakest ad revenue positions cancelling their licenses. This might well occur first in the largest station-populated media markets (i.e., those over-built).

Table 2. Poisson Regression Models of Number of AM or FM Stations Cancelled by Market Rank, Reach, and Number of Stations

Variable:	*AM Coefficient*	*FM Coefficient*
Rank	-.0010932 ns	.0002374 ns
Number of Stations	***.0224707 ******	***.0168337 ******
Audience Reach	5.68e-08 ns	-6.56e-08 *
constant	.3421033 ns	-.2400388 ns
Pseudo-R^2	.115	.246

Note: DMA level data with author's calculations.

Table 2

To examine this scenario, **Figure 13** contains a scatter-plot for AM and FM broadcast stations in each DMA. The number of station cancellations is plotted by the total number of licenses for each mode. Indeed, there is a positive correlation between the market establishment size (number of stations) and the number of stations cancelled for each AM and FM mode. The strength of the relationship is stronger for FM (R2 = .389) than for AM stations (R2 = .264). The reader can note in each respective panel the DMAs that have higher number of station licenses cancelled and the size of the market's stations. Note that the Denver DMA for FM stations is an outlier. Recomputing the correlation without that data point does not account for the full difference between the two scatter-plots (analysis not shown).

Because this set of comparative results fit the shakeout perspective, I created a model for the number of stations canceled as influenced by the number of stations, the area in the DMA (square miles), and the mode's reach in the market. We know that market reach (audience) is a clear factor in determining ad rates and revenue. The size in land area may affect AM stations but decidedly may shape FM broadcasting (RBR-TVBR 2023). If a local media market is over-built for the current market's needs, the number of stations in that market would shape how many do not survive. This effect would be telling especially with market reach controlled. The results are in **Table 2** (above).

With the rank of audience size and reach controlled, the respective number

of AM or FM stations in the media market are significantly related to more station cancellations. This is the pattern in the data that is consistent with a local media market shakeout. Moreover, we see that the effect of station market size is larger for AM stations than for FM stations (.022 vs .017). But both AM and FM stations are affected by the shakeout over the past fifteen-year period. This suggests that this factor is not unique to AM broadcasting.

The factor of audience reach, which drives ad-revenue, only has a significant effect in reducing station cancellations in the FM broadcasting sector. While reach is important to all broadcast sectors, it was not related to license cancellations once the total number of licensees in the market is taken into account. Thus, whether smaller or larger audience reach is present in the local media market, the number of stations competing for that audience is the key factor in station loss for the recent past.

The R2 coefficient shown in the table is a measure of the total influence of the predictors on the respective number of stations cancelled. In all, the model has less of an overall influence on station cancellation numbers for AM stations (R2 = .115) than for FM stations (R2=.246). This is no doubt that audience reach is more important in the FM sector, even with market audience rank and number of stations held constant.

While only experimental in nature, these results are consistent with the notion that AM station cancellations are part of a localized market shake out in the larger media markets. The important ad-revenue data for DMAs are not public so we could not include them. They would be a critical factor in understanding the local media market shakeout pattern we hypothesize here.

Can We Delay the Obituary for AM Radio?

The obituary for AM radio is much too soon based on the results of this study. There is very little observable data showing that the fundamentals supporting AM radio have changed such that it is walking the last mile (Jacobs, 2023) or even close to it. In the future, should AM radio meet its demise, those who forecast it will certainly recall their dire prognostication. But it will not be based on the data analysis presented here.

There has been a decline in AM radio licenses, as well as in FM full power licenses. But these are small in relative share to the total number of historic licenses. Moreover, the recent declines of some eight percent, while troubling, are shared with losses in FM broadcasting. The noted dip in Figure 3 for FM station licenses during 2019-2021 were not met with similar calls for that mode being on death's door. Instead of dying, we suggest that AM radio's place in the media marketplace is changing, perhaps into occupying a lesser status, but not in imminent danger of extinction.

The support system for AM radio remains strong. Almost all adults listen to AM radio in one form or another over a month's time. Advertising dollars flow into AM/FM radio significantly, recently surpassing TV revenue. It may be that FM radio is carrying more of the ad revenue than AM stations, but we cannot tell by the available data. Nonetheless, forecasts by S&P Global do anticipate a small decline in radio ad revenue (-1.6%) but this varies by region (Nelson 2024). The Great Lakes (-2.07%) and Central South (-1.92%) regions may have the sharpest declines. These regions are consistent with the results I have presented here in terms of regional viability for AM radio (although S&P Global bundle AM and FM together).

The morass of predicates for the demise of AM radio may well reflect a random set of varied underlying causes for individual stations. But most of the forecasts are based on celebrated AM station closings without regard for the local media market viability, pontificating opinions about the quality of AM signals vs FM or satellite audio, the "auto wars" debate on continuing AM radio receivers by auto makers, and the cost of maintenance for AM radio broadcast facilities. I have shown that some of these predicates may be at work in some local radio markets. The "auto wars" issue will resolve itself in the coming years. We will see how that affects AM radio. Until then, there are no clear patterns in numbers of stations, audience reach, or ad revenue that points to the end of the road for AM radio.

As in Mark Twain's famous published obituary, the reports of AM radio's death have been grossly exaggerated based on observable numbers of AM radio licenses, ad revenue, and how alternative internet-based media platforms have performed. Short-term rates of social change rarely hold up in a linear fashion (Kavanagh *et al.* 2021). The escalation of ad revenues for radio surpassing television by some 12 percent certainly suggests that viability nationwide may be present for some time. Let us delay the obituary while the corpse is breathing.

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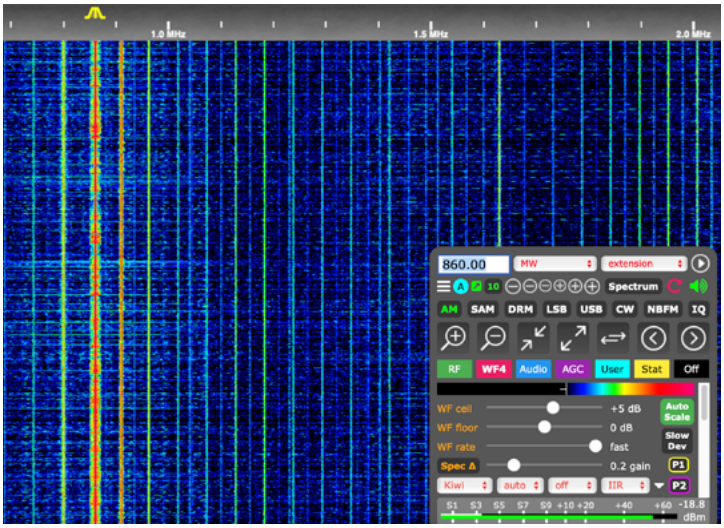

AM radio is still keeping up with the times. Left: A 1922 government pamphlet led the way for many people in rural areas to make a crystal set capable of receiving stations from around the country under the right conditions. At left is how a farmer's set-up might have looked. You can see from his imaginary station log that the radio is working well. The galena crystal set is in the center, flanked by a homemade "book" tuning capacitor. From a feature article in the April 2020 issue of The Spectrum Monitor, "Crystal Clear: How a 1922 Circular Brought the Wonderment of Radio to the Farm," by Richard Fisher KI6SN. (KI6SN photo) Right: KWPC 860-AM, Muscatine, Iowa, tuned in via KiwiSDR radio receiver online, July 2025. (KS4ZR photo via KiwiSDR)

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