

POLICY BRIEF

PPM ENCODING

AN OVERVIEW FOR A STATION'S BUSINESS AND CREATIVE STAFF

While PPM encoding falls within the domain of a station's engineering team, it is important that other station staff have a high level understanding of concepts and policies related to encoding. In this policy brief, we explain some of those concepts and policies. We've attempted to use as plain language as possible so that station managers, programmers, talent, salespeople, and researchers will be able to read and understand the technical concepts. We hope that this information helps demystify PPM encoding, and by doing so, increases your understanding of the reported data.

CBET AND ENCODERS

The formal name for our PPM watermarking technology is 'Critical Band Encoding Technology' or 'CBET.' Inside each PPM watermark or 'code' is an attention signal that indicates to a Panelist's meter that more information is forthcoming, a unique station identifier, a time stamp that notes when the encoder transmitted the code, and other information.

A PPM encoder is a piece of audio equipment that transmits a station's PPM codes. An encoder can transmit a new code as often as every few seconds. This means a station's signal can carry thousands upon thousands of PPM codes per day.

When a Panelist listens to a PPM-encoded radio station, the Panelist's meter receives the codes and stores them in its memory. The meter then adds its own 'time received' stamp, and quality marker to each received code. The collection of codes, time stamps, markers form a 'log' of the Panelist's radio listening. As our systems collect this information from the Panelists meters, it applies a series of edits. Downstream systems use this data as a foundation for our PPM Audience data. (For additional information on how we transform PPM codes into ratings, see the separate publication 'From Codes to Credit' available for view on Nielsen Answers.)

In 2015, we released 'Enhanced CBET' to all encoded stations. This firmware upgrade includes a set of algorithm

updates that improved the PPM's ability to detect encoded audio in a listening environment that includes significant background noise and/or when the content's volume is low.

ENCODING AGREEMENT

The Encoding Agreement is a contract that establishes an encoding relationship between your station and Nielsen. To participate in PPM measurement, your station manager (or other designated official) agreed to the terms of the Encoding Agreement, including those relating to the proper use of the encoding equipment and compliance with our encoding policies. Upon receipt of the Encoding Agreement, we provided your station with its PPM encoders.

THE PPM CODE POLICY

To help ensure that stations receive appropriate PPM listening credit, our policy is that a station must transmit the appropriate PPM codes. We refer to this simple rule as 'the PPM Code Policy.' The PPM Code Policy is a cornerstone of PPM, dating back to our first demonstration market.

Radio Stations

The PPM Code Policy applies to all outlets that are eligible to be reported in our currency PPM services, including AM stations, FM stations, HD-multicast stations, and these station's internet streams. All of those different outlets must transmit unique PPM codes. The policy also applies to outlets that simulcast or that are part of a Total Line Reporting combo; each of a combo's partner outlets must transmit a unique PPM code.

Other Signals

HD1 / HD-Primary Signals: The PPM Code Policy does not apply to HD1 signals. Today, we automatically include audience delivered by a station's HD1 signal in that station's audience estimates. In some instances, there may be a technical need to encode the HD1 signal with its own code. However, since there is no ratings advantage or business reason to encode an HD1 signal with a unique PPM code,

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most broadcasters choose to use one encoder/code for both the analog and HD1 versions of the station's signal.

Translators, Boosters, Repeaters: Translators, boosters, and repeaters are exempt from the PPM Code Policy. Because these transmitters will re-transmit any PPM codes in its host signal, the host station automatically receives PPM listening credit for audience delivered via the translator. Because we do not publish standalone translator estimates, there is no need to encode a translator with a unique PPM code.

Sharing Non-Encoded Audio

To comply with the PPM Code Policy, a station must ensure that any audio it provides to another station for re-transmission is unencoded. Similarly, a station must work with its partners to ensure that any audio it re-transmits does not include another station's PPM codes. Both scenarios have the potential to negatively impact a station's credit.

Emergency Simulcasts

During emergency conditions such as an extreme weather event, natural disaster, civil emergency, child Amber Alert, or activation of the Emergency Broadcast System, it is common for radio stations to share audio with each other and other media outlets. Acknowledging that PPM encoding will not be top of mind during such times, we will waive the PPM Code Policy for stations that are unable to/do not follow the policy during an emergency simulcast.

Encoder Misuse

Any time a station re-transmits another station's PPM codes, provides its encoded signal to another station for re-transmission, streams its on-air encoded signal, or otherwise not follow the PPM Code policy, that station has the potential to negatively affect the market's data. If it comes to our attention that a station misused the equipment in any of these ways, we will take action as warranted in our judgment.

Why the PPM Code Policy is Important

Encoding policy is important because it helps to define the rules of the road for broadcasters, preserves a level playing field for the marketplace, and help ensure that agencies and advertisers continue to have confidence in the PPM data and in radio as an accountable and reliable advertising medium.

ENCODING BEST PRACTICES

In the decade since we commercialized PPM, we've shared best practices information with station engineers in our equipment manuals, product notices, policy briefs, webinars, and other venues. Here is a recap of the best practices that we've shared with your station engineer:

- Install the encoder downstream of any switching or delay equipment in a location that offers consistent audio levels (+4dBu for Analog, -20dBFS for Digital).
- Ensure your station's encoders are running the latest version of Enhanced CBET firmware.
- Encode each of your station's transmission paths that can go to air, even paths that you use only in an emergency.
- Cool the encoder with an external fan if the ambient temperature in the room regularly nears 85°F.
- If the encoders are in series, enable either the primary or the backup encoder. Do not enable both encoders at the same time.
- Connect the encoder to an accurate external time source (Master Clock or Time Server) if one is available.
- If your station uses a central alarm system, connect the encoder and In-Station PPM Encoding Monitor to that system.
- Connect your Nielsen In-Station PPM Encoding Monitor to a tuned over-the-air-feed of your broadcast.
- Monitor all of your signals that are encoded, including the station's HD1 signal.
- Install your back-up encoders, connect them to an audio source, and power them up.
- Periodically switch between encoding your signal with your Primary and Backup encoders. (A good guideline is to run your Backup encoder for one week per month.)
- Ensure that audio you send to, or receive from, another radio station is unencoded. Re-encoding a piece of audio that has already been encoded may affect station credit.
- When contacting a Nielsen Broadcast Engineer directly via email, please cc: ppmencoding@nielsen.com.

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MAKING SIGNAL CHANGES

We also recommended to your station engineer that he or she contact us prior to making any signal or encoder changes. During this consultation, a Nielsen Engineer will be able to provide information on how to mitigate any factors related to the changes that could adversely affect encoding.

IN-STATION PPM MONITORING

It is the responsibility of your station's technical staff to monitor your station's PPM encoding. For this purpose, we provide each station with at least one PPM encoding monitor.

The in-station PPM encoding monitor is a piece of audio equipment that continuously 'listens' to your station's signal for PPM encoding. If the monitor does not hear any encoding, it will alarm. If the monitor alarms, we've instructed your station engineer to disable the alarming encoder and immediately enable a back-up encoder.

In 2016 we released our next generation PPM encoding monitor. In addition to the aforementioned alarms, this next generation monitor includes additional features and reporting abilities that will be of interest to your engineer, including reports that estimate the signal's 'encodability' and the 'detectability' of the PPM codes within your signal.

Encodability

'Encodability' is an objective measure of an audio signal's capacity to be PPM-encoded. Encodability is determined by dividing the number of PPM codes inserted into the left and right signal channels by the maximum possible number of codes that could be inserted.

Detectability

'Detectability' is a subjective assessment from 0 (worst) to 4 (best) of the likelihood a Panelist's meter will detect PPM codes in an audio source. Detectability is determined by averaging the audio's message signal strength over the past 60 seconds and comparing that average to a set of thresholds. Detectability is an estimate, however, because it is not possible for the algorithm to take into account all of the factors in any particular Panelist's listening environment (i.e. radio volume, meter position, background noise, etc.) that could affect the code being detected.

WHEN THE SIGNAL IS NOT ENCODED

When a radio station's signal is not encoded, it is not possible for the station to receive any listening credit. For this reason, any unencoded period has the potential to count against your ratings. An extended unencoded period is certain to have a negative effect. Unencoded intervals have the potential to be so serious, in fact, that the Media Rating Council requires us to note the details of all unencoded periods in applicable issues of the Radio Market Report / eBook. Considering how serious an unencoded interval can be, many station engineers have made successful in-station PPM monitoring a priority.

CONTACT

24-7 Encoding Technical Support Hotline: 1.866.767.7212

For questions about our encoding policy:

John Budosh, 667.786.4552, john.budosh@nielsen.com

For questions about your audience estimates:

Contact your Nielsen Client Services representative.

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