

# Program Associated Data Deployment at Wisconsin Public Radio

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*Abstract - This paper describes the roll-out of Program Associated Data service at Wisconsin Public Radio. Program Associated Data (PAD), also known as Program Service Data (PSD), is the metadata related to the audio programming generated for display on the front panels of FM RDS/RBDS receivers, HD Radios, web players, and other consumer devices. A 33-station, three-network operation, WPR's implementation of PAD is more challenging than a typical stand-alone music station cranking out the hits. WPR airs programs from a wide variety of live, recorded, network, and remote sources running on a complex array of radio stations that come and go from the network at varying times – not to mention multiple web as-playing pages and audio streams.*

## INTRODUCTION

Radio listeners have always enjoyed having some background information about the programs they are hearing. Traditionally this could be a “Top-40” disk-jockey fast-talking his way through the last few song titles and artists, or a jazz host reading album liners notes, or a talk show host telling you more about the guest in the studio.

But announced information is easy to miss for one reason or another, such as distractions (“Shut up I’m trying to hear the radio!”) or tuning in after the show has already started (“What the heck is this show is about?”), or even too-infrequent stations identifications (“Which station is this?”).

To provide additional opportunities to get this information to the listeners, systems have been developed to display text and graphical information on the front panel of the receiver or computer screen (in the case of an internet audio player). This is called Program Associated Data (PAD) or Program Service Data (PSD). This PAD data can be both static (information related to the overall program service) and dynamic (details of the particular program element currently being broadcast).

## STIMULUS FOR ACTION

Beginning with early experiments with broadcasting in 1917, Wisconsin Public Radio has a long tradition of innovation [1], so Program Associated Data was naturally attractive. WPR listeners tend to be actively engaged in the programming, often making contact to ask questions about what they have heard. Clearly providing additional information along with the audio programming would be a helpful service for both radio and internet listeners.

Some emerging technologies stimulated WPR’s interest:

- FM RDS/RBDS
- HD Radio on AM and FM stations
- Internet audio players

RDS/RBDS allowed FM stations to display station identification, slogans, and basic program information. Deployment of HD Radio on AM and FM stations brought basic identification and format display information. Likewise, new internet audio players with metadata display capabilities came on the scene. These technologies whetted the appetite of listeners for more and better Program-Associated-Data transmission. And these new technologies brought ways to make it happen.

## DEFINE THE PROBLEM

Albert Einstein once said that if he had one hour to save the world he would spend fifty-five minutes defining the problem and only five minutes finding the solution.

Wisconsin Public Radio is a statewide radio service with 3-networks airing on 33-stations and 9 web streams. We would like PAD to be visible on FM receivers with RDS capability as well as AM/FM HD Radios. We would also like to provide similar information for listeners to our internet audio services.

The PAD data would include both static and dynamic information.

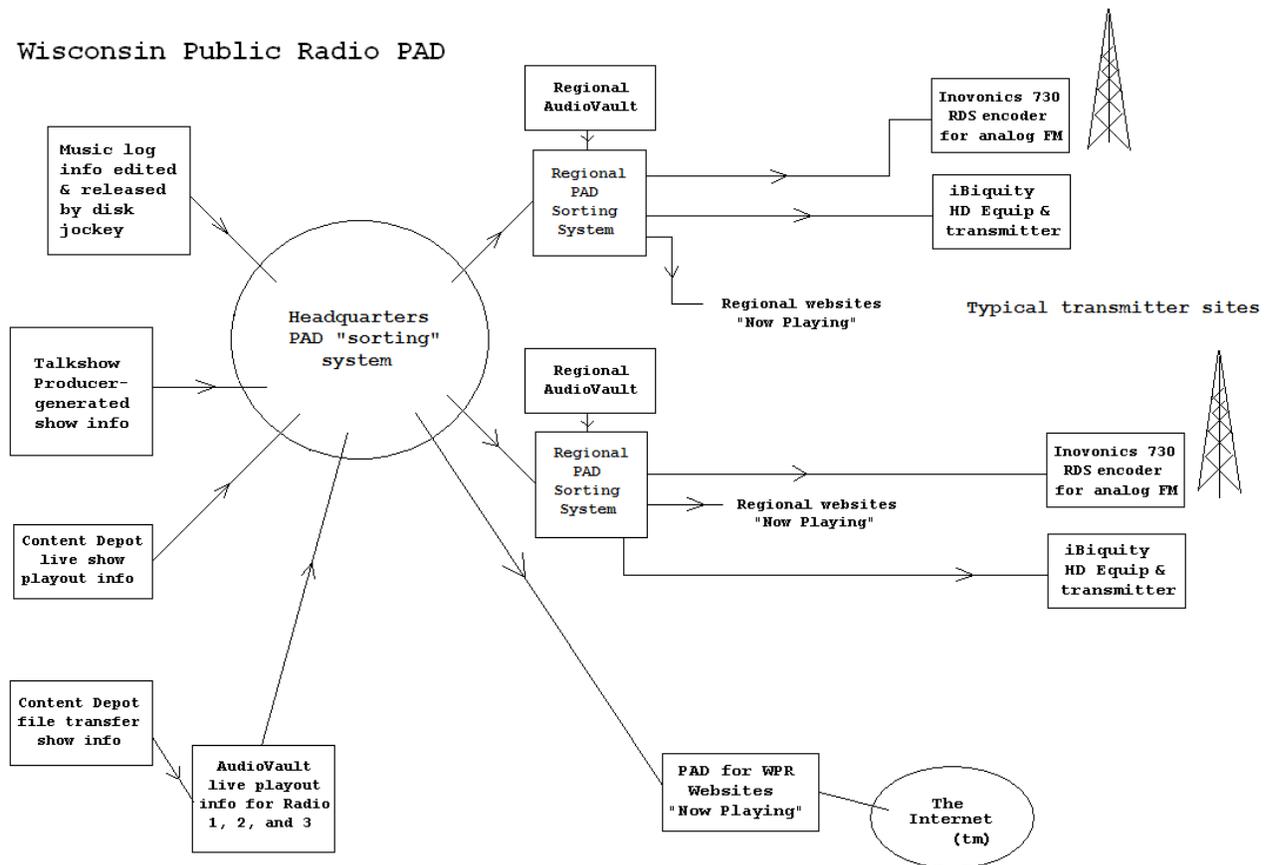
### Static PAD

- Callsign, frequency, slogan
- “Wisconsin Public Radio”
- Network Name

### Dynamic PAD

- Current weather information
- Name of show on the air
- Name of the host now on the air
- Music title/composer/artists
- Talkshow topic and guests
- Request and call-in numbers
- Special pledge drive information
- Emergency Alerts

## Wisconsin Public Radio PAD



All interconnections are by ethernet.

Figure 1

Complicating matters, WPR airs programs from a large number of live, recorded, network, and remote sources. And almost none of those sources presently has metadata available. Our live music shows are all hand-made productions with hosts playing music from CDs. Music shows from outside network providers can only offer logs, no real-time data. NPR and other public radio programs do not as yet offer real-time metadata either.

WPR uses Broadcast Electronics' AudioVault system for audio storage and playback at the Madison headquarters and regional groups of stations. AudioVault has metadata transmission capabilities, but this may not be much help during live-assist conditions.

And the final aspect of the problem: WPR programs air on a variety of radio stations that come and go from the networks at times to broadcast their own regional and local shows. There is no end to the fun since every station seems to be a "special case"!

A key part of "defining the problem" was a series of drawings we used to visually describe the flow of information for PAD at WPR. See Figure 1.

## GETTING STARTED

Wisconsin Public Radio's first tentative steps in PAD used the tool we had purchased with our HD Radio systems: Broadcast Electronics' product known as TRE – The Radio Experience. [2] Using TRE we created a rotating schedule of static information to display on our flagship station, WHA. This schedule transmitted items like "WHA AM-970", "Wisconsin Public Radio", "The Ideas Network", and the name of the show scheduled to be on the air at that time, such as "The Larry Meiller Show". This worked well but it was difficult to see how to expand operations to include dynamic information. At about the same time, our web team began to provide basic network PAD for display on user audio player displays. Similar limitations arose when contemplating how to go beyond the static information.

For our live music shows – how would we generate dynamic title/composer/artist information? An electronic music log is prepared by our music department for each show, presenting the possibility of harvesting the text about the music to be played. But clearly a way would be needed

for the hosts to indicate when a particular piece of music had been started (“releasing” the next song PAD to be displayed), as well as a mechanism for manual edits should deviation from the log be necessary.

For talk shows, our producers already prepare “show notes” which are a paragraph of information used to promote their upcoming shows both on the air and on the web. This suggested there might be a way to gather up-to-date information about show topics, hosts, and guests, but would require some changes in data entry to provide text that would fit into the field restrictions present in the various display technologies. We would also need a way to manually enter data for specials.

### FINDING A VENDOR

As we considered these factors it seemed necessary to have our PAD organized at several levels – network, regional, and individual stations. We consulted with several PAD software vendors as to the costs we could expect for such an extensive installation – the manner in which the companies chose to license their products was a big factor in the total project cost. We were also interested in whether or not the various software packages offered a user-friendly interface for management and show producer data editing and release.

WPR selected the Arctic Palm software product known as “Center Stage Live”[3]. Center Stage was chosen for WPR primarily because of the flexibility it offers, thanks to add-on modules that allow the software to collect data from several sources and compile them in one format suitable for use on-air and on the web.

Based on a schedule one can define windows of time for each source of data. For instance, WPR station WLSU in La Crosse will pass data sent from the network throughout the day. When WLSU goes to local programming each night at 7PM, the local Center Stage software will ignore the network data and instead send data from the local source. This functionality works as well for passing data from a network provider like NPR, where it can pass information on a network show to air, and then switch to local sources when the show ends.

The WPR implementation of Center Stage includes several key modules.

**CSScheduler** is used to schedule static messages by station, date, day-of-week, time-of-day or to trigger the release of a message based on what is playing in the automation system.

**CSWeather** can capture information from web sites. Local weather forecasts and alerts can be downloaded from the National Weather Service.

**CSRDS** is the actual metadata handling module. This program captures and merges data from a variety of input sources and sends it to any combination of RDS encoders, websites, and HD Radio systems, on-line streams, or other applications. Music metadata and "triggered" events will be

sent to all configured outputs but promotional messages, weather forecast, etc may be blocked from any one or more outputs.

**CSLogIt** allow us to use our music scheduling software to provide a daily playlist. Since we use CDs during our live music shows, this allows the host to easily indicate when a scheduled piece begins, “releasing” the data about the music into the PAD channels. A module was also created to harvest “Now Playing” information from the satellite music source web playlist, and parses it to become PAD information.

**CSRAS** is a “Radio Automation Simulator” that will send PAD data based on a pre-defined playlist. If you are recording a live broadcast that will be re-broadcast at a later date and/or time, one can schedule the repeat broadcast using the CSScheduler module. At the desired date and time, the metadata provided during the original broadcast will be resent for the repeat broadcast. Different messages can also be used during the repeat broadcast. Similarly, if you are delaying a live broadcast to be aired at the same time in another time zone, one could configure CSRAS to hold the metadata for later use. For example, if a live broadcast at 10AM EST is to be delayed for broadcast at 10AM CT, CSRAS could delay the release of the PAD for one hour before sending it on to CSRDS for the central time broadcast.

**CSSocial** is Arctic Palm’s new social media interface plug-in for its Center Stage software. This module that will automatically post messages to Twitter and Facebook accounts. With CSSocial the PAD process could also post selected messages into Facebook or Twitter.

One of the biggest advantages of Center Stage for WPR was lower cost. Because of our large network, and the correspondingly large number of licenses we would need, licensing structure and ultimate cost was a major consideration. The price for Center Stage came at a fraction of competing software, with better options and good customer support.

### TAKING IT TO THE NEXT LEVEL

We devised a series of “phases” for the implementation of PAD at Wisconsin Public Radio.

1. Install software on new computers in server room. Set-up a schedule of static PAD for each network. Establish feeds from new network PAD system to Madison regional stations’ PAD systems. Result: Display of static PAD on Madison HD and FM-RDS receivers.
2. Work out details of satellite-delivered file PAD import into AudioVault w/metadata, then send PAD

to stations on playback. Set-up the flow of ethernet PAD for the live satellite shows .

Result: Display of local and national static PAD on Madison HD and FM-RDS receivers.

3. Establish interconnection between the existing web-based program notes, as-playing, and Center Stage. (If web system remains the WPR show source, additional short fields and XML export needed)  
Result: Display of static & limited-dynamic PAD on Madison HD & FM-RDS receivers, and website.
4. Establish method for music hosts to edit/release the PAD imported from music log when CD is started.  
Result: Display of full static & dynamic PAD on Madison HD and FM-RDS receivers, and website.
5. Set-up regional Center Stage systems to manage the PAD from Madison vs. PAD for regional shows. Work out the connections between the regional AP systems and the HD and FM-RDS transmitters.  
Result: Display of full PAD on all HD & FM-RDS receivers on as many stations as practical.

### PROGRESS SO FAR

Wisconsin Public Radio is now operating PAD data on our AM and FM stations in Madison and Milwaukee, and our network web streams. The information displayed includes station call signs and slogans, current weather, name of the show now on the air, local host names, guest, topic, and call-in information for local shows.

Automated music shows are operating smoothly with PAD, but we are still working out the bugs with the live music log import and “release” system. We are also awaiting the beginning of PAD transmissions for our various satellite programs. The new Public Radio Satellite System receivers recently placed into service have PAD transmission capability but it has only been tested for basic functionality. Most shows that use the Content Depot system are not sending any real data yet.

We are also eager to move the next phase of the project and begin tackling the regional and local PAD for our stations. Our recent transition to an audio-over-IP method of statewide program delivery has meant a huge expansion of our computer networks. This in turn provides plenty of bandwidth and access points for transmission of PAD by IP. Decisions remain to be taken as to where to locate the regional Center Stage systems. Should the machines be located at our headquarters in Madison, or at each of our regional bureaus around the state? How can we best incorporate EAS and Amber alerts for the regional stations? There’s lots of work yet to be done.

### SUMMARY

The roll-out of Program Associated Data service at Wisconsin Public Radio has been a complex undertaking. A 33-station, three-network operation, WPR’s implementation of PAD is naturally more challenging than a typical stand-alone music station cranking out the hits. WPR airs programs from a wide variety of live, recorded, network, and remote sources running on a complex variety of radio stations that come and go from the network at varying times – not to mention multiple web as-playing pages and audio streams.

A practical, step-by-step approach to the task has allowed us to tackle this thorny problem and provide an amazing improvement in service for the listeners. Listeners have started to notice – our Audience Services Department has been receiving appreciative and positive comments.

### REFERENCES

- [1] [http://www.wpr.org/hd/hd\\_innovation.cfm](http://www.wpr.org/hd/hd_innovation.cfm)
- [2] <http://www.bdcast.com/products/studio-products/datacasting-the-radio-experience/>
- [3] <http://www.arcticpalm.com/CSRDS.htm>

### AUTHOR INFORMATION

**Steve Johnston**, Director of Engineering and Operations, Wisconsin Public Radio, Madison, Wisconsin.

Steve started taking apart radios as a youngster and became a ham radio operator at age 13. His professional career started at age 19 with Susquehanna Radio Corporation. Steve served Susquehanna for nearly 20 years in several markets. In 2000, Steve shifted to public radio when he became Director of Engineering and Operations for Boise State Radio. In 2005 he moved to Wisconsin Public Radio as Director of Engineering & Operations. Steve has a BA in History and Masters in Business Administration. He and his wife Christy have two children.

**Kevin Trueblood**, Broadcast Engineer, Wisconsin Public Radio, Madison, Wisconsin.

Kevin began his radio career while in high school at a group of stations in Galesburg, IL. Over the years he has been an announcer, a Program Director, Operations Manager, and moved into engineering full-time in 2007. He has been a Broadcast Engineer at Wisconsin Public Radio since 2010. Kevin holds a BA in Communications. He lives in Madison with his wife and young daughter