Audi A4 testing

- Audi of America made a 2021 A4 available to NAB for testing

- Tested hybrid radio portion of the new Audi *Multi Media Interface (MMI) navigation plus* (MIB3)

- Tests conducted between 2021-02-26 and 2020-03-01 in MD, DC, PA, VA, WV

SOURCES
Search
Last stations
Favorites
FM
AM
SiriusXM
Online – includes linear and non-linear content

# Audi A4 testing - goals

- Hybrid radio - observe switching between over-the-air (OTA) broadcast audio and streaming audio

- Exercise various metadata usage and display options esp. use of Gracenote Smartradio solutions

- Test in both mobile and stationary environments

BROADCASTER

GRACENOTE

Favorites (think "presets")
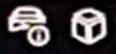
radio.net
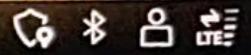
☆ Source **Radio**
Favorites
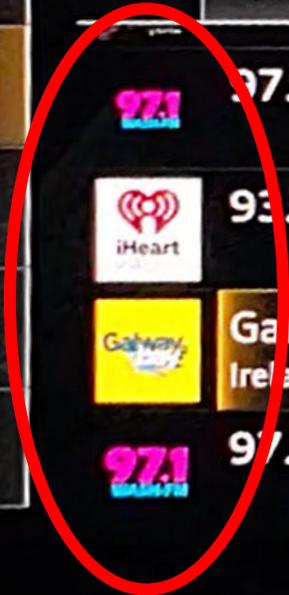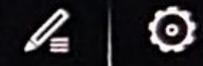
	97.1	**97.1WASH**	FM
	93.1	HD 3 WPOC-FM	FM
		Galway Bay 95.8 FM	WEB
		Ireland	
	97.1	HD 1 WASH-FM	FM

8:01 AM

9

Today's presentation

- About NAB

- NAB Digital Dash Best Practices

- US rollout of hybrid radio

- Action items

National Association of Broadcasters

- Largest U.S. trade association for free over-the-air broadcasters
- Departments include:
  - Global Connections and Events (GCE)
  - Communications
  - Industry Affairs
  - Legal
  - Government relations
  - **Technology**

October 9-13, 2021

October 13-14, 2021

VIRTUAL October 19-29, 2020

IT'S TIME. THE WAIT IS OVER.

OCTOBER 9-13, 2021 | **LAS VEGAS CONVENTION CENTER**

NABSHOW®
Where Content Comes to Life

AN UNRIVALED AUDIO
AND VIDEO EXPERIENCE

TOGETHER WITH: radio show   NAB SMTE   AES SHOW FALL 2021   BEA

13

SAM MATHENY
EXECUTIVE VICE PRESIDENT AND CTO, NAB

LYNN CLAUDY
SENIOR VICE PRESIDENT, TECHNOLOGY

JOHN CLARK
EXECUTIVE DIRECTOR, PILOT

KRISTIE MILEWSKI
EXECUTIVE ASSISTANT TO THE CTO

DAVID LAYER
VICE PRESIDENT, ADVANCED ENGINEERING

KELLY WILLIAMS
VICE PRESIDENT, ENGINEERING AND TECH. POLICY

TARIQ MONDAL
SR.DIRECTOR, INNOVATION AND EMERGING TECH.

NAB | LEGAL

ALISON NEPLOKH
VICE PRESIDENT, INNOVATION & STRATEGY

ROBERT WELLER
VICE PRESIDENT FOR SPECTRUM POLICY

14

NAB Technology and the radio industry

- Committees:
  - National Radio Systems Committee (NRSC)
  - NAB Radio Technology Committee (NABRTC)

- PILOT

NAB Technology and the radio industry

- National Radio Systems Committee:
  - Co-sponsored by NAB and CTA
  - Broad membership
  - Set technical standards for analog and digital radio
  - Hold meetings at NAB Show, CES, Radio Show
- NAB Radio Technology Committee:
  - Membership limited to NAB member companies (broadcasters & networks)
  - Advise NAB on technical and regulatory matters

https://www.nrscstandards.org/

NAB Technology and the radio industry

- PILOT
  - Led by John Clark, Executive Director
  - Funds radio technology projects
  - Developed PILOT radio test bed

https://nabpilot.org/

PILOT membership

Radio & Android Automotive

- Collaborative began in Fall 2020
- Advocate for proper support of broadcast radio in Android Automotive
  - Build support into the open-source platform (AOSP)
  - Functionality openly available to all developers
  - Support broadcast standards (AM/FM, HD Radio, DAB/DAB+, CDR)
- Create reference presentations and user interfaces

PILOT radio test bed (2021)

RF ATTENUATOR

RF CHAN. SIMULATOR

AM EXCITERS

GEN 3 EXPORTERS

AUDIO BLADES

GEN 3 IMPORTER

(RED INDICATES NEW EQUIPMENT IN 2021 UPGRADE)

FM EXCITERS / TRANSMITTERS

TEST COMPUTER 1
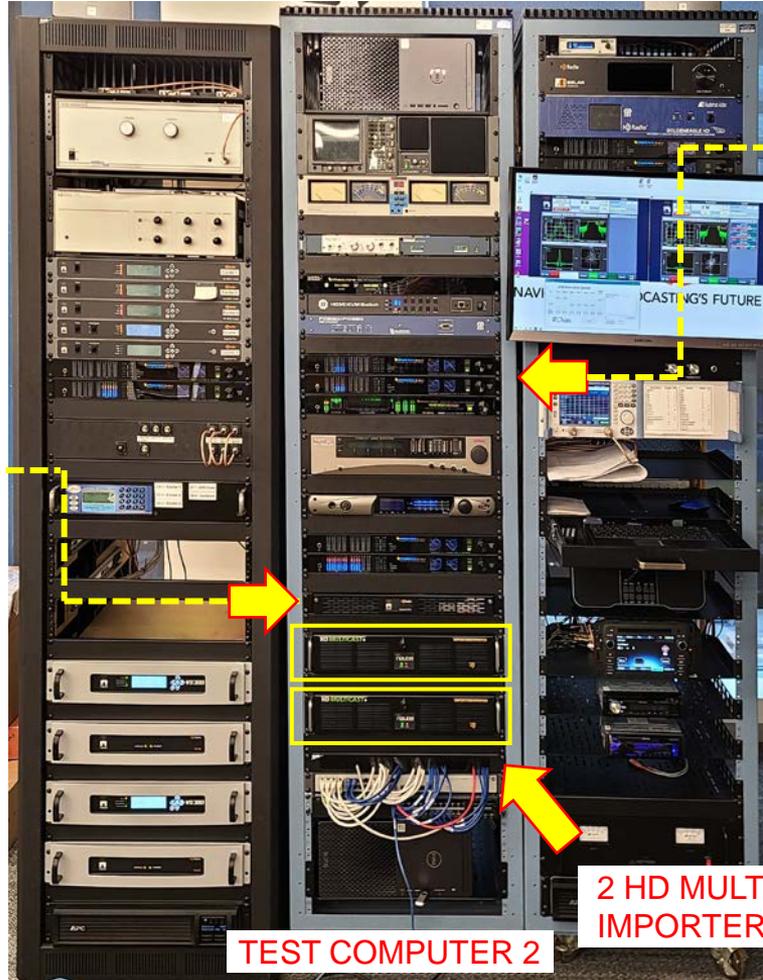
AUDIO BLADES

MONITOR

SPECTRUM ANALYZER

KEYBOARD

RECEIVERS

2 HD MULTICAST + IMPORTER/EXPORTER

TEST COMPUTER 2

20

RF spectrum plot showing three FM-band HD Radio signals
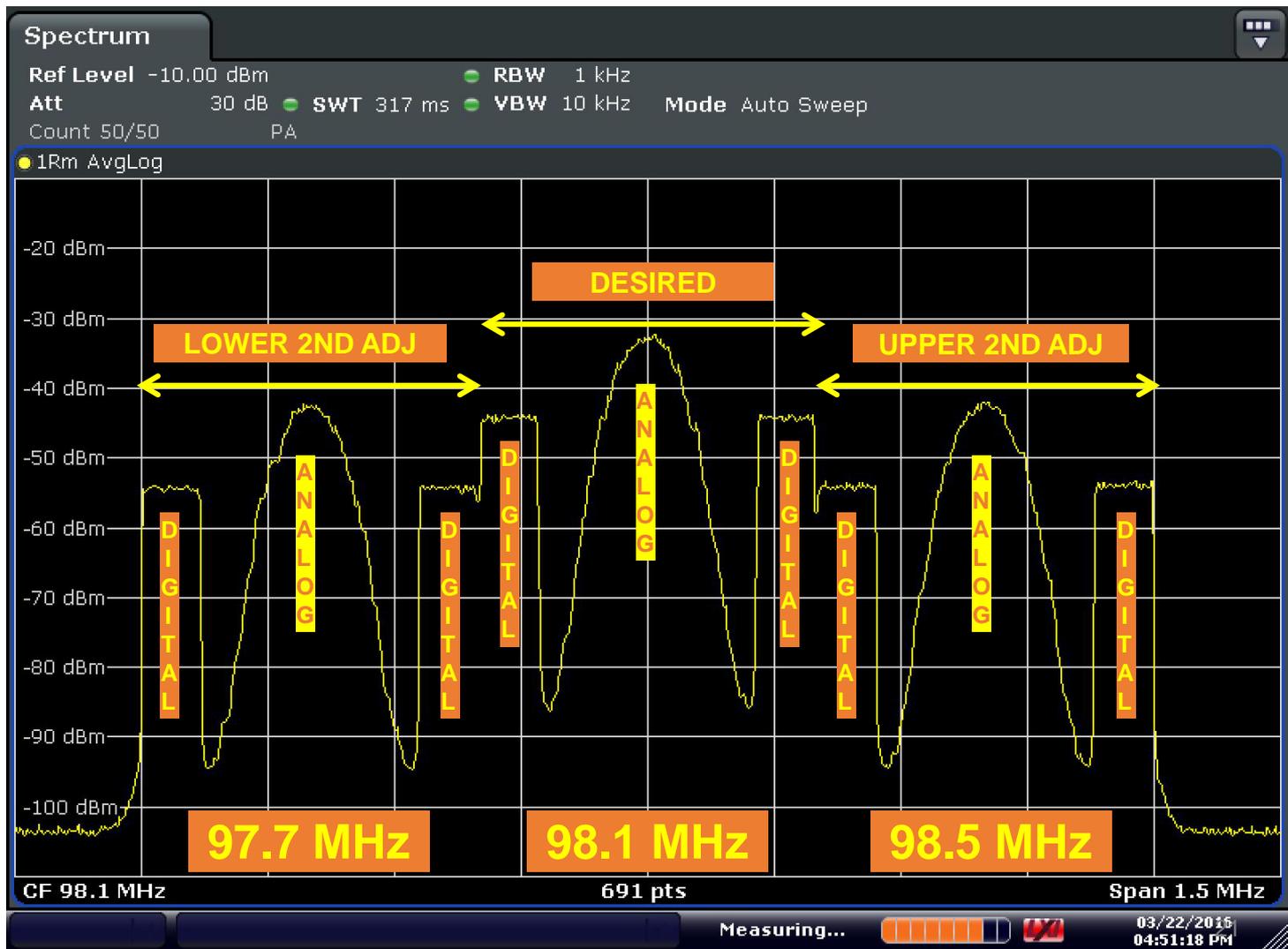
MIKE RHODES

Today's presentation

- About NAB

- **NAB Digital Dash Best Practices**

- US rollout of hybrid radio

- Action items

DIGITAL DASHBOARD
BEST PRACTICES REPORT
August 2017

RADIOSHOW
Produced by NAB and RAB

24

NAB Digital Dashboard Best Practices Report

- Authors:
  - Fred and Paul Jacobs (Jacobs Media)
  - Glynn Walden (Audacy)
  - NAB staff
- Describes metadata "audits" undertaken in 3 cities (and results)
- Explains what broadcasters need to do, good metadata practices

Example of results from metadata audit

Philadelphia Audit: HD Radio Vehicle, Afternoon Drive		
Score	Number of stations	Percent of total
Green	7	14%
Yellow	25	49%
Orange	8	16%
Red	11	22%

Charlotte Audit: RDS Radio Vehicle, Midday		
Score	Number of stations	Percent of total
Green	9	33%
Yellow	5	18%
Orange	8	30%
Red	5	18%

|	
Green	The station utilized the full display functionality of the system (RDS or HD Radio) and information was displayed properly
Yellow	The station did not properly utilize all of the display functionality
Orange	The station's display functionality was poor or there were errors
Red	There was no display functionality

Example of results from metadata audit

Philadelphia Audit: HD Radio Vehicle, Afternoon Drive

| Score	Number of stations	Percent of total
Green	7	14%
Yellow	25	49%
Orange	8	16%
Red	11	22%

NAB Digital Dashboard Best Practices Report

- Report has been updated and was re-released in June

- New information on hybrid radio receivers, metadata service providers

- Part of NAB's ongoing effort to help broadcasters improve their metadata usage

https://www.nab.org/innovation/NAB_DigitalDash_RecommendedBestPractices_0621.pdf

3 pages

29 pages

Hybrid radio metadata sources

Metadata source/provider by auto manufacturer (May 2021)

Manufacturer	Metadata Source/Provider	
	Static	Dynamic
Audi	RadioDNS	Radioplayer
BMW	RadioDNS	n/a
Mercedes	Various (including RadioDNS, direct integration with Xperi is recommended)	Various (direct integration with Xperi is recommended)

Metadata Service Providers

This information is provided for informational purposes only. Please contact David Layer at NAB, **dlayer@nab.org**, if you want your company's services to be included.

Service Provider	List of services	Comments
Aiir **https://aiir.com/**	• RadioDNS registration, service information (SI) file creation	Currently offered for free to U.S. broadcasters
Arctic Palm **https://arcticpalmapps.com/**	• Radio station production software for metadata management	Evolving into the Rapid Xperi platform (see below)
Pluxbox **https://pluxbox.com/**	• RadioDNS registration, service information (SI) file creation (**https://metadata.radio/**) • Full-service dynamic metadata including song title and artist, artist images and synchronized ad display messages	Currently offered for free to U.S. broadcasters
Quu Interactive **https://myquu.net/**	• RadioDNS registration, service information (SI) file creation • Full-service dynamic metadata including song title and artist, artist images and synchronized ad display messages	Acquired Jump2Go in 2019
Radioline **http://business.radioline.co/**	• Full-service dynamic metadata including song title and artist, album art	Have developed a hybrid radio platform for Android Automotive OS
Radioplayer **https://radioplayer.org/**	• RadioDNS registration, service information (SI) file creation • Full-service dynamic metadata including song title and artist, album art • Exclusive dynamic metadata service provider for Audi and BMW hybrid radio solutions	Not currently available in the U.S.
Rapid **https://www.aimrapid.com/**	• Radio station production software for metadata management	Predecessor system is Arctic Palm
TRE **https://www.bdcast.com/products/studio-products/tre-the-radio-experience/**	• Radio station production software for metadata management • Full-service dynamic metadata including song title and artist, artist images	
Xperi **AutoStage, https://dts.com/autostage/**	• Acquire service information (SI) using RadioDNS standards • Full-service dynamic metadata including song title and artist, artist images and synchronized ad display messages • Analytical information on listener behavior shared with the broadcaster • Exclusive service provider of broadcast metadata for Mercedes hybrid radio solution	AutoStage is an amalgam of TiVo metadata services and the DTS Connected Radio platform
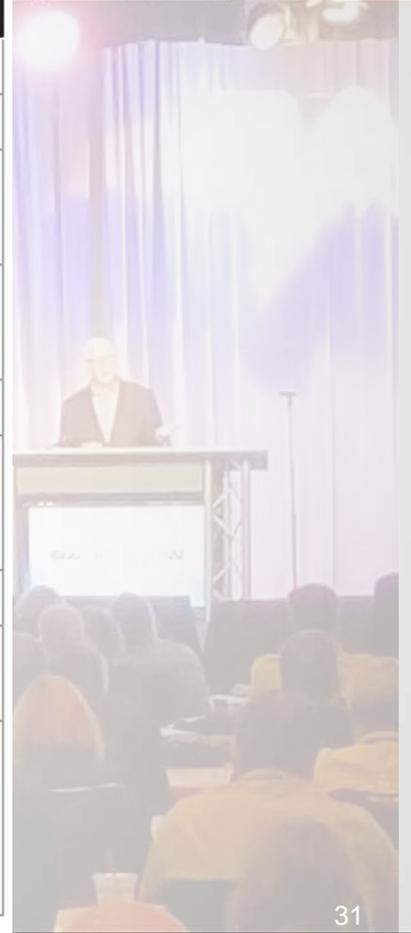
NAB Digital Dashboard Best Practices Report
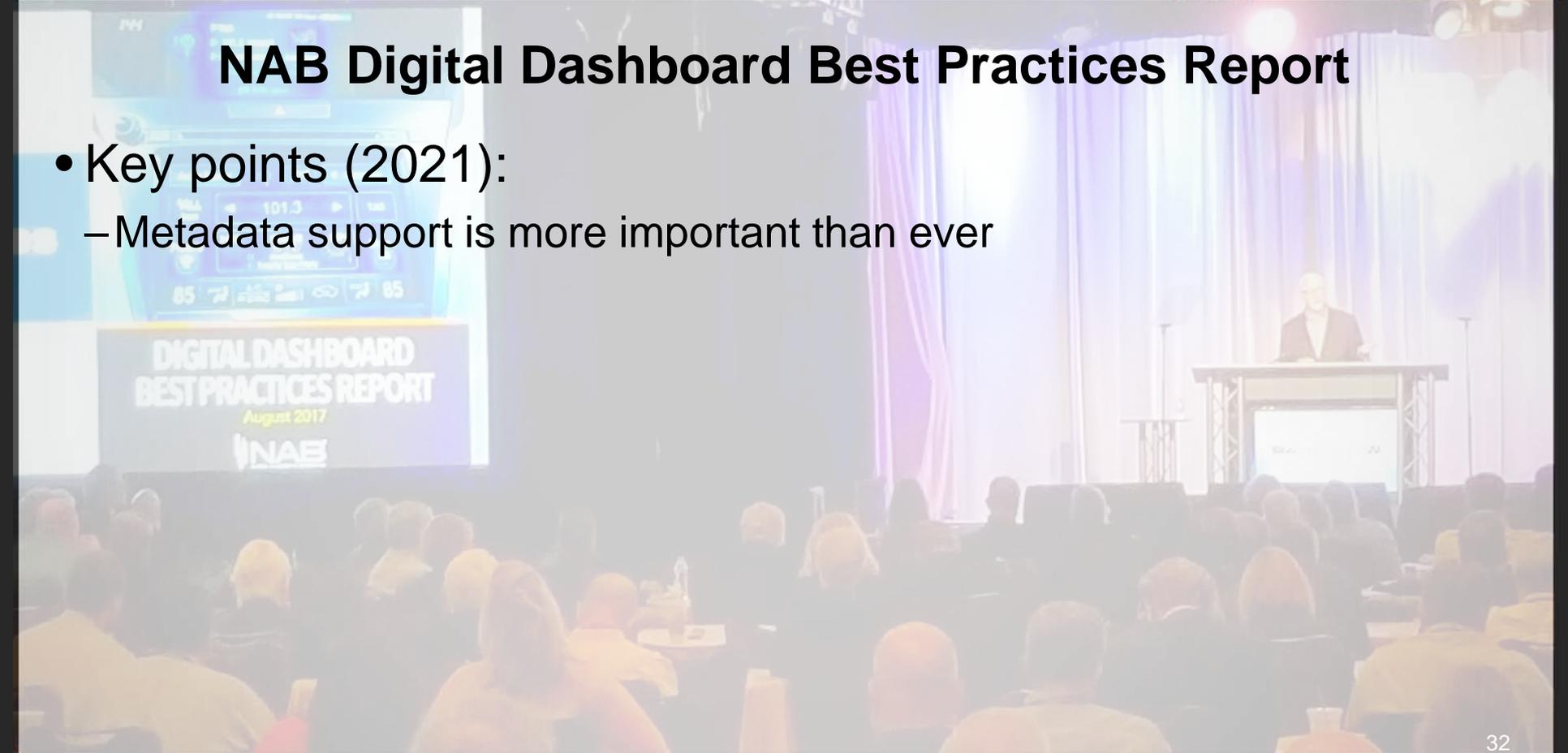
- Key points (2021):
  - Metadata support is more important than ever

NAB Digital Dashboard Best Practices Report

- Key points (2021):
  - Metadata support is more important than ever
  - Many automakers are using in-vehicle databases

Music Recognition for Radio in the Car

Drivers have a dizzying array of music options to choose from. Gracenote MusicID Radio brings order to the chaos by identifying music playing from every possible radio source and delivering consistent metadata, Album Cover Art and relational links to the driver's dashboard.

- Raises consumer expectations

- Levels the playing field

- Broadcaster's metadata content might not be displayed

35
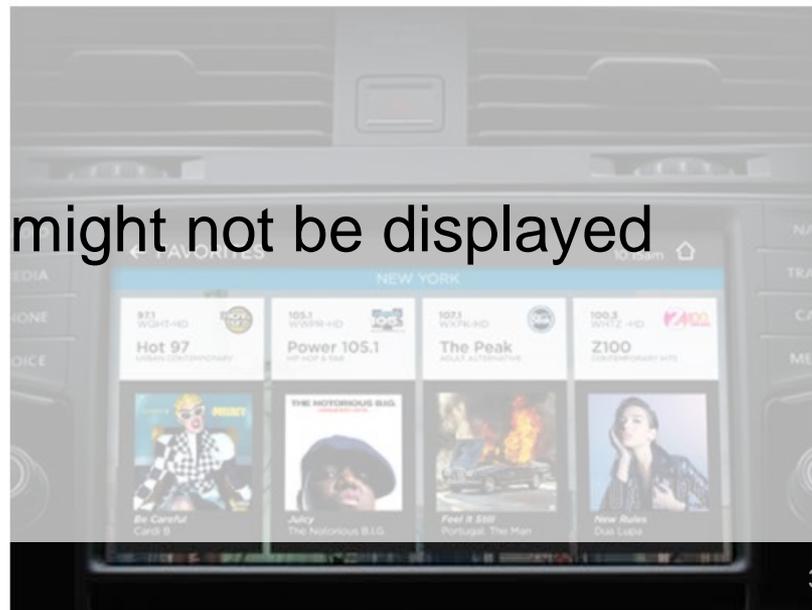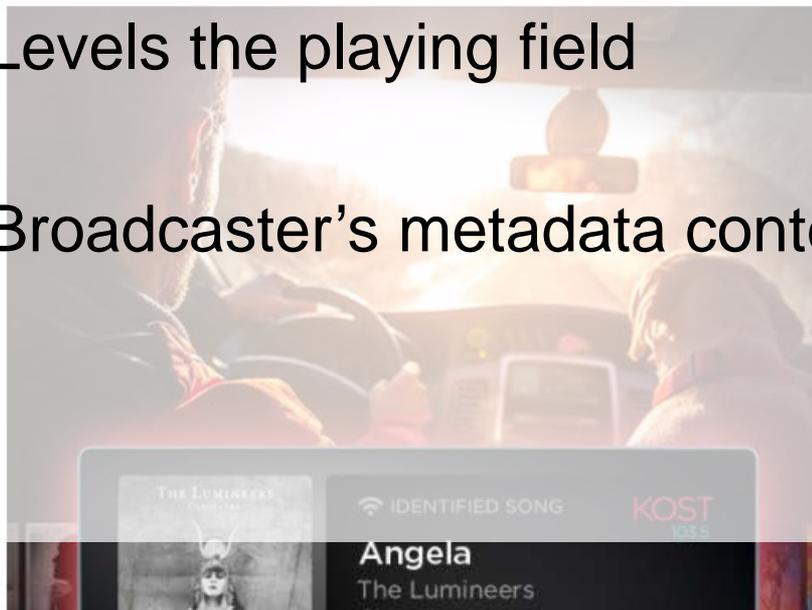
Audi A4 testing - metadata

- Consumer has to select "ONLINE ADDITIONAL DATA" to use Gracenote metadata
- Gracenote is only metadata source for online sources
- Sirius XM is separate
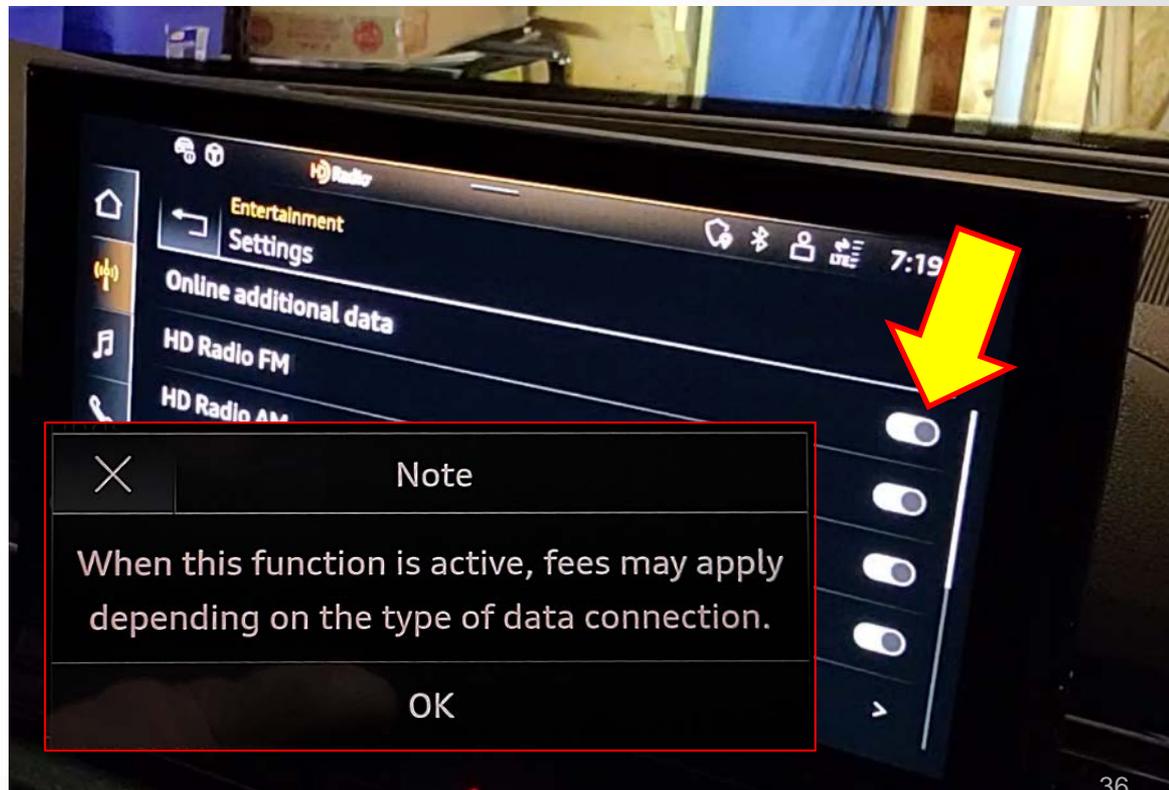
Audi A4 testing - metadata

- With ONLINE ADDITIONAL DATA selected, broadcaster metadata is unlikely to reach consumers – impacts:
  - Timing of metadata display relative to audio content
  - Broadcaster artwork vs. Gracenote artwork
  - Services like Quu Interactive which rely on broadcaster-provided metadata

37
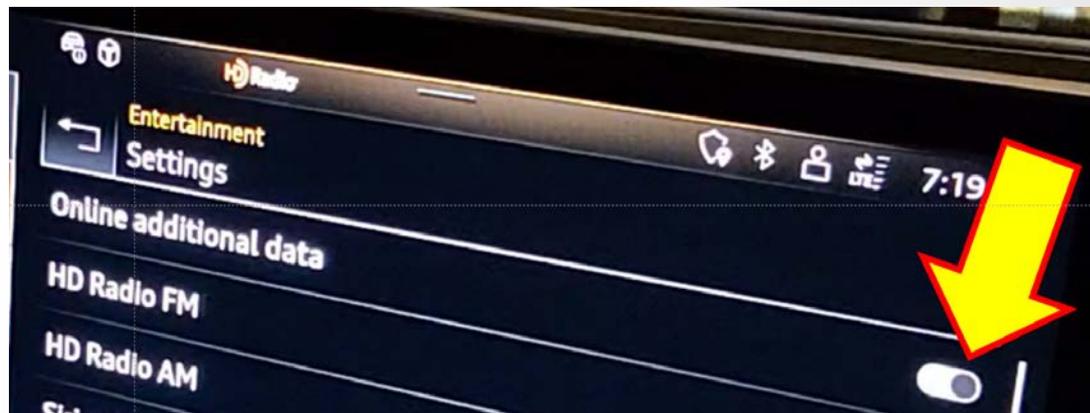
Audi A4 testing - metadata

- When "ONLINE ADDITIONAL DATA" is deselected, broadcaster-provided metadata appears *(but now no metadata for online services)*

Audi A4 testing – metadata examples

- Broadcaster-provided

- During commercial break, note station logo metadata

Audi A4 testing – metadata examples

- Gracenote-provided

- No metadata during commercial break

- Has implications for advertising

Audi A4 testing – metadata examples

- Broadcaster-provided

- NPR example using MetaPub story-level metadata

Audi A4 testing – metadata examples

- Gracenote-provided

- Logo stored in receiver, no metadata on story being broadcast
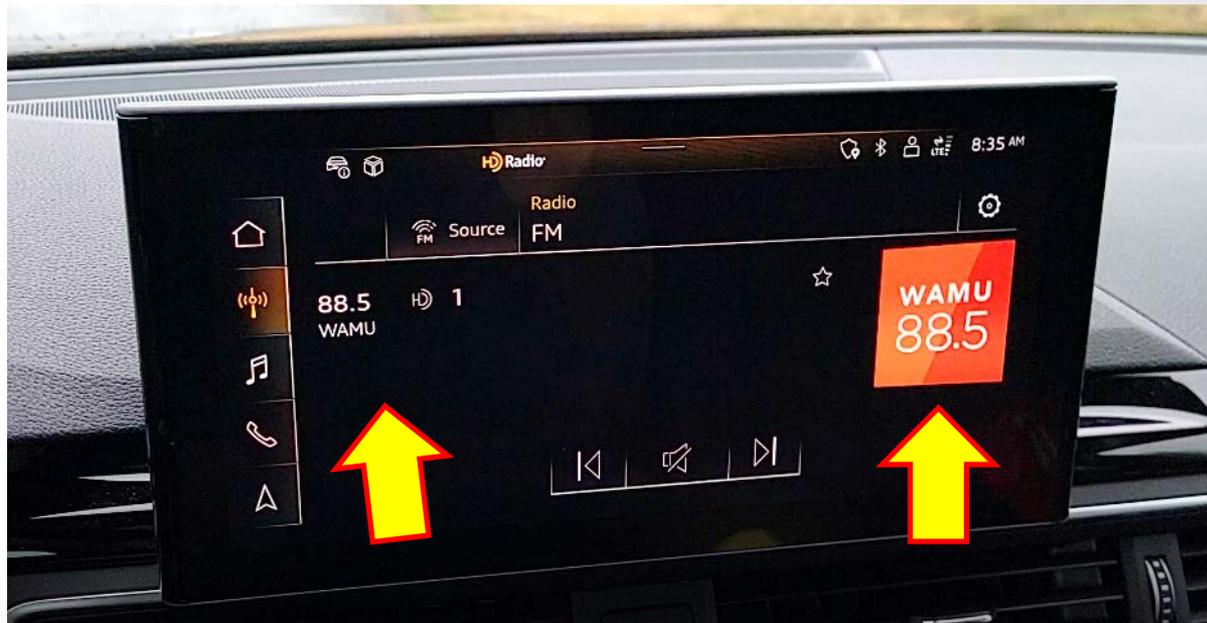
Audi A4 testing – metadata examples

- Online content example

- With ONLINE ADDITIONAL DATA *deselected*

Audi A4 testing – metadata examples

- Online content example

- With ONLINE
  ADDITIONAL DATA
  selected

Audi A4 testing – metadata examples

- Different artwork example

- Broadcaster-provided – this metadata appeared a few (2-5) seconds before song began, during announcer intro

Audi A4 testing – metadata examples

- Different artwork example

- Gracenote-provided – this will not appear until song starts, takes 2-5 seconds for recognition process to complete

NAB Digital Dashboard Best Practices Report

- Key points (2021):
  - Metadata support is more important than ever
  - Many automakers are using in-vehicle databases
  - Using RadioDNS is a good start to enhance a station's image

Radio DNS
HYBRID RADIO

Introducing Hybrid Radio

News & Campaigns

Technical Information

Policy & Organisation

Documentation & How To Guides

Search..   GO   CONTACT

HOME   Technical Information   Documentation & How To Guides
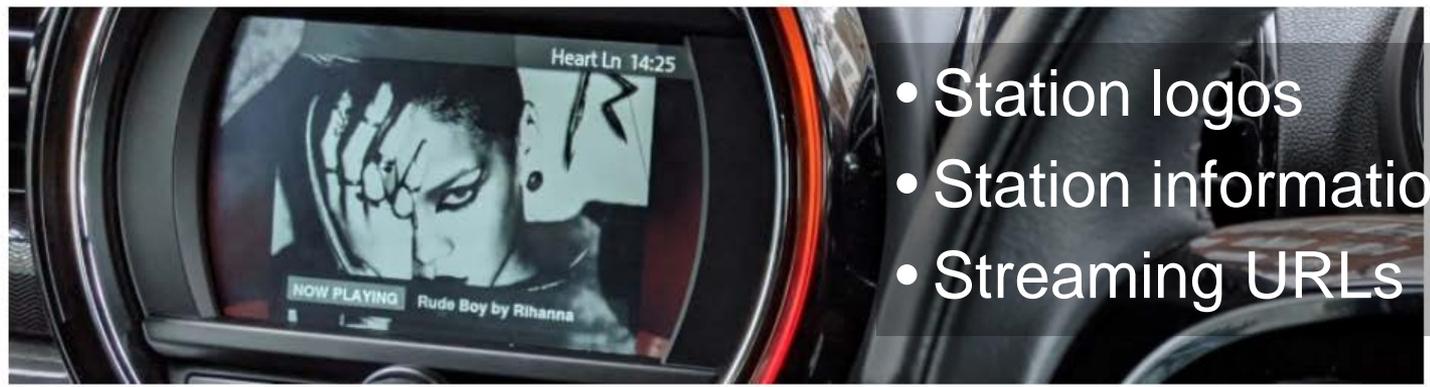
- Station logos
- Station information
- Streaming URLs

These documents are here to help developers of RadioDNS Hybrid Radio systems and receiver implementations

4% of Wisconsin radio stations are registered with RadioDNS

759 stations in Wisconsin   4%

Call Sign	HD?	Frequency	PI Code/Facility ID	City	State	Service	Stream?	Service Provider	Bearer
WDKV	No	91.7	5dad	FOND DU LAC	WI	K-LOVE - Positive and Encouraging	Yes	Educational Media Foundation	fm:5a0.5dad.09170
WLVE	No	105.3	73da	MUKWONAGO	WI	K-LOVE - Positive and Encouraging	Yes	Educational Media Foundation	fm:7a0.73da.10530
WPFF	No	90.5	7ccb	STURGEON BAY	WI	K-LOVE - Positive and Encouraging	Yes	Educational Media Foundation	fm:7a0.7ccb.09050
WATQ	No	106.7	56a6	CHETEK	WI	Moose Country 106.7	Yes	iHeartMedia	fm:5a0.56a6.10670
WATQ-HD1	Yes	106.7	36357	CHETEK	WI	Moose Country 106.7	Yes	iHeartMedia	hd:292.08e05
WBIZ-FM	No	100.7	5835	EAU CLAIRE	WI	Z100 Eau Claire	Yes	iHeartMedia	fm:5a0.5835.10070
WBIZ-FM-HD1	Yes	100.7	2108	EAU CLAIRE	WI	Z100 Eau Claire	Yes	iHeartMedia	hd:292.0083c
WIBA-FM	No	101.5	19e2	SAUK CITY	WI	101.5 IBA FM	Yes	iHeartMedia	fm:1a0.19e2.10150
WIBA-FM-HD1	Yes	101.5	17385	SAUK CITY	WI	101.5 IBA FM	Yes	iHeartMedia	hd:292.043e9
WKKV-FM	No	100.7	1729	RACINE	WI	V100.7	Yes	iHeartMedia	fm:1a0.1729.10070
WKKV-FM-HD1	Yes	100.7	68758	RACINE	WI	V100.7	Yes	iHeartMedia	hd:292.10c96
WMAD	No	96.3	145b	CROSS PLAINS	WI	96.3 Star Country	Yes	iHeartMedia	fm:1a0.145b.09630
WMAD-HD1	Yes	96.3	50055	CROSS PLAINS	WI	96.3 Star Country	Yes	iHeartMedia	hd:292.0c387
WMEQ-FM	No	92.1	74d0	MENOMONIE	WI	Classic Rock 92.1	Yes	iHeartMedia	fm:7a0.74d0.09210
WMEQ-FM-HD1	Yes	92.1	52473	MENOMONIE	WI	Classic Rock 92.1	Yes	iHeartMedia	hd:292.0ccf9
WMIL-FM	No	106.1	1533	WAUKESHA	WI	FM106.1	Yes	iHeartMedia	fm:1a0.1533.10610
WMIL-FM-HD1	Yes	106.1	63919	WAUKESHA	WI	FM106.1	Yes	iHeartMedia	hd:292.0f9af
WQRB	No	95.1	a8a3	BLOOMER	WI	Hot Country B95	Yes	iHeartMedia	fm:aa0.a8a3.09510
WQRB-HD1	Yes	95.1	5870	BLOOMER	WI	Hot Country B95	Yes	iHeartMedia	hd:292.016ee
WRIT-FM	No	95.7	126f	MILWAUKEE	WI	95.7 BIG FM	Yes	iHeartMedia	fm:1a0.126f.09570
WRIT-FM-HD1	Yes	95.7	60233	MILWAUKEE	WI	95.7 BIG FM	Yes	iHeartMedia	hd:292.0eb49
WRNW	No	97.3	12f4	MILWAUKEE	WI	97.3 The Game	Yes	iHeartMedia	fm:1a0.12f4.09730
WRNW-HD1	Yes	97.3	26609	MILWAUKEE	WI	97.3 The Game	Yes	iHeartMedia	hd:292.067f1
WXXM	No	92.1	13c6	SUN PRAIRIE	WI	Rewind 92.1	Yes	iHeartMedia	fm:1a0.13c6.09210
WXXM-HD1	Yes	92.1	17383	SUN PRAIRIE	WI	Rewind 92.1	Yes	iHeartMedia	hd:292.043e7
WZEE	No	104.1	1718	MADISON	WI	Z104 Madison	Yes	iHeartMedia	fm:1a0.1718.10410
WZEE-HD1	Yes	104.1	41980	MADISON	WI	Z104 Madison	Yes	iHeartMedia	hd:292.0a3fc

NAB Digital Dashboard Best Practices Report

- Key points (2021):
  - Metadata support is more important than ever
  - Many automakers are using in-vehicle databases
  - Using RadioDNS is a good start to enhance a station's image
  - Broadcasters should sign up for DTS AutoStage

► Get in touch:
juan.galdamez@xperi.com

► Join us in revolutionizing the future of broadcast radio in the connected car

► Enabling partners:

- Quu Interactive
- RCS
- Plubox
- Radio.com
- Broadcast Electronics
- Arctic Palm/All In Media

► Learn More @ www.dts.com/autostage

NAB Digital Dashboard Best Practices Report

- Key points (2021):
  - Metadata support is more important than ever
  - Many automakers are using in-vehicle databases
  - Using RadioDNS is a good start to enhance a station's image
  - Broadcasters should sign up for DTS AutoStage
  - Broadcasters must develop strategies for supporting non-linear content and interactivity

8:55 AM

Radio
Online

Source

How Bruce Lee Worked

WEB ★

Bruce Lee may have introduced more Westerners to Asian culture than any person in history. And, because he died...

22:18 | -33:52

STUFF YOU SHOULD KNOW

PODCAST

List

NAB Digital Dashboard Best Practices Report

- NAB continues to work with automakers and others to enhance broadcast radio in the vehicle

- Getting broadcasters on-board with improved metadata is a marathon not a sprint

NAB Digital Dash Survey

- Please complete the NAB Digital Dash Survey for your radio station or group
- On the nab.org web page

Please fill out the survey for your station or group. This information will not be public except in the aggregate along with similar information from other stations/groups. No identifiable information will be released. **Please provide an estimated number of stations for each category.**

1. Song Title and Artist:
Skip this step if your station(s) do not have a music format.

	Now	Within 6 Months	Not Planned
RDS			
HD Radio			
Streaming Audio			

NAB
NATIONAL ASSOCIATION OF BROADCASTERS®

About Us ▼   Advocacy ▼   Education ▼   Innovation ▼   Events ▼   News ▼   Membership ▼   My NAB

HOME / INNOVATION / NAB DIGITAL DASH SURVEY

NAB Digital Dash Survey

Important: please be sure to review this information prior to taking the survey below:

- Read the NAB Digital Dashboard Best Practices Report to familiarize yourself with the contents of the survey
- Review the categories below to see the data being requested
- Please compile this data in advance of filling out the survey. You may find it helpful to print out this page for use as a worksheet.
- Any questions? Please contact dlayer@nab.org

When ready, completely fill out the survey and click on Submit. Page will reload if refreshed and your data will be lost.

Thank you for your help with this brief survey.

Have Questions? Need Help?

If you have questions or need help with this survey, please contact David Layer by email: dlayer@nab.org.

https://www.nab.org/innovation/digitalDashSurvey.asp

Today's presentation

- About NAB

- NAB Digital Dash Best Practices

- **US rollout of hybrid radio**

- Action items

US rollout of hybrid radio

- Audi, BMW and Mercedes now selling vehicles in the US with hybrid radio (more coming)

- Broadcasters should be providing RadioDNS info and be connected to Xperi AutoStage

  – AUTOMAKERS ARE WATCHING!

Radio **DNS**
HYBRID RADIO

www.radiodns.org

US rollout of hybrid radio

- Broadcasters can adapt the station information in existing database(s) to the RadioDNS format
- Broadcasters can automatically publish a service information (SI) file on their own web servers
- Broadcasters can set up DNS records to point to SI file
- It's easy to register stations with RadioDNS (and no cost)
- There are software tools, online tools and documentation to help

NEWS

Federal Communications Commission
45 L Street NE
Washington, D. C. 20554

News Media Information 202 / 418-0500
Internet: http://www.fcc.gov
TTY: 1-888-835-5322

This is an unofficial announcement of Commission action. Release of the full text of a Commission order constitutes official action.
See MCI v. FCC. 515 F 2d 385 (D.C. Circ 1974).

July 12, 2021

BROADCAST STATION TOTALS AS OF JUNE 30, 2021

The Commission has announced the following totals for broadcast stations licensed as of June 30, 2021:

AM STATIONS	4533	
FM COMMERCIAL	6681	
FM EDUCATIONAL	4214	
TOTAL		**15,428**
UHF COMMERCIAL TV	995	
VHF COMMERCIAL TV	378	
UHF EDUCATIONAL TV	265	
VHF EDUCATIONAL TV	119	
TOTAL		**1,757**
CLASS A UHF STATIONS	355	
CLASS A VHF STATIONS	31	
TOTAL		**386**
FM TRANSLATORS & BOOSTERS	8614	
UHF TRANSLATORS	2532	
VHF TRANSLATORS	764	
TOTAL		**11,910**
UHF LOW POWER TV	1496	
VHF LOW POWER TV	489	
TOTAL		**1,985**
LOW POWER FM	2093	**2,093**
TOTAL BROADCAST STATIONS		**33,559**

FC NEWS

Federal Communications Commission
45 L Street NE
Washington, D. C. 20554

News Media Information 202 / 418-0500
Internet: http://www.fcc.gov
TTY: 1-888-835-5322

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AM STATIONS	4533
FM COMMERCIAL	6681
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FM TRANSLATORS & BOOSTERS	8614
LOW POWER FM	2093
TOTAL	**26,135**

UHF LOW POWER TV	1496	
VHF LOW POWER TV	489	
TOTAL		**1,985**
LOW POWER FM	2093	**2,093**
TOTAL BROADCAST STATIONS		**33,559**

- FCC -

Owner	Rank	Total Stations	Major Market	Large Market	Medium Market	Small Market	Unrated
iHeartMedia	1	858	160	103	198	312	85
Cumulus Media	2	429	34	44	108	222	21
Townsquare Media	3	321	1	0	32	213	75
Entercom	4	235	118	52	57	8	0
Saga Communications	5	113	2	15	29	24	43
Salem Media Group	6	109	66	19	20	3	1
Forever Media	7	83	1	5	4	22	51
Midwest Communications	8	82	0	3	5	64	10
Beasley Media Group	9	65	32	7	10	15	1
Bell Media Radio	10	61	4	0	1	3	53
Univision Radio	11	58	42	7	7	1	1
Cox Media Group	12	56	30	12	10	0	4
Hubbard Broadcasting	13	54	26	8	2	2	16
Radio One	14	53	28	19	6	0	0
Bicoastal Media	15	50	1	0	0	5	44
Entravision	16	49	13	6	17	8	5
Cherry Creek Radio	17	43	0	0	0	4	39
Mid-West Family Bdcasting.	17	43	0	0	8	25	10
Lotus Communications	19	41	3	9	25	2	2
Lazer Broadcasting Corp.	20	40	4	3	11	14	8
NRG Media	20	40	0	0	8	21	11
High Pl			0	0	1	2	37

2,923 (about 20%)

Today's presentation

- About NAB

- NAB Digital Dash Best Practices

- US rollout of hybrid radio

- **Action items**

Action items

- For broadcasters –
  - NEAR TERM – provide the metadata and do it now
  - LONG TERM – develop hybrid radio strategy
    - continue to work with receiver mfgs and OEMs to create a great hybrid radio experience

- For receiver manufacturers (esp. OEMs) –
  - NEAR TERM – use the broadcaster metadata if available
  - LONG TERM – continue to work with broadcasters to create a great hybrid radio experience

Today's presentation

- About NAB

- NAB Digital R

- US rollout o

- Action items

Thanks for having me today!

dlayer@nab.org