



**Radio**<sup>®</sup>  
Digital AM & FM  
**In Canada**



# Agenda

- Regulatory issues in Canada
- Canadian Association of Broadcasters
- Traffic Data role in HD Radio roll out
- Status of HD Radio in Canada
- Number of radios equipped with HD
- HD implementation Primer
- Station Choices - bandwidth, audio channels & traffic information
- Your questions



**Chuck Kelly**  
Regional Sales Manager  
Asia Pacific, Nautel



**Gary Manteuffel**  
Director, Canada/US  
National Accounts  
Nautel



**Jeff Detweiler**  
Executive Director  
Xperi



**Kirk Nesbitt**  
Technical Advisor  
Canadian Association  
of Broadcasters



**Paul Brenner**  
Executive Officer  
Emmis Communications

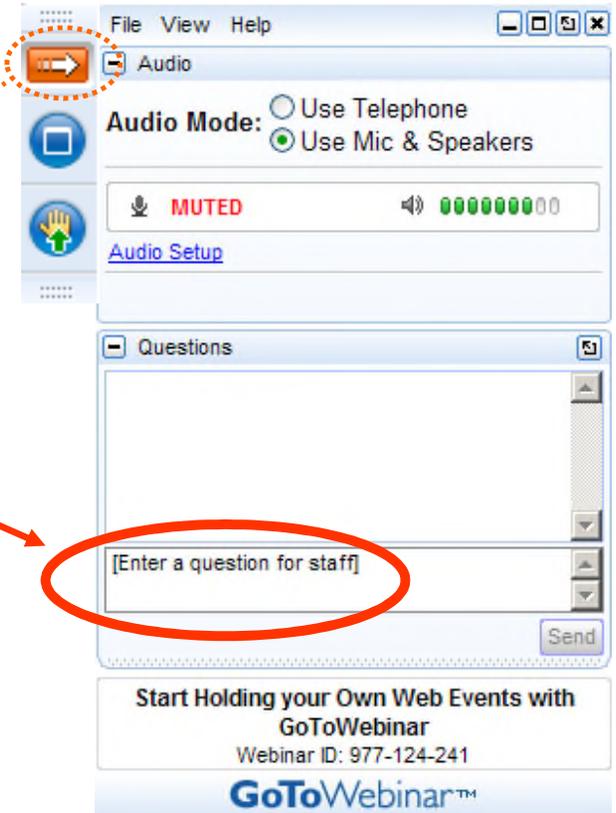
# Your questions please?

(If you don't see the control panel, click on the orange arrow icon to expand it)

Please enter your questions in the text box of the webinar control panel (remember to press send)



Remember: The completion of a Nautel webinar qualifies for ½ SBE re-certification credit, identified under Category I of the Re-certification Schedule for SBE Certifications.



## CANADA – REGULATORY



- On October 28<sup>th</sup>, 2014, the CRTC released a targeted policy review of the commercial radio sector (Broadcasting Regulatory Policy CRTC 2014-554). Included in this review was a flexible approach for introducing HD Radio technology in Canada, designed to allow for innovation and experimentation.
- Licensees are required to apply to Innovation, Science and Economic Development Canada (ISED) for experimental authorization and inform the CRTC in writing of any experimentation with HD Radio (or other digital radio technologies) that they undertake, including the type of service they intend to provide.



## CAB Initiatives

- The CAB is targeting four issues;
  - Measure penetration and growth through Numeris.
  - Review ISED/CRC lab measurements.
  - Consult CRTC re digital policy
  - Understand future licence fees as an industry.
- Also, monitor HD Radio developments to include hybrid radio.
  - Important for service following and tuning by logo.

# HD RADIO GLOBAL ROLLOUT



As of May 2018.

# HD RADIO CANADA ROLLOUT

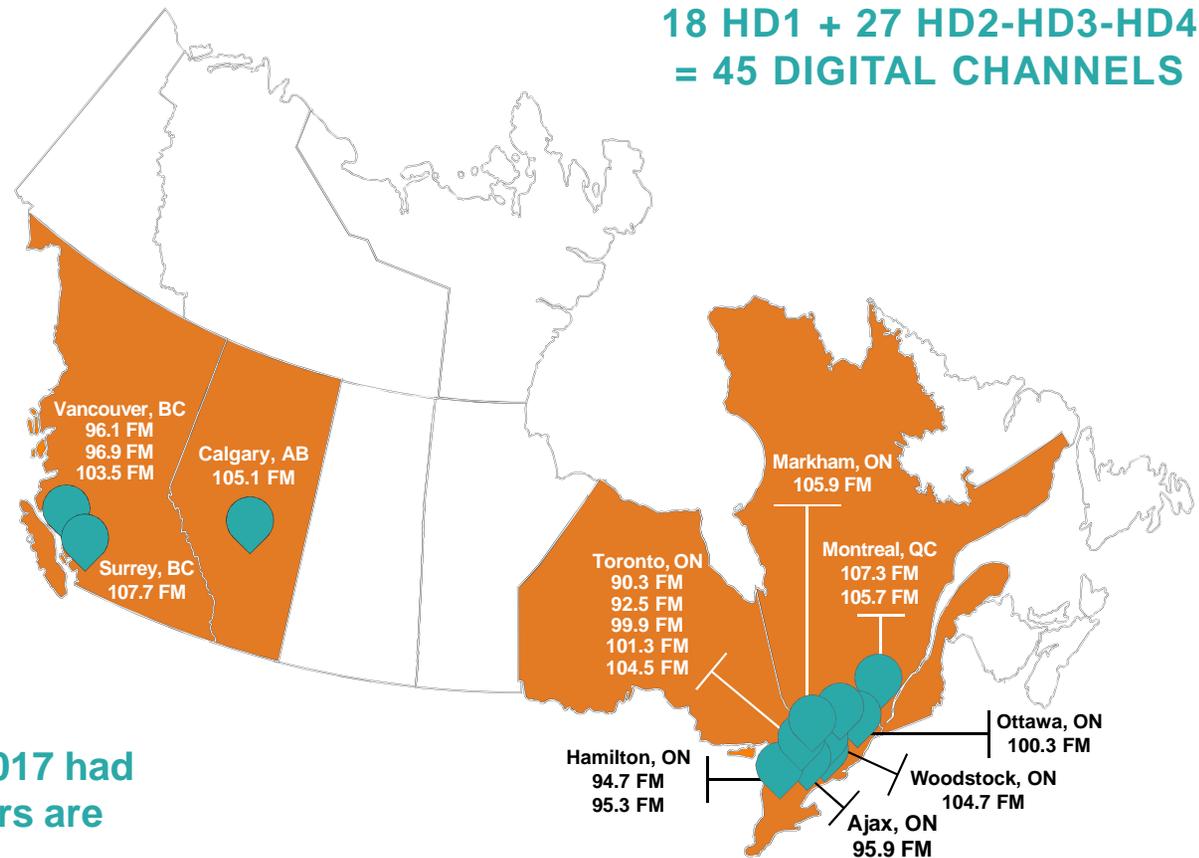


## 10 covered markets; 18 stations

- Ajax, ON (CJKX)
- Calgary, AB (CKRY)
- Hamilton, ON (CING and CHKX)
- Markham, ON (CFMS)
- Montreal, QC (CITE and CFGL)
- Ottawa, ON (CJMJ)
- Surrey, BC (CISF)
- Toronto, ON (CJSA, CKIS, CHUM, CJBC & CKFM)
- Vancouver, BC (CFMI, CHQM, CJAX)
- Woodstock, ON (CIHR)

1 in 5 new vehicles sold in Canada in 2017 had HD Radio Technology. HD Radio receivers are available in 20 auto brands in Canada.

18 HD1 + 27 HD2-HD3-HD4  
= 45 DIGITAL CHANNELS



# CANADA - HD RADIO PROGRAM OFFERINGS

## CJSA 101.3 MHz Toronto, Ontario

- ✔ HD1-Multi lingual (20+ languages per week) Hindi, Tamil, Punjabi, Urdu and other Indian languages, African and Eastern European
- ✔ HD2-Tamil
- ✔ HD3-Hindi & Urdu
- ✔ HD4-Punjabi

## CKIS 92.5 MHz Toronto, Ontario

- ✔ HD1-Kiss FM /Non Stop Hits
- ✔ HD2-CFTR AM 680 News
- ✔ HD3-CJCL 590 AM SportsNet -The Fan

## CHUM 104.5 MHz Toronto, Ontario

- ✔ HD1-Today's Best Music
- ✔ HD2-CHUM-AM 1050 kHz TSN

## CKFM 99.9 MHz Toronto, Ontario

- ✔ HD1-Virgin Radio, Toronto's #1 Hit Music Station
- ✔ HD2-CFRB-AM 1010 News Talk

## CIHR 104.7 MHz Woodstock, Ontario.

- ✔ HD1-Heart 104.7
- ✔ HD2-80's and more

## CFMS 105.9 MHz Markham, Ontario

- ✔ HD1-105.9 The Region
- ✔ HD2-South Asian
- ✔ HD3-Farsi
- ✔ HD4-Chinese

## CING 95.3 MHz Hamilton, Ontario

- ✔ HD1-Fresh FM-Hamilton's Hit Music Station
- ✔ HD2-CFMJ AM 640 – News/Talk
- ✔ HD3-CHML AM 900 – News/Talk

## CHKX 94.7 MHz Hamilton, Ontario

- ✔ HD1-KX 94.7 New Country
- ✔ HD2-Jazz
- ✔ HD3-92.9 The Grand

## CJBC 90.3 MHz Toronto, Ontario

- ✔ HD1 Radio-Canada's Ici Musique network
- ✔ HD2 CBC Ici Premiere CJBC 860

## CJKX 95.9 MHz Ajax, Ontario

- ✔ HD1- KX96 New Country
- ✔ HD2 – The Wave (Jazz)
- ✔ HD3 CKDO Durham's Classic Hit

## CJMJ 100.3 MHz Ottawa, Ontario

- ✔ HD1-Majic 100.3 Today's Best Variety
- ✔ HD2-CFRA 580 News Talk Radio
- ✔ HD3-TSN 1200 Sports Network

## CFGL 105.7 MHz Montreal, Quebec

- ✔ HD1-Rythme FM

## CITE 107.3 MHz Montreal, Quebec

- ✔ HD1 – MONTAGE ROUGE FM
- ✔ HD2-CJAD 800 News Talk Radio
- ✔ HD3-TSN Radio 690 Montreal

## CKRY 105.1 MHz Calgary, Alberta

- ✔ HD1-Country 105
- ✔ HD2-CHQR AM 770 –News/Talk

## CISF 107.7 MHz Surrey, British Columbia

- ✔ HD1 Pulse

## CJAX 96.9 MHz Vancouver, British Columbia

- ✔ HD1-Jack FM
- ✔ HD2-CKWX AM 1130 News

## CFMI 101.1 MHz Vancouver, British Columbia.

- ✔ HD1-Rock 101 - Greatest Hit's of 70's, 80's and 90's
- ✔ HD2-CKNW AM 980 - News/Talk

## CHQM 103.5 MHz Vancouver, British Columbia

- ✔ HD1-QMFM Today's Best Variety/Soft Rock
- ✔ HD2-CKST AM 1040 Sports TSN
- ✔ HD3-CFTE AM 1410 Sports TSN

# HD RADIO CANADA ROLLOUT



**38% OF CARS SOLD IN CANADA Y-T-D 2018 CAME WITH HD RADIO TECHNOLOGY!**



Acura	Alfa Romeo	Audi
Bentley	BMW	Cadillac
Chevrolet	Chrysler	Dodge
Fiat	Ford	GMC
Honda	Hyundai	Infiniti
Jaguar	Jeep	Kia
Lexus	Land Rover	Lincoln
Mazda	Mercedes	Mini
Mitsubishi	Nissan	Porsche
Ram	Subaru	Tesla
Toyota	Volkswagen	Volvo

**OVER 2.1 MILLION CARS ON THE ROAD IN CANADA WITH HD RADIO TECHNOLOGY**

**HD Radio receivers available in 33 auto brands.**

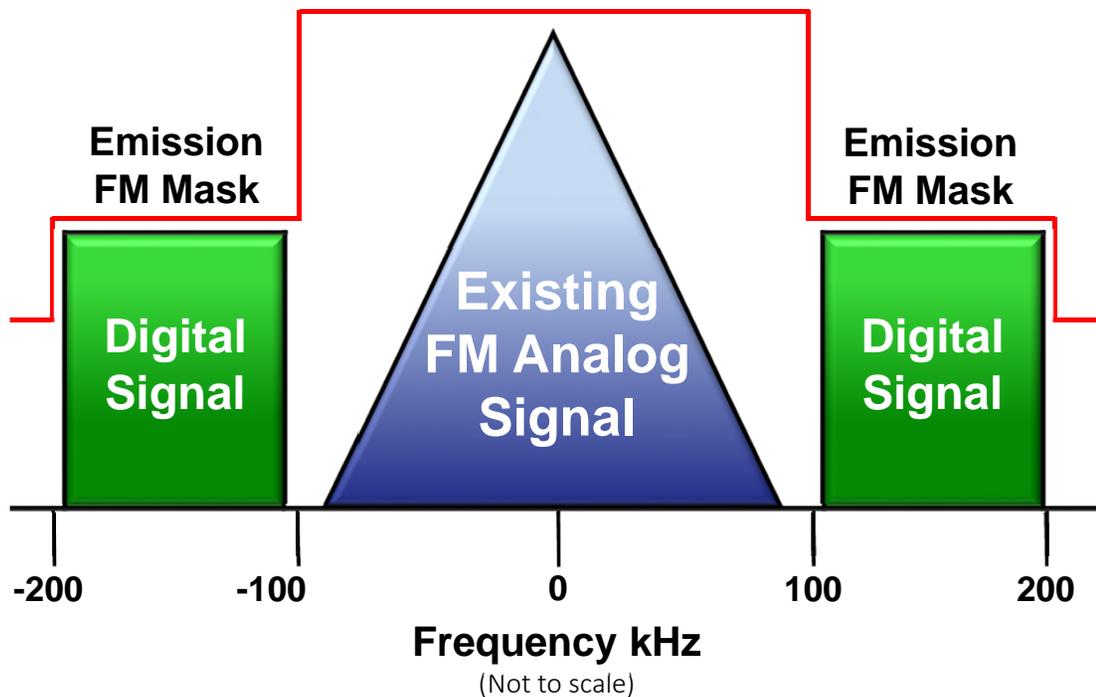
**Well over 1 in 3 new vehicles sold in Canada in 2017 came with HD Radio Technology.**

As of May 2018.

**XPERI**

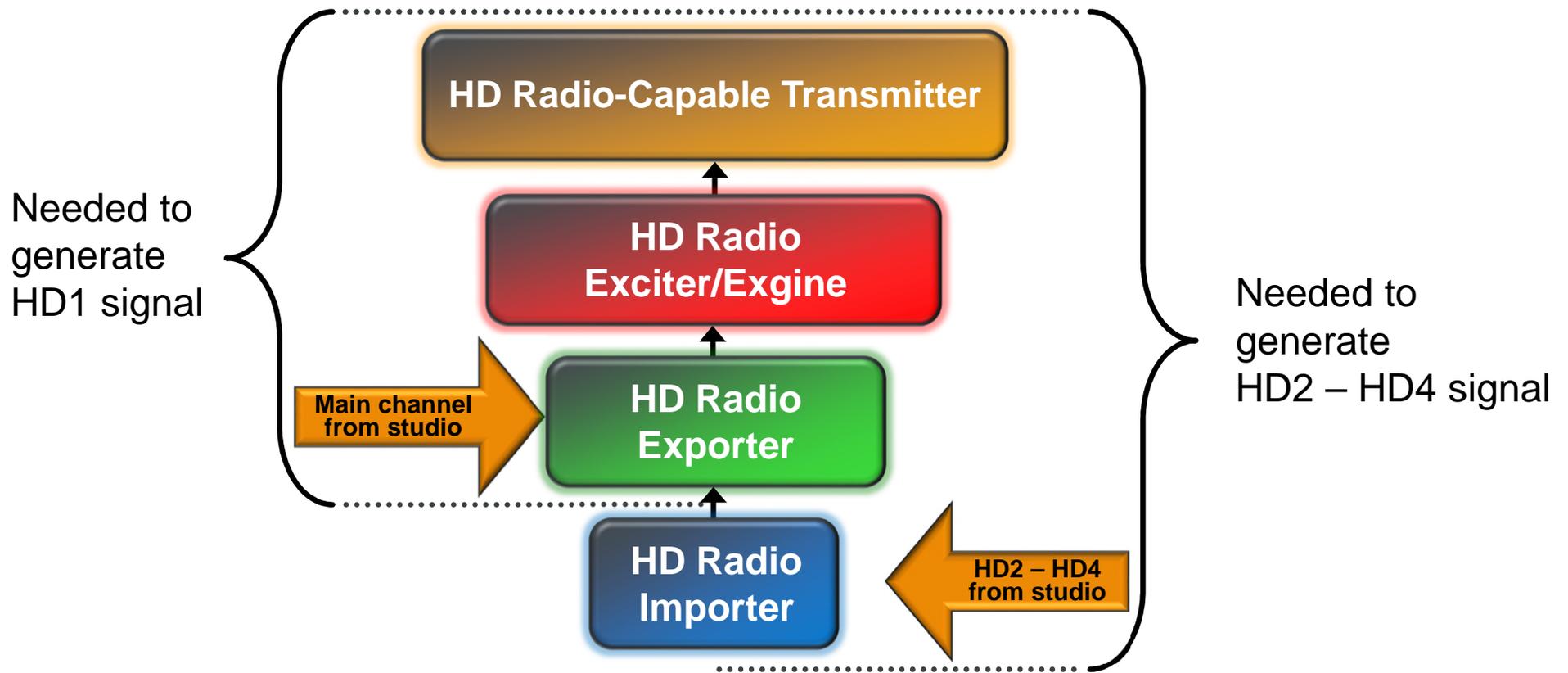
# HOW HD RADIO WORKS

✔ HD Radio Technology uses In-Band, On Channel (IBOC) method

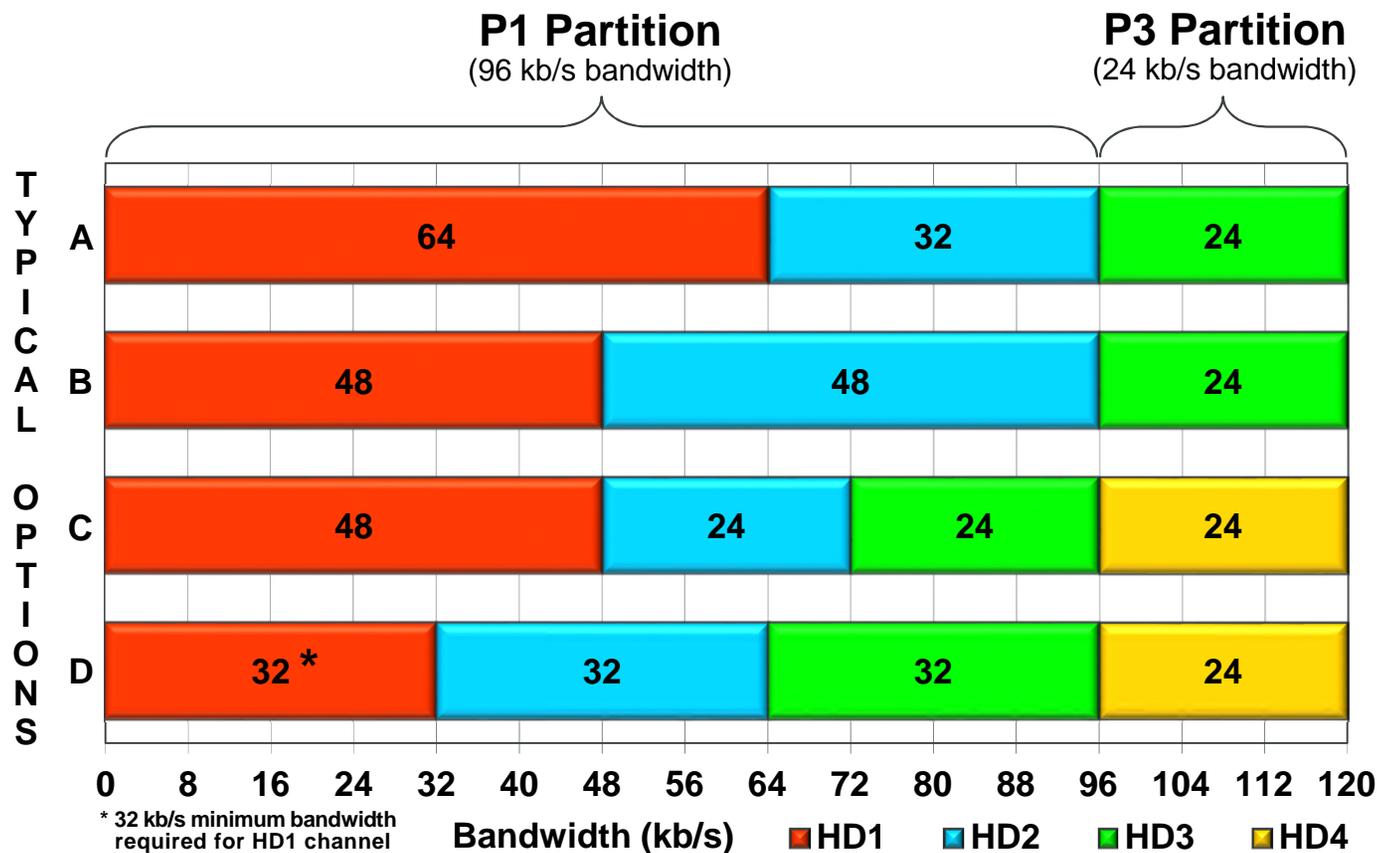


- ✔ Enables simultaneous transmission of analog and digital signals
- ✔ Analog receivers continue to function normally
- ✔ Additional digital channels “invisible” to analog-only receivers
- ✔ Digital transmissions immune to multipath distortion, adjacent channel interference and static

# HOW HD RADIO WORKS



# HOW HD RADIO WORKS



- Allocate 120 kb/s channel bandwidth according to program content and user preference
- All bandwidth above 96 kb/s (P3 partition) must be treated as a single stand-alone unit – it cannot be combined with lower 96 kb/s (P1 partition)

# HD RADIO DIGITAL AUDIO FEATURES

- ✔ HD Radio audio programming is 100% subscription-free!

<b>Program Info</b>	Program Info displays information like <b>artist, song title and album name.</b>
<b>HD2/HD3/HD4</b>	FM stations can divide the digital signal offering up to 3 additional digital-only audio programs on <b>multicast channels.</b> Over 2,200 AM and FM stations now broadcasting with HD Radio Technology across the U.S., and <b>over 1,950 new, extra local multicast channels</b> are also now available.
<b>Digital Sound</b>	HD Radio Technology offers <b>crystal clear, static free sound</b> with none of the clicks, hisses or pops associated with traditional analog radio. FM radio sounds like near - CD quality, and AM radio sounds like FM stereo.
<b>Artist Experience</b>	Images related to the broadcast can be displayed on the radio display, including items such as <b>album cover art and station or advertiser logos.</b>

# HD RADIO ARTIST/ADVERTISER EXPERIENCE



Images related to the broadcast can be displayed on the in-car display, such as album cover art, station logos and of course advertiser logos



# HD RADIO DIGITAL AUDIO FEATURES



FM STATIONS CAN  
DIVIDE THEIR DIGITAL  
SIGNAL OFFERING INTO  
UP TO 3 ADDITIONAL  
DIGITAL-ONLY AUDIO  
PROGRAMS ON THE  
MULTICAST CHANNELS

WRXO-FM 107.7 Oklahoma City, OK



Digital simulcast of analog signal  
Format: Sports Talk



TARGET DEMOGRAPHIC: MEN 18 - 49



Targeted niche programming  
Format: Classic Rock



TARGET DEMOGRAPHIC: ADULTS 35 - 64



Spanish language programming  
Format: Spanish Oldies



TARGET DEMOGRAPHIC: HISPANICS 35 - 64



AM station simulcast  
Format: News / Talk



TARGET DEMOGRAPHIC: MEN 25 - 54

## HD Radio Data Services



- Strategic goals of BTC are innovation and value proposition to OEM's
- Exclusive partner with data provider HERE, a global leader in mapping and location platform services, since 2007
- Data Services for traffic, weather, fuel prices, navigation and non-navigation products
- First HD Radio test station in Canada
- Top Canadian markets on the air since 2015
- Identical setup and operation as US BTC stations
- Ongoing interest from automakers for consistent North American solution

---

## So, I'm new to FM HD Radio, what do I need to know?

- In FM analog, the transmitter amplifiers are operating in Class C. For HD Radio, they are re-biased for more linear operation.
- The analog and the digital signals are all contained in the single radio channel, which contains the analog, the digital representation of the analog, plus up to 4 additional channels.
- The digital carriers are 10 to 20dB below the analog signal.
- Generally, the same antenna can be re-used from the analog installation.

# The Nautel GV Series

Major New Capabilities:	Plus, everything you expect from Nautel:
Charts new territory in digital efficiency	Field-proven, high-power architecture
Reduced cost of ownership for IBOC	Industry's highest digital TPO
New HD Spectrum/Efficiency Optimizer	Award-winning control via Nautel's AUI
Separate controller "back up" user interface	Commercial grade instrumentation
New site control functionality via AUI	HD PowerBoost PAPR/crest reduction
Low mains operation to 90V @ 1/3 TPO	MER instrumentation
New dynamic RDS scrolling	Asymmetrical sidebands
New oscilloscope instrumentation	Spectrum analyzer
	HD Reliable transport
	MPX over AES
	Constellation view



making digital broadcasting work

# Choose your GV



	GV3.5 *	GV5	GV7.5 *	GV10	GV15 *	GV20	GV30 <sup>N</sup>	GV30 *	GV40	GV60	GV80
<b>Analog Only</b>	4.13	5.5	8.25	11	16.5	22	33	33	44	66	88
<b>-20dB Hybrid</b>	3.75	5	7.5	10	15	20	30	30	40	60	80
<b>-14dB Hybrid</b>	3.38	4.5	6.75	9	13.5	18	27	27	36	54	72
<b>-10dB Hybrid</b>	2.5	3.3	5	6.6	10	13	20	20	26	40	52
<b>ANALOG POWER OUTPUT (kW)</b>											
<b>Modules</b>	2	2	4	4	8	8	12	16	16	24	32
<b>Power Supplies</b>	4	4	8	8	16	16	24	32	32	48	64

\* Upgradable; these GV transmitters are future ready, providing an easy upgrade path to the next highest nameplate power level.

# Simplifying the installation



Exporter 2 Engine Link (E2X)

## 4<sup>th</sup> Generation HD Radio System Architecture

### Importer

- Windows based 2RU
- HD2,3,4 audio capture and encode
- Program Service Data
- Artist Experience (req. automation support)
- Station Logo (req. automation support)
- Data Services (req. automation support)

### Exporter

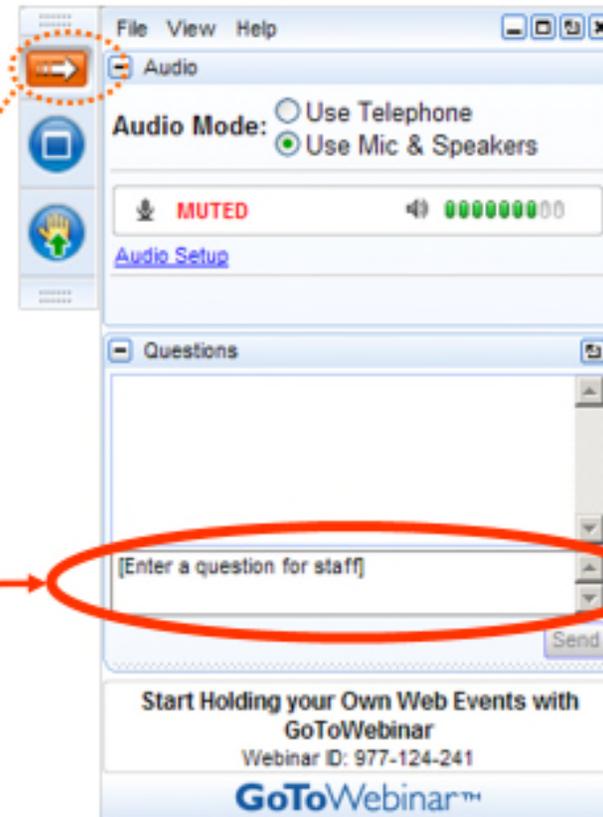
- HD1 audio capture and encode
- HD1 Program Service Data
- Integrated GPS time base (heart beat)
- FM audio capture and diversity delay



making digital broadcasting work

# Questions?

Click on  to open/close webinar panel



Enter questions here  
...then press **Send**

## For additional information:

Nautel: [gmanteuffel@nautel.com](mailto:gmanteuffel@nautel.com)

Xperi: [jeff.detweiler@xperi.com](mailto:jeff.detweiler@xperi.com)

Kirk Nesbitt: [aknesbitt@rogers.com](mailto:aknesbitt@rogers.com)

NextRadio: [kgibson@nextradioapp.com](mailto:kgibson@nextradioapp.com)

Nautel Waves Newsletter

<http://www.nautel.com/news-events/newsletters-2/>

Webinars

<http://www.nautel.com/webinars/>

Youtube

<https://www.youtube.com/user/NautelLtd>

# *Thank you!*



making digital broadcasting work