



VIRTUAL NUG

Radio Technology Forum

Radio Technology Forum

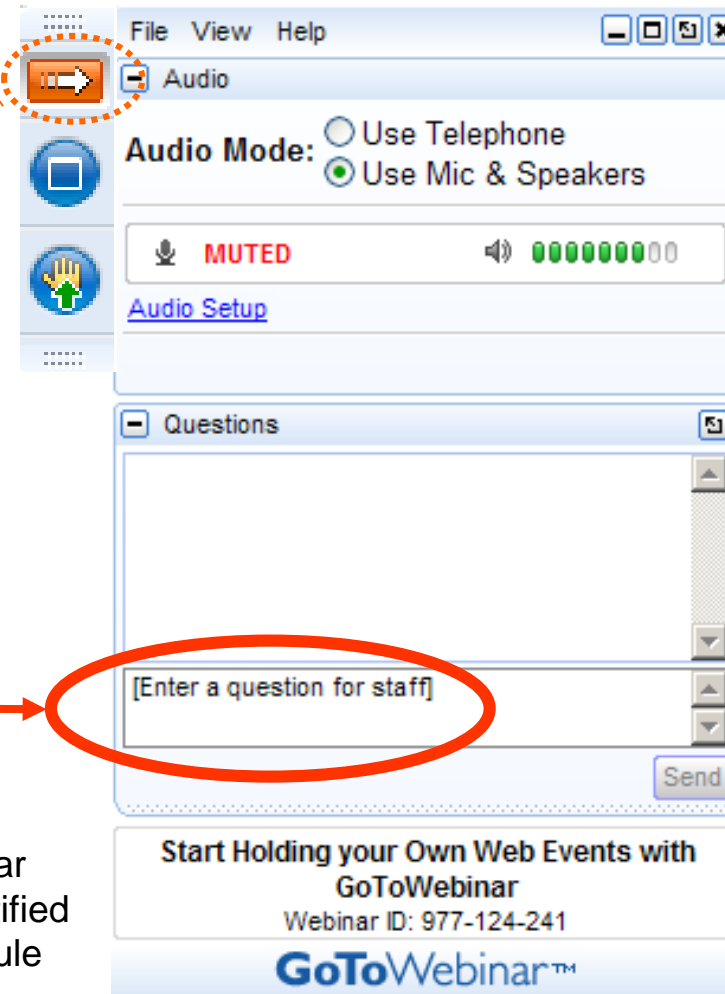
Your questions please?

(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.



Guest Speakers



Paul McLane

Editor in Chief
Radio World



Jeff Welton

Sales Manager, Central USA
Nautel



Dave Kolesar

Senior Broadcast Engineer
WTOP/WFED



Alex Hartman

Customer Service Technologist
Nautel



Mike Raide

Senior Manager
Broadcast Technologies
Xperi



Matt Herdon

Product Manager / Marketing
Nautel

Agenda

- Welcome
- Paul McLane: Stories We're Watching at Radio World
- MA3 – all digital AM
- MDCL
- AUI2 – goodbye to Flash!
- HDMC+ and where it's going
- LookingGlass
- Tips'N'Tricks

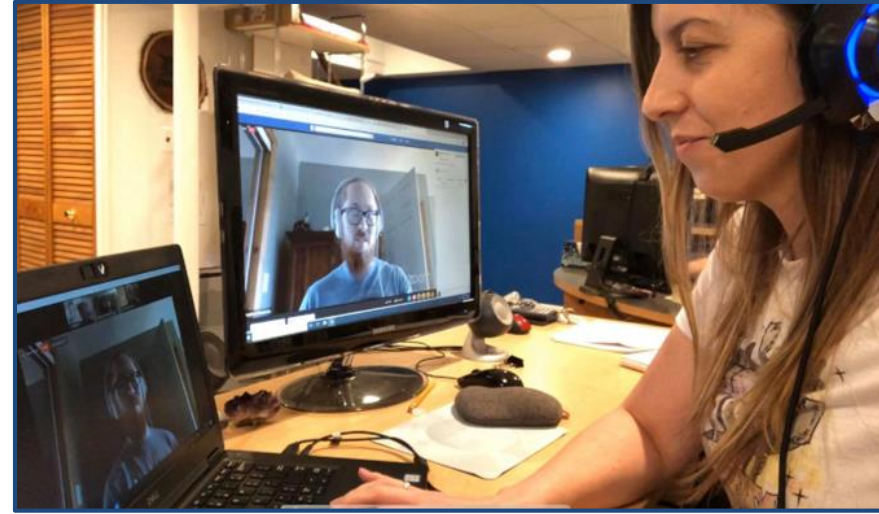


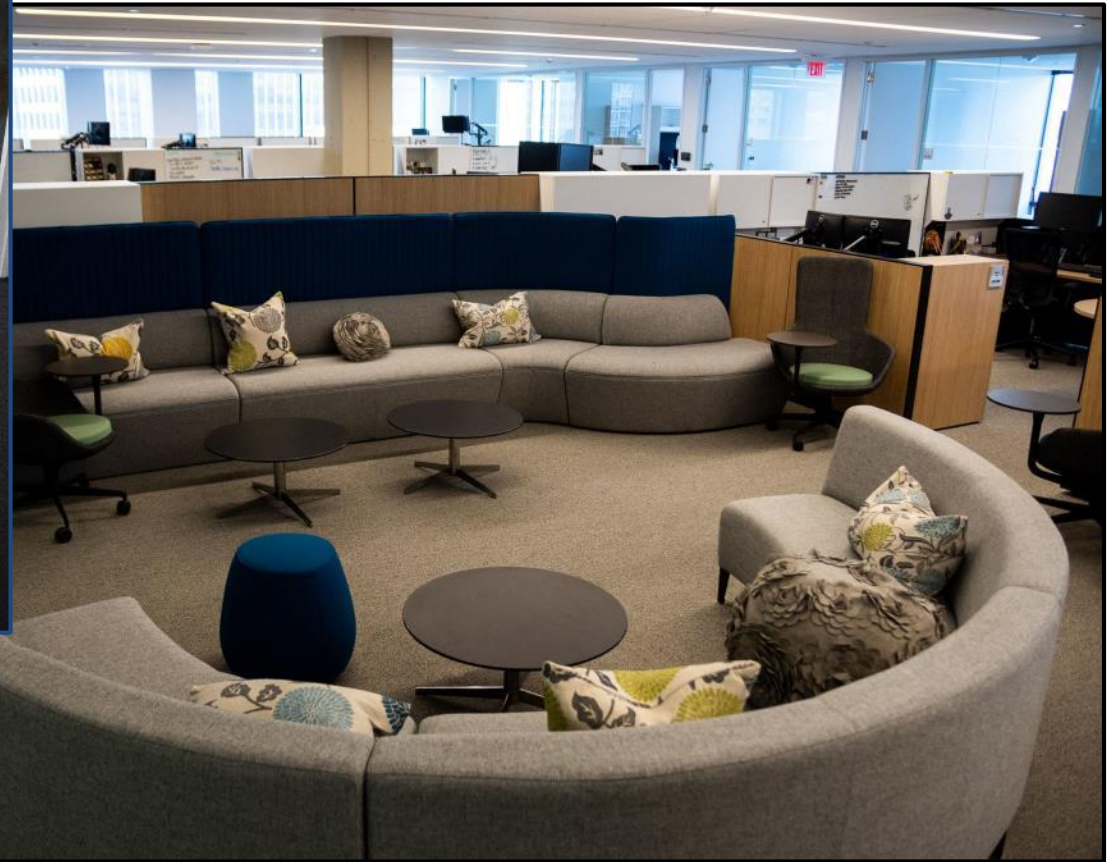
Stories We're Watching



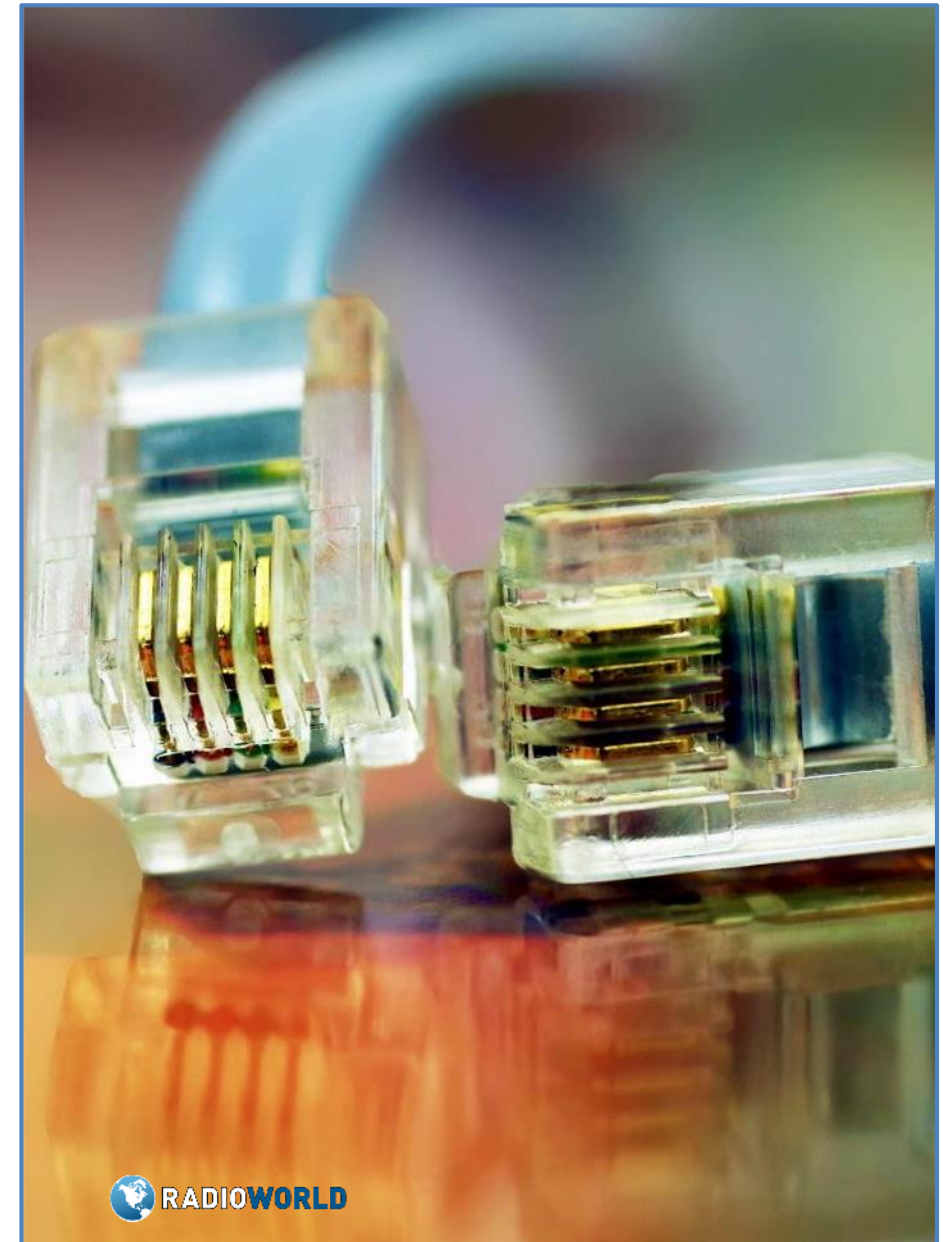


STORIES WE'RE WATCHING





- ▶ ALL-DIGITAL ON THE AM BAND?
- ▶ ASYMMETRIC SIDEBANDS
- ▶ NEW OPERATION MODES FOR DIGITAL FM
- ▶ HYBRID RADIO
- ▶ BROADCAST-ONLY ZONES
- ▶ LPFM RULES UPDATED
- ▶ RADIO IN-CAR USER EXPERIENCE
- ▶ CLOUD & VIRTUALIZATION
- ▶ RADIO TURNS 100!





RADIOWORLD

DECEMBER 4, 2019 | The News Source for Radio Managers and Engineers | \$3.00 | RADIOWORLD.COM

RF SAFETY — Page 16

Kolesar Sees the Promise in All-Digital on AM

Our Excellence in Engineering Award recipient Dave Kolesar is a revitalizer and disruptor

BY PAUL MURANE

The recipient of the Radio World Excellence in Engineering Award for 2019-2020 is Dave Kolesar, CBT, CDET, senior broadcast engineer at Hubbard Radio. He is recognized for his initiative in converting AM station WAFD in Frederick, Md., to full-time, all-digital transmission, the first AM station of its kind in the United States, and for advancing our industry's discussion and awareness of the potential uses of the HD Radio MA3 mode.

The FCC in November proposed to allow all U.S. AM broadcast stations to convert to all-digital if they wish, and is taking comments on the idea now. While many people have played a role in advancing voluntary conversions, Kolesar is recognized for advocating within Hubbard for the experiment, which necessitates turning off a station's analog AM signal entirely, and then encoding it over satellite.

Continued on page 26



The FCC Explores All-Digital AM

Anticipating voluntary conversions, a new NPRM asks many questions.

Page 4



Radio Gambles on Sports Betting

Early players in this new arena express confidence in the idea

BY JAMES CARELESS

Who would have thought that a Supreme Court decision would spur the growth of a new talk radio format? But that's what appears to be happening since May 2018, when the Supreme Court ended the federal ban on sports betting.

Today, sports betting is legal in 11 U.S. states, according to thasiamedia.com, while 26 more states have

Continued on page 16



Former Eagles player David Allen and Scott Bock, host of "Daily Ticket," during a pregame show at Xfinity Live! SportsMedia promotes it as Philly's first daily sports gambling show.

DAD, MusicMaster, and all new hardware for a low monthly cost.

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RADIO IN YOUR PARKING LOT — Page 3



ENCO.com/VirtualDemo

How Will iHeart's "Centers of Excellence" Strategy Play Out?



Pittman: "We don't think the quality will go down, we want the best programming in each market"

BY RANDY L. STINE

The massive technical recalibration of iHeartMedia earlier this year — when it shed over 10,000 jobs and moved to a more centralized content distribution system — was viewed by some industry observers as one possible blueprint of commercial radio's future. And that was before coronavirus hit the country hard.

This article is about the long-term implications of that reorganization, though each discussion now must carry additional cautions about the unknown impact of the health crisis, over coming weeks as well as years to come.

It's certain that similarly sized radio broadcast companies were already watching closely to see if iHeartMedia's cloud-based, top-down programming structure would succeed. Now iHeart and every other company is also struggling to adapt to the public health

capabilities of artificial intelligence. This doesn't surprise radio experts since it is in line with corporate America's love of automation. The company didn't describe the exact role of the hubs in press releases describing the changes.

The tech-based reorganization allowed the company to eliminate many jobs on the programming side, and in March it was still not clear how many technical and engineering positions were affected. It is possible iHeartMedia has added some podcast producers and data scientists to fill out new digital teams, industry observers say. These concerns preceded fresh news at the end of March that the company would institute furloughs due to the coronavirus and that company head Bob Pittman would not take a salary for the rest of the year.

(Continued on page 10)

Lee De Forest, Pioneer Broadcaster



Radio scientist was playing a key role years before KDKA's historic broadcast.

BY JOHN SCHNEIDER

One in a series of articles celebrating radio's first century.

Nov. 2, 1920, traditionally is recognized as the start of radio broadcasting in the United States. It's the date that station KDKA broadcast the Harding-Cox election returns from a primitive transmitter atop a Westinghouse factory building in

(Continued on page 10)

AudioScience's thoughts are with those who have been directly affected by COVID-19 and all of those who are struggling with the continued repercussions of this global health crisis.

Save Space, Save Money

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Four conventional interfaces (expensive)



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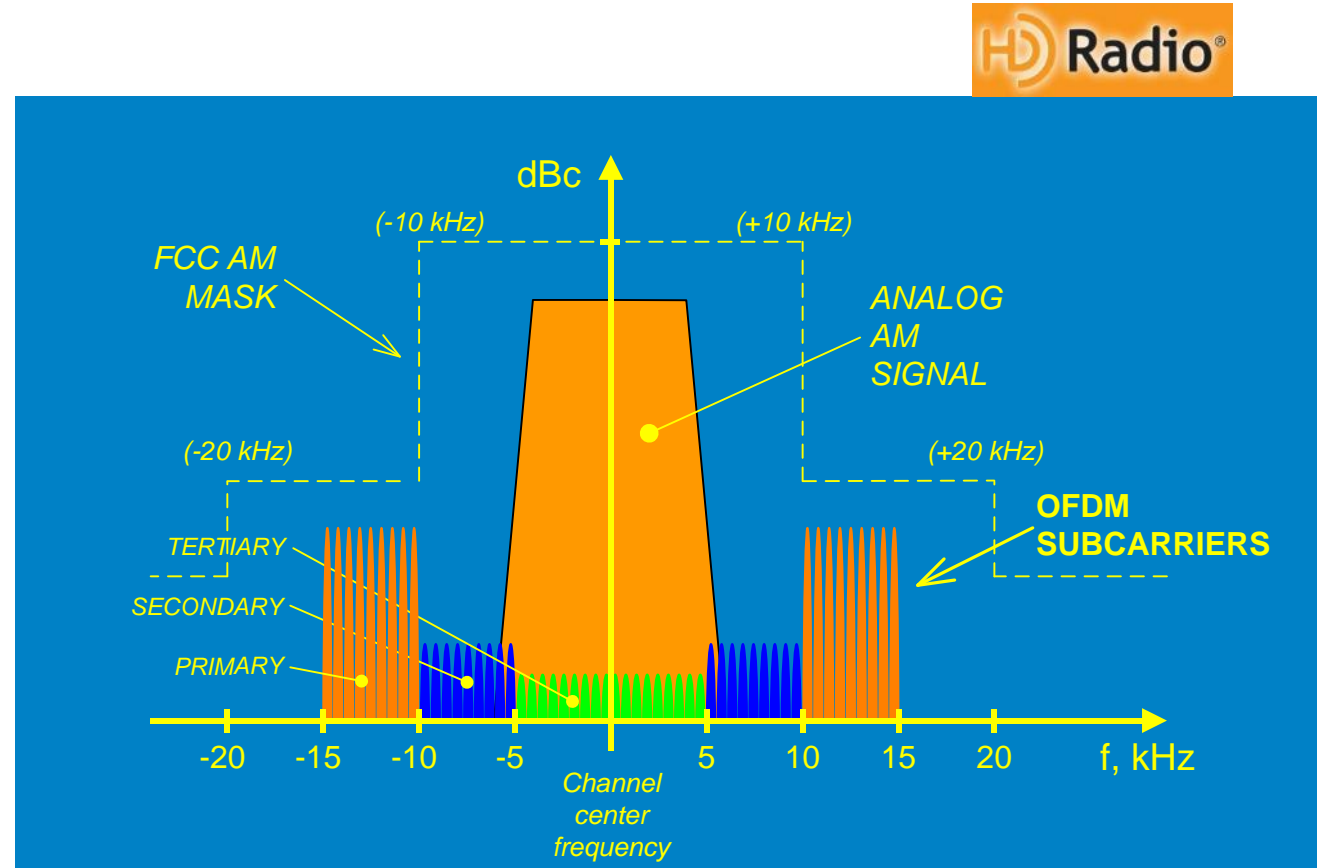


AES67 LiveWire+ Connected to Future



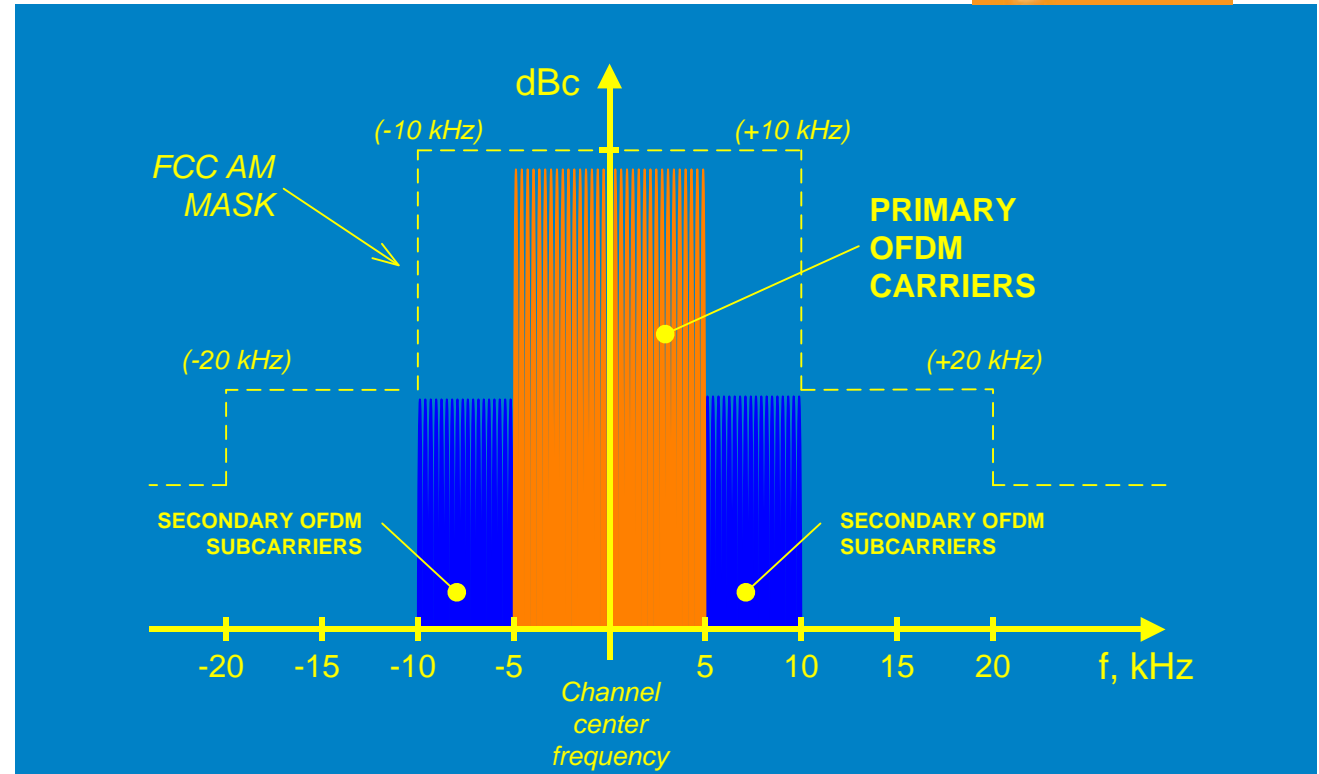
All-digital AM IBOC

- Hybrid AM IBOC signal
 - Authorized by FCC in 2002
 - “HD Radio” is the trademark of Xperi Corp.
 - Approximately 300 stations licensed for hybrid AM

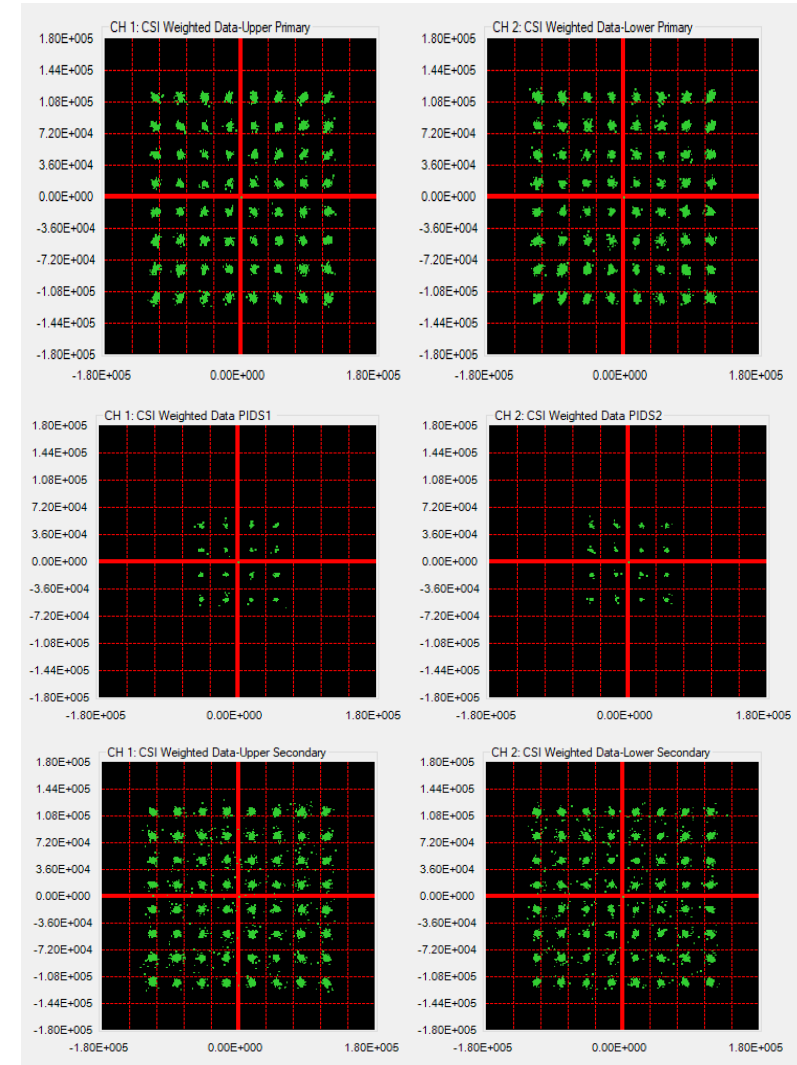
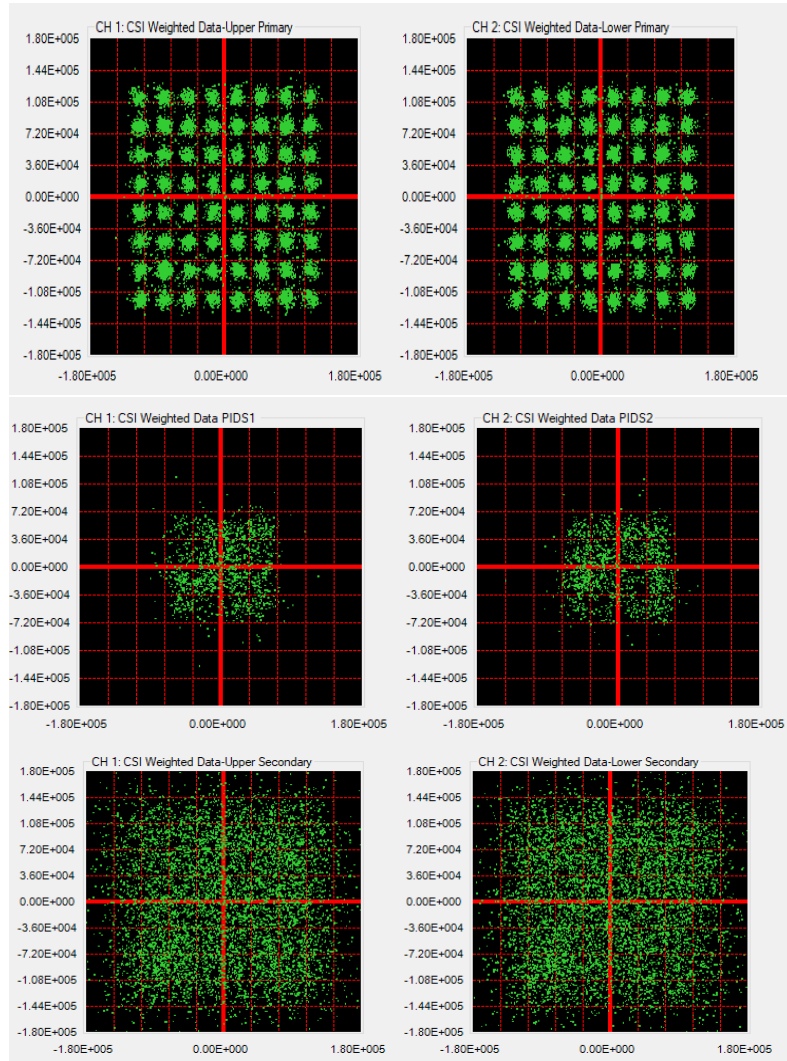


All-digital IBOC

- All-digital AM IBOC signal
 - Currently requires experimental authority from FCC
 - Not receivable on analog AM radios
 - IS receivable on existing HD Radio receivers



Transmitter with inadequate PDM switching frequency & no CFR vs. Transmitter with proper PDM switching frequency & CFR applied.



MA3

HD RADIO TECHNOLOGY



WWFD-AM DAYTIME PATTERN – ALL DIGITAL

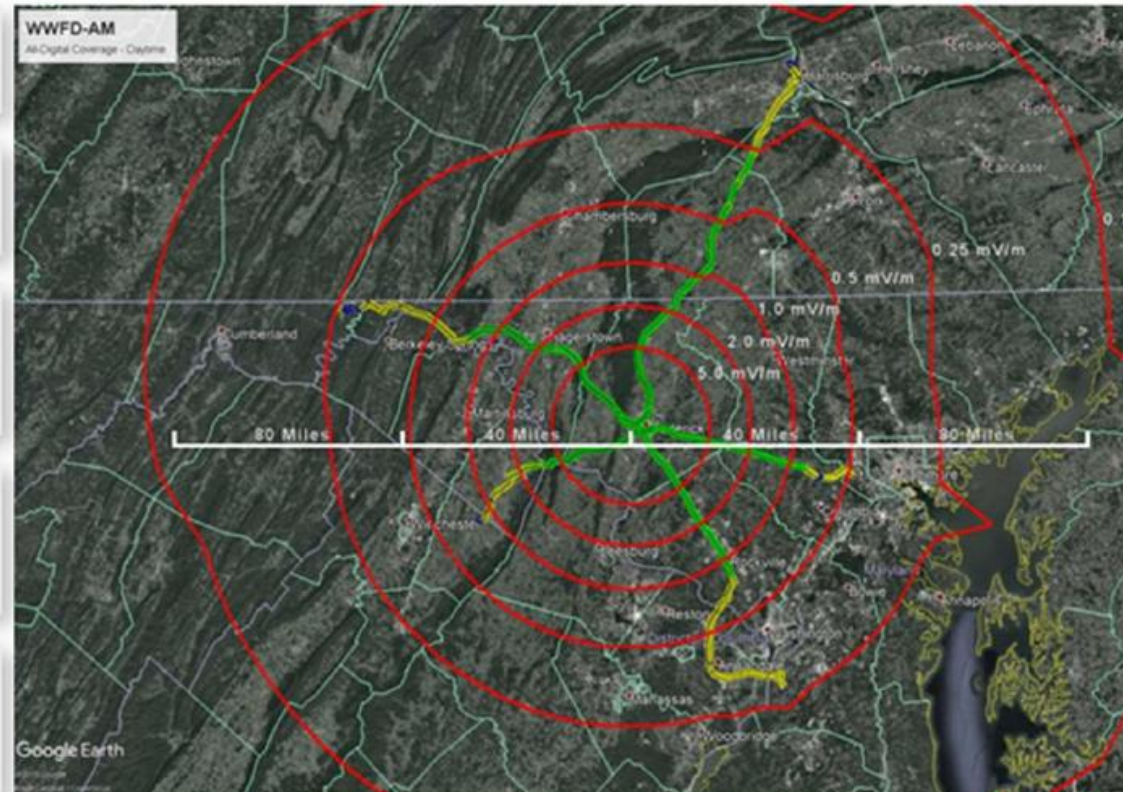
5.0 / 2.0 / 1.0 / 0.5 / 0.25
mV/m contours shown

All-digital signal fills in 0.5 mV/m
protected daytime contour

Class: B – 820 kHz
Daytime Power: 4.3 kW
Day – Non-Directional

Enhanced Mode = Green
Core Only Mode = Yellow
Mute Mode = Blue

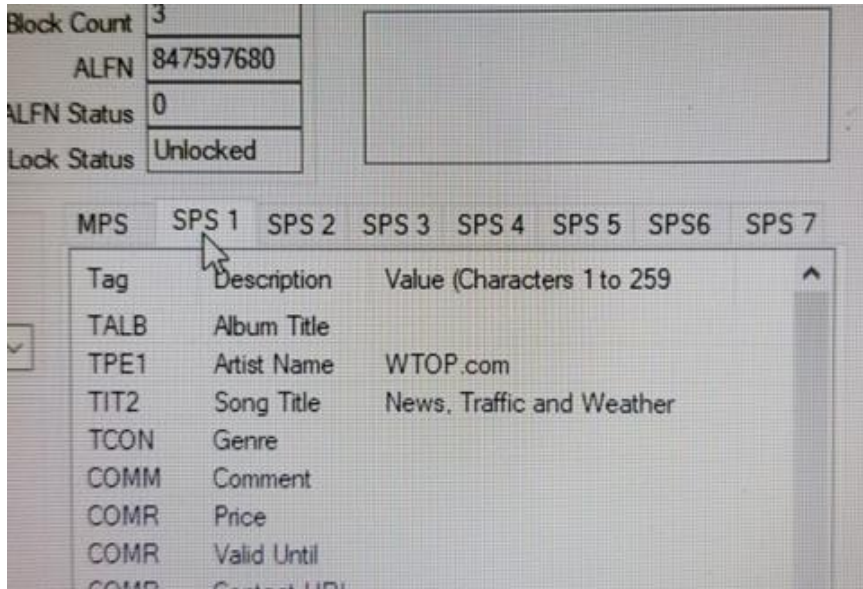
5.0 mV/m population = 215,124
2.0 mV/m population = 456,791
0.5 mV/m population = 2,777,722



© 2019 Xperi

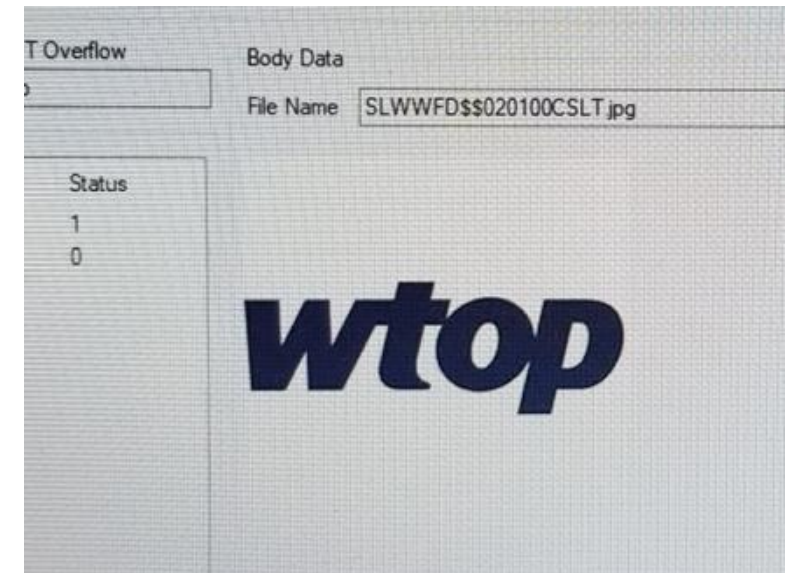


MA3 Improvements: HD2 Testing



- _ The first AM HD2 was tested on WWFD in December 2019
- _ Program Service Data (PSD) and a Station Logo was transmitted as well

- _ Signal was received on an Xperi test receiver
- _ Proof-of-concept demonstrates flexibility of MA3 system
- _ Possible FM translator implications for AM stations



MDCL - AM Power Savings

On Nautel NX series transmitters, it's as simple as turning it on



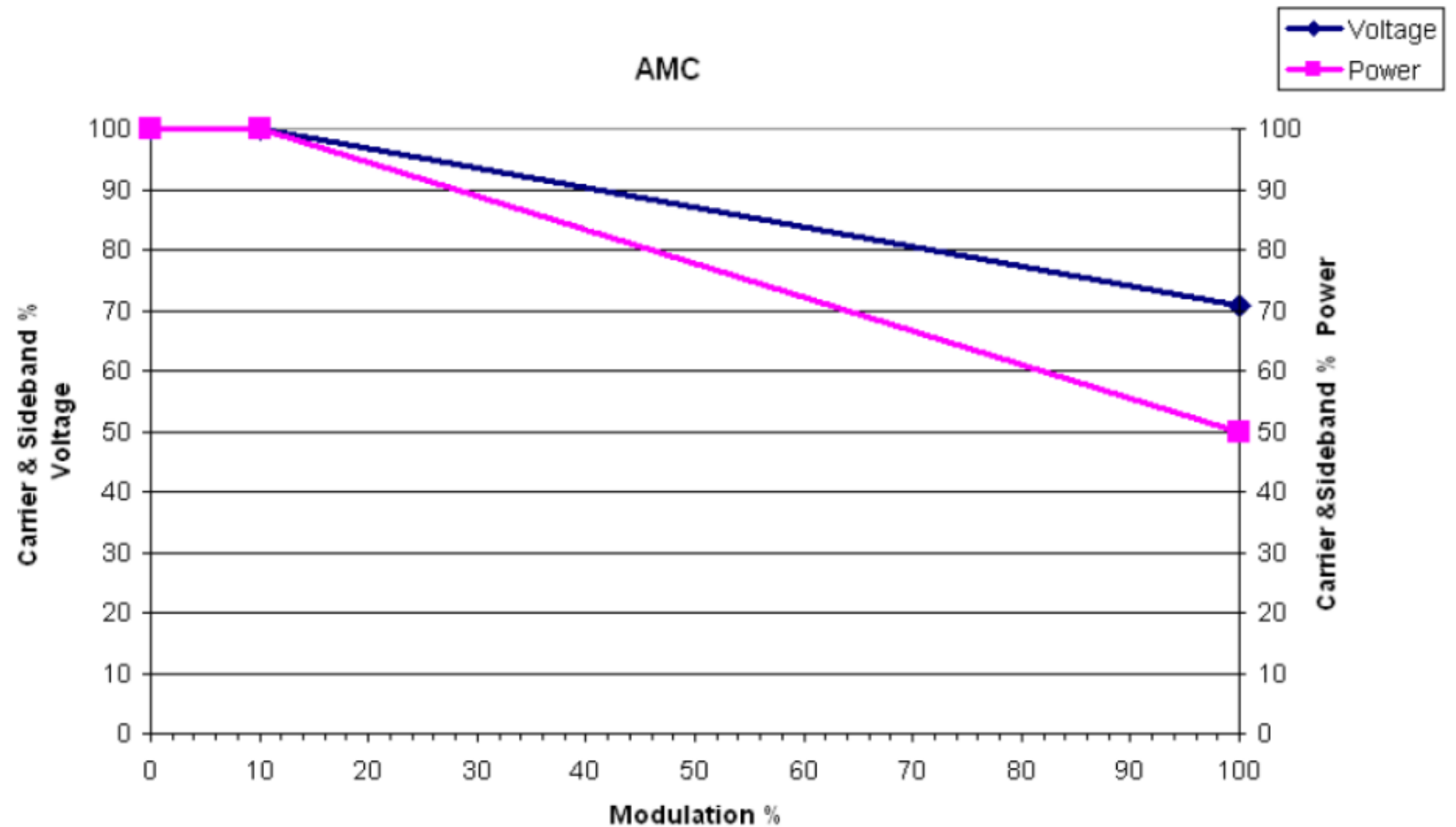
MDCL

	Select Modulation Density		Mild ▼
	Current	NX Power	10 ▼
Cost per kW/h (US cents)	11	11	11
Power of Transmitter in kW	10	10	10
Rated Efficiency	50	86%	86%
Modulation Factor	1.1	1.1	1.1
Consumption in kW/H	22.00	12.80	9.00
Hours of Operation / Day	24	24	24
Days of Operation / Year	365	365	365
Total Yearly Consumption in kW/H	192,720.00	112,128.00	78,840.00
Total Transmitter Energy Cost (USD)	\$21,199.20	\$12,334.08	\$8,672.40
Transmitter Power Savings / Year		\$8,865.12	\$12,526.80
A/C Costs may add 10-15%	\$3,179.88	\$1,850.11	\$1,300.86
Total Energy Cost	\$24,379.08	\$14,184.19	\$9,973.26
Total Energy Savings / Year		\$10,194.89	\$14,405.82
Total Carbon Footprint Savings (Tons)		71.87	101.56

- Cost of operation calculator at <https://www.nautel.com/am-mdcl-savings/>

MDCL

- Several algorithms
- Varying levels of compression
- Impact on signal also varies

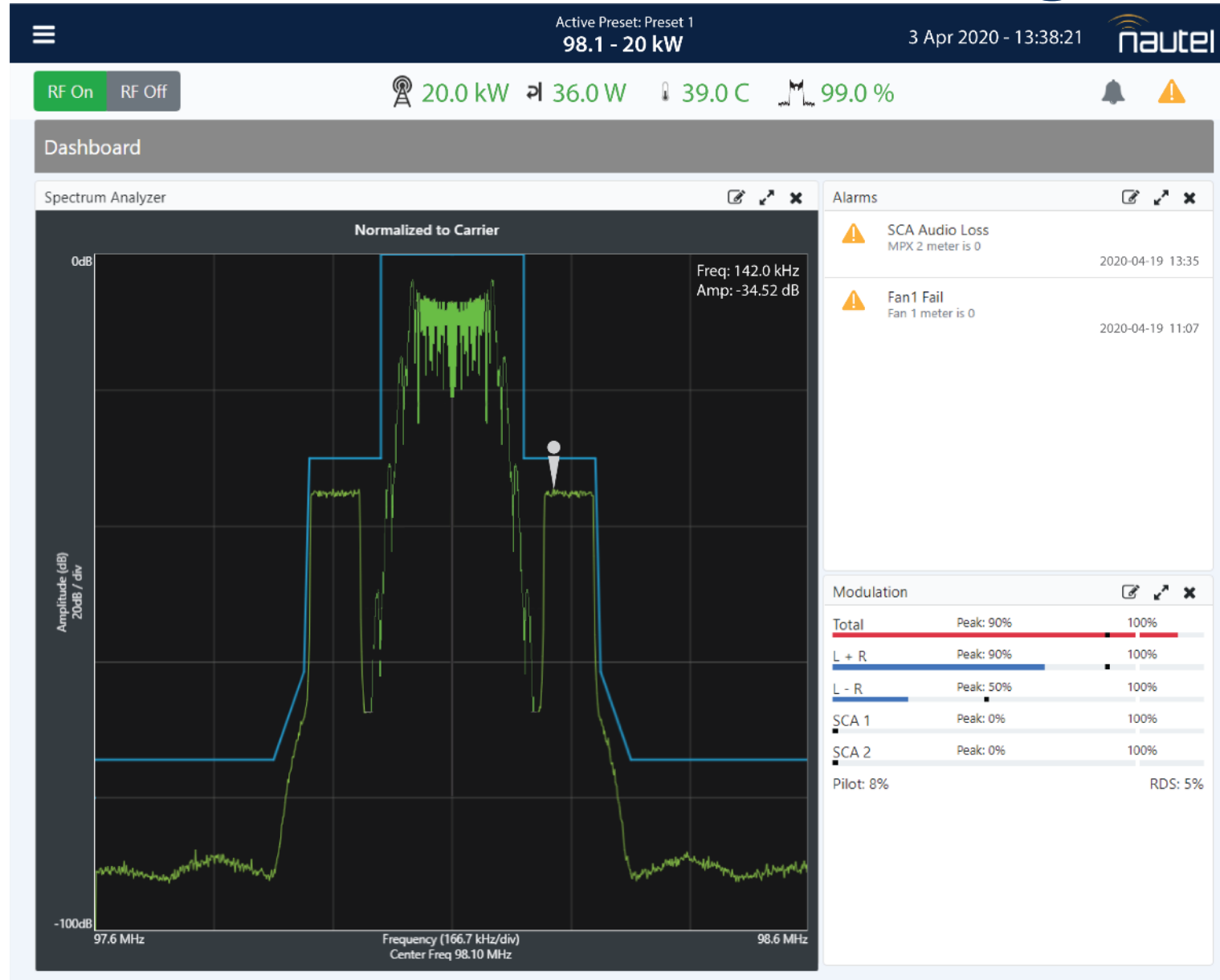


Gain characteristic of AMC with a typical maximum reduction setting of 3 dB.

MDCL

- Pros:
 - Significant power savings
 - Potential reduction in peak voltage means lower operating voltages (less stress on antenna components)
- Cons:
 - Can impact range and signal quality
 - Peak voltage can also be increased – depends on algorithm

AUI2... after the Flash is gone



Goals (other than the obvious)

- Familiar
- Usable
- Secure
- Long life
- Mobile friendly
- All AUI transmitters

Overview

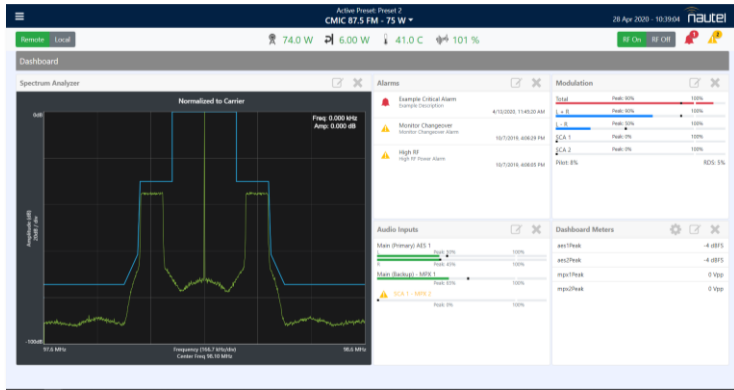
- **What's new?**

- AUI
 - Common AUI for all series
 - HTML5
 - Latest UI technology for long life
- Operating system

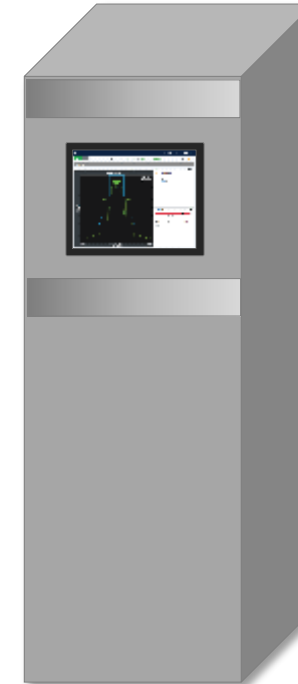
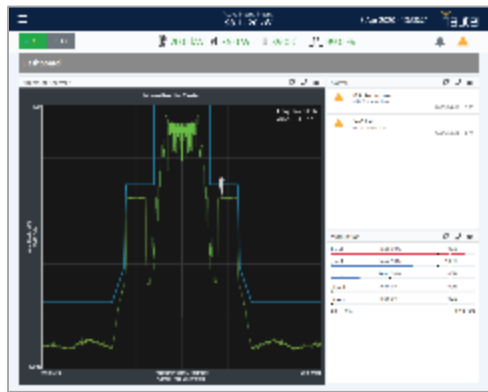
- **Which transmitters?**

- GV
- NV^{LT}
- NV
- VS
- NX
- ...future transmitters

One AUI



Remote AUI



Front Panel AUI

Local AUI



Demo

Availability

- Beta in August and final release in November
- Beta sign-up link now on AUI page
 - support.nautel.com/aui

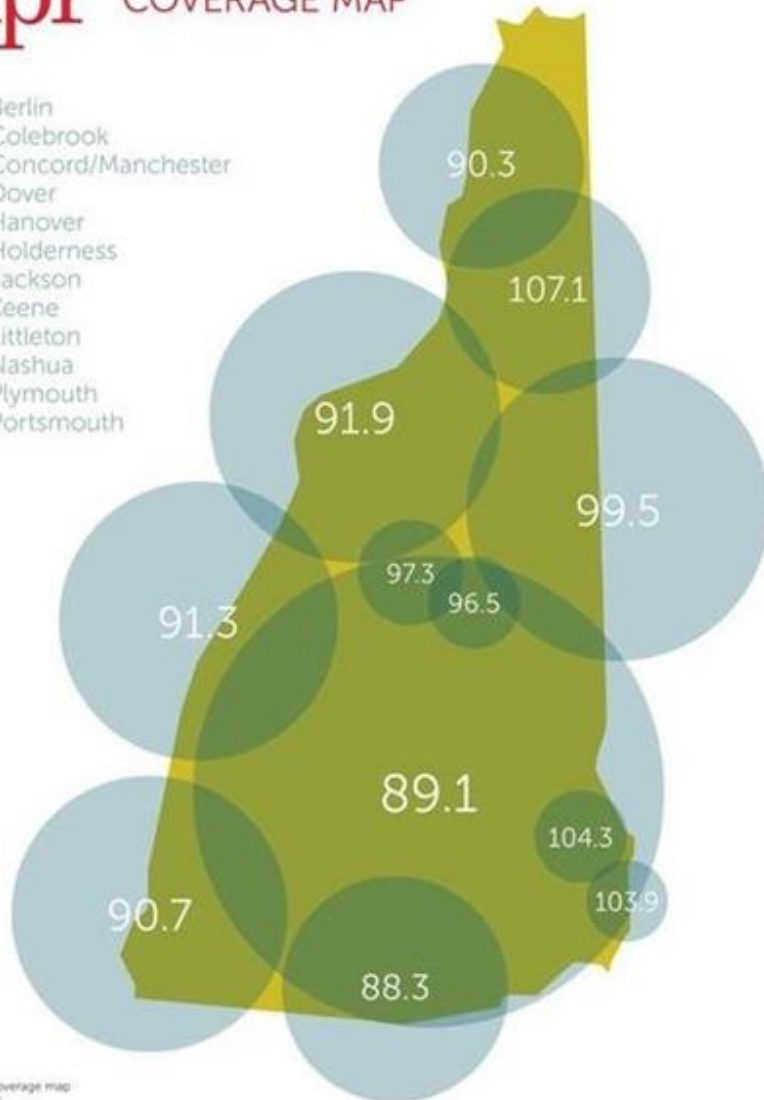
HDMC+ - lots of power, little package



HDMC+ - lots of power, little package

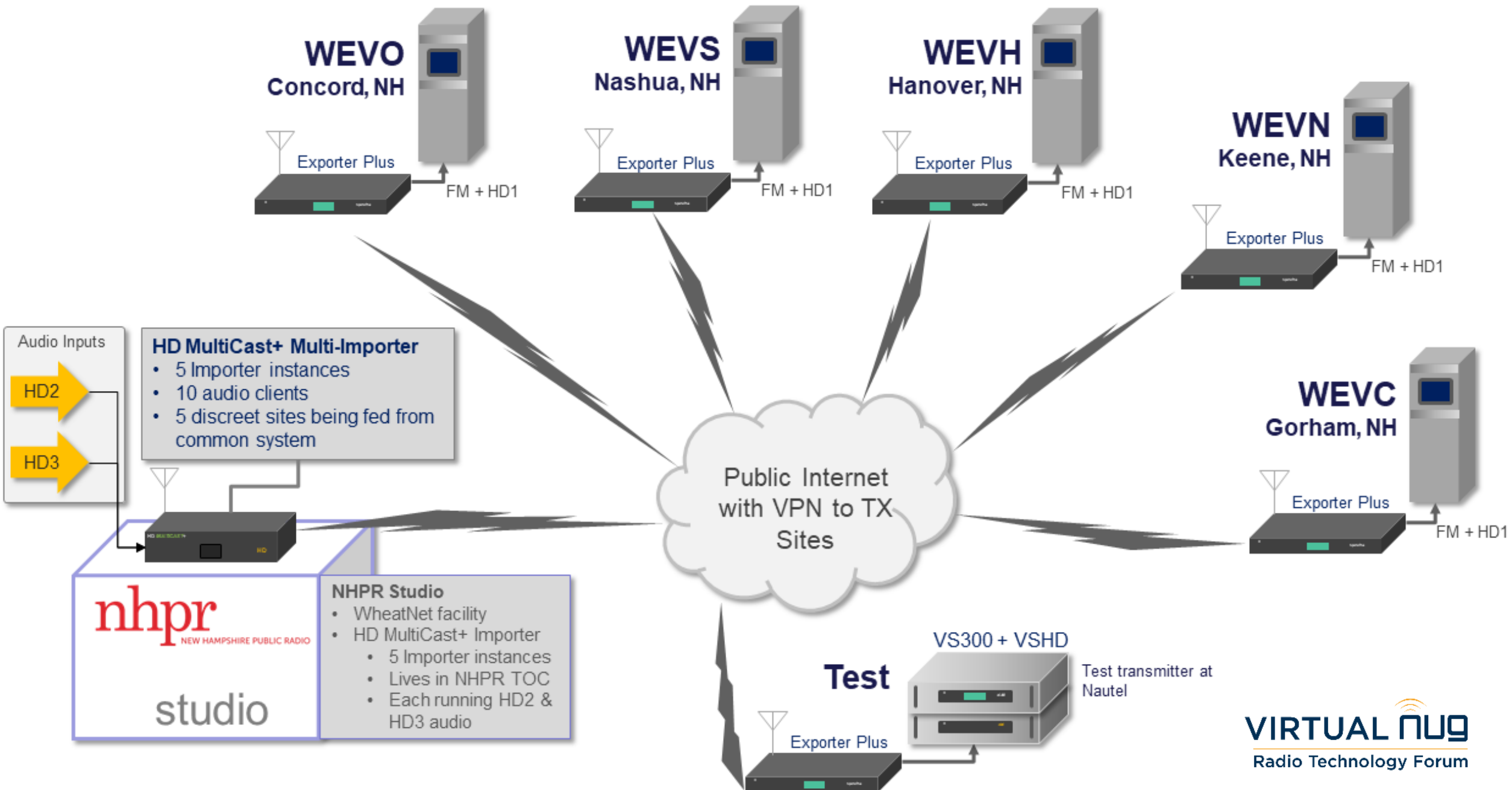
nhpr COVERAGE MAP

107.1	Berlin
90.3	Colebrook
89.1	Concord/Manchester
104.3	Dover
91.3	Hanover
96.5	Holderness
99.5	Jackson
90.7	Keene
91.9	Littleton
88.3	Nashua
97.3	Plymouth
103.9	Portsmouth

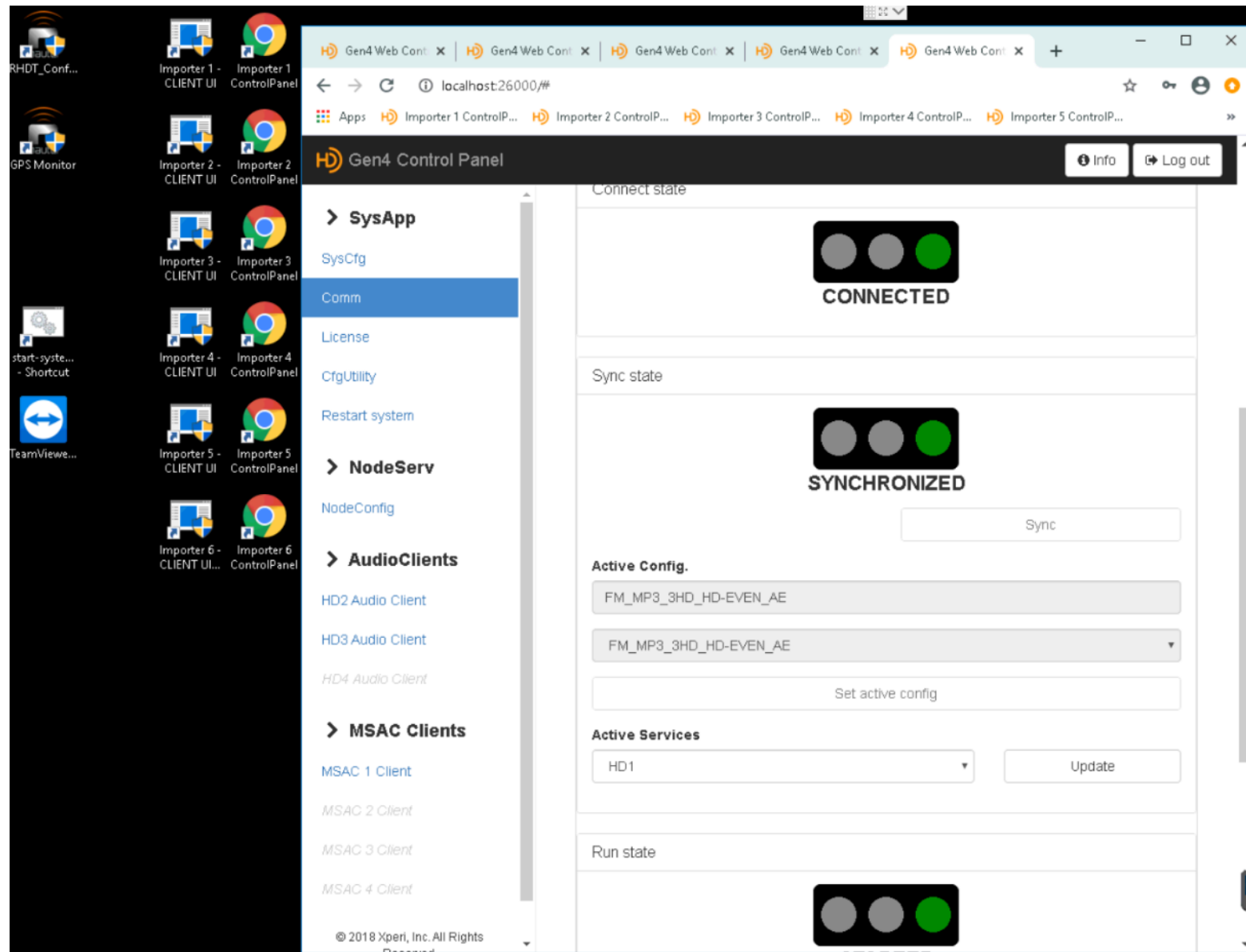


Official engineering coverage map
available upon request.

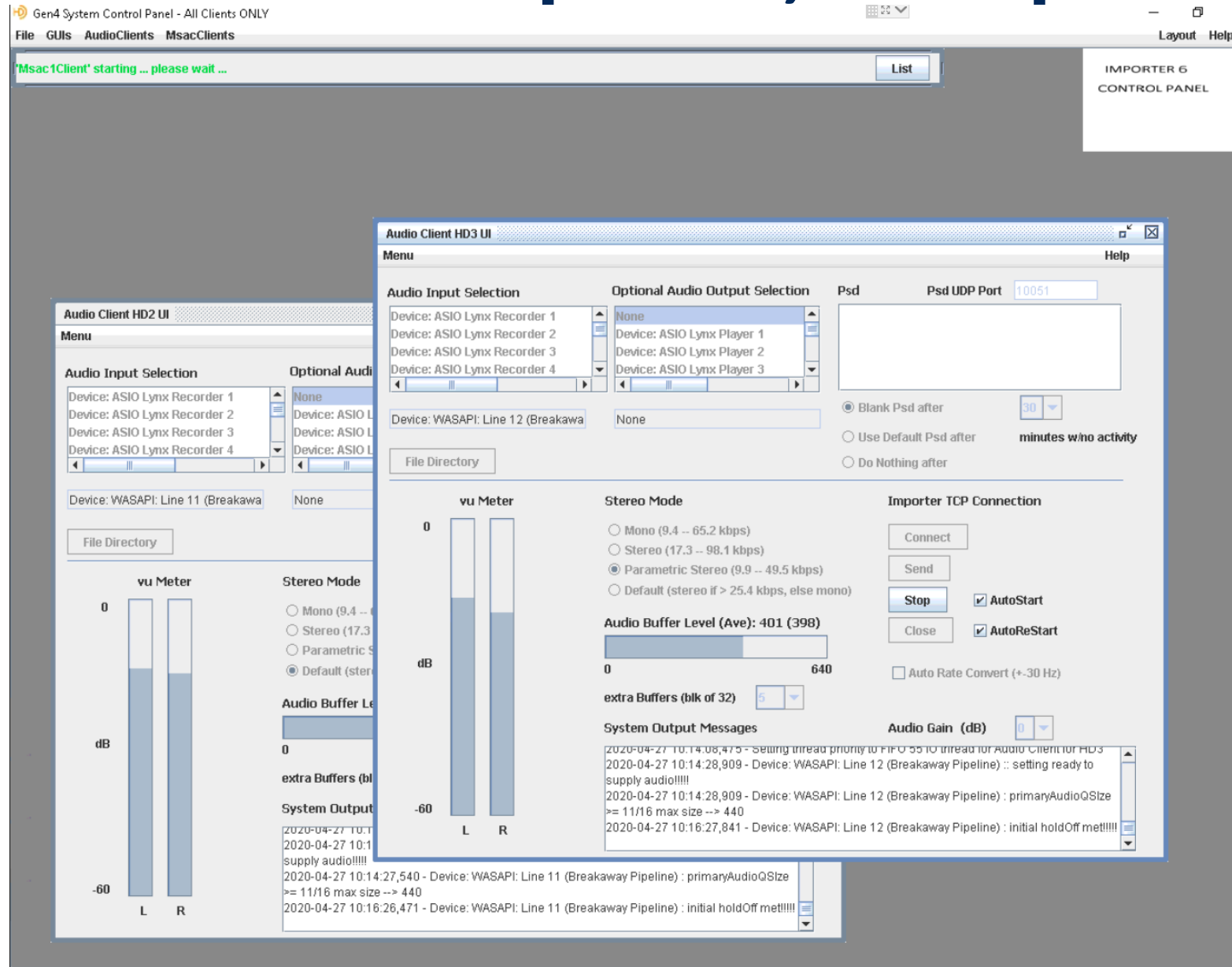
- Central TOC
- Several satellite stations
- Mostly common programming
 - Looking to minimize equipment
 - Reduce update costs
 - Maximize flexibility



HDMC+ - lots of power, little package



HDMC+ - lots of power, little package



HDMC+ - lots of power, little package

SOHAS68
98.1 HD2

L

R

Programs:


FM HD1 HD2 HD3 HD4 HD5 HD6 HD7 HD8

Image Display:

Simple | Listener Advanced | Broadcaster

HD1

[Logs](#)
[Artist Experience](#)



Slogan: NHPR Main Program

Type: Information

Artist:

Title: FM+HD1 is added with exporterPlus at each Transmitter

Album: WEVO Concord, WEVS Nashua, WEVH Hanover, WEVN Keene, WEVC Gorham

L

R

Programs:


FM HD1 HD2 HD3 HD4 HD5 HD6 HD7 HD8

Image Display:

Simple | Listener Advanced | Broadcaster

HD2

[Logs](#)
[Artist Experience](#)



Slogan: NHPR Classical

Type: Classical

Artist: Bach, Johann Sebastian

Title: Brandenburg' Concerto No. 5 in D, BWV 1050

Album: Music of the Baroque

L

R

Programs:


FM HD1 HD2 HD3 HD4 HD5 HD6 HD7 HD8

Image Display:

Simple | Listener Advanced | Broadcaster

HD3

[Logs](#)
[Artist Experience](#)



Slogan: NHPR News

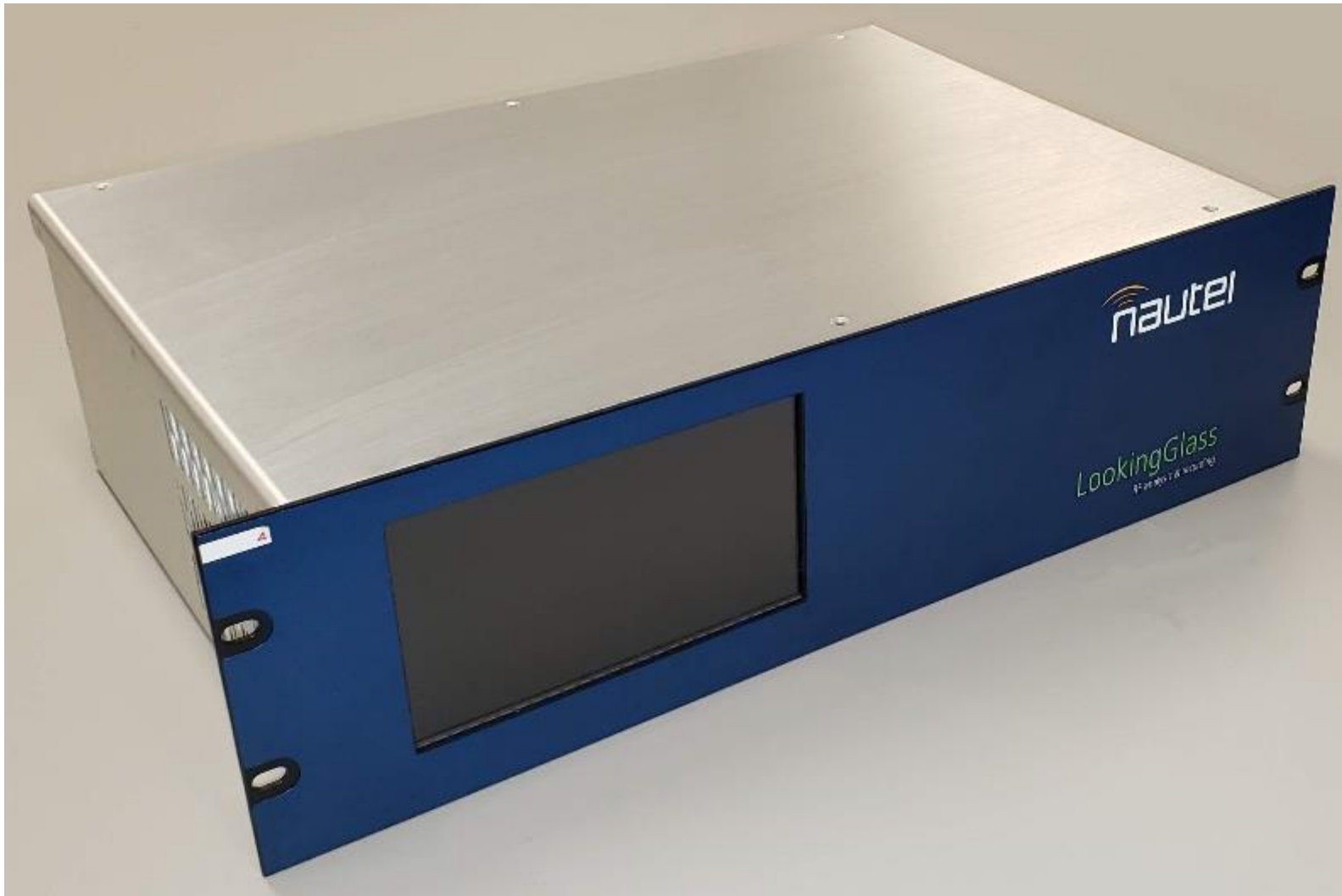
Type: News

Artist:

Title: World News

Album:

LookingGlass – let's see what's really going on



LookingGlass – let's see what's really going on



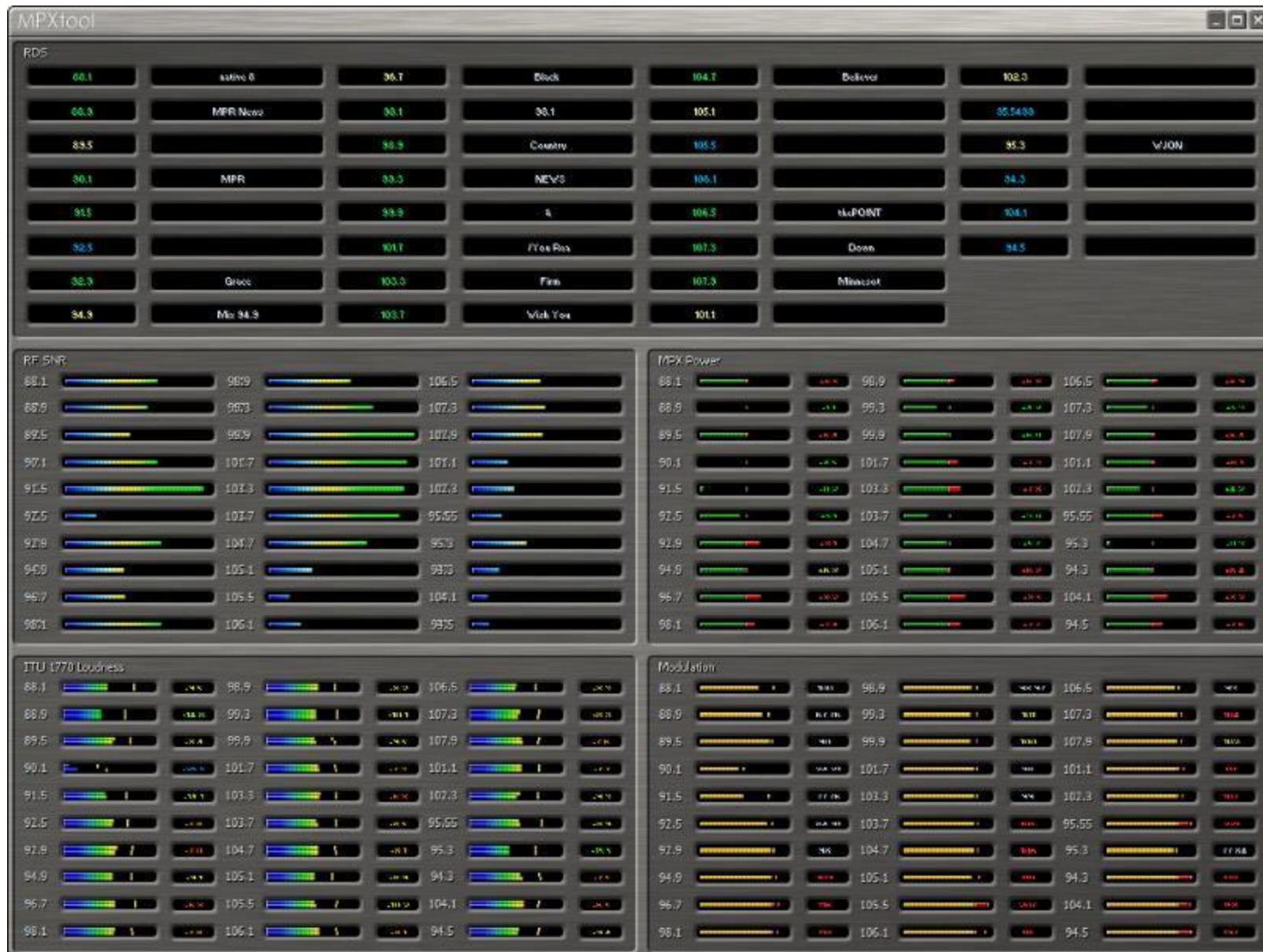
LookingGlass – let's see what's really going on



LookingGlass – let's see what's really going on



LookingGlass – let's see what's really going on



LookingGlass Deeper Dive

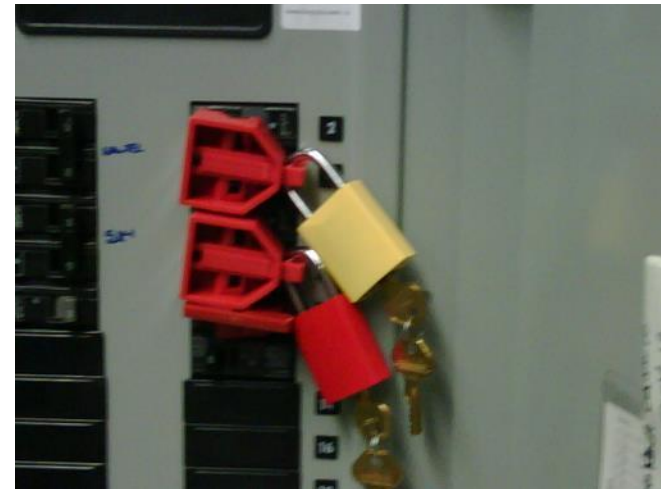
- Sign up for the May 7th Webinar @ [nautel.com](https://www.nautel.com)



<https://www.nautel.com/resources/webinars/all/nautel-lookingglass-overview-demo/>

Play Safe

More and more, the new normal will require working alone at the transmitter site. Please make sure you have proper protective equipment and tools to work safely!



Maintenance Run!

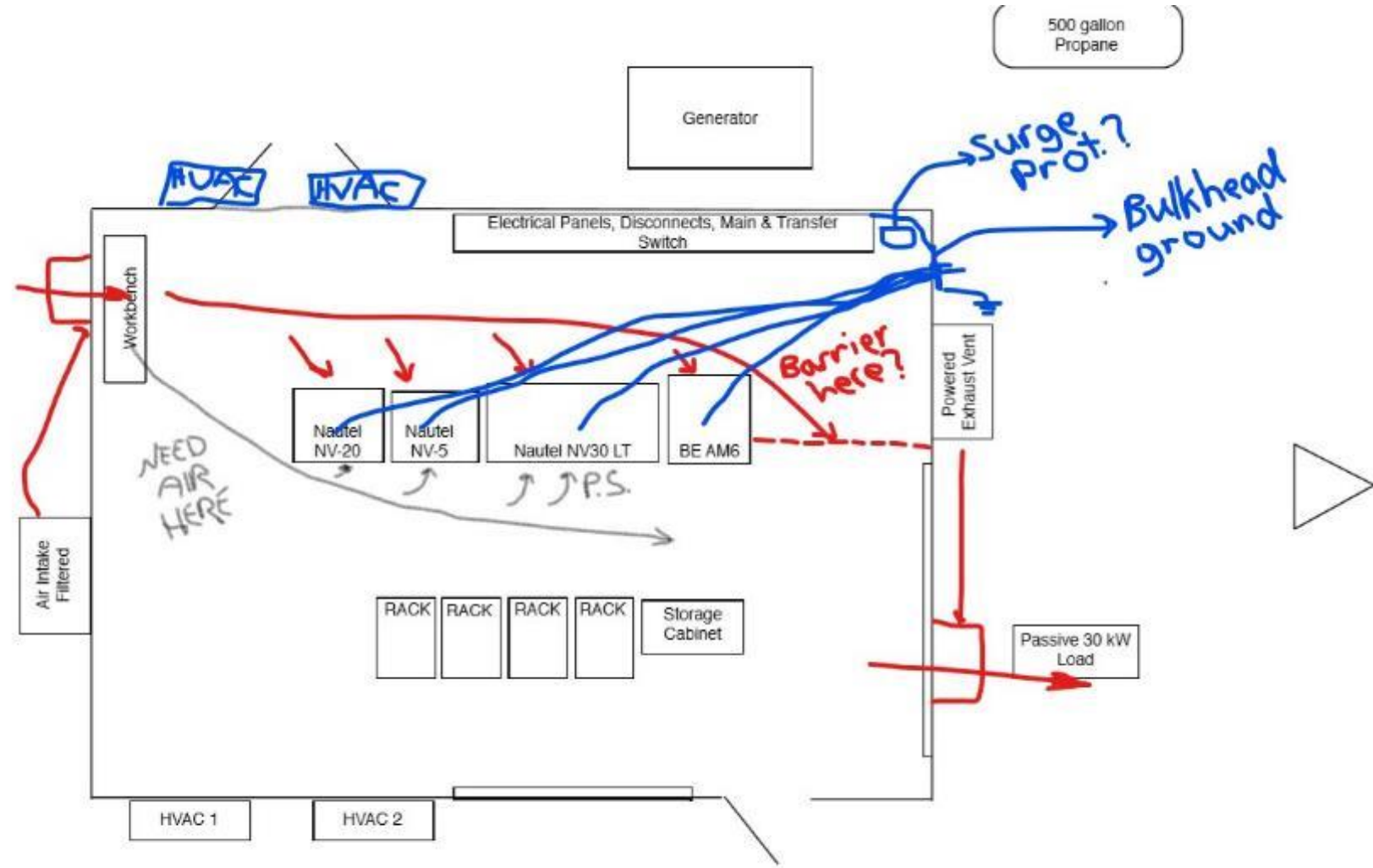


Transmitter sites – the ultimate in social distancing

- _ Air filters
- _ Generator fuel, oil, filters
- _ Check breaker panels for warm breakers
- _ Check ground connections
- _ Fencing
- _ Groundskeeping

Document Everything

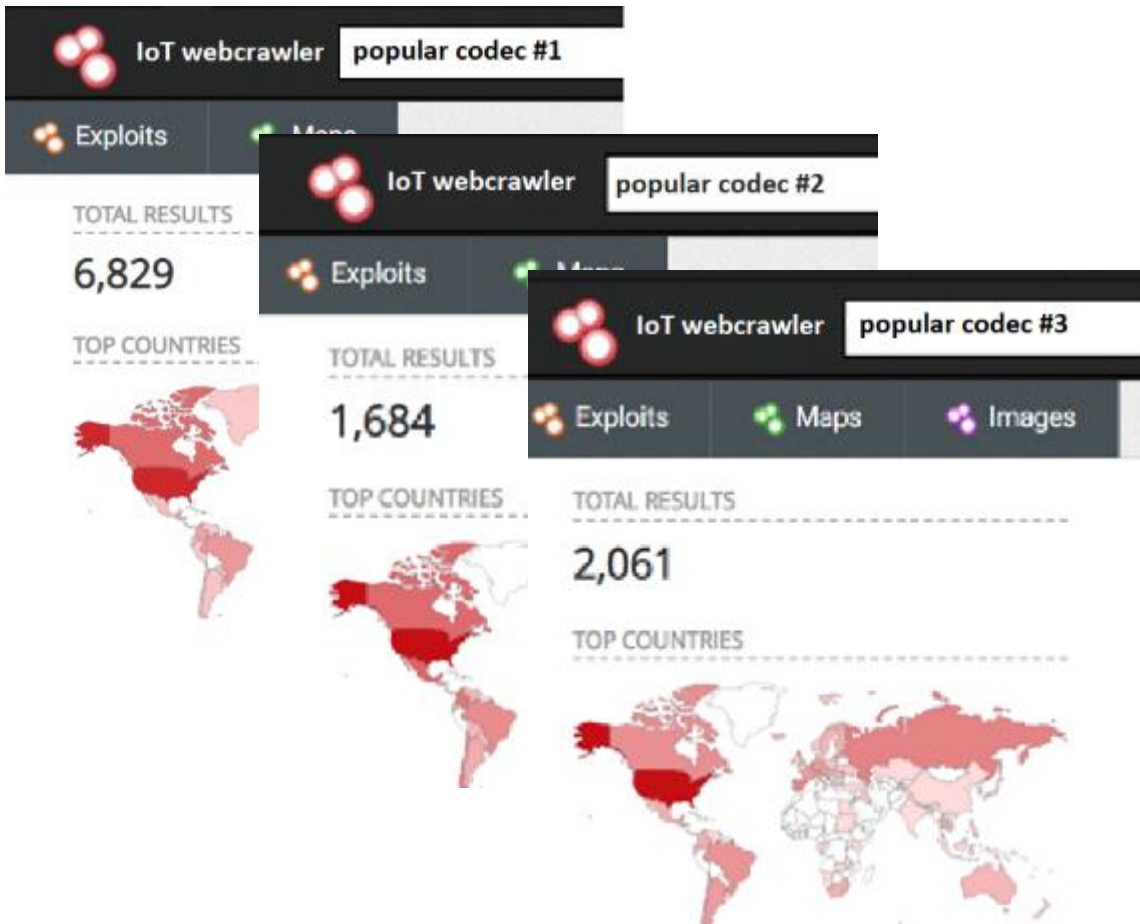
- Site diagram
- Equipment list
- photos



Thermal Scans



Don't leave the keys in the lock



- Password is not a password
- If it can be seen, it's a target
- Passwords are like keys...
 - Have spares/backup systems
- VPNs are inexpensive
- Air gaps work best
- Have a sacrificial machine
- Don't leave the defaults active

Tell Two Friends



Knowledge is best shared

- SBE
- Industry forums
- Articles
- Social Media

QUESTIONS?

Online Information



Webinars

<https://www.nautel.com/resources/webinars/>



Nautel Waves Newsletter

<https://www.nautel.com/newsletters/>



YouTube

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



See you next year in Las Vegas!

