

# RADIO WORLD

Your guide to radio technology

## LeGeyt raises the volume on radio

The head of NAB talks with Radio World about his first year on the job.

FUTURE

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Can the industry reinvent itself to attract those youthful demos?

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# Radio on the radar

## Don't lose sight of the threat to radio in the dashboard



**Paul McLane**  
Editor in Chief

In this issue, NAB President/CEO Curtis LeGeyt talks about his first year on the job with our contributor Randy Stine.

The NAB is active in a lot of areas, of course; but it is, foremost, a lobbying and advocacy organization. For an example of the importance of such work, you don't have to look further than an announcement in December by U.S. Sen. Ed Markey.

Markey is a member of the Senate Commerce, Science and Transportation Committee. He issued a press release saying that he had written to 20 carmakers urging them to maintain broadcast AM radio as a feature in new cars, including electric vehicles.

Markey asked each carmaker to tell him, in writing, whether they have decided to discontinue free AM and/or FM radio in any of their products. His letter was sent to all the big names: General Motors, Ford, BMW, American Honda, Hyundai, Jaguar, Kia and so on.

"Although EVs can cause electromagnetic interference with AM radio signals, car manufacturers appear to have developed innovative solutions to this problem," Markey wrote.

"Therefore, as the United States works to meet President Biden's goal of 50 percent electric vehicle sales by 2030, we urge your company to maintain broadcast AM radio in its vehicles to ensure that consumers have access to critical emergency response information."

Judging from the depth and nature of its contents, this three-page letter was almost certainly prepared in coordination with the NAB. It's a perfect example of how an effective advocacy group can work through its legislative allies not only to influence public policy but to put pressure on market partners. So score one for NAB.

But the larger issue here is very concerning.

As consultant Fred Jacobs pointed out a few weeks earlier, the latest Ford F-150 Lightning truck, an electric vehicle, does not have AM tuning.

"Following in the footsteps of Musk's Teslas, this amazing truck won't be able to receive stations like WABC, WWL, WGN and other AM stalwarts, still slugging it out in the broadcast radio landscape," Jacobs wrote on his blog and

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**On the cover**

Curtis LeGeyt is shown at last spring's NAB Show. Photo by Jim Peck

on the Radio World website. He wondered why more radio people weren't expressing concern about it.

"These stations will be accessible via apps, of course, but the AM tuner is a thing of the past in these forward-leaning F-150 Lightnings. ... The 2022 F-150 Lightning had a whip antenna to facilitate AM reception. Now, the Ford brain trust has apparently concluded it's not worth the expense for a radio platform that is clearly facing the death spiral. ... In an obvious slap in the face to radio broadcasters, Ford is sending the message that AM radio doesn't really matter to their drivers."

Jacobs adds that FM broadcasters should not feel smug because such decisions by carmakers could be seen as a lack of confidence in radio itself.

We spend a lot of time and space in Radio World writing about how radio is presented in the connected car and how it may evolve further. These latest developments demonstrate why this topic is so important.

I've heard it said that today's cars are like smartphones on wheels. Given how central the radio was to a driver's experience in the past, we might realize that, at one time,



**Above**  
The F-150 Lightning has nifty features like external zone lighting ... but no AM radio.

cars were like radios on wheels. But our medium doesn't enjoy that secure and privileged position anymore.

It's crucial that our industry stays engaged with the question of how drivers and passengers experience radio and how carmakers perceive its value. We'll continue to cover that story. Send me your own ideas to [radioworld@futurenet.com](mailto:radioworld@futurenet.com).

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## Writer



Randy J. Stine

Radio World's lead news contributor wrote recently about iHeartMedia's initial efforts in the metaverse.

## Above

Curtis LeGeyt, left, welcomed attendees to the first in-person NAB Show in three years in April. He's with Steve Hill, president/CEO of the Las Vegas Convention and Visitors Authority, and Mary Beth Sewald, president/CEO of the Las Vegas Chamber of Commerce.

# Curtis LeGeyt completes his first year on the job

Association leader says radio needs to capitalize on emerging tech capabilities

**A**s Curtis LeGeyt completes his first year as president and CEO of the National Association of Broadcasters, he and his members are assessing the policy implications from the 2022 midterms, preparing to defend against additional music royalty costs and worried about another FCC regulatory fee increase.

LeGeyt's first 12 months on the job saw the radio and television industry emerge from a pandemic while navigating a quickly evolving media environment. LeGeyt sets the edge for the group's advocacy priorities on Capitol Hill. Observers say his deep knowledge of how lobbying works in Washington has made for a smooth transition from his predecessor Gordon Smith.

"The most striking thing to me in this first year," LeGeyt said, "is the degree to which policymakers are very focused on the state of our industry. They understand the value broadcasters provide to communities. How important what broadcasters offer stands in contrast to what happens

in the rest of the media landscape and in particular social media."

He added: "Broadcast issues are not partisan. We have champions on both sides of the aisle in the House and Senate."

LeGeyt, 44, was NAB's chief operating officer for several years and its executive VP for government relations from 2015 to 2020. Prior to joining NAB in 2011, he was senior counsel to then-Senate Judiciary Chairman Patrick Leahy. He and his wife Kacey reside in Washington; they have three children, Caitlin (10), Jack (8) and Desmond (5).

Radio World interviewed him in November.



**What do you see as NAB's most important actions regarding broadcast radio in the year since you took the top job?**

**Curtis LeGeyt:** There are a few things. We started the year with so much disruption with this Congress and what happened on Jan. 6 (2021). Being able to overcome that

polarizing environment and still be able to attract a majority of lawmakers in the House and then another nearly 30 in the Senate, on both sides of the aisle, to come together in support of the Local Radio Freedom Act opposing any new royalty on local radio is a significant accomplishment.

Then the work at the FCC to reduce their initial regulatory fee increase — which saw nearly 100 members of Congress write to the FCC to oppose the fee increase — was a significant win for local broadcasters. I'm sure that issue will be near the top to our efforts again for 2023.

“ Sometimes in this very fragmented media landscape, the popularity of radio gets lost in the layers. So we are raising the volume on that story. ”

And then the bipartisan support and progress we had on the Journalism Competition Preservation Act, especially for those radio broadcasters that focus disproportionate resources on local news. It would provide some revenue from tech platforms when they are repurposing our content. That bill passed out of the Senate Judiciary Committee just before Congress went out of session prior to the election in the fall.

Those are the three significant wins for local radio this year.

**RW** What are the top goals for radio members going into 2023?

**LeGeyt:** On the advocacy side, we will remain focused and advocate against any new terrestrial performance royalty. That fight is not going away. The recording industry is investing more resources on the other side of this. They have recruited the former head of the House Democratic Caucus, Joe Crowley, to lead their MusicFirst effort, so they are not going anywhere.

And secondly, we need to work toward legislation that ensures a level playing field between the big tech platforms and local broadcasters. We need to make sure policymakers understand the impact that big tech is having on the local advertising market.

As listeners migrate online, we understand the tremendous gatekeeping ability those platforms have, enabling us to have a direct relationship with our audiences. If they are going to repurpose our content we want to be fairly compensated for it. We will engage with lawmakers on both side of the aisle for legislation that allows broadcasters to compete with big tech.

**RW** Is there any reason to think the latest American Music Fairness Act to pay music performers will actually become law? The latest proposal would limit payments by small and local stations to about \$500 annually. Does the idea of a capped payment for smaller broadcasters open the door at all for you on this?

**LeGeyt:** No. I don't think that is a starting point. A starting point for NAB would be a proposal that looks at music royalty more holistically and provides some relief for local broadcasters on the royalties they are paying when streaming to audiences online. I think those fees are far too burdensome and I feel they are impeding innovation by local broadcasters. That is innovation that needs to happen to enable our medium to thrive.

I think solving something holistically and creating a sustainable royalty model that allows for broadcasters to thrive in the digital space is a win-win for local broadcasting and performing artists who will benefit from more airplay on our platforms.

But the current economics are not sustainable. So we are willing to have a conversation about what a terrestrial fee should look if it is wrapped into the larger conversation around digital. Absent that, and the current AMFA doesn't have anything to do on digital, then it's a non-starter.

**RW** Should the Senate approve the nomination of Gigi Sohn to the FCC?

**LeGeyt:** We made very clear when Gigi Sohn was first nominated that we had some significant concerns involving her role with regards to some of our television issues. She since had proffered that if she is confirmed, she would recuse herself from a set of television issues. We were clear in the aftermath that given her voluntary recusal on those television issues, it satisfied the NAB's most significant concerns with her nomination.

**RW** Do you feel that matters of importance to NAB members are being held up by lack of a fifth commissioner?

**LeGeyt:** We certainly think the FCC functions best when it has its full complement of commissioners. We need to give real credit to Chairwoman Rosenworcel that she has forged a very, very productive tenure with a 2-2 commission. I think the structure has taken the temperature down on some telecom issues and enabled her to focus on those

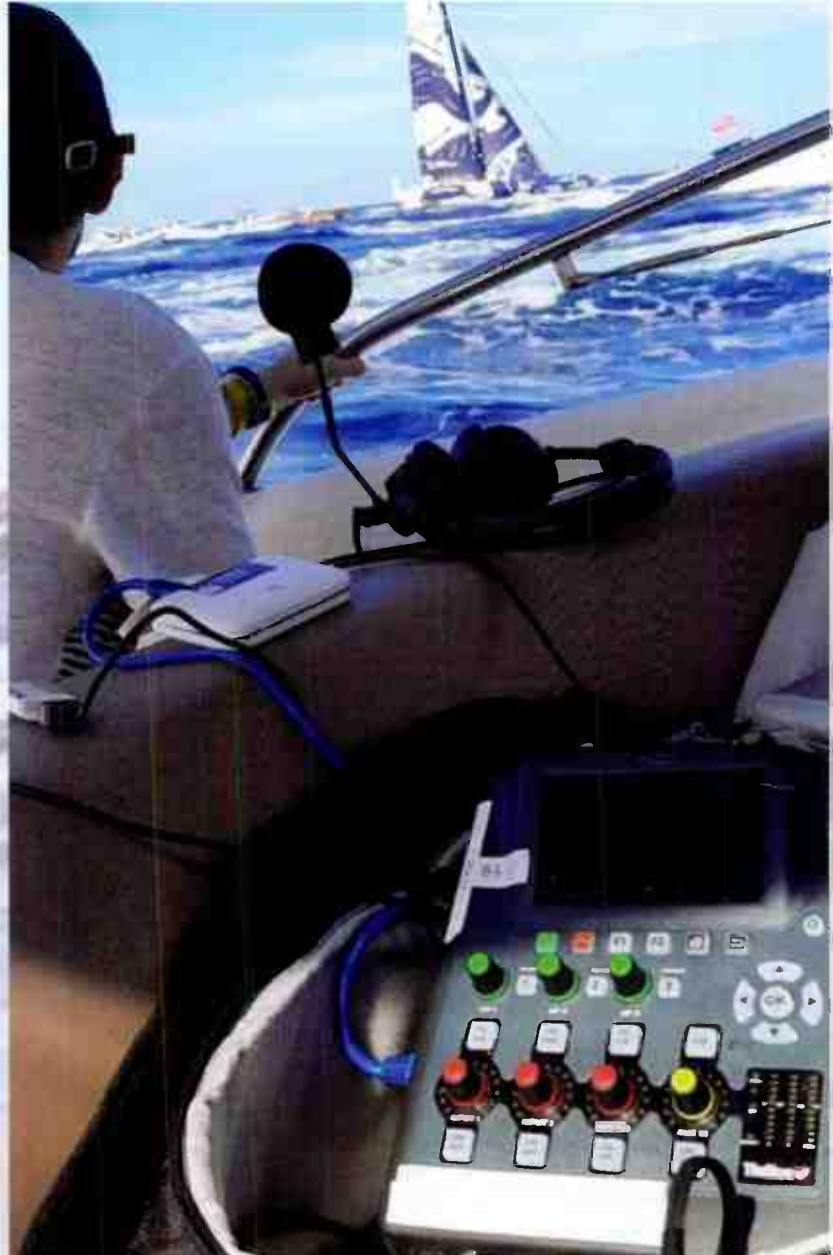




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places where there is bipartisan consensus and has looked pretty productive from where I sit.

**RW** NAB has been vocal in opposing the GeoBroadcasting proposal to allow limited geotargeting on FM boosters. You've made policy and technical arguments against it, but geotargeting proponents say NAB also has been "savage" in its opposition, issuing "disingenuous" arguments with "out of context personal allegations" that go too far. How do you feel about those characterizations?

**LeGeyt:** I'm not going to get into specific adjectives, but it is fair to say we have significant concerns with the GBS proposal. Our members just don't see geotargeting as a

**Above**  
At the spring show, LeGeyt joined Library of American Broadcasting Foundation Co-Chairs Heidi Raphael and Jack Goodman in presenting the inaugural Insight Award to LeVar Burton, second from right, for his contributions to broadcasting, history and American culture.

viable technology that will help them compete in today's media landscape.

**RW** So NAB's criticism of GBS co-founder Chris Devine and his business background have been fair?

**LeGeyt:** Yes. The record right now reflects significant concerns raised by a litany of voices across the broadcast industry. And the opposing viewpoint is what has been submitted by Mr. Devine's company. I do think his credibility is an extremely important factor here, given the fact that he is asking the FCC to rely entirely on his company's assertions in terms of the viability of the technology and its efficacy.

**RW** The National Association of Black Owned Broadcasters recently reversed its stance on geotargeting and no longer supports it. Did NAB ask NABOB to change sides?

**LeGeyt:** No truth to that. I would love to have the ability to influence the positions of other trade associations but NAB has no ability to do that.

**RW** NAB held off the FCC's foreign sponsorship ID proposal via a successful court challenge; but the chairwoman has revised the proposal and is trying again. Does the NAB accept her revised proposal?

**LeGeyt:** I think it is important to say at the outset that the NAB shares the FCC's goal of ensuring the public knows

**“ The work at the FCC to reduce their initial regulatory fee increase ... was a significant win for local broadcasters. ”**





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when it is listening to foreign propaganda. And we are committed to working with the chairwoman on a fair proposal that achieves that goal. However, we remain concerned about rules that unfairly burden the vast majority of broadcast stations that are not engaged in that practice, that do not air foreign propaganda. Our worry with the current proposal is that it imposes a burden on stations far outside the intended target.

**RW** **Do you expect the commission to at least consider easing subcaps on radio ownership in 2023?**

**LeGeyt:** I am absolutely hopeful that FCC will conclude the quadrennial review of media ownership rules that encompasses the subcap issue. The rules [aimed at] assuring a diversity of voices within local communities are outdated. This premise that local broadcasters are only competing against other broadcasters in local markets is antiquated.

The way Americans engage with audio platforms has changed, and the FCC needs to look at it. Unfortunately the rules just haven't kept up. The FCC needs to consider rules that will allow radio broadcasters to compete.

**RW** **It's unique that broadcasters are in a relationship with big tech in certain areas, the car for example, but yet compete with them in that space.**

**LeGeyt:** Well, I think if we want to perform the service we are paid to do for our industry, which is to make sure they are equipped and ready to innovate to remain competitive in this current media environment, we need to be at the table with some of these platforms.

The work we have done with Google on the Android Automotive project is a great example of that. We have completed and presented to Google a proposal affecting radio including extensions meant to maintain interoperability between car interface developers and hardware suppliers for tuners.

Without having a seat at the table, radio is going to end up not being fairly represented in the technology as the connected car develops.

**RW** **Speaking of the connected car, you got a demo of the DTS AutoStage platform from Xperi at the NAB Show New York this fall. What's your take on that platform?**

**LeGeyt:** I think Xperi has done tremendous work putting the AutoStage platform not just here in the U.S. but globally. I think it has a lot of potential for what radio can offer to audiences as well as advertisers. The marrying of a radio station's over-the-air content with internet-delivered content opens up all kinds of new opportunities for broadcasters and advertisers.

**RW** **Talk of AM revitalization seems to have died off at the commission. Meanwhile some new electric vehicles are shipping without AM capacity. What encouragement can you offer your AM members?**

**LeGeyt:** We are going to continue to tell the story here in Washington about the incredible service that both AM and FM stations are providing. I also think that as a trade association, there is a real role for us to play to make sure the auto manufacturers have the latest data in terms of consumer preferences as it relates to radio.


Sometimes in this very fragmented media landscape, the popularity of radio gets lost in the layers. So we are raising the volume on that story. To the degree that a manufacturer is making a decision that might make radio accessibility more difficult, that is not going to be in the best interest of their consumer, and I'm sure not in the interest of policymakers in Washington concerned about public safety.

**RW** **You have been in the new Washington headquarters**

**near the capitol for a while now. How is NAB benefitting from its proximity to the decisionmakers it seeks to influence?**

**LeGeyt:** It's an incredible opportunity for our industry. It enables us to get more members of Congress over to our headquarters in a building that really represents the future of broadcasting. It allows us to tell the story of radio and the great innovations happening.

**RW** **What stations do you like to listen to and on what platforms do you listen?**

**LeGeyt:** I utilize a little bit of everything. When it comes to terrestrial radio I'm a political junkie and sports junkie. Here in Washington I probably spend a disproportionate amount of time listening to [Hubbard's] WTOP as well as [Audacy's] 106.7 The Fan, WJFK(FM). 

 **Comment on this or any story to [radioworld@futurenet.com](mailto:radioworld@futurenet.com).**

**“ We need to give real credit to Chairwoman Rosenworcel that she has forged a very, very productive tenure with a 2-2 commission. ”**

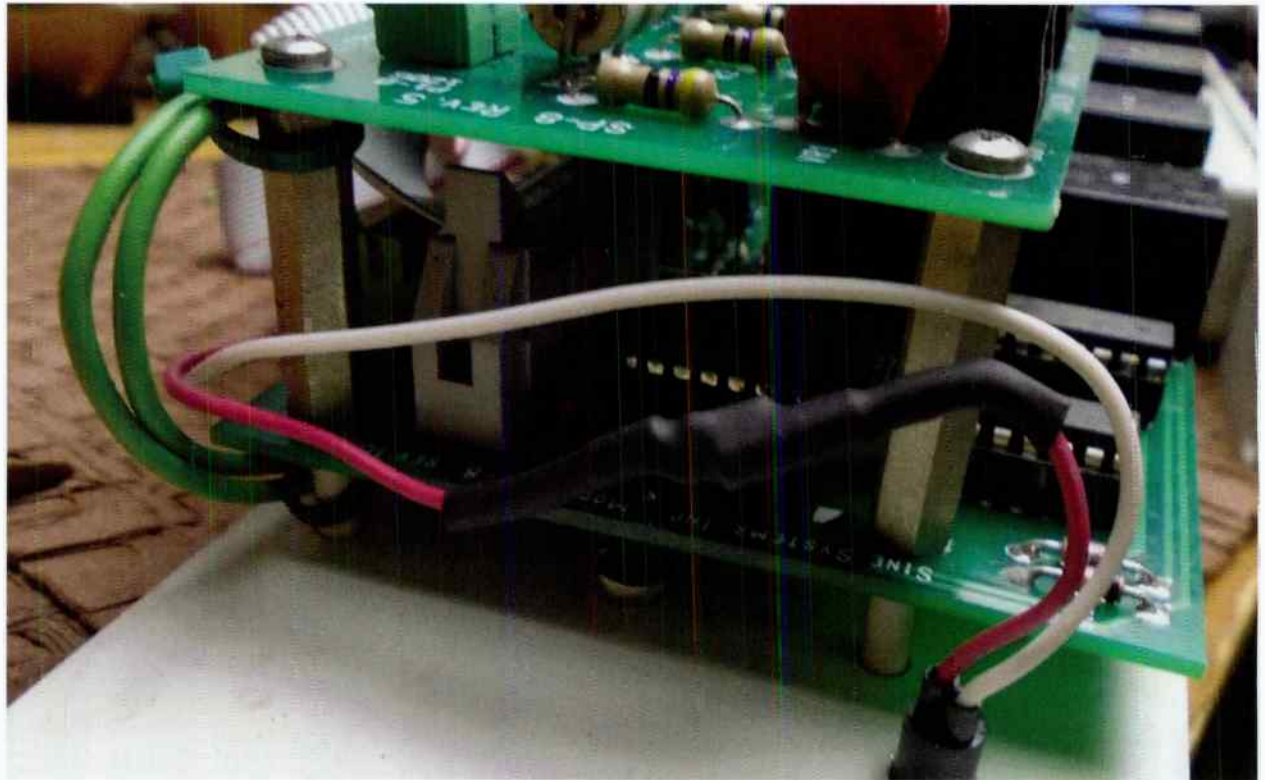




**John Bisset**

**CPBE**

The author has spent over 50 years in broadcasting and is in his 32nd year writing *Workbench*. He handles western U.S. radio sales for the Telos Alliance and is a past recipient of the SBE's Educator of the Year Award.



**Tips are GEP, too**

Workbench submissions are encouraged and qualify for SBE recertification credit. Email [johnpbisset@gmail.com](mailto:johnpbisset@gmail.com).

## GEP: Ditch the wall wart

A simple project using junk box supplies gets rid of the wall wart

**C**onsulting engineer and Radio World colleague Charles "Buc" Fitch, P.E., recently had one of those ubiquitous Sine Systems remote control panels on his workbench. He decided to forgo the wall-wart power source and convert it to a plug-in device.

In the broadcast engineering business, you may hear mention of GEP, which stands for Good Engineering Practice. In working on this project, Buc was reminded of one of its more basic tenets: the treatment of the line voltage input.

When 120 volts single-phase enters a unit, the phase line — the 120 volt potential referenced to neutral and ground — should go first to the fuse or circuit breaker, then to the on/off switch, and from there onto the transformers and circuits that use this power.

More specifically, the phase line goes directly to the center pin (the deepest contact) of any bayonet/twist-type fuse holder. The goal is to keep this potential as far as possible from anyone changing the fuse who might touch the capture ring just under the lip of the fuse holder.

GEP also expects that any appearance of this killer voltage will be covered by some sort of insulation or barrier, to minimize any shock.



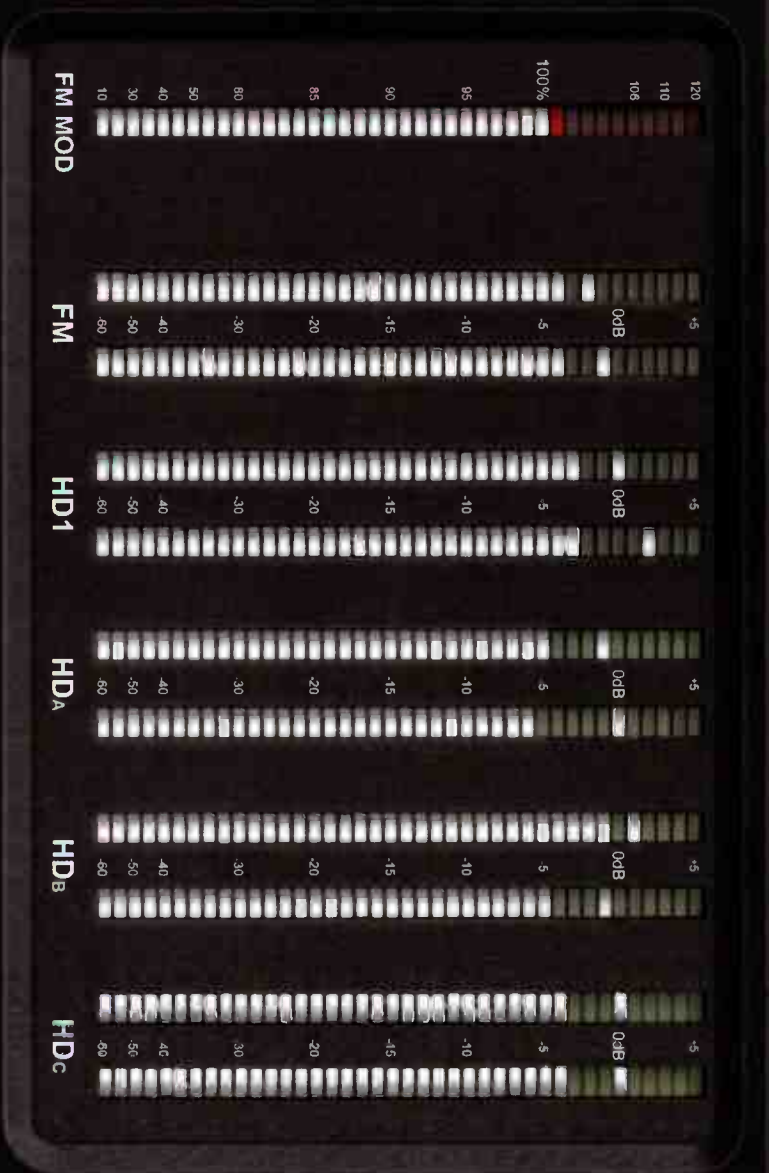
**Above**  
The front-panel LED wiring.

**Right**  
Placement of the AC power "on" LED.

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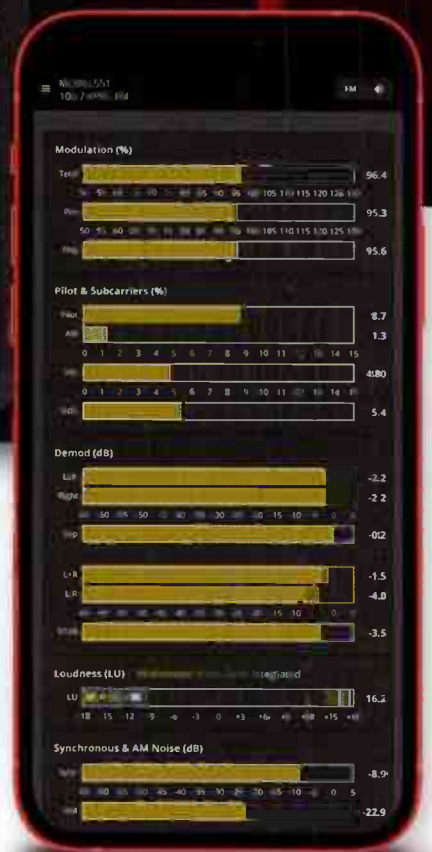


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Buc chose a Visual Communications L10005 (green). Any diode that can handle better than 20 mA will work.

The Sine uses 12 to 16 volts AC, so this little Stancor 12.6 volt 250 mA transformer (or equivalent) is perfect. The LED is powered by a diode — in this case a 1N4004 because he bought 100 of them for about five dollars — with a series voltage drop/current limiting 470 ohm 1/2 watt resistor. Buc reminds us to observe polarity or the LED won't light.

The image at the top of page 11 shows the entire assembly covered with shrink wrap.

The only item of concern is the exposed AC, and as Buc has noted in the past, those connections on the fuse holder can be covered in GE silicon caulk, seen in the third photo.

“The main board of the RP-8 allows enough space to install a transformer, fuse and LED power indicator.”

14

**Above**  
Plenty of room for mounting the transformer. Note the GE silicone sealant that Buc used to insulate the fuse.

**Right**  
Buc mounted the transformer and fuse holder so as not to interfere with the front-panel silk screening.

Obviously if you must have a bare appearance of 120 volt, such as a voltage selection terminal strip, you should mark the presence of the potential on the strip or chassis.

### The construction

The main board of the Sine Systems RP-8 is undersized for the 2 RU rack panel, which leaves just enough space to install a transformer, fuse and other components on one end and an LED power indicator on the other.

Buc only needed to drill four holes: two for #4 screws to mount the transformer, a 1/2-inch hole for the fuse holder on the right side of the panel, and a 1/4-inch hole on the left for the LED. The positions were chosen so the holes wouldn't cover the informational lettering on the front of the panel.

Buc harvested the AC cable from a computer. The fuse holder is a Bussmann GMA type (fast-blow) to minimize size. The LED was not critical;

Shrink wrap buries all other sins.

The final current flow is about 18 mA. Because this LED (like the Sine itself) will run continuously, it's good to hold down the current. As mentioned, all items are dressed tightly so that the panel can continue to be rack-mounted.

It's a simple project, using junk box supplies, that gets rid of the wall wart.

PS: If you like modifying equipment, Dan Slentz, our roving internet explorer, shares a fun clip of a Roomba vacuum clear modified to run at 35 mph, affectionately known as the VRoomba! On YouTube, search "Building the World's Fastest Roomba."

### Reminder

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# How can radio address its problems with young consumers?

Radio has reinvented itself before to “go where the listeners are.” It could do so again

**B**roadcast radio is facing some significant challenges — and one of them involves young people.

That’s according to a recent report to the government of the United Kingdom. Though specific to the U.K. marketplace, the “Digital Radio and Audio Review” explores issues that are relevant to broadcasters everywhere.

The report was a joint government/industry project commissioned by the

## Writer



**James Careless**

The longtime Radio World contributor wrote about the surprising resilience of shortwave radio in the Sept. 1 issue.

Department for Digital, Culture, Media & Sport, prompted by the question of whether analog radio services should be sunset.

The report has many positive things to say overall. It describes radio as “a great British success story” and said the medium has evolved to embrace digital opportunities to maintain universal appeal. It describes a “thriving” radio market and said new online formats from broadcasters and new entrants have grown rapidly, bringing “increased choice and new habits to the U.K.’s audio sector.”

It said radio remains a strong, trusted medium, and it goes on to explore issues such as consumption trends, the role of competing services, the state of DAB+, the impact of voice activation

and so forth. It makes dozens of recommendations, some relevant only to the U.K., others that could be applied broadly. Its main conclusion was that the time is not right in that country for a switch-off of analog radio services.

For anyone interested in large-scale radio trends, it is worth reading; find the report and the government’s response at [www.gov.uk](http://www.gov.uk), search “Digital Radio and Audio Review.”

But its discussion about trends among young listeners is eye-catching.

## Losing ground

The report notes an ongoing decline in young listeners as online music options proliferate.

“In the 10 years from 2010 to 2020, the weekly reach of live radio



among 15–24s declined by 8% (or 7.1 percentage points) from 88.7% to 81.6%,” the review stated.

“During the same period, the average hours per 15–24 listener fell by 23% (from 16 hours 8 minutes in Q1 2010 to 12 hours 30 minutes in Q1 2020).”

“As a result, the total listening hours of 15–24-year-olds fell during the period by 34%,” it continued. As well, “Young audiences do not seem to sufficiently grow into radio later in life to compensate: 25–34s today are listening to slightly less live radio (16 hours 6 minutes in Q1 2020) than they were 10 years ago.”

Then there’s the emergence of smart speakers for in-home listening. The good news is that many people do listen to radio broadcasts on their smart speakers. The bad news: “Use of smart speakers to listen to the radio falls to 34% among 16–34s but rises

to 67% among those aged 54 and over,” said the review.

“In contrast, 67% of all smart speaker users listen to music via a streaming service on their device, rising to 77% of 16–34s but dropping to 55% of those aged 54 and over.”

Radio World asked industry observers about the implications of these declines in listening among the young.

“While come/reach isn’t a problem, total time spent listening seems to be in decline for radio, especially at the younger end,” said James Cridland, radio “futurologist” and editor of the Podnews podcast newsletter.

“In the U.K., radio’s weekly time spent listening for people aged 15–24 on AM/FM, DAB and online has declined by almost 40% since Q2 2013. I see similar declines for TSL from young audiences in the U.S.”

There is no doubt that the emergence of online music services

with tailored music experiences has cut into radio’s audience.

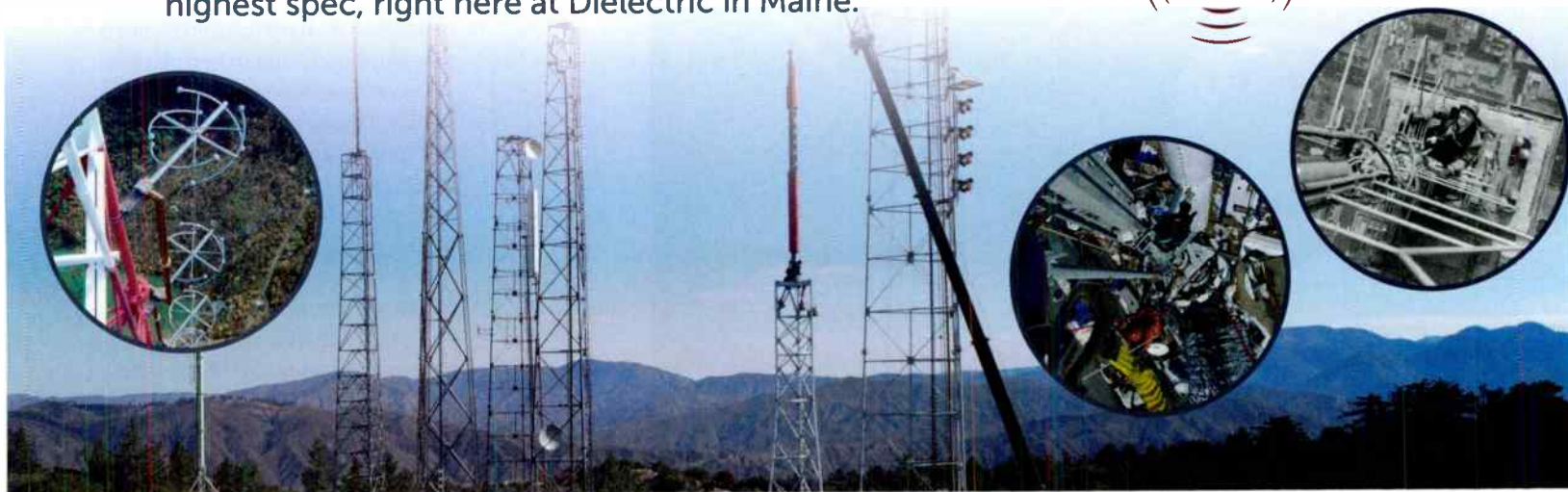
Meanwhile, “About a decade ago the radio audience began to split into two listener groups who wanted different things,” said Ben Downs, vice president and general manager of U.S. company Bryan Broadcasting, who is on the board of the National Association of Broadcasters.

While some listeners remain dedicated to listening to broadcast radio, he said, “There was the ‘jukebox group’ that had no interest in anything that stopped the music such as news, sports, traffic, weather — and unfortunately commercials. That’s the group that has drifted away from radio, because we generally can’t operate outside of our advertising-supported business model.”

However, some observers say the industry isn’t doing enough to build relationships with younger consumers

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and doing absolutely everything to attract them.

"I worry that programmers are doubling down on programming that attracts the older demographic, leaving nothing for younger listeners and accelerating the decline of the industry," Cridland said.

In the long term, he said, "Radio aimed at people aged 55+ is hard to make money from, and harder to see new listeners dipping into."

### Online competition

What will it take to keep broadcast radio competitive, attractive and relevant to new generations of listeners?

Fred Jacobs has been pondering that. He is president of Jacobs Media, renowned for creating the classic rock format that is still popular today.

"Radio's future can still go a variety of different ways, depending on how industry actors in these various countries choose to play their hands," Jacobs told Radio World.

"They can lean into radio's strengths, being live, local and free, and perhaps carve out a sustainable but different future. They can specialize in personality development, another core strength not being

pursued by most streaming players. Or they can meet the audience where they are, weaning themselves off transmitters and towers as the dominant distribution outlet to provide content and services on myriad other channels. Many are doing this now, but in fits and starts."

These are not the only options for broadcasters to compete with online services, said Jacobs.

"They can explore and experiment with alternative business models, not unlike what Bauer Media is doing in Europe with its subscription service. Offering versions of broadcast radio stations that are commercial-free and with 'song skips' could prove to be a viable option for already strong, well-established radio brands.

"They can also seek out strategic mergers, acquisitions, collaborations and partnerships to bolster their portfolios and capabilities, in much the same way that public radio station WBEZ recently purchased the Chicago Sun-Times. If that strategy is correct, the new Chicago Public Media entity could 'own' local news in Chicagoland."

Broadcast radio's unmatched ability to deliver "local and live" content

was emphasized by NAB President/CEO Curtis LeGeyt in a recent edition of "Borrell's Local Marketing Trends Podcast."

"What is always going to differentiate radio is the trust of the local personality and the live programming," LeGeyt said. "I think radio will continue to thrive in that regard, whether they are distributing that programming through an AM/FM traditional terrestrial signal, or whether that programming is being consumed through a stream through an adjacent podcast, whatever it may be."

Radio critics have said for years that this "local and live" advantage is compromised when a station relies too much on automation and voice-tracking, not supporting listener music requests and on-air interactions, or using out-of-town announcers with no presence or connection in the community.

Another programming possibility: Radio stations could offer audiobooks and author interviews through HD Radio channels and web streams. According to [www.wordrated.com](http://www.wordrated.com), globally, audiobook revenue is projected to be worth \$4.11 billion in 2021. So that's one area where new listeners might be found.

"The other thing we have to do is quit annoying our listeners," Downs said. "Our spot loads are now and have always been the greatest turn-off to free radio. Syndicated talk formats have places in their formats built for 20 to 22 minutes of commercials each hour — and don't forget to count the top-of-hour newscasts. It's hard to listen through that plus poorly researched playlists.

"As well, we need to find on-air talent that super-serves the community and keep them in our studio chairs. If we do all this, we may not get 100% of our audience back, but we can win back a lot."

Unfortunately, said Cridland, "Radio's reaction to declining linear audiences appears to be to cut costs on output, thus making radio

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even less likely to compete well with more interactive offerings by Spotify, Amazon and other services.

"Real human beings, producing relevant output to their audiences, appears to be the way forward," he said. "Real and relevant' can come from live and local, but it doesn't have to. That said, it's much harder to deliver 'real and relevant' using non-stop automated music or short presenter breaks voice-tracked six days ago in a different city."

Another solution is offered by John Lund, president of the Lund Media Group consultancy.

"There needs to be a paradigm shift from perceiving radio as a device receiving content distributed from a transmitter and antenna," he said. "Instead, radio should be perceived as content distributed by a transmitter and over the internet — apps for cellphones, website streams and smart speakers. The advantage terrestrial radio

**“ The teen issue is especially challenging, largely because most broadcasters have mistakenly and myopically chosen not to compete in that arena. But Gen Z is not actively ‘anti-radio.’ ”**

has is that it is a mass-marketing mechanism limited by licenses from the FCC. Satellite and internet content providers do not have this valuable marketing vehicle.”

### Winning back the young

If one considers the data in the U.K. report, one might conclude that broadcast radio is doomed simply because it seems unable to attract younger listeners. Without them, radio's fate presumably is tied

to the life expectancy of the 55+ demographic.

But it doesn't have to be this way, its supporters say. Radio has faced doom before, as when television supplanted radio as the mass-market venue for comedy, drama and other spoken-word programming. Radio survived by reinventing itself as a youth-focused music medium.

Young listeners can again save broadcast radio and will do so if the industry lets them.

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Patrick Hannon is president of WorldDAB, which advocates for the DAB/DAB+ digital radio platform. "The key challenge for radio is to pursue a course that balances the need to encourage innovation, whilst simultaneously protecting the core strengths of broadcast radio," he said.

He believes the multitude of additional channels provided by DAB+ digital radio makes it possible for radio to rebuild its connection to younger audiences.

"DAB+ can offer listeners more choice, such as new stations targeted at children, including 'Fun Kids' in the United Kingdom and 'ABC Kids listen' in Australia," he said. "These stations help build radio listening habits from an early age, as well as providing educational and entertaining content."

On the other hand, said James Cridland, "Podcasting is showing that younger audiences are keen to seek

out the kind of programming they want on their terms. It's telling that the big U.S. broadcasters are heavily investing in the podcasting industry, though also telling that podcasting accounts for just 9% of iHeart's total revenue or 6% of Cumulus Media's revenue."

Downs said, "While I wish young people were more interested in their community, they will listen to our signals if we give them something they can't find anywhere else. And if we're good enough we'll be able to share them with the all-music services. In our case, our collegiate sports radio programs are a unique product that motivates young people to listen."

Said Fred Jacobs: "The teen issue is especially challenging, largely because most broadcasters have mistakenly and myopically chosen not to compete in that arena. But Gen Z is not actively 'anti-radio.' There's simply never been anything

on the radio of interest or relevance to them."

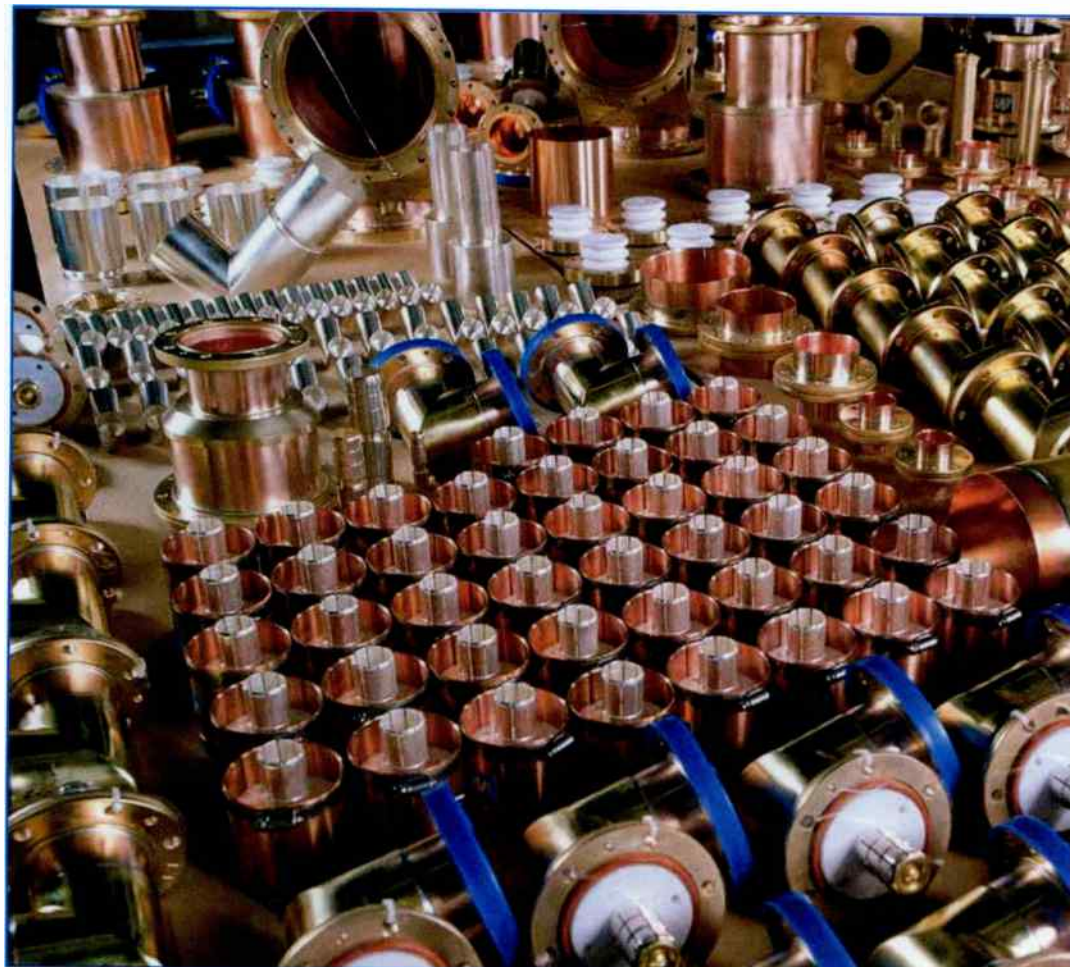
But that does not mean a content stream or platform couldn't be devised that would appeal to them. Jacobs noted that TikTok has disrupted juggernauts Facebook, Instagram and others but it didn't even exist until 2016.

### What's ahead?

Can radio survive this second extinction-level event, the onslaught of online music services? Our conversations with experts keep coming back to the notion that stations must reinvest in the "local and live" model to which so many publicly traded broadcast groups give lip service.

"Radio — in a more complex media future — cannot and will not be what it was," concluded Fred Jacobs.

"But in every phase of its evolution, it has morphed to meet the moment. The challenge of today is more



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arduous and financially precarious, but the medium has the ability to adapt and become a different version of itself. The question is whether its owners/operators have the wherewithal, the stamina and the innovativeness to make it happen."

And what did the "Digital Radio and Audio Review" conclude about the youth issue?

"The U.K. radio industry is actively trying to address the shifting needs of these young listeners," it told the government.

their investment in music streaming and podcast services."

More broadly, the report acknowledges that radio is facing "significant" challenges.

"While the BBC and commercial broadcasters have invested heavily in developing and improving DAB transmission infrastructure, and broadcast platforms continue to dominate both in-home and in-car audio entertainment, the options for what to listen to and the ways of listening to radio services

**“The other thing we have to do is quit annoying our listeners.”**

"Commercial radio has launched a number of new digital-only services such as KISS Garage and developed online audio players such as Global Player, while the BBC has further evolved BBC Sounds and launched, for example, a new stream of content to help young audiences manage stress and wellbeing.

"Existing initiatives show some signs of success," it stated, "but the challenge will intensify as online audio audiences grow, leading competing global providers to further increase

continues to increase. Audiences are changing, distribution is changing, and connected audio and global streaming platforms such as YouTube, Amazon Music and Spotify are competing for the radio audience.

"The future is still a bright one — especially as opportunities open up for the audio production sector — but significantly less certain, and much will depend on industry continuing to collaborate to sustain a thriving audio ecosystem of U.K.-produced content." 📻

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## About Buyer's Guide

The Buyer's Guide section appears in every other issue, focusing on a particular category of equipment and services. It is intended to help buyers know what's on the market and gain insight into how their peers are using such products.

## Tech Update

### A Lower-Cost Surge Suppressor for Solid-State Transmitters

Sine Control's PowerClamp HP200-1-TX Surge Protective Device is for broadcast transmitter sites, network studio complexes and other mission-critical installations. The new unit is suitable for solid-state transmitters that use switching power supplies.

"PowerClamp SPDs use a hybrid of multiple technologies to greatly reduce the amplitude of AC spikes and surges that often damage these switching supplies," the company says.

"The unit's 'clamping level' performance is exceptional, reducing surges and spikes to within just a few volts of the sinewave peak."

The new PowerClamp HP200-1-TX is rated at 200,000 surge-amps per phase.

The HP200-1-TX is for single/split phase 120/240 volt power; other Series 200 models are available for three-phase wye electrical service from 120 to 480 volts. LEDs monitor the unit's fuses, with Remote Status Monitoring optionally available.

Load matching is not required. There is no insertion loss or risk of power cutoff. In the unlikely event of an overload, the PowerClamp's internal fuse will open, but power to the load (the transmitter) will remain on.

Series 200 SPDs have more surge-amp capacity than previous PowerClamp units but cost less due to newer production technology. Units are generally in-stock.

Info: <https://henryeng.com/powerclamp/>

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**Tech Update**

## ERI Upgrades FM Channel Combiners With 3 dB Hybrid

Electronics Research Inc. has incorporated its newly designed HY0241 and HY0244 3 dB hybrids into its 955, 780 and 783 series constant impedance FM combiner modules.

These filters are used in FM channel combining systems with four or more FM stations sharing a single master FM antenna. The new hybrids cover the entire FM band and exhibit very flat response from 88 to 108 MHz with isolation of greater than 30 dB, ERI reports.

"Both HY0241 and HY0244 hybrids have very high-power handling capability and are rated to handle the significant peak RF voltages for systems with multiple FM stations operating with hybrid analog FM and HD Radio signals."

The HY0241 is available with any combination of coaxial ports including 1-5/8, 3-1/8, 4-1/16 or 6-1/8-inch. The HY0244 has a higher power and peak RF voltage rating and is available with standard coaxial ports, including 3-1/8, 4-1/16, 6-1/8 or 9-3/16-inch in any combination.

The individual FM bandpass filters included with these combiner systems are usually three- or four-section filters with optionally available non-adjacent coupling for additional isolation when



combining closely spaced frequencies. The filters are typically floor-mounted or can be stacked vertically to reduce the footprints of the filters.

"When included with an ERI Axiom Master FM Antenna, the channel combiner offers a high-performance economical solution for shared transmission facilities for multiple FM broadcast stations."

Shown is an ERI Constant Impedance FM Channel Combiner for six full-service FM stations.

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AUDIOARTS ENGINEERING

# Dielectric accelerates a transition in the Maritimes

MBS Radio has moved several AM stations over to the FM band

**C**anadian broadcaster MBS Radio, which owns and operates 22 radio stations across Atlantic Canada, has transitioned several former AM stations to FM frequencies. CKNB(FM) on the Quebec/New Brunswick border is the most recent, switching from 950 kHz to 100.7 MHz on Nov. 14.

"AM transmits using the ground plane, and we could reach listeners well given the regional topography," said Kevin Feltmate, director of information technology at MBS Radio. "Audio quality and listenership is limited, however, and with our transmitter showing signs of age we didn't want to invest in new AM technology."

FM would reach more listeners with improved audio quality, but it required an entirely new infrastructure. MBS Radio erected a new 120-foot tower and side-mounted a new Dielectric DCR-H ring-style FM antenna at the 100-foot elevation on the tower to enable the switch.

Feltmate asked contract engineer Francois Gauthier to determine the antenna specifications best suited for the regional topography.

"Francois worked closely with Dielectric on the pattern and antenna




**Above**  
Installation work in progress.

  
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design and confirmed that a two-bay array would keep our 1.4 kW signal within our regulated boundaries. We have installed DCR-H antennas at another FM station recently. This site is more challenging for coverage due to signal reflection from a mountain range."

The CKNB(FM) antenna is itself notable because it was among the first virtually modeled Dielectric

antennas. The manufacturer said this greatly reduced the time and labor of physical antenna modeling. Feltmate plans to order another Dielectric antenna for CJCW(FM) in Sussex using the same Dielectric Artificial Intelligence Optimization technology. He anticipates a spring completion.

He said installation of the DCR-H with radomes was simple and that Dielectric supplied the connectors and flex transmission line. "The riggers used a basic boom truck to raise and mount the antenna, and the radome protects the antenna in a wild climate that ranges from -20 to 30 Celsius. Outside of building the tower, Dielectric supplies all the components we need for a new FM antenna system. They take care of everything." 

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**Tech Update**

## Kintronic Supplies Custom ATU for JOCR

JOCR in Kobe, Japan, recently installed a Kintronic Labs AM antenna tuning unit to serve a 1 kW relay station on 1395 kHz.

The project was unusual in that the new unit had to replace an older ATU that was equipped with a built-in MAD switcher and dummy load. The replacement needed to have those as well, and fit in the same footprint.

"It was driving an unusual pole with rigid top hat, for which the user had both old and new measurements of impedance," said Kintronic Senior Staff Engineer Bobby Cox.

"The new and old impedance figures didn't match, and they were quite high impedances. We modeled the pole and top hat to get an idea of the expected impedance, allowing for variation due to stray base capacitance influences. The designed ATU would be able to tune to reach the range of measured impedances they had found in their documentation as well as our modeled impedance."

The customer also requested all-roller inductors to allow for quick tuning of the four-branch matching network. The unit also incorporated a third-order harmonic filter for the transmitter.

When the ATU was installed, the client emailed Cox: "We only needed to do a very small fine adjustment to the ATU and it took us only five minutes to do so."



Kintronic offers a range of specialized RF products. For AM/medium-wave, these include ATUs; impedance matching units; diplexers, triplexers and quadruplexers; phasing and matching systems, multiplexed directional systems; skirt kits; transmitter combiners; dummy loads; and ground system kits.

Info: [www.kintronic.com](http://www.kintronic.com)

**Tech Update**

## A Smart Antenna Monitor System From BDI

The SWP-206 Digi-Monitor Antenna Monitor system from Broadcast Devices is for master antenna system monitoring, VSWR protection and interlock control.

"Master antennas for radio and television use have grown in popularity due to their economy of use of sites and tower space," BDI states. "Accordingly they require monitoring of both the antenna and the combiner system itself."

The SWP-206, below, used with BDI's DPS-1000 series power monitor, shown at right, provides a compact and "smart" antenna monitor system. It gives essential information like RF power, VSWR level, line pressure and temperature, but also can be programmed to provide an interlock system that knows whether a problem is broadband or narrow-band in nature.

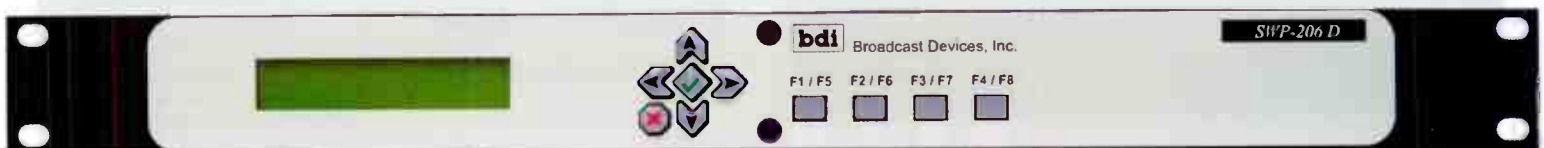
For example if a broadband event is detected with one of the antenna feeds, the SWP-206 interlock system opens all system

interlocks. If a narrow-band event occurs affecting only one module of the system, it will only open the interlock of the affected module of the combiner and associated transmitter feed.

Emailed alarms and thresholds for various alerts can be set using BDI's application software. And the SWP-206, along with other BDI RF support products, are SNMP agents compatible with SNMP-based remote control systems and third-party software.



Info: <https://broadcast-devices.com>



**Tech Update**

## ISS Is "AMReady" With Antennas and Accessories

Information Station Specialists and its website theRADIOsource.com now offer three styles of temporary AM antennas for quick deployment should the need arise. They are intended for use in situations such as antenna failures, loss of transmitter sites and other auxiliary applications.

"Representing varying levels of efficiency and power capability, these low-power solutions can handle up to 270 watts and can be installed on buildings with flat roofs or on independent support pole/towers," the company states.

The lightweight antennas range from 15 to 30 feet in length and weigh from 15 to 32 pounds, depending on the model and frequency. The various designs match to near 50 ohms so antenna tuning units are not required.

"Information Station Specialists can bundle the antennas with options, such as insulator mounts, matching transformers, support masts, cable/junctions and prefabricated ground planes," it said. Commonly required frequencies are in stock for quick shipment as part of the AMReady line of products.

Low-power transmitters, new or preowned, can be included if required and may be purchased or rented by the month for short-term applications. The antennas and transmitters are small enough to be portable/shippable. AMReady products are frequency agile so they can be moved to various frequencies as the need requires.



Info: <https://theradiosource.com/products/AMReady.htm>

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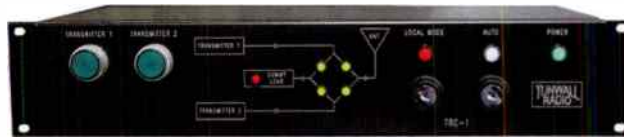
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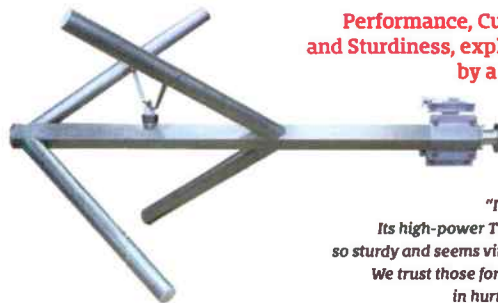
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## Pirate hunting looks good on paper

Regarding the FCC sending letters to property owners about pirate radio operations:

Leave it to Congress to pass yet another spineless, barely enforceable act, the PIRATE Act of 2020, bringing back shades of the worthless 1986 Electronic Communications Privacy Act.

While I can see where pirate broadcasting can certainly be a problem, in all honesty the majority of listeners love listening to pirates. Radio magazines even run columns devoted to it.

While I don't necessarily disagree with fine-levying, such levies are worthless if the FCC is powerless (or fund-less) to collect. Quoting your article on pirates: "To date ... no forfeitures have been assessed under the act."

In an earlier letter I pointed out that the FCC's 2016 \$25,000 forfeiture order against an amateur radio operator has yet to be collected. His callsign was recently appropriated

by a friend of his, and the obscenity, sexist and racist jamming of the WARFA net on 3.908 has now doubled, with current and former owners of the callsign tag-teaming to jam net operations nearly every Sunday, Tuesday and Thursday.

Over 100 complaints have been filed through the FCC's website, only to be given a case number while "the band plays on."

This individual has loudly proclaimed on 3.908 that WBJ means "World's Best Jammer" and that the FCC will never collect the \$25,000. He even plays a song on top of the net showcasing the "virtues" of being a jammer. He been at it for over 10 years. Isn't it time to bring in the local sheriff or federal marshals and shut this clown down?

How can we believe the FCC will be capable of enforcing any \$100,000 to \$2 million judgements when they can't even collect a six-year-old \$25,000 forfeiture? I'm all for the FCC doing their enforcement job. My question is, when will that be?

*Ron Fitch, WQ6X  
President  
Amateur Radio Club of Alameda*



## Software has its limits

Lou Sabatini, Scott Todd and Archie Stulc were "spot on" in their comments about maintaining consistent audio levels, especially when dealing with digital technology. And as always I appreciate Mark Persons' contributions and experience. [To see those letters, search "RW Readers Comment About Audio Levels" at [radioworld.com](http://radioworld.com).]

Yes, we do have means to make small corrections "ex post facto," but even the best software has its limits.

My introduction to digital audio recording was at a small TV station nearly 30 years ago. As an "experienced" engineer, I wondered why this device's indicator was several dB lower than the mixer's VU meter, so I "corrected" its gain. Big mistake!

That was my first (and only) lesson on allowing sufficient "headroom" for peaks that the board's analog meters couldn't display. My church's nascent "media ministry" started with cassettes and VHS, but I soon discovered the tremendous improvement in quality when I started mastering the audio on a (now long-obsolete) Sony MiniDisc recorder (properly adjusted, of course).

Now I use rack-mounted recorders with SDHC memory-cards, and Audacity on my PC to produce some really good CDs or MP3 files for distribution.

The only thing that's still somewhat out of my control in my churches is the participants' mic techniques and vocal styles. I've had folks who shout one minute, whisper the next; walk away from their mic; neglect to turn their wireless mic on; or somehow twist its lapel clip so their mic points anywhere but up.

While Audacity has tools to fix some problems, it still can't make filet mignon out of hamburger.

*Michael Shovan, WB2KHE  
fd&t technical services*



### How to submit

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# RADIOWORLD

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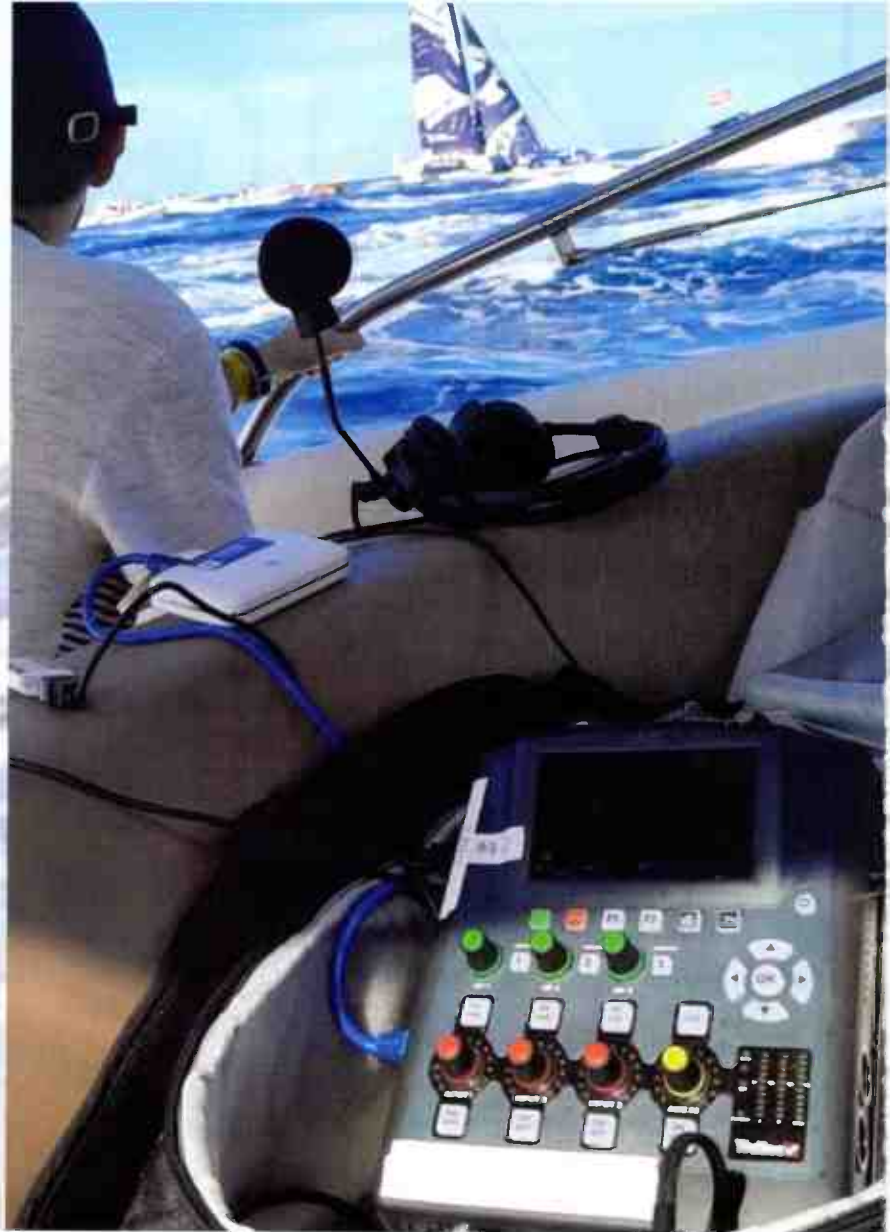
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# Technology solutions for all

**H**ere is your 2023 Source Book & Directory, a technology resource for professionals in the radio broadcasting and digital audio industries.

Our technology business space continues to evolve, with the proliferation of cloud-based tools, hybrid workspaces, virtualization, streaming channels and much more. Meanwhile, professionals in these industries also still need consoles, codecs, transmitters and no end of other specialized gear and solutions.

The companies listed in this directory are those that responded to our solicitations. They are the folks who make or sell the hardware, software and services that help the radio broadcast and audio industries go.

Find them listed alphabetically in the Vendor & Product Directory section starting on page 24. A cross-index helps you find companies by type of product or service, starting on page 18. On pages 4 to 16, sponsors highlight key products in the Profiles in Excellence section. And starting on page 40 are sponsored reprints of stories that appeared in Radio World in recent months.

Thank you for being a Radio World reader. I hope this resource is helpful to you and that you'll do business with these companies, particularly those that advertise in Radio World. They make it possible for us to serve you.

*Paul McLane*  
Editor in Chief

## THIS ISSUE

### PROFILES IN EXCELLENCE

**4-16**

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### VENDOR & PRODUCT DIRECTORY

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**40-46**

## From the Lincoln Bedroom to Lincoln High School. Connectivity. Solved.

Connectivity. In today's world it's all about connectivity. How much bandwidth, how fast is the connection and how reliable is the connection. Whether it's a broadcast from the White House or Joe's Used Cars, you want reliable connectivity for your wireless remotes. And you get that with MaxxKconnect Wireless.

MaxxKconnect routers out class the competition in several ways. First and foremost is connectivity. Not all cellular carriers are equal. Coverage can vary from location to location. MaxxKconnect has LTE cellular connectivity from all the major carriers so you can pick the carrier that has the better network in your area. And if you can't decide which to use, they have a solution where you can use both in the same router.

MaxxKconnect has a better class of service than your standard cell phone. With a nationwide true public STATIC IP address, you can set up inbound connectivity to your remote device and router for remote management. This also lets you increase your network security by whitelisting your public static IP in your studio firewall, which keeps you from having wide open ports. MaxxKconnect has a prioritized, high-speed connection with higher QOS on their carriers and no data throttling. This means that at those big events, your remote will stay on the air when your cell phone is having issues. And all MaxxKconnect routers have wired LAN ports.



MaxxKconnect has your back on support as well. Every router ships to you preconfigured and is ready to use – right out of the box! No more fumbling around trying to set it up and figure out the manual that was printed in way too small of a font to be readable. IP addresses, username and the Wi-Fi name are all right on a label on the bottom of the router and on a Customer Information Sheet you can stick in your desk drawer for future reference. They've also got a great new Customer Portal that lets you monitor your usage on every SIM, plus RMS access to your routers – all in one place and at NO additional charge!

Designed by Broadcast Engineers for Broadcasters, MaxxKconnect has support staff who know specifically what you're doing and can fix it when it doesn't work. Let's face it, nothing works forever and when you need help MaxxKconnect has someone on the phone that can not only walk you through troubleshooting but if the router can get online, they can attempt to fix your issue remotely. They'll also help you troubleshoot your codec ports and connection too!

Don't just consider MaxxKconnect for remotes. ISDN is gone or will be soon. Set up a backup STL with a MaxxKconnect and your favorite codec. You won't regret it.

MaxxKconnect Wireless is available from The MaxxKconnect Group at [www.maxxkconnect.com](http://www.maxxkconnect.com) or by calling 205-598-1200.



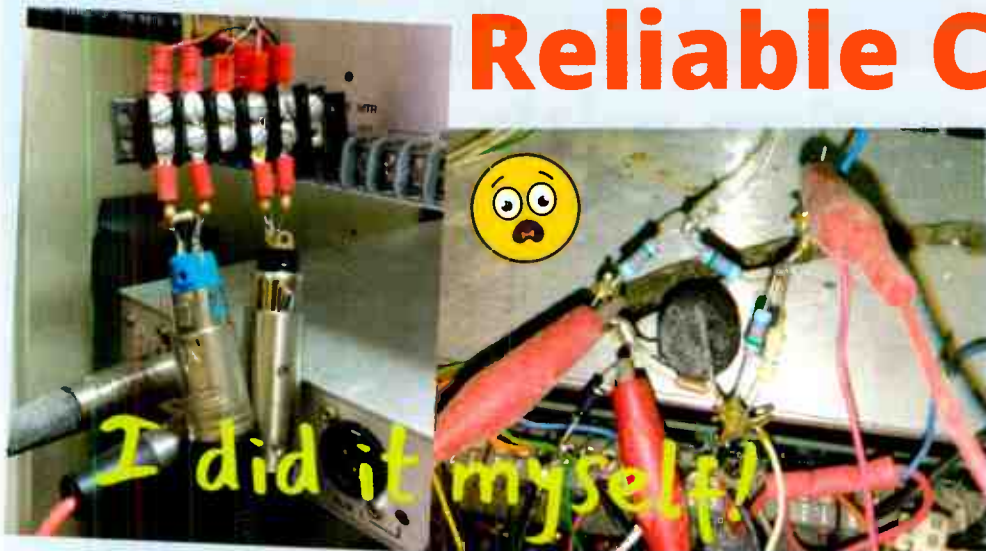
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## Innovation with AoIP Codecs

Comrex has been an industry leader in developing IP audio codecs since 2004, with the release of the original ACCESS - a handheld codec that opened up remote broadcasting possibilities that weren't available before. Since then, Comrex has continued to build IP audio technology and break boundaries in audio transportation.



### BRIC-Link Codecs

Designed for point-to-point links, our BRIC-Link codec line provides rock solid connections in any context. From STLs, to home studios, to voice-over links, to plain old IP codec connections between studios, BRIC-Link codecs are known for their reliability. It's the "set-it-and-forget-it box" that's beautifully boring – in the best way possible.

**BRIC-Link III**, the newest addition to the BRIC-Link line, is a work-horse codec, ready to handle anything. Featuring CrossLock (Comrex's proprietary suite of reliability tools), BRIC-Link III is designed for ultra-reliable IP audio transmission and is capable of being used in 24/7/365 environments. Perfect for point-to-point connections, multicasting, streaming, and more, BRIC-Link III offers incredible versatility in a small package.

### ACCESS Codecs

Our flagship AoIP codec line, ACCESS codecs feature a sophisticated suite of features to supply exceptional audio. All ACCESS codecs include CrossLock in addition to HotSwap, a feature that allows users to back up studio-to-transmitter links (STL) or other dedicated links with a wireless modem. The **ACCESS NX Rack** studio codec and **ACCESS MultiRack** multi-channel codec are both AES67-compatible and ready to integrate into a modern studio. But the ACCESS line is defined by its remote codecs.

ACCESS NX is an IP audio codec designed to go anywhere. A handheld unit with two mic inputs



and an optional four-channel mixer, **ACCESS NX** can deliver exceptional audio, even over the kind of marginal IP networks one might encounter in the field. Plus with CrossLock, ACCESS NX can connect to multiple IP networks simultaneously, to take advantage of any bandwidth available.

### Gagl

While it's not technically a codec, Gagl is a brand-new cloud service that brings Comrex codecs to the next level. **Gagl** allows up to five users to send and receive audio from computers and smartphones. That audio is "Gag'l'd" together (if more than one user), and delivered to a Comrex hardware codec such as ACCESS or BRIC-Link, usually in a studio. All participants can hear each other (with their own mix-minus) and the codec "send" audio back to them.

Gagl is now available for purchase. Subscriptions are \$35.00 USD per month, or customers can save \$70.00 on an annual subscription with a code from their favorite Comrex dealer or Comrex directly. Free 14-day trial available for all new subscriptions.

For pricing and availability on Comrex equipment, please contact an authorized Comrex dealer.

For more information, visit the Comrex website at [www.comrex.com](http://www.comrex.com) or contact the Comrex Sales team at [sales@comrex.com](mailto:sales@comrex.com) or +1-978-784-1776.



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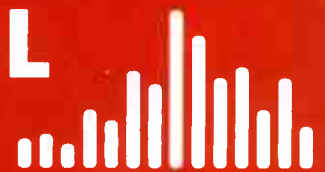
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Axia Quasar™ AoIP consoles are the ultimate AoIP Broadcast Mixing Consoles, putting the power at your fingertips for next-level content creation. Including XR and SR models—the Quasar family offers broadcast engineers and less seasoned board operators alike boundless production possibilities, modularity, scalability, and workflow flexibility.



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Delivering unlimited production possibilities. Quasar XR is our top-of-the-line mixer featuring extensive metering built into the surface right where it needs to be—on every channel display and next to each fader, as well as on the monitor module. These LED meters allow users to live mix rather than merely confidence monitor, giving users active control over their environments for the best possible outcome.



### Axia Quasar™ SR AoIP Mixing Console

Powered by simplicity, Quasar SR delivers all the power, ergonomics, industrial design, and star appeal of our flagship Quasar XR console. Quasar SR is not reserved for the most knowledgeable broadcaster but is approachable to any board operator thanks to its streamlined surface design. If the LED meters next to each fader on the Quasar XR console are a bit too much functionality for your surface, then Quasar SR might be the solution for you.



### Axia Quasar Soft Remote Mixing Solution

Unlock your XR or SR's remote capabilities with the optional Quasar Soft Software Upgrade. This customizable remote control solution lets you control your Quasar surface from a browser. You can generate up to eight HTML-5 pages and configure them to display any of the 64 input channels, plus a small monitor section, or even the entire master section of the console. Included as part of the Quasar Soft license, Quasar Cast is a remote monitoring solution that lets you listen to any Livewire stream in the network through the same web browser.



### Mic / Headphone Control Module

The Mic/Headphone Control Module provides remote control of mic on/off functions where dedicated Mute and Talkback buttons give talent full control of their position. A Volume/Source selection knob allows users to select their headphone monitor source and the display readout confirms their choice.



### Axia Console GPIO Accessory Module

The Quasar GPIO Accessory Module is an in-studio accessory for remote control of mic on/off functions including Mute and Talkback buttons. The GPIO Module can be mounted in tabletops or turrets. Requires one free Axia® GPIO port per module and works with legacy Axia Fusion® consoles, the iQ family of consoles, and Quasar XR and SR consoles.



### Quasar Engine

The Quasar Engine provides bulletproof mixing console signal processing for Quasar surfaces and is a must-have for the operation of your XR or SR surface. Allowing you to pay only for the number of channels you need, the Quasar Engine is modular, starting at 16 channels and scaling up in blocks of 16 channels.



### Mic In / Headphone Out Module

The Quasar Mic in/HP out Module is an optional 1ch-wide module that can be placed anywhere on the surface to add a convenient Talkback Input and headphone Output to your Quasar.



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# Tieline Gateway for Streaming Media Conversion

Tieline believes in IP interoperability within the broadcast plant, to expand options and simplify workflows when integrating software and hardware from vendors supporting different protocols.

## Customized Solutions

Gateway and Gateway 4 codecs are often 'edge' devices in IP networks, acting as a media converter and bridging between the AoIP broadcast plant, other studios (inter-studio links), production facilities and live events. Interoperability delivers greater flexibility when integrating IP audio streams into the broadcast plant from a range of sources. Gateway and Gateway 4 codecs embrace both proprietary and open standards and protocols across LANs, WANs and the public internet, with simple monitoring and control.

## More Standards, More Powerful Solutions

When planning your next AoIP project, remember Tieline delivers native support for AES67, ST2110-30, ST 2022-7, Livewire+,

RAVENNA, NMOS IS-04 and IS-05, Ember+. WheatNet-IP is an option at purchase and a Dante option will be available soon. Gateway codecs support up to 16 mono or 8 stereo channels with AES3 and analog supported. You can multi-unicast, multicast, stream up to 8 channels of phase-aligned audio for surround sound solutions (8.0, 7.1, 6.0, 5.1 and 4.0), plus HTTP streaming is included as well. Tieline also future-proofs your investment with simple and free software updates to deliver new technology as it develops.

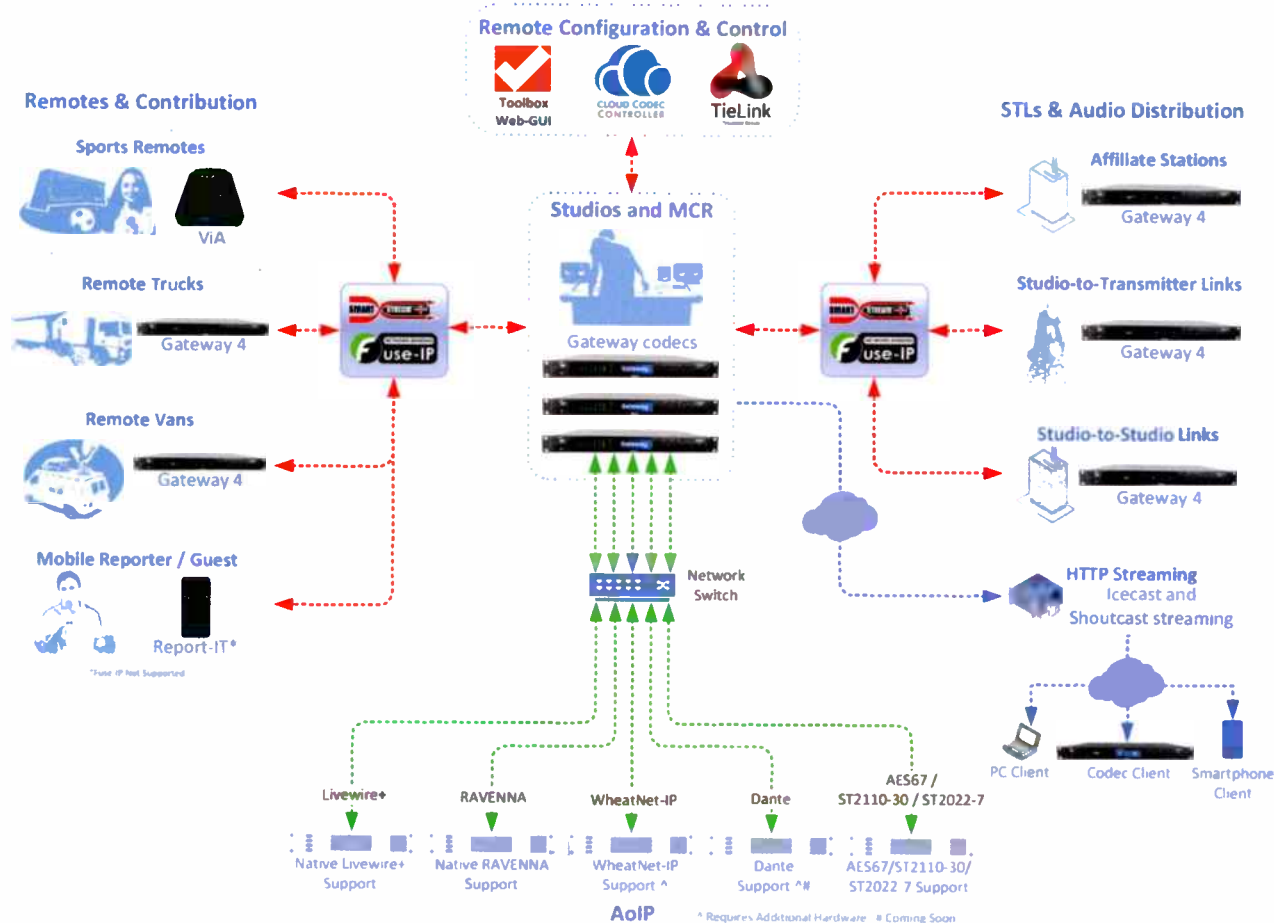
With innovative and wide-ranging standards-based technology, it's no surprise Tieline is at the heart of major global broadcast networks. Contact Tieline today and take your network to the next level.

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1 = Coming Soon | 2 Requires an additional internal card

World Radio History

# DRM – Smart Radio for All, Anytime and Anywhere

## What Is It?

Digital Radio Mondiale is the global, open, green replacement for analog transmissions in all frequency bands (from AM to VHF).

The international not-for-profit DRM Consortium ([www.drm.org](http://www.drm.org)) promotes the flexible DRM standard:

## DRM for large-area coverage

DRM in all the AM bands below 30 MHz, so broadcasters can provide FM-quality services over large areas (national and international transmissions)



## DRM for local/regional services

DRM also in the FM/VHF bands I, II and III. DRM provides flexible localized capacity for up to 3 stereo programs plus multimedia within half the bandwidth required by analog FM



More on DRM: [pocket.drm.org](http://pocket.drm.org)

## Why Use DRM?

DRM offers an attractive package of benefits in both AM and FM/VHF bands

## For listeners

Advanced services, revolutionizing the radio experience:

- DRM offers *better-than-FM audio quality* with optional 5.1 MPEG Surround
- DRM has sound data applications such as DRM Text Messages, Journaline advanced text, image slideshow, TPEG traffic data, in all languages and scripts worldwide
- DRM is the first global digital radio standard using state-of-the-art MPEG audio codec xHE-AAC
- DRM provides emergency alert signaling for immediate mass-notification in case of impending disasters (DRM Emergency Warning Functionality - EWF)



- DRM can offer distance education and "internet without the internet"

## For broadcasters

Transmission network efficiency and cost savings:

- DRM transmissions in the VHF/FM band can carry up to 3 radio programs along with multimedia components on a single frequency of 100 kHz bandwidth only (half of an existing analogue FM frequency bandwidth)
- Diversified content increases listener base and revenue potential
- Sharing transmitter infrastructure between independent broadcasters is the latest enhancement of the DRM standard in the FM band. Broadcasting of as many as six individual DRM signals from a single transmitter and antenna means as many as 18 programs in pure DRM mode can be available with up to 90% energy cost reduction
- DRM gives full control to broadcasters over their own broadcast infrastructure (studios, transmitters, antennas). DRM can generally utilize and upgrade the existing infrastructure



## And The Receivers?

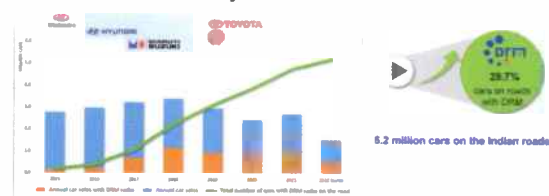
These are already available from various sources internationally ([products.drm.org](http://products.drm.org)), either as finished products, or OEM parts,

as Apps on Android phones (with dongles) and more are being developed all the time.



These receivers need your broadcasts, your interest and involvement.

The automotive industry has taken DRM on board



## Where Can We Meet?

Here are some of the events, where you can meet us:

- **BES India**, February 16-18, New Delhi, India
- **ABU DBS**, March 6-9, Kuala Lumpur, Malaysia
- **NAB**, April 15-19, Las Vegas, USA
- **BroadcastAsia**, June 7-9, Singapore
- **IBC**, September, Amsterdam, Netherlands

For more information, for updates and further events go to: [newsletter.drm.org](http://newsletter.drm.org). To talk to us, to join the Consortium or get information contact us at: [projectoffice@drm.org](mailto:projectoffice@drm.org)





# **RAPID**

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PUBLISH RICH VISUAL CONTENT FOR YOUR RADIO STATION ACROSS DIGITAL, FM, ONLINE, MOBILE AND CONNECTED CARS

- Used by hundreds of radio station across the world.
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# Supplier Cross Index

This section helps you locate suppliers of types of equipment and services. Find contact information for these companies in the Vendor & Product Directory section starting on page 24. This list is based on information provided by the companies, who are listed only if they checked a given category.

## **ACOUSTIC & BUILDING MATERIALS**

Acoustics First Corp.  
Auralex Acoustics Inc.

## **ANTENNAS (FM/AM), FEEDLINE & WAVEGUIDE**

Alan Dick Broadcast Ltd.  
Aldena Telecomunicazioni Srl  
Bext Corp.  
Burk Technology  
DB Elettronica Telecomunicazioni  
Dielectric  
Electronics Research Inc. (ERI)  
Hatfield & Dawson  
Consulting Engineers  
Information Station Specialists  
Jampro Antennas Inc.  
Kathrein Broadcast GmbH  
Kintronic LLC Inc.  
meduci LLC  
Micronetixx  
Myat Inc.  
OMB America  
ONAIR Medya Communication Ltd.  
Progressive Concepts  
Propagation Systems Inc. (PSI)  
R.V.R Elettronica Srl  
SCMS Inc.  
Shively Labs  
Telsat Srl  
Transcom Corp.  
Tunwall Radio LLC

## **APPS & APP DEVELOPMENT**

22HBG  
Aair  
Auddia  
Cirrus Streaming  
Micronetixx  
RadioFX Inc.  
RadioLand App

## **ASSOCIATIONS, ORGANIZATIONS & ADVOCACY**

Audio Engineering Society  
IEEE Broadcast Technology Society  
National Association of Broadcasters  
National Federation of Community Broadcasters  
NATE: The Communications Infrastructure Contractors Association  
Society of Broadcast Engineers

## **AUDIO ACCESSORIES & PROBLEM-SOLVERS**

AngryAudio LLC  
Broadcast Tools Inc.  
CEntrance  
CircuitWerkes  
DHD audio GmbH

Energy Transformation Systems (ETS)  
GlenSound  
Henry Engineering  
Inovonics Inc.  
JK Audio  
Paravel Systems LLC  
RAM Systems  
Sonifex  
StudioHub  
Titus Technological Laboratories  
Yellowtec

## **AUDIO DELAYS - PROFANITY & DIVERSITY**

Eventide Inc.  
ONAIR Medya Communication Ltd.  
Telos Alliance

## **AUDIO DISTRIBUTION, BETWEEN LOCATIONS**

*(See also Codex; Satellite & Internet Distribution)*

AETA Audio Systems  
Auddia  
Audinate  
Barix  
Comrex  
DaySequerra Corp.  
DB Elettronica Telecomunicazioni  
DEVA Broadcast LLC  
Digigram  
DoubleRadius Inc.  
Elenos Group  
GatesAir  
International Datacasting/  
Novra Group  
Mobile Viewpoint  
Moseley Associates  
NPR Distribution Services (NPRDS)  
Tieline

## **AUDIO DISTRIBUTION & ROUTING WITHIN A FACILITY**

AngryAudio LLC  
Arrakis Systems  
Audinate  
AudioScience Inc.  
Broadcast Devices Inc.  
Broadcast Tools Inc.  
Calrec Audio  
DaySequerra Corp.  
DHD audio GmbH  
Digigram  
Energy Transformation Systems (ETS)  
ESE  
GlenSound  
Henry Engineering  
Lawo Inc.  
Logitek  
StudioHub  
Telos Alliance

Tieline  
Wheatstone Corp.

## **AUDIO INTERFACES**

Energy Transformation Systems (ETS)  
GlenSound  
Lynx Studio Technology Inc.  
Pro Audio Interface  
Sonifex

## **AUDIO LOGGERS**

Broadcast Software International  
Burli Software Inc.  
Eventide Inc.  
Mediaproxy  
NETIA  
ONAIR Medya Communication Ltd.  
OPNS  
Summit Technology Group  
Tracy Johnson Media Group  
Win-OMT Software Inc.

## **AUDIO PROCESSING (ON-AIR & STREAMING)**

AngryAudio LLC  
Aqua Broadcast Ltd.  
Auddia  
Audinate  
AudioScience Inc.  
Axel Technology  
Broadcast Electronics Inc.  
Broadcast Radio Ltd.  
Broadcast Software International  
Broadcast Supply Worldwide  
Calrec Audio  
CEntrance  
CGI Deutschland B.V. & Co. KG  
DEVA Broadcast LLC  
High Sound  
Inovonics Inc.  
JT Communications LLC  
On-Hertz  
Orban  
Orban Legacy Parts & Service  
StreamS/Modulation Index LLC  
Syndicate of Sounds  
Telos Alliance  
Thimeo Audio Technology B.V.  
Wheatstone Corp.  
Win-OMT Software Inc.

## **AUDIO PROCESSING, PRODUCTION**

Aqua Broadcast Ltd.  
Audinate  
Broadcast Software International  
Calrec Audio  
CEntrance  
CGI Deutschland B.V. & Co. KG  
Innovationszentrum für Telekommunikationstechnik GmbH IZT

NETIA  
On-Hertz  
Orban  
PreSonus Audio Electronics Inc.  
SoundStack  
StreamS/Modulation Index LLC  
Syndicate of Sounds  
Thimeo Audio Technology B.V.  
Win-OMT Software Inc.

## **AUTOMATION, PLAYOUT, MEDIA ASSET MGT.**

AEQ  
Arrakis Systems  
AudioScience Inc.  
Axel Technology  
Broadcast Electronics Inc.  
Broadcast Pix  
Broadcast Radio Ltd.  
Broadcast Software International  
Burli Software Inc.  
CGI Deutschland B.V. & Co. KG  
dcsTools.com  
DJB Radio Automation Software  
Elenos Group  
ENCO Systems Inc.  
Jutel Radioman  
NETIA  
NextKast  
OmniPlayer  
OPNS  
Paravel Systems LLC  
Progressive Concepts  
RCS  
Smarts Broadcast  
StreamS/Modulation Index LLC  
Vizrt  
WideOrbit  
winMedia  
Win-OMT Software Inc.

## **BUSINESS/ FRONT-OFFICE SERVICES**

Futuri Media  
Granite Telecommunications LLC  
Marketron  
TruNorth Consulting  
Xytech Systems

## **CAPTIONING & TRANSCRIPTION**

ENCO Systems Inc.  
Take 1

## **CLOCKS & TIMERS**

Axel Technology  
ESE  
Novus Power Products LLC  
RAM Systems

## **CLOUD SERVICES FOR RADIO**

2wcom Systems GmbH  
Barix  
Broadcast Pix



# BSI RADIO AUTOMATION TODAY, ALL DAY, EVERY DAY



**BSIUSA.COM**

**SALES@BSIUSA.COM**

**888-274-8721**



**Broadcast Software  
INTERNATIONAL**

Broadcast Radio Ltd.  
 Cirrus Streaming  
 Digigram  
 International Datacasting/  
 Novra Group  
 Jutel Radioman  
 Kline Consulting Group LLC  
 Nautel  
 On-Hertz  
 OPNS  
 SoundStack  
 StreamGuys  
 Summit Technology Group

## CODECS, HARDWARE/SOFTWARE

2wcom Systems GmbH  
 AEQ  
 AETA Audio Systems  
 Audio Codecs Ltd.  
 AVT Audio Video  
 Technologies GmbH  
 Barix  
 Bay Country Broadcast  
 Equipment Inc.  
 Broadcasters General Store  
 Broadcast Bionics  
 Broadcast Supply Worldwide  
 Comrex  
 DEVA Broadcast LLC  
 Digigram  
 Ferncast  
 GatesAir  
 In:Quality  
 NewTek  
 On-Hertz  
 SCMS Inc.  
 SIPitPRO Ltd.  
 Sonifex  
 Streams/Modulation Index LLC  
 Synthax US  
 Telos Alliance  
 Thimeo Audio Technology B.V.  
 Tieline  
 WorldCast Systems

## CONNECTIVITY

Audio Codecs Ltd.  
 DaySequerra Corp.  
 Granite Telecommunications LLC  
 In:Quality  
 MaxxConnect Group  
 NewTek  
 Wired Broadcast

## CONSOLES, MIXERS, CONTROL SURFACES

AEQ  
 AngryAudio LLC  
 Arrakis Systems  
 Axel Technology  
 Bay Country Broadcast  
 Equipment Inc.  
 Broadcasters General Store  
 Broadcast Radio Ltd.  
 Broadcast Supply Worldwide  
 Broadcast Tools Inc.

Calrec Audio  
 DHD audio GmbH  
 JK Audio  
 Lawo Inc.  
 Logitek  
 NewTek  
 On-Hertz  
 Progressive Concepts  
 Radio Systems Inc.  
 RAM Systems  
 SCMS Inc.  
 Sierra Automated Systems  
 Sonifex  
 Telestream  
 Telos Alliance  
 Vizrt  
 Wheatstone Corp.  
 Yellowtec

## CONSULTANTS (TECHNICAL), CONTRACT ENGINEERS, INSPECTIONS

Au Contraire Software Ltd.  
 Cavell, Mertz & Associates Inc.  
 Central Coast Electronics  
 DNAV  
 Hatfield & Dawson  
 Consulting Engineers  
 Inrush Broadcast Services  
 JMS & Associates Inc.  
 Kintronic Labs Inc.  
 Kline Consulting Group LLC  
 Lightner Electronics Inc.  
 Micronetixx  
 NATE: The Communications  
 Infrastructure Contractors  
 Association  
 National Federation of  
 Community Broadcasters  
 Nova Electronics  
 QCommunications LLC  
 Summit Technology Group  
 Technical Services Group  
 V-Soft Communications - Doug  
 Vernier Telecommunications  
 Consultants

## CONTENT SYNDICATION & FORMATS

RadioMusic.com

## DEALERS & DISTRIBUTORS

305 Broadcast Inc.  
 Broadcast Supply Worldwide  
 Broadcasters General Store  
 DNAV  
 Lightner Electronics Inc.  
 MaxxConnect Group  
 Orban Legacy Parts & Service  
 ProAudio.com  
 SCMS Inc.  
 Synthax US  
 Telsat Srl  
 Transcom Corp.  
 Wired Broadcast

## DIGITAL AUDIO EDITING & PRODUCTION

Burli Software Inc.  
 CGI Deutschland B.V. & Co. KG  
 DHD audio GmbH  
 Eventide Inc.  
 Lynx Studio Technology Inc.  
 NETIA  
 PreSonus Audio Electronics Inc.  
 SoundStack  
 Wheatstone Corp.

## DRONE-BASED SERVICES

Cavell, Mertz & Associates Inc.  
 Dielectric  
 Kline Consulting Group LLC  
 NATE: The Communications  
 Infrastructure Contractors  
 Association  
 QCommunications LLC

## ELECTRONIC & ELECTRIC COMPONENTS

DAC System  
 Energy Transformation  
 Systems (ETS)  
 Global Security Systems/Alert FM  
 Kintronic Labs Inc.  
 meduci LLC

## EMERGENCY ALERTING, EAS & CAP

AudioScience Inc.  
 Digital Alert Systems  
 Global Security Systems/Alert FM  
 Gorman-Redlich Mfg. Co.  
 Paravel Systems LLC  
 Sage Alerting Systems Inc.

## ENGINEERING & ALLOCATION SERVICES/SOFTWARE

Cavell, Mertz & Associates Inc.  
 Global Security Systems/Alert FM  
 MaxxConnect Group  
 RadioLand App  
 SoundStack  
 Technical Services Group  
 V-Soft Communications -  
 Doug Vernier Telecommunications  
 Consultants

## EQUIPMENT RENTAL & LEASING

Information Station Specialists  
 Technical Services Group  
 Wired Broadcast

## FACILITY DESIGN & ARCHITECTURE

Auralex Acoustics Inc.  
 DNAV  
 Global Security Systems/Alert FM  
 Inrush Broadcast Services  
 JMS & Associates Inc.  
 Kline Consulting Group LLC  
 Nova Electronics  
 Paravel Systems LLC

Second Opinion  
 Communications Inc.  
 Technical Services Group

## FURNITURE FOR RADIO; RACKS

Graham Studios  
 Omnirax Furniture Co.  
 RAM Systems  
 Studio Technology

## GROUND SYSTEMS

Nova Electronics

## MICROPHONES & MIC ACCESSORIES

5BWindowscreens.com  
 Audio Codecs Ltd.  
 Audio-Technica  
 CEntrance  
 Electro-Voice  
 Henry Engineering  
 Moveo  
 MXL Microphones  
 PreSonus Audio Electronics Inc.  
 RAM Systems  
 Yellowtec

## MUSIC PRODUCTION LIBRARIES

Bentztown  
 RadioMusic.com

## NEWS & NEWSROOM PRODUCTS/SERVICES

Auralex Acoustics Inc.  
 Broadcast Radio Ltd.  
 Burli Software Inc.  
 JK Audio  
 NETIA  
 RCS  
 Telestream  
 Vizrt  
 winMedia

## PODCASTING PRODUCTS & SUPPORT

2wcom Systems GmbH  
 Arrakis Systems  
 Auralex Acoustics Inc.  
 Broadcast Bionics  
 Burli Software Inc.  
 CEntrance  
 Cirrus Streaming  
 Comrex  
 DHD audio GmbH  
 DJB Radio Automation Software  
 JK Audio  
 Omnirax Furniture Co.  
 Progressive Concepts  
 SoundStack  
 StreamGuys  
 Streams/Modulation Index LLC  
 Tieline





# orban

LEGACY PARTS & SERVICE

**501-650-8453**

OrbanLegacy.com

## POWER PRODUCTS, GENSETS, UPS, SURGE

Henry Engineering  
Sine Control Technology Inc.

## PROGRAMMING, RESEARCH & RATINGS

Grace Broadcast Sales  
RadioMusic.com  
RCS  
Talk Shows USA  
Tracy Johnson Media Group

## PUBLICATIONS

Radio World  
Teak Publishing

## REBUILT TRANSMITTER TUBES

CPI

## RECEIVERS

DaySequerra Corp.  
DEVA Broadcast LLC  
Gorman-Redlich Mfg. Co.  
Innovationszentrum für  
Telekommunikationstechnik  
GmbH IZT  
Inovonics Inc.  
International Datacasting/  
Novra Group  
meduci LLC

## REMOTE FACILITY CONTROL & MONITORS

22HBG  
Bay Country Broadcast  
Equipment Inc.  
Belar Electronics  
Broadcast Devices Inc.  
Broadcast Tools Inc.  
Burk Technology  
Calrec Audio  
CircuitWerkes  
DAC System  
Davicom  
Elenos Group  
Novus Power Products LLC  
Sine Systems  
Transcom Corp.  
WorldCast Systems

## RF ACCESSORIES, CONNECTORS, TUBES

Aldena Telecomunicazioni Srl  
Altronic Research Inc.  
Ampegon Power Electronics AG  
Austin Insulators Inc.  
Coaxial Dynamics  
CPI  
Delta Meccanica Srl  
Electronics Research Inc. (ERI)  
Kathrein Broadcast GmbH  
Kintronic Labs Inc.  
Myat Inc.  
Propagation Systems Inc. (PSI)  
R.V.R. Elettronica Srl

Shively Labs  
Tunwall Radio LLC

## RF FILTERS, COMBINERS, CUSTOM COMPONENTS

Alan Dick Broadcast Ltd.  
Altronic Research Inc.  
Ampegon Power Electronics AG  
Bext Corp.  
Broadcast Electronics Inc.  
Coaxial Dynamics  
Delta Meccanica Srl  
Dielectric  
Electronics Research Inc. (ERI)  
High Sound  
Jampro Antennas Inc.  
Kathrein Broadcast GmbH  
Kintronic Labs Inc.  
LBA Technology Inc.  
Micronetixx  
Myat Inc.  
ONAIR Medya Communication Ltd.  
Propagation Systems Inc. (PSI)  
RFE Broadcast  
R.V.R. Elettronica Srl  
Shively Labs  
Surcom Associates Inc.  
Telsat Srl  
Tunwall Radio LLC

## RF MONITORING

2wcom Systems GmbH  
Aldena Telecomunicazioni Srl  
Broadcast Devices Inc.  
Burk Technology  
DAC System  
Davicom  
DEVA Broadcast LLC  
Dielectric  
Electronics Research Inc. (ERI)  
Hatfield & Dawson  
Consulting Engineers  
Innovationszentrum für  
Telekommunikationstechnik  
GmbH IZT  
Inovonics Inc.  
meduci LLC  
Micronetixx  
Shulins' Solutions LLC  
Sourcerer LLC  
V-Soft Communications – Doug  
Vernier Telecommunications  
Consultants  
WorldCast Systems

## SALES DEPARTMENT SOLUTIONS

Adthos  
Aiir  
AllMediaDesk  
Futuri Media  
Grace Broadcast Sales  
Marketron  
StreamGuys  
Wedel Software  
Xytech Systems

## SATELLITE & INTERNET DISTRIBUTION

Dawnco  
International Datacasting/  
Novra Group  
NPR Distribution Services (NPRDS)

## SCHEDULING/TRAFFIC & BILLING

Broadcast Radio Ltd.  
Marketron  
MusicMaster  
OPNS  
Radio Workflow  
RCS  
Smarts Broadcast  
Wedel Software  
WideOrbit  
winMedia  
Xytech Systems

## SOCIAL MEDIA TOOLS

22HBG  
Aiir  
AllMediaDesk  
Cirrus Streaming  
Mediaproxy  
NeoGroupe  
Sprite Media, Inc  
Telestream  
Vizrt

## SOFTWARE FOR ENGINEERING & MAPPING

Aldena Telecomunicazioni Srl  
Au Contraire Software, Ltd.  
DAC System  
GeoBroadcast Solutions LLC  
RadioLand App  
V-Soft Communications – Doug  
Vernier Telecommunications  
Consultants

## SPEAKERS & HEADPHONES

Genelec  
PreSonus Audio Electronics Inc.

## STL & RPU/ MICROWAVE

*(See also Audio Distribution,  
Between Locations)*  
Barix  
Bay Country Broadcast  
Equipment Inc.  
Bext Corp.  
Broadcast Electronics Inc.  
Elenos Group  
GatesAir  
OMB America  
RFE Broadcast  
SCMS Inc.  
Tieline  
Transcom Corp.  
  
**STREAMING**  
22HBG  
2wcom Systems GmbH  
Auddia

Broadcast Radio Ltd.  
Cirrus Streaming  
DEVA Broadcast LLC  
Information Station Specialists  
Inovonics Inc.  
International Datacasting/  
Novra Group  
Lawo Inc.  
Mobile Viewpoint  
Movo  
NewTek  
Orban  
Quortex  
RCS  
StreamGuys  
Summit Technology Group  
Telestream  
Tieline  
Wheatstone Corp.  
Wired Broadcast

## STUDIO SUPPORT, SIGNALING, AIR LIGHTS

AngryAudio LLC  
Henry Engineering  
Paravel Systems LLC  
Sprite Media Inc  
StudioHub  
Titus Technological Laboratories  
Yellowtec

## STUDIO/TRANSMITTER LINKS

*(See Audio Distribution,  
Between Locations)*

## SUBCARRIER, RDS, DATACASTING

Broadcast Devices Inc.  
Inovonics Inc.  
Orban  
Xperi

## SYSTEMS INTEGRATION & FACILITIES

Burk Technology  
DB Elettronica Telecomunicazioni  
DNAV  
Inrush Broadcast Services  
Lightner Electronics Inc.  
MaxxKonnnect Group  
Second Opinion  
Communications Inc.  
Technical Services Group

## TELCO INTERFACES & BROADCAST PHONE SYSTEMS

AEQ  
AVT Audio Video  
Technologies GmbH  
Broadcast Bionics  
Broadcast Tools Inc.  
CircuitWerkes  
Comrex  
In:Quality  
JK Audio  
NeoGroupe



# Supplier Cross Index

Sierra Automated Systems  
Telos Alliance

## TEST & MEASUREMENT, ANTENNA MONITORS, ANALYZERS

Aldena Telecomunicazioni Srl  
Coaxial Dynamics  
DAC System  
Davicom  
ESE  
Innovationszentrum für  
Telekommunikationstechnik  
GmbH IZT  
LBA Technology Inc.  
Mediaproxy  
Myat Inc.  
Novus Power Products LLC  
NTI Americas Inc.  
Rohde & Schwarz GmbH & Co. KG  
Sourcerer LLC  
Tunwall Radio LLC  
WorldCast Systems

## THERMAL SERVICES & INSPECTIONS

Cavell, Mertz & Associates Inc.  
Shulins' Solutions

## TOWERS & TOWER SERVICES/HARDWARE

Alan Dick Broadcast Ltd.  
Austin Insulators Inc.  
Electronics Research Inc. (ERI)  
FM Services  
FullWave Towers and Broadcast  
Ice Krackers Inc.  
Kathrein Broadcast GmbH  
LumenServe Inc.  
Nova Electronics  
Novus Power Products LLC  
Phillystran  
Telsat Srl

## TRANSMITTERS, TRANSLATORS & EXCITERS

305 Broadcast  
ABE Elettronica  
Ampegon Power Electronics AG  
Aqua Broadcast Ltd.  
Armstrong Transmitter Corp.  
Bext Corp.  
Broadcast Electronics Inc.  
Broadcasters General Store  
Burk Technology  
CircuitWerkes  
DB Elettronica Telecomunicazioni  
Digigram  
Elenos Group  
GatesAir  
GeoBroadcast Solutions LLC  
Information Station Specialists  
Innovationszentrum für  
Telekommunikationstechnik  
GmbH IZT  
Nautel

Nova Electronics  
Novus Power Products LLC  
OMB America  
ONAIR Medya Communication Ltd.  
Progressive Concepts  
RFE Broadcast  
Rohde & Schwarz GmbH & Co. KG  
R.V.R Elettronica Srl  
SCMS Inc.  
Telsat Srl  
Transcom Corp.  
Tunwall Radio LLC  
WorldCast Systems

## USED EQUIPMENT

Bay Country Broadcast  
Equipment Inc.

Information Station Specialists  
Transcom Corp.

## VIDEO FOR RADIO

AEQ  
Audinate  
Axel Technology  
Broadcast Bionics  
Broadcast Pix  
Broadcast Supply Worldwide  
Broadcasters General Store  
CGI Deutschland B.V. & Co. KG  
Comrex  
ENCO Systems Inc.  
InSoft LLC  
Kline Consulting Group LLC  
Movo

MultiCAM Systems  
NewTek  
Sprite Media Inc.  
Telestream  
Vizrt  
winMedia

## WEATHER PRODUCTS, SOFTWARE, ALERTING

Gorman-Redlich Mfg. Co.  
Summit Technology Group

## WIRE, CABLES, CONNECTORS & CABLE MANAGEMENT

Neutrik Americas  
StudioHub  
Telsat Srl

**winCam**  
FULLY AUTOMATED VISUAL RADIO

YouTube f LIVE

World Radio History

This section is an alphabetical listing of industry suppliers. To find companies by product category, see the Supplier Cross Index starting on page 18. (Suppliers, did we miss you? Email radioworld@futurenet.com so we can send you the request next year.)

## 22HBG

✉ [info@22hbg.com](mailto:info@22hbg.com)  
[www.22hbg.com](http://www.22hbg.com)

## 25-Seven Systems

See Telos Alliance

## 2wcom Systems GmbH

+49-461-662830-0  
✉ [sales@2wcom.com](mailto:sales@2wcom.com)  
[www.2wcom.com](http://www.2wcom.com)

## 305 Broadcast Inc.

+1-305-200-3322  
✉ [sales@305broadcast.com](mailto:sales@305broadcast.com)  
[www.305broadcast.com](http://www.305broadcast.com)

## 5BWindscreens.com

+1-800-959-3343  
✉ [eric@5bwindscreens.com](mailto:eric@5bwindscreens.com)  
[www.5bwindscreens.com](http://www.5bwindscreens.com)

## ABE Elettronica

+1-305-431-1520  
✉ [alfonso.lopez@abe.it](mailto:alfonso.lopez@abe.it)  
[www.abe.it](http://www.abe.it)

## Acoustics First Corp.

+1-888-765-2900  
+1-804-342-2900  
✉ [info@acousticsfirst.com](mailto:info@acousticsfirst.com)  
[www.acousticsfirst.com](http://www.acousticsfirst.com)

## Adthos

+1-212-203-0396  
✉ [welcome@adthos.com](mailto:welcome@adthos.com)  
[www.adthos.com](http://www.adthos.com)

## AEQ

+34-91-686-13-00  
✉ [aeqsales@aeq.es](mailto:aeqsales@aeq.es)  
[www.aeq.eu](http://www.aeq.eu)

## AETA Audio Systems

+33-1-41-36-12-00  
✉ [info@aeta-audio.com](mailto:info@aeta-audio.com)  
[www.aeta-audio.com](http://www.aeta-audio.com)

## Aiir

+1-212-500-1144  
✉ [hello@aiir.com](mailto:hello@aiir.com)  
<http://aiir.com>

## AIM Rapid

See Xperi

## Alan Dick Broadcast Ltd., a Jampro Co.

+44-1242-820-976  
✉ [sales@alandickbroadcast.com](mailto:sales@alandickbroadcast.com)  
[www.alandickbroadcast.com](http://www.alandickbroadcast.com)

## Aldena Telecomunicazioni Srl

+39-02-90390461  
✉ [aldena@aldena.it](mailto:aldena@aldena.it)  
[www.aldena.it](http://www.aldena.it)

## AlertFM

See Global Security Systems

## AllMediaDesk

+1-512-271-2556  
✉ [hello@allmediadesk.com](mailto:hello@allmediadesk.com)  
[www.allmediadesk.com](http://www.allmediadesk.com)

## Altronic Research Inc.

+1-870-449-4093  
✉ [dstarkey@altronic.com](mailto:dstarkey@altronic.com)  
[www.altronic.com](http://www.altronic.com)

## Ampegon Power Electronics AG

+41-58-710-44-00  
✉ [info@ampegon.com](mailto:info@ampegon.com)  
[www.ampegon.com](http://www.ampegon.com)



## AngryAudio LLC

128 Holiday Ct., Ste. 118  
Franklin, TN 37067 USA  
+1-615-763-3033  
✉ [answers@angryaudio.com](mailto:answers@angryaudio.com)  
[www.angryaudio.com](http://www.angryaudio.com)  
Products/Services: Angry Audio makes the gadgets and gizmos that solve difficult studio problems for professional broadcasters and podcasters, including the popular Bluetooth Gadget, Failsafe Gadgets, studio signal lights and controllers, and the exciting new Chameleon audio processors for streaming and mic processing. Problems disappear when you get Angry.

## APT

See WorldCast Systems

## Aqua Broadcast Ltd.

+44-203-411-0387  
✉ [info@aquabroadcast.co.uk](mailto:info@aquabroadcast.co.uk)  
[www.aquabroadcast.co.uk](http://www.aquabroadcast.co.uk)

## Armstrong Transmitter Corp.

+1-315-673-1269  
✉ [kevin@armstrongtx.com](mailto:kevin@armstrongtx.com)  
[www.armstrongtx.com](http://www.armstrongtx.com)

## Arrakis Systems

✉ [sales@arrakis-systems.com](mailto:sales@arrakis-systems.com)  
[www.arrakis-systems.com](http://www.arrakis-systems.com)

## Au Contraire Software Ltd.

+1-303-489-3454  
✉ [info@aucont.com](mailto:info@aucont.com)  
[www.aucont.com](http://www.aucont.com)

## Auddia

+1-303-995-3036  
✉ [jeff@thramann.com](mailto:jeff@thramann.com)  
<https://auddia.com>



# Vendor & Product Directory

## Audemat

See WorldCast Systems

## Audinate

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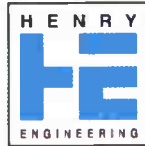
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Writer



Herb Ayer  
Assistant  
Chief Engineer,  
WABI(TV)

# Bangor broadcaster relies on Burk

Gray Television station has two ARC Plus Touch systems

**W**e are WABI(TV) in Bangor, Maine, part of Gray Television Group. We run three television transmitters, one full-power and two low-power, all with the same programming.

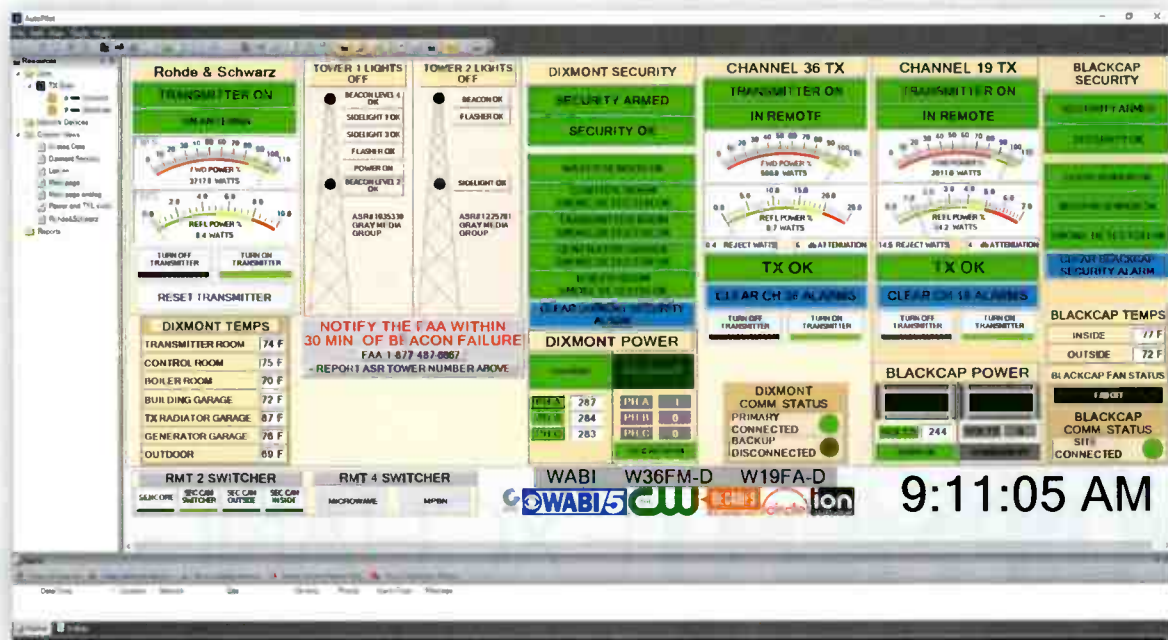
generators), and for security.

I have found the programmability of the system to be flexible, allowing the raw data from the sensors to be used in many ways.

The use of virtual channels and macros gives me the ability to look at multiple sensors to automate complex decisions. The ability to use

forward power and tower light status, but I can go in and ask the system to print data for any inputs/commands/alarms on any day since the system has been online. This is helpful when we have an intermittent problem and want to see if there is a pattern, or if someone changed a value.

AutoPilot is user-friendly and



We have two Burk ARC Plus Touch systems. One includes three Plus-X 600s, one Plus-X EM64 and one Plus-X AC-8. The other has a Plus-X 600, a Plus-X EM32 and a Plus-X AC-8.

We also use phone modems in four-wire mode on our STL/TSL analog audio subcarrier trays as a backup for communication if our network link goes down.

We use them to monitor our transmitters located at two different sites. We also use the systems to monitor ambient temperatures and electrical power (including

SNMP as part of the return data and control is very good. The integration of multiple sites within the same program is useful as well.

Another nice feature is the email/text of any alarm, whether critical or warning level, triggerable for every channel, virtual channel, or through the use of a macro. The logging of all inputs/commands/alarms within the system, even when the local monitoring computer is offline and not running AutoPilot, is a good data protection benefit.

I automatically print daily logs for

straightforward to program. I can design multiple pages that cleanly and clearly display the information I want to convey to our master control operators. The ability to have it on multiple computers without having to buy additional licenses is a big plus. If I have a problem on one computer, I can just fire it up on another computer in order to maintain monitoring of our sites.

As far as customer service, it is very good. They are either immediately available over the phone or will get back to me promptly. 🍌

Right  
WABI's  
customized  
main page.



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# DCL helps Leavens serve jazz fans

ENCO DAD is deployed at WZUM and at PubMusic

**P**ubcasting industry veteran Chuck Leavens uses multiple ENCO DAD systems to run jazz-formatted WZUM in Pittsburgh and, separately, the nation's largest nationally syndicated 24x7 jazz "white label" music service.

DAD's database architecture along with its DAD Command Language, or DCL, has allowed him to write scripts to automate various aspects of his nationally distributed continuous radio service, building a virtual footprint of contributing hosts from around the country.

The host shares their content files via the internet, which are then curated by Leavens in Pittsburgh and automated out of the NOC at NPR headquarters in Washington. ENCO says coast-to-coast "virtual operations" were part of this user's plan well before the pandemic began.

Leavens says he is impressed by the automation system's reliability; outside of a failed hard drive, he said, only the

local power company has had an adverse impact on his programming.

According to ENCO, "What's amazing about PubMusic's programming is how they enable local stations to brand the music as their own. At precise times, PubMusic inserts proper DAD-generated logic commands to alert location stations downstream when to automatically insert their own promos, underwriting, lead-ins and so forth, all backed by internationally recognized content curated by PubMusic."

Local WZUM in Pittsburgh also is a customer, with its own local-interest stories, program and host voiceovers.

"Another key piece of ENCO's DCL is how it enables Chuck to program DAD to shift time across four time zones by stacking playlists, such that each local station gets the right content, every time," the company says,

Then he built a custom checking routing to ensure branches are reset properly to their timeframes, and to make playlists self-correcting. 🎵



**More Info**  
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# A new architecture for FM and HD Radio

“Nautel is fully invested in this disruptive vision”

In 2020 Nautel participated in a demonstration that described a new approach to HD Radio time alignment. We asked Chief Technology Officer Philipp Schmid for an update.

**RW** **First let's summarize what was demo'd.**

**Philipp Schmid:** In response to industry demand, Nautel, in cooperation with Telos Alliance, demonstrated a new FM+HD Radio transport architecture based on established standards that allows a broadcast transmitter to simply connect to an IP address for all its audio and data content for both FM and HD Radio including all subchannels and data services.

This approach greatly simplifies today's HD Radio installations consisting of many fixed-purpose boxes (and ensuing rat's nest of cables) at the transmitter site.

Now we can relocate major broadcast functions like audio processing such as the Omnia Enterprise 9s and audio encoding as in Xperi Gen4 into pure software components that can be centrally managed. Software components can also easily be duplicated for maintenance and redundancy purposes.

We demonstrated how we cloned several instances of the HD Radio air chain in Amazon Web Services and distributed them across data centers across the globe. We demonstrated a Nautel VS transmitter switching between the cloned air chains on simulated air chain failure conditions with minimal interruption to the overall broadcast signal.

The final standby air chain was running on our HD MultiCast+ platform running beside the transmitter, demonstrating continued broadcast under complete STL failure conditions.

**RW** **The implications for how digital radio air chains are constructed include software-based premise server and cloud-based management?**

**Schmid:** Yes, the ultimate centralized location is the cloud, no matter if it's a corporately managed data center or third-party service provider like AWS, Microsoft Azure or others. Smaller broadcasters can also benefit from shared centralization through simplified management and access to a pool of technical experts.

With the right transmitter, upgrading to HD Radio broadcasting will be so simple and cost-effective that any broadcasters can easily convert to HD Radio, even only for a limited time, should they see an opportunity to lease an HD Radio sub-channel or host a data service on their licensed frequency.

**RW** **Can you expand on the implications?**

**Schmid:** The ability to clone a software-based air chain is disruptive.

revert to the last safe restore point.

Fixed-purpose boxes cannot be easily replicated and are no safer. In fact, malicious actors can hide in embedded systems without your knowledge. Our solution is incorporating state-of-the-art encryption and authentication to guarantee an uncompromised encoder to transmitter connection even across the public internet.

**RW** **What new products does Nautel offer that build on these concepts?**

**Schmid:** Nautel is fully invested in this disruptive vision. We are aligning our existing transmitter portfolio to this new architecture and will backport it to already shipped Nautel transmitters ready to convert to HD Radio tomorrow. As we head



A graphic of the software-based airchain demonstration described in the article.

Where fixed-purpose boxes require down time for repair or firmware updates, a broadcaster can apply new software updates and features by cloning a new standby air chain, updating, then testing the final on-air product using a spare transmitter, and then switching over before retiring the old air chain.

Fleet upgrades are a breeze. IT security is greatly improved; should your air chain become compromised, fix the attack vector, ditch the compromised air chain,

towards the NAB Show we'll be adding Telos Alliance Omnia software audio processing options to the HD MultiCast+, our current software-based importer/exporter, which is already unique in the industry by way

of its optional hardware-based audio processing. This is a first step towards the larger vision.

To learn more and stay up to date on Nautel's innovative Air Chain development program go to [www.nautel.com/radio-air-chain](http://www.nautel.com/radio-air-chain).

**More Info**

Contact Nautel at [nautel.com](http://nautel.com) or call 877-662-8835 (U.S.) or +1-902-823-3900



# RCS says customers want more cloud options

Generali: Radio workflows are evolving away from devices

**RW** What do you think is the most important trend or change happening in radio automation?

**Philippe Generali:** The most important overall trend is dematerialization. The same way pictures and music started being made of bits 15 years ago when the first iPhone was released, we see critical functions in radio automations not needing specific hardware anymore.

Sound processing, electronic ratings, console mixing are evolving from devices to pure cloud-based software, the same way our Zetta automation system is evolving into a cloud-based playout with no specific hardware needed on premises. Where and how people work with automation systems for content creation and presentation — the transition to a virtualized environment has really pushed what you can do from afar. The customer demand for these new virtualized environments seems to be scaling up at surprising rates.

There was a time when “remote” broadcasting was primarily only used for the car dealer or local game broadcasts. Now many customers are operating in this “remote model” 24 hours a day, seven days a week.

Zetta was a pioneer in this space over a decade ago and continues to be the leader in remote workflow feature sets.

**RW** RCS was early to market with the message that automation systems could be run from the cloud, for disaster recovery if not more. Can you update us on how the market is responding to that message?

**Generali:** Clients are quickly adapting to cloud options and are clamoring for more. Based on this feedback we are customizing cloud-based automation and workflows for our clients.

What was once only a simple emergency playout and backup solution now boosts bidirectional content contributions such as voice tracking. This allows users to break free of the traditional VPN-oriented remote contribution and allow users to simply use a two-factor sign-in to lay in voice tracks into the cloud. This content loaded directly into the cloud can now be migrated back to




a traditional system for insertion and playout. This multi-point solution allows the ultimate in flexibility and control over where and how you want to remotely work.

**RW** What else should we know about what's going on at RCS or in the automation space?

**Generali:** Software is evolving quickly with workflow architecture changes in the broadcasting space.

It is quick and relatively simple to place a virtual machine on a cloud service, run legacy software and call it a “cloud solution.” While by definition it may be a cloud solution, that approach does not scale well because it relies on an infrastructure that was designed and intended for traditional hardware platforms and really isn’t “cloud-based.”

A true cloud-based design and platform should not revolve around the constraints of an OS environment, rather it should be based on a containerized architecture that can scale up and down dynamically based on need and loading conditions. Users would be best served to understand and compare the foundations of the solutions.

RCS is committed to a fully featured platform in the cloud and will always build upon a base of cloud design and architecture for best-in-class performance. 

Above  
Zetta2GO running  
on an iPad.



Above  
Philippe Generali



## More Info

Contact RCS at  
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# Pattison Media installs Gateway

“Morning shows from anywhere was the hope”

**B**arry Mandziak is responsible for six stations in his role as technical supervisor for Pattison Media's operations on North Vancouver Island in British Columbia, Canada.

“During the pandemic our office buildings and studios in Nanaimo, Courtenay and Port Alberni emptied out, and we had to ramp up our remote broadcast capabilities immediately to support announcers and producers working from home in remote studios,” he said.

“We had only four Tieline Bridge-IT units and were running six shows. We purchased a Tieline Gateway eight-channel IP codec that would be wired into our Nanaimo studio location. This would service all four of our morning shows and all the remote cut-ins. Morning shows from anywhere was the hope.”

The Gateway 8 provided the option to phase out copper ISDN



**Top**  
Morning host Bill Dean has the Tieline software interface open on-screen.

**Bottom**  
The Tieline Gateway in the rack

lines completely and rely on the Gateway 8 connected over fiber to Bridge-IT codecs.

“We also use the Report-IT Enterprise app extensively over cellular connections for both shows and remote cut-ins.”

The Gateway 8 services two Parksville stations, CHPQ(FM) and CIBH(FM), as well as CHWF(FM) and CKWV(FM), both out of Nanaimo. It is connected 24/7 on two stations.

“We’ve never had any dropouts or audio issues,”

Mandziak said. “We now do morning shows remotely from announcers' homes and other locations that often change daily. We also connect to the Gateway for remotes and voice tracking. If anyone gets sick, they can easily do their show from home using the Report-IT app as a codec and transport.”

The upgrade has allowed the stations to get rid of all their copper ISDN links and increased their capability and flexibility. Mandziak said the savings from dropping the ISDN and broadcast loops was appreciable. 🍌



**More Info**  
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# MP-532, the little processor that rocked

Chris Verdi on Great Eastern Radio's new Wheatstone MP-532

**A** station acquisition often calls for an audio processor "refresh," doubly so if you're acquiring two stations and there's a format change involved.

Such was the case when Great Eastern Radio acquired WXMS 97.9 and WWFK 107.1 in Burlington, Vt.

Chris Verdi, CBNT, CBNE, is chief technology officer for Great Eastern. "The two additions, which brought our total to 19 stations covering greater New England, came with dated processors that just could not make the cutover to a classic rock and hot AC format, respectively," he said.

Their prior recent processor purchase was a Streamblade, a WheatNet-IP audio appliance for provisioning multiple streams that includes processing designed for nuances of streaming.

"We had heard about the MP-532, an AM/FM/HD multiprocessor that is also made by Wheatstone. We had heard field reports about how it could produce 'airy and silky highs,' mids that are 'warm and mud-free' and 'deep, powerful lows.'" He also liked the price and that it includes features like an RDS encoder as standard.

"We started with Classic Rock 107.1 Frank-FM. I installed the MP-532 using the quickstart default preset. I was expecting to have to fiddle to get it close to what we wanted and was surprised what came out instead."

Everything sounded "cleaner, brighter and louder than anything I've heard in a long time."

The little tweaks they did for the classic rock station worked so well that they decided to run a similar setting on the AC station.

"We have a country station there running a top-of-the-line Wheatstone X3 FM/HD audio processor, and this little MP-532 really holds its own next to the X3 and any other processor in the market. It doesn't look as pretty in the rack, but it sounds almost as good, if not better in some ways."

It was a bonus that the MP-532 is a multipurpose processor. He recommends it for a cluster that might need an all-around backup that can stand in as an AM or an FM, or as a streaming processor. 🎧



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**This little MP-532 really holds its own next to the X3 and any other processor in the market.**



# A single-frequency network for Radio Coromandel

Broadcaster uses APT codecs, Ecreso transmitters to solve severe coverage difficulties

**T**he Coromandel Peninsula on the North Island of New Zealand extends 53 miles north from the western end and is 25 miles wide at its broadest point. A majority of its population lives on the narrow coastal strips fronting the Hauraki Gulf and the Bay of Plenty.

In clear weather the peninsula is visible from Auckland, the country's biggest city, 34 miles to the west.

The peninsula is steep and hilly and largely covered in bush. The Coromandel Range forms the spine for most of the peninsula, with the highest point at nearly 3,000 feet. It has a permanent population of around 30,000 and approximately 60,000 reside in the station's broadcast coverage area.

On securing a single FM license in one of the towns on the peninsula, the challenge for the station owners was how to maximize their investment by extending coverage into other towns across such a rugged area. The main competitor used no fewer than 12 frequencies to provide coverage in a similar area.

Radio Coromandel partnered with Auckland-based consultants Southern Broadcast, who developed a plan to deploy synchronous transmitters along the eastern coast. The NZ regulator later referred to this plan as an "efficient use of radio spectrum."

The station has four synchronous sites broadcasting on the same frequency. In order to carry IP traffic from the first transmission site to the four other linked sites the station established its own microwave radio network.

The system uses Ecreso Digital

SFN-enabled FM transmitters and APT Digital MPX IP codecs with SynchroStream technology. The accuracy of SFN timing allows almost total elimination of "mush zones."

"The synchronous transmission works well and has become a very popular feature," said station

owner John Grant. "Many listeners commented on how easy it is to stay tuned to our station that has seamless coverage down one entire coast and across hills on a single frequency. We could not have achieved this without WorldCast APT codecs and Ecreso transmitters." 📻



**Left**  
An Ecreso transmitter is seen in the middle of the left rack bay.



**More Info**

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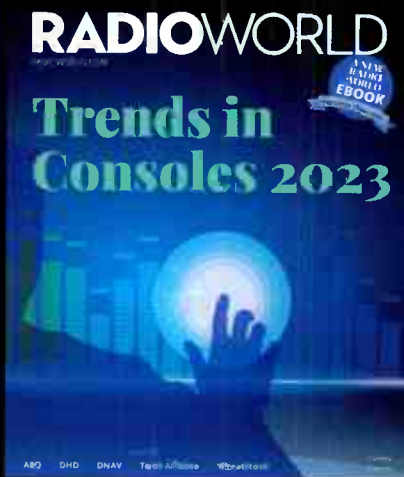


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