



RADIO WORLD

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Alt Station Experiments With VR



The merchandise area in Endless Riff's VR environment, with a photo of the WFPK team.

VISUALRADIO

NAB Pushes FCC to Revamp Rules

Critics fear "breathtaking" deregulatory move, the possible "death of AM"

BY RANDY J. STINE

WASHINGTON — A majority on the NAB Radio Board thinks the time is right for the FCC to revise radio ownership rules when it conducts its next quadrennial media ownership review. That process is expected to start later this year.

The NAB would like the commission to change the number of terrestrial radio stations that one company may own in a radio market. Current market caps were established 22 years ago as part of the historic 1996 Telecommunications Act, which placed ownership limits on a sliding scale. In the largest of radio markets an entity can own as many as eight radio stations, with a "subcap" of five in a given service (FM or AM). In the smallest markets, the cap is two stations, limited to one in each service.

The association wants the commission to change these market subcaps to allow a company to own up to eight FM stations in a given top 75 market and permit an operator to own or control

(continued on page 8)

Local radio explores teleportation of music fans to another "place"

BY JAMES CARELESS

Due to space limitations, only 70 people are allowed into 91.9 WFPK(FM)'s "Live Lunch" music concerts. The events are broadcast live on the Louisville, Ky.,

independent alternative station every Friday at noon.

Until now, the only way to enjoy these concerts was to be one of the lucky 70 attendees or to listen via WFPK's FM broadcast or web streaming. But things

changed the first day of June. When the band Awolnation took to the stage at the downtown Louisville Public Media performance studio that noon hour, a new audience got to see the concert in virtual reality.

Using an Endless Riff VR app that runs on immersive VR headsets made by Oculus and Samsung, WFPK music fans were able to go into a virtual concert hall where Awolnation was playing live. Inside this online space, their avatars could move around and interact with each other, as well as see and hear the band from various locations in the virtual concert hall.

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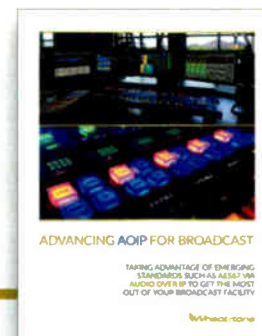
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Embracing Change Is Important To Broadcasting's Future

But how to do bring your people along? Here's one common mistake to avoid

They work overtime to protect their job, their turf and their way of doing things. The moment they sniff change in the wind, they click into gear to overturn it and even sabotage it.

Whether you're an owner, a manager or a state broadcast association, you have to figure out how to put together a majority of people to help you change, grow and ultimately succeed.

ASSOCIATIONS

BY STEVE WEXLER

The author is board chair of the Wisconsin Broadcasters Association and vice president, radio at E.W. Scripps



Steve Wexler

Robert Kennedy said, "Twenty percent of the people will be against anything." Baseball great Casey Stengel once said, "The secret of managing is to keep the guys who hate you away from the guys who are undecided."

Casey and Kennedy were on to something! During times of continuous change, people quickly align themselves into one of three camps, according to management change expert Price Pritchett.

The first group, typically about 20 percent of the group, embraces change. They are immediately energized and excited about change — sometimes before they even know everything about it. They are innately curious and ready to challenge the status quo.

"Starting today, we're changing how we do things!" you announce. Your change embracers immediately sign on and can't wait to help you implement your changes even though they don't know every detail.

The second group is a tougher audience. Fifty percent of people will sit on the fence. They'll ask questions. They'll get together in small groups to decide whether they like the change or not. They'll withhold judgment on the change. At times, they'll simultaneously endorse the change ("This is great. I'm so glad we're finally doing this differently") ... but they privately work to destroy it ("I can't believe we're doing this. It'll never work.") The good news: This 50 percent eventually will take sides, depending on which way the wind is blowing.

The third group, call it 30 percent, are active change resisters. They hate change. They love the status quo.

EVANGELISTS

According to Pritchett, most of us make the mistake of trying to romance that stubborn 30 percent who hate change, hoping we can turn them into change embracers. It's not going to happen.

A better strategy is to spend time and energy first with the 50 percent of people who want to understand the change, how it benefits them and the organization and why change is important and necessary. This is your highest-leverage group, and they are worth your time and energy. Talk to them. Engage with them. Explain the change and your own reaction to how changes will affect the group.

Next, encourage the 20 percent who love change. Thank them for their spirit. Tell them you need their help and are counting on them. Since they love change so much, let them know that once these changes start working, there'll be more change to come. They are your evangelists!

This is harder to do, but just as important: We pretty much have to ignore the 30 percent of naysayers. They will get louder and more difficult to manage, but you will expend important energy and credibility by spending hours unsuccessfully trying to convince them that change is necessary and good for them.

Trying new approaches that challenge the status quo takes courage and vision. Surround yourself with enough change embracers and well-intentioned fence sitters, and we'll be successful evolving and growing.

Our business, our industry and yes, our state association will continue to change as we tackle new challenges. Our ability to embrace change will go a long way in determining our success in the years to come.

Radio World welcomes commentaries and news updates from state broadcast associations. Email radioworld@futurenet.com.

IN CASE YOU MISSED IT

A sampling of recent headlines delivered to Radio World readers in their free daily NewsBytes e-newsletter. (Click the Subscribe tab at radioworld.com, then Newsletters.)

► Smart Speaker Owners Listen to More Audio (But Not Necessarily Radio)

In the US, about 43 million people — 18 percent of Americans 18 and older — now own a smart speaker. That's according to the "Smart Audio Report" from NPR and Edison Research. While some in the radio industry are optimistic about smart speakers, others are concerned that the technology is displacing listeners who will not

tune in via a different platform. This study indicates there may be some truth to that fear.

► Pilot and NABEF Launch Grant Program to Fund Internships

Pilot and the NAB Educational Foundation announced a new grant program that will fund paid engineering or media technology internships at NAB member companies that do not currently offer internships in these fields. Pilot will offer grants for part-time internships in the spring 2019 academic term and full-time internships next summer. The spring grant application window closes Aug. 15; the summer window closes Nov. 2.

NCAB Inducts Carl Davis Into Its Hall of Fame

He's the first engineer so honored by the North Carolina Association of Broadcasters

NEWSMAKER

BY EMILY M. REIGART

The North Carolina Association of Broadcasters has honored Carl W. Davis Jr. with the 2018 NCAB Hall of Fame Award.

Davis is a certified Professional Broadcast Engineer with a background in both radio and television and who also worked in sales for several broadcast equipment manufacturers; today, he is a regional sales manager for Electronics Research Inc.

"The best thing about [broadcast] technology is that it allows us to educate, inform and entertain our citizens," he was quoted saying in the award announcement.

"While the symphony or the ballet can't come to every town in North Carolina, UNC(TV) can bring the symphony and ballet into every home. We can connect the people of our state."

Davis grew up in Hickory, N.C.,

where he got his start in radio at WIRC and WXRC. He then went on to study sociology at East Carolina University in Greenville, N.C., where he also worked at campus radio station WECU(AM). As a senior, Davis began to work for Greenville's WOOW(AM); he was chief engineer and program director.

Several years later, he tackled a new job as president and owner of Fisher and Davis Electronics Inc. From 1976–1980, he worked as WCTI(TV) transmitter supervisor for Malrite Broadcasting Co.

For his next gig, Davis was tapped as director of engineering for Durham Life Broadcasting, where he directed the technical operations of four radio stations, one NBC affiliate TV station, two regional sports networks, one national farm network and a statewide satellite news/information network, according to his résumé.

In 1985, he was named vice president of engineering for Voyager Commu-

nications Group, overseeing 11 radio stations in four states. He went on to work in broadcast TV equipment sales beginning in 1994, first as district sales manager for Harris Corp.

He returned to the engineering world in 1998. Davis was hired by University of North Carolina Center for Public Television to modernize a network that had signed on in 1955. He worked for the network as assistant general manager for 14 years before returning to



Davis attending the hall of fame luncheon with his goddaughter, Beth Voltz, a Raleigh-based attorney.

Greenville.

We asked him about the award and his career.

Radio World: You've been vocal about the need for organizations to recognize engineers. You're the first engineer so honored by the North Carolina Association of Broadcasters.

Carl Davis: I was really surprised by the award from the NCAB. Initially, I was just speechless, and for me that's not a common occurrence. Yes, I am the first broadcast engineer in the group of more than 100 members, with tal-

ented people like Edward R. Murrow, Andy Griffith, Charles Kuralt and David Brinkley and great owners like Jim Goodmon, Don Curtis, Henry Hinton and George Beasley. Unfortunately, engineers are the forgotten part of the broadcast operation. They only know your name when the station is off the air.

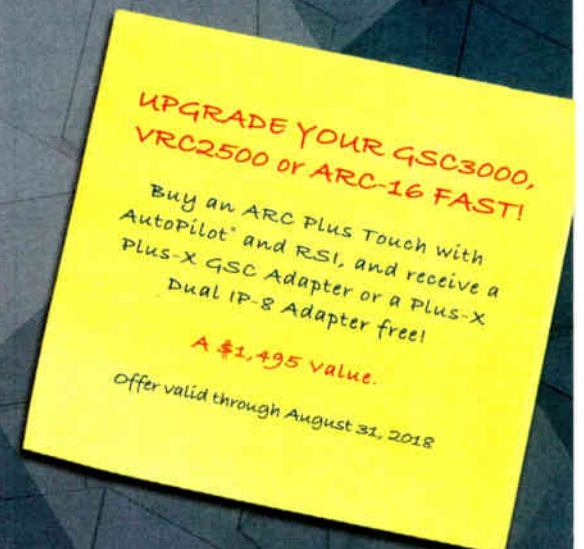
RW: The award announcement mentioned that your mother asked you to stay away from your college radio

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NEWS

Carl Davis sends a clear signal to viewers statewide by reengineering UNC-TV for the digital age.

Davis in master control at UNC-TV. He was assistant GM for the statewide public TV network for 14 years.

station. Is that true? How did she feel about you making radio your career?

Davis: In high school, I was working full time at the local radio station. My mother thought I was spending too much time with radio and not enough with school. She was probably right!

Also, she wanted me to be a doctor. In that era, she couldn't see how someone could make a living working in radio. During the recession of 2008, I'm sure some others shared her feelings. She finally accepted it.

RW: *What advice do you have for young radio or TV enthusiasts who are considering a career as a broadcast engineer or are just starting out in the business?*

Davis: Young people starting out need to find a mentor. They are out there. The best advice I ever got was at WIRC in Hickory, N.C. The assistant GM told me to learn as much as I could about every job in the station. I did that, and it has served me well. Also, you need to have some balance in your career. Don't work so much that you burn out quickly.

RW: *What was the most interesting project you've worked on so far in your career?*

Davis: That's a hard question. The most complex had to be the digital conversion at UNC-TV because of the number of different pieces. Fortunately, the voters of North Carolina gave us the funding in a higher education bond. That was leveraged with grants and other funds to over \$70 million. We built towers and installed antennas, line and transmitters. We built switching, storage, automation, and both studio and remote production facilities.

In the end, we had 12 digital full-power TV stations, 1,100 miles of digital microwave, 25 digital translators and an outstanding production and broadcast facility. All of it had redundancy. We reached 13.6 million people with multiple channels of service.

RW: *You've worked in both radio and TV. If you had to play favorites, which medium would you choose?*

Davis: I have been asked that question many times over the years. I'm worked in both and sold to both radio and television stations, so I should have an answer; I don't.

"When people outside the industry ask me if I like my job, my answer is that I am selling to people I genuinely like and people I would like to have as my next-door neighbor."

Technically, they are same. An antenna or transmission line doesn't care if it's carrying FM or TV RF. A computer hard drive doesn't care it's storing audio or video or both. The only difference is the people in the stations. I have been fortunate to work with some of the finest radio and television professionals in the country. I can't choose!

RW: *You now are a regional sales manager for ERI. How has your engineering background informed your work in sales?*

Davis: Having been a broadcast engineer has been a huge help during my sales career. I understand the issues facing the broadcast engineer. I can relate to them better than someone who has never been on that side. I know the questions that they are getting from their boss and try to help them help their stations. I try to ask the right questions and put myself in their situation.

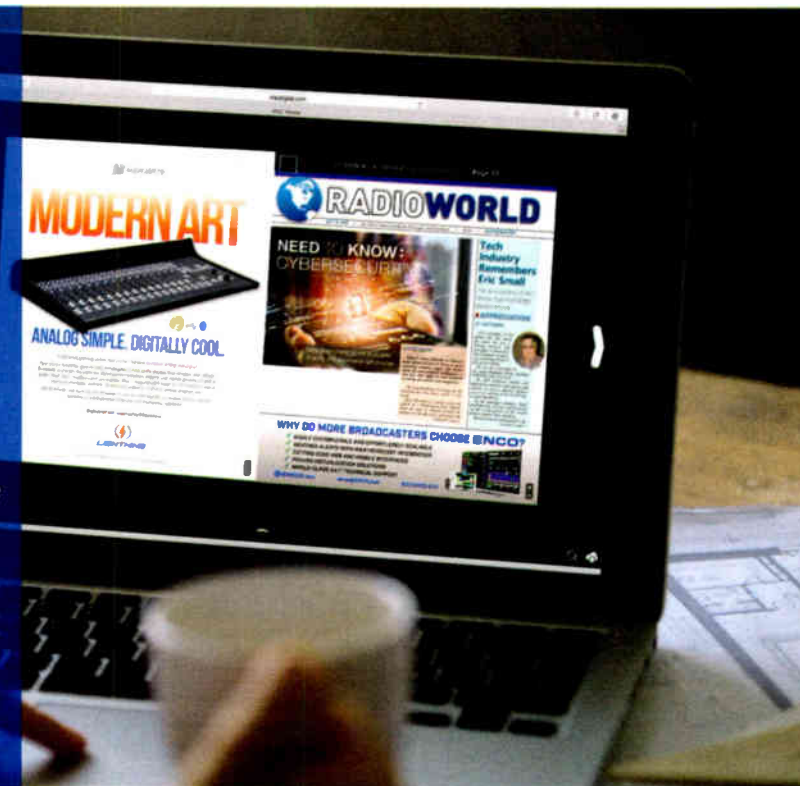
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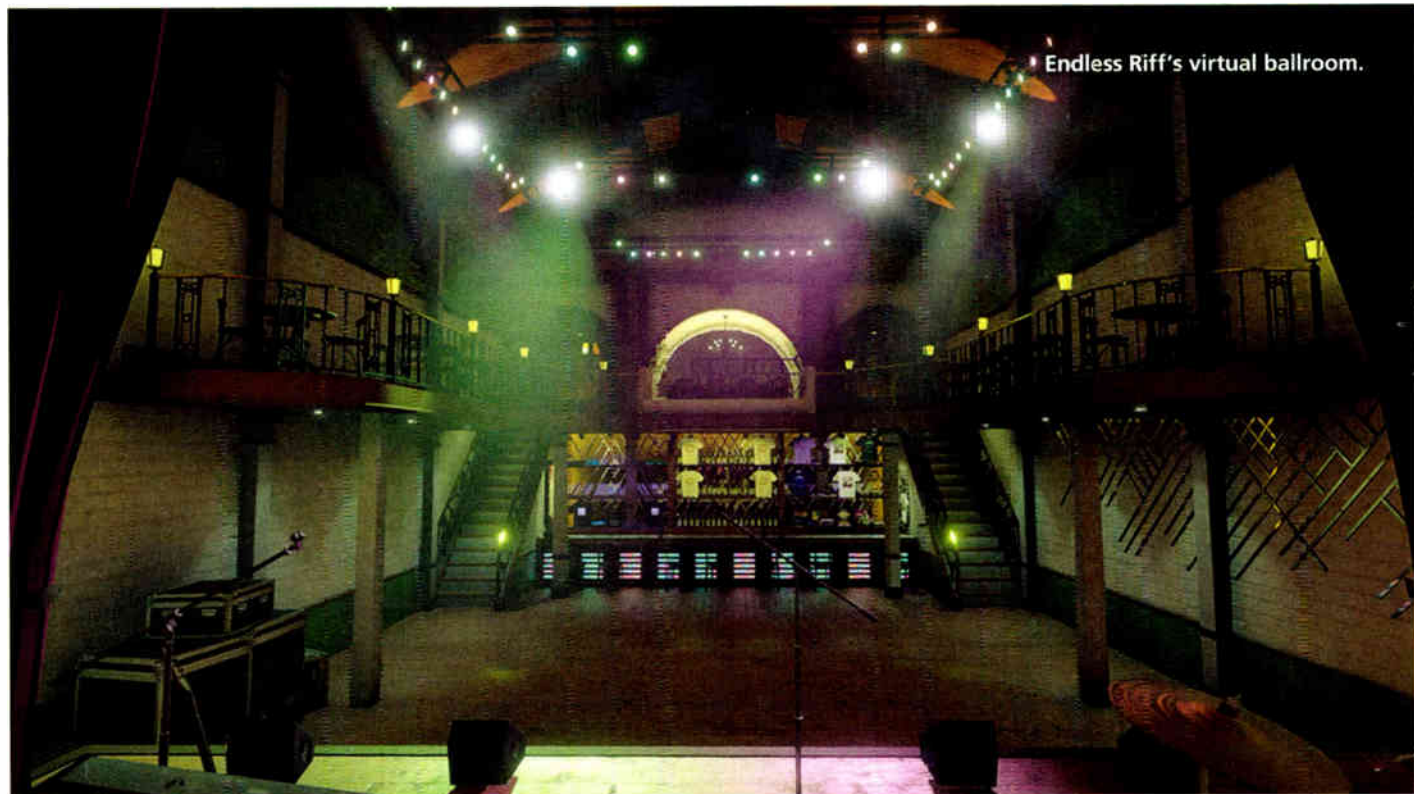
VR

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"We're streaming live on Facebook, and for the first time ... also streaming in virtual reality on the Endless Riff app," said "Live Lunch" host Kyle Meredith when the concert began. "It's a little weird saying in front of a lot of live people that we're in VR. But that's what going on."

Creating this virtual world live isn't easy: Working with Endless Riff, a maker of VR solutions and host of its own "virtual music community," WFPK had to set up video cameras in the Louisville Public Media performance studio and send those camera views along with the station's audio feed back via IP to Endless Riff.

In turn, Endless Riff created the virtual concert hall for the Live Lunch broadcast, and handled everything involved with allowing VR users to join Awolnation interactively in cyberspace. Endless Riff has produced more than 175 live VR shows in the past year and a half.



Endless Riff's virtual ballroom.



Stacy Owen

"Our age demographic (35-55) is in line with the audience Endless Riff is trying to reach," said WFPK Program Director Stacy Owen. "Our listeners are at an age where they have more income, but not as much time or inclination to go out to live shows. Offering concerts in VR gives us a chance to share the artists we love in live performance with those who don't make it to shows like they used to. It also gives us a chance to expose our service and brand to an audience outside of our local community."

THE EXPERIENCE

Endless Riff says it is more than a VR solutions maker/enabler. It is a creator of virtual worlds — a social music VR platform, to use the company's own words.

10 of the **TOP 10** U.S. radio stations are Nautel customers.

nautel.com nautel

By connecting their headsets to www.endlessriff.com, VR fans can roam this social music platform, enjoying VR concerts at New York City's Rockwood Music Hall and events such as SXSW.

The process starts when users log onto the Endless Riff site to see a VR event, and choose their avatars. Currently they choose from a selection of pre-formatted avatars; Endless Riff plans to add customizable avatars available for a fee.

"Once an avatar is selected, the fan enters into their personal RV trailer where they can invite their friends — initially through Facebook — to join them for a private experience," said

Endless Riff CEO and founder Mark Iannarelli. "From the RV, a fan can enter a 'venue' where they are fully able to move throughout the environment and talk to other fans."

The venue is rendered using 2D graphics and synchronized so that all users share a common wraparound reality, including the live concert video feed and artist interviews. "Depending on the show, there are also 360 degree camera vantage points that can be jumped into on demand," said Iannarelli. "We will soon be adding 180 degree and full volumetrically captured content (high-def holographic/3D video) to the venues as well."

Is seeing a band in VR the same as being there in person? No, but that's the point: VR is an intermediate stage between being there in person and streaming the event onto a web-connected screen. As well, the use of avatars allows users to create and inhabit fantasy personas that can inter-

act with others, allowing them to enjoy an immersive video game experience on the "virtual premises" of their favorite radio stations.

RADIO AND VR

WFPK is a big believer in digital technology and in using the web to increase its listenership. This is why the station started streaming the "Live Lunch" on Facebook Live a year ago.

As well, WFPK's archived "Live Lunch" concerts are a big hit with its listeners. "While there may only be 100 people streaming during the perfor-

mance, thousands watch the archived video afterward," said Stacy Owen. "The artists almost always share the link as well, which connects us to their many fans."

Owen called the partnership with Endless Riff a testing ground for the station.

"We've played around with filming video in 360, but haven't tried offering anything live in VR before. We love trying new things, and felt this would be beneficial to both parties and a safe way to dip our toe in the water."

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DAVIS

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When people outside the industry ask me if I like my job, my answer is that I am selling to people I genuinely like and people I would like to have as my next-door neighbor.

RW: What do you think is the most pressing issue facing broadcast engineers today?

Davis: Too few people are choosing broadcast engineering. Some of the most successful younger engineers in the last few years have come not from school but from other parts of the station, like promotion or programming.

Just this week, a very good contract engineer described a young engineer working on a complex project. The young engineer asked him how he knew why something worked the way it did. The answer was "I just know from experience." There is no substitute. Sta-

tion owners and managers see this as a problem, but not as much of a problem as it really has become. Almost every day someone asks if I know of an engineer for this market or that market. In the current job market, stations are going to have to pay more and offer better benefits. It's a fact of life.

RW: Is there life outside of broadcasting?

Davis: Yes, I've been very involved for a long time with my alma mater, East Carolina University. I've served as chairman of the ECU Board of Visitors and chairman the ECU Alumni Association. My wife and I attend dozens of ECU sporting and other events every year. We don't have children but feel like we have 30,000 ECU students in our family. Higher education, including the campus radio station, had a huge impact on my life. We are doing what we can to help our university have that impact on another generation of students.

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OWNERSHIP

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an unlimited number of AMs, among other changes. In smaller markets, there would be no cap at all.

The NAB's plan is controversial and finds at least two of the largest broadcast groups in the country, iHeartMedia and Townsquare Media, on opposite sides.

NAB made the proposal in a letter in June to Michelle Carey, chief of the FCC's Media Bureau. The proposal, approved by the Radio Board, was sent by the association's Legal and Regulatory Affairs department and signed by General Counsel/EVP Rick Kaplan.

The NAB noted that current ownership rules were set before the launch of streaming services like Pandora and Spotify, before satellite radio, podcasts or Facebook. All of these services compete with terrestrial radio for advertising dollars.

Critics of the plan, including the Multicultural Media, Telecom and Internet Council, say the proposal would devalue AM radio as big owners stop investing in those properties and buying AM broadcast equipment, and that it would ultimately hurt ownership diversity. However, NAB argues in its request that "increased common ownership should enhance radio programming diversity."

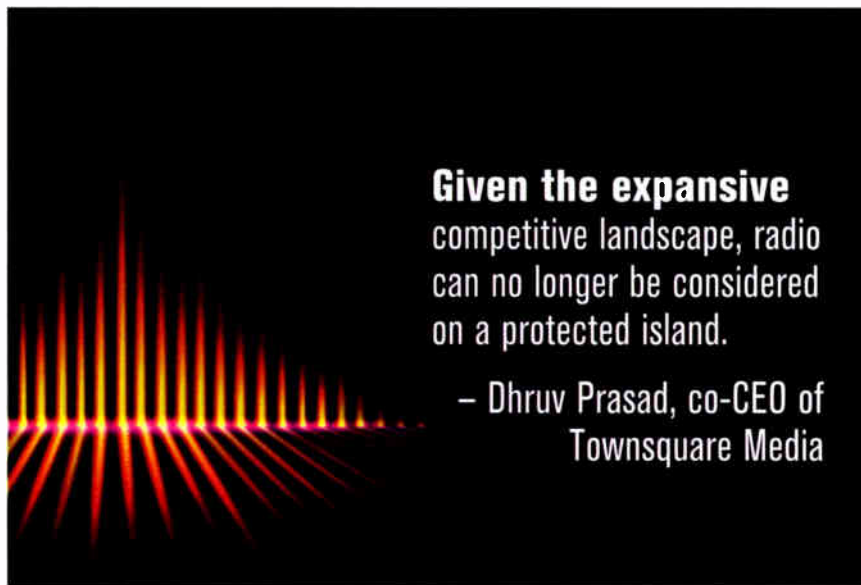
In fact, NAB proposes that owners who "incubate" the ownership of stations by new entrants into broadcasting be allowed to own up to two additional FM stations in a market program, bringing the limit to 10 FMs under single ownership in top 75 markets.

The proposal didn't spell out how an existing owner would qualify for such a limit waiver. But FCC Chairman Ajit Pai is circulating an incubator proposal among the commissioners that would establish requirements to govern an incubator program. Such a program was detailed in a 2017 NPRM aimed at supporting the entry of new and diverse voices into the broadcast industry. His item will be on the agenda for the commission's August meeting.

"THE RIGHT CLIMATE"

The industry seems divided on the radio ownership issue, according to several insiders. They said the vote of the NAB Radio Board to float the proposal was not unanimous. It's been widely reported that iHeartMedia voted against the proposal while Townsquare Media gave a yes vote. (Reports indicating that Cumulus Media voted against the plan were not accurate, a company spokesperson told Radio World in an email, declining further comment.)

Under Chairman Pai, the commis-



Given the expansive competitive landscape, radio can no longer be considered on a protected island.

— Dhruv Prasad, co-CEO of Townsquare Media

sion has set an aggressive agenda of relaxing limits on media ownership. Last fall it ended the newspaper/broadcast cross-ownership ban. In addition, it has eliminated a rule requiring that broadcast stations have a main studio in their local coverage area.

Most observers interviewed seemed to think the commission is likely to remain on its generally deregulatory track and said they'd be surprised if this NAB idea doesn't win approval at least in some form.

"I was surprised by the proposal, but it's the right climate for this type of pro-

posal," said Melodie Virtue, a communications attorney at Garvey Schubert Barer, who specializes in FCC filings and applications.

Virtue said that despite some opposition, she expects numerous radio groups would be eager to take advantage, initiating sales and swaps.

"I would expect such a change would increase the value of FMs unless the market gets overheated," she said. "AM properties would go down in value."

Another observer congratulated the NAB on "crystallizing the radio ownership debate in a constructive way" that

allows the FCC to move forward.

"At least the FCC can now delve into radio ownership deregulation in specific terms rather than nearly an abstract goal," said Scott Flick, communications attorney with Pillsbury Winthrop Shaw Pittman LLP in Washington. "I certainly think that we will see changes to the subcaps, but it's far more difficult to say what sorts of changes will be implemented in terms of local ownership caps. There will be many more proposals made before the FCC reaches any conclusions, but the NAB's proposal is what those proposals will now be compared against."

"FINANCIAL VIABILITY"

The NAB's push comes as the growth in non-broadcast sources of digital content continues to put competitive and revenue pressures on local stations.

David Oxenford, a communications attorney with Wilkinson Barker Knauer LLP, wrote on his Broadcast Law Blog that the changes in competition for local advertising have been dramatic, "with some sources showing that over 50 percent of local advertising revenue (the bread and butter of local radio) is now going to digital competitors — with Facebook, Google and even the digital music services selling advertising to local advertisers throughout the country, even in the smaller markets."

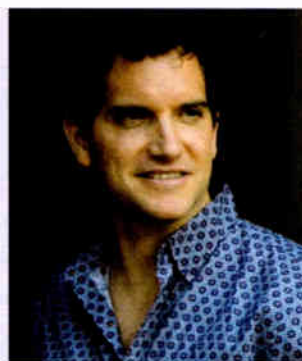
(continued on page 10)

VR

(continued from page 6)

For his part, Endless Riff's Mark Iannarelli sees the combination of radio and VR as a marriage made in audience-building heaven. "We believe there is huge pent-up demand for music experiences between friends over the age of 30," he said. "We intend to highly optimize the experience for the particular artist communities, nostalgia and music discovery demand within this group. Genre targets at first are rock, alternative, country and hip-hop."

Taking a big-picture view, "We see VR as a huge opportunity for radio — and the relationship it still has with fans locally — to transcend current forms of music consumption and recapture curation leadership," said Iannarelli. "It is a huge opportunity if done right by being social, specific and persistent. Local radio is in the best position to effect a teleportation of a music fan, and



Mark Iannarelli

people in general, emotionally to another 'place.'"

Stacy Owen is bullish about this form of radio content distribution and its unique appeal to music listeners worldwide, so much so that she is already planning to expand WFPK's use of VR.

"If all goes well, next year we'll invest in the cameras we need to offer our spring/summer outdoor waterfront series in 360 degree VR," said Owen. "WFPK Waterfront Wednesday is attended by 12 to 15 thousand each month and features national talent like Iron and Wine, The Mavericks and Car Seat Headrest."

Tell us about your own explorations of new technology platforms. Email radioworld@futurenet.com.



Indie-rock band Typhoon's performance at WFPK's studio as seen through Endless Riff.

More than Just an IP Codec

Introducing Record and Playback on the ViA



The screenshot shows the ViA Media interface with the following details:

- Time: Jul 3 3:12 am
- Signal strength: 4G
- Track: Record0042.mp3
- Size: 2.7 MiB Sample 48 kHz
- Duration: 00:01:29
- Space Remaining: 14.6 GiB
- Buttons: Record, Manage Recordings, Record Mix, Switch to Playback, Play, Stop

Stream

Record

- Select & record any input, return audio or file playback
- Stream, Record & Play simultaneously
- Record to SD card
- View & manage recordings

Playback

- Create playlists of local & imported recordings
- Route file playback to any output or record media
- Offline Cue monitoring

((ViA))

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OWNERSHIP

(continued from page 8)

NAB's letter put the question in existential terms: "For radio to remain a free, over-the-air option able to provide quality entertainment and informational programming to all consumers, broadcasters must be able to create ownership structures that better ensure their financial viability today and into the future."

Oxenford doesn't expect a NPRM in the quadrennial review until late this year and no final decisions from the commission until late 2019. He described the NAB's proposal as controversial, as evidenced by the reported Radio Board vote.

"Proponents of more diversity in broadcast ownership will suggest that consolidation will hinder opportunities. Additionally, opponents will likely contend that consolidation since 1996 has not benefitted the economics of radio companies, but instead led to some being financially overextended," Oxenford posted on his blog.

Paul Rotella, president and CEO of the New Jersey Broadcasters Association, thinks NAB's request is aptly timed.

"I think they see an opportunity to look at things from a clean slate with Chairman Pai. Given the benefits to broadcasters that some of these rules changes will provide to the industry, success is probable."

"BREATHTAKING" DEREGULATION

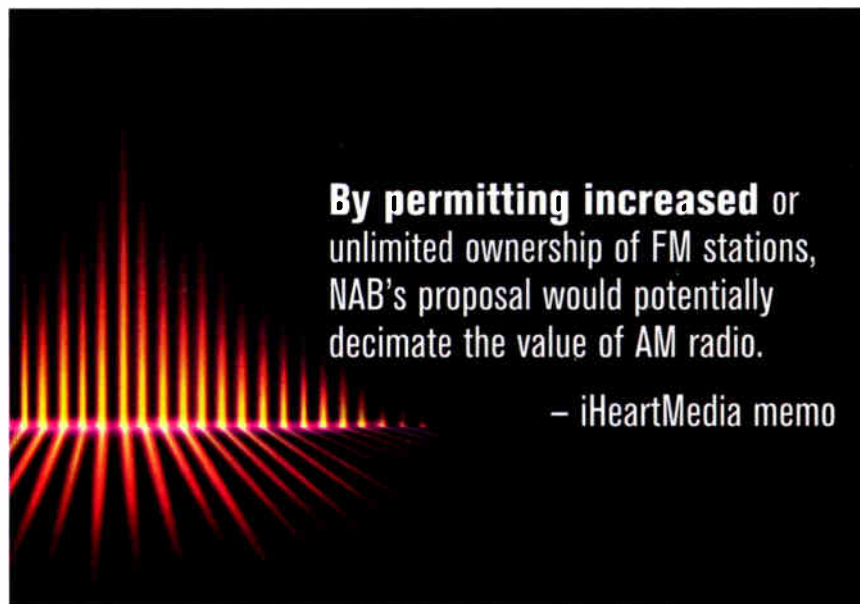
Optimism about ownership rule changes is not shared by the country's largest radio group. In a company memo in June released on several websites, iHeartMedia Chairman/CEO Bob Pittman and COO Rich Bressler said the NAB request is bad for the industry.

"A faction within the board of directors of the National Association of Broadcasters wants the Federal Communications Commission to change these limits in favor of breathtaking deregulation, while other board members do not. When it was put to a board vote, the faction in favor of deregulatory overreach did win the vote — but the vote was not even close to unanimous, emphasizing that among the membership of the NAB, this was — and remains — a divided issue," the

iHeartMedia executives said.

The pair specifically cited the potential impact on the value of AM properties, of which it owns many in big markets like Tampa and Denver.

"By permitting increased or unlimited ownership of FM stations, NAB's proposal would potentially decimate the value of AM radio. With no limits on FM ownership, companies would logically buy FM stations instead of AMs, and would probably divest themselves of AMs — and, at the very least, would not be interested in acquiring more AMs. With that kind of sell-off or lack of demand, the value of AMs would most certainly decline," they wrote in the memo.



But Dhruv Prasad, co-CEO of Townsquare Media and newly elected this spring to the NAB Radio Board, told Radio World in an e-mail that the emergence of digital and social media has fundamentally disrupted how information is disseminated.

"Given the expansive competitive landscape, radio can no longer be considered on a protected island, and it follows logically that the rules that were intended to limit advantage and undue influence must themselves adapt or be eliminated altogether," Prasad said. "After all, on the internet, none of our competitors are subject to any of these limitations."

Prasad said Townsquare has an abiding interest in AM. Of its 317 total stations, 85 are on the senior dial, making it the third largest owner of AM stations in the United States.

"The best way to ensure the value of AM stations, and to deliver for the listeners of this service, is to provide essential and important programming, and unique and valuable benefits to advertisers," Prasad said.

He believes the FCC's AM revitalization efforts gives those stations and owners opportunities to ensure their success and longevity.

ON THE TABLE?

Here are the NAB Radio Board's specific recommendations to the FCC:

- In the top 75 Nielsen markets, allow a single entity to own or control up to eight commercial FM stations, with no limit on AM ownership;
- To promote new entry into broadcasting, an owner in these top 75 markets should be permitted to own up to two additional FM stations (for a total of 10 FMs) by participating in the FCC's incubator program; and
- In Nielsen markets outside of the top 75 and in unrated markets, there should be no restrictions on the number of FM or AM stations a single entity may own or control.

provide as much coverage as Class A FM stations and have ratings that are significant."

The idea that an incubator program would help small minority-owned stations is invalid, Lipp said, if there is no viable competition in a radio market. "In order for the incubator program to succeed, there should not be a dominant force in the market."

The Multicultural Media, Telecom and Internet Council, an advocate for minority broadcast interests, had yet to comment specifically on the NAB Radio Board's idea as of early July. But in ex-parte comments filed with the FCC earlier this year, MMTC said it believes if the radio market subcaps were eliminated, most broadcast companies would promptly find a way to expand to the eight FM limit.

"When the largest companies stop investing in AM radio, AM equipment manufacturers will stop designing improved AM equipment and the top engineering firms will stop doing AM work. This will lead to a rapid deterioration in the AM service and undermine the commission's AM revitalization effort. Elimination of subcaps would be the death knell for AM broadcasting," according to the MMTC.

The quadrennial review process remains in the planning process, according to observers. Chairman Pai had not offered public comment on it at press time, although he has been firmly on record as exasperated by the FCC's repeated failure to carry out that quadrennial duty in a timely way.

The NAB said it would file additional comments to justify radio ownership rule changes as the review progresses.

A WARNING CALL

Mark Lipp, a communications attorney with Fletcher, Heald & Hildreth, agrees with the NAB that radio is facing increased competition from digital sources, but that "doesn't mean owning more stations" will solve the problem, he said.

"In the larger markets, some number of additional stations would be acceptable, but I would also factor in the HD channels (of large broadcast groups) that offer separate programming. There should be some recognition that these stations compete for advertising as well. The FCC should also consider FM translators that rebroadcast the HD channel in analog to its listeners," Lipp said.

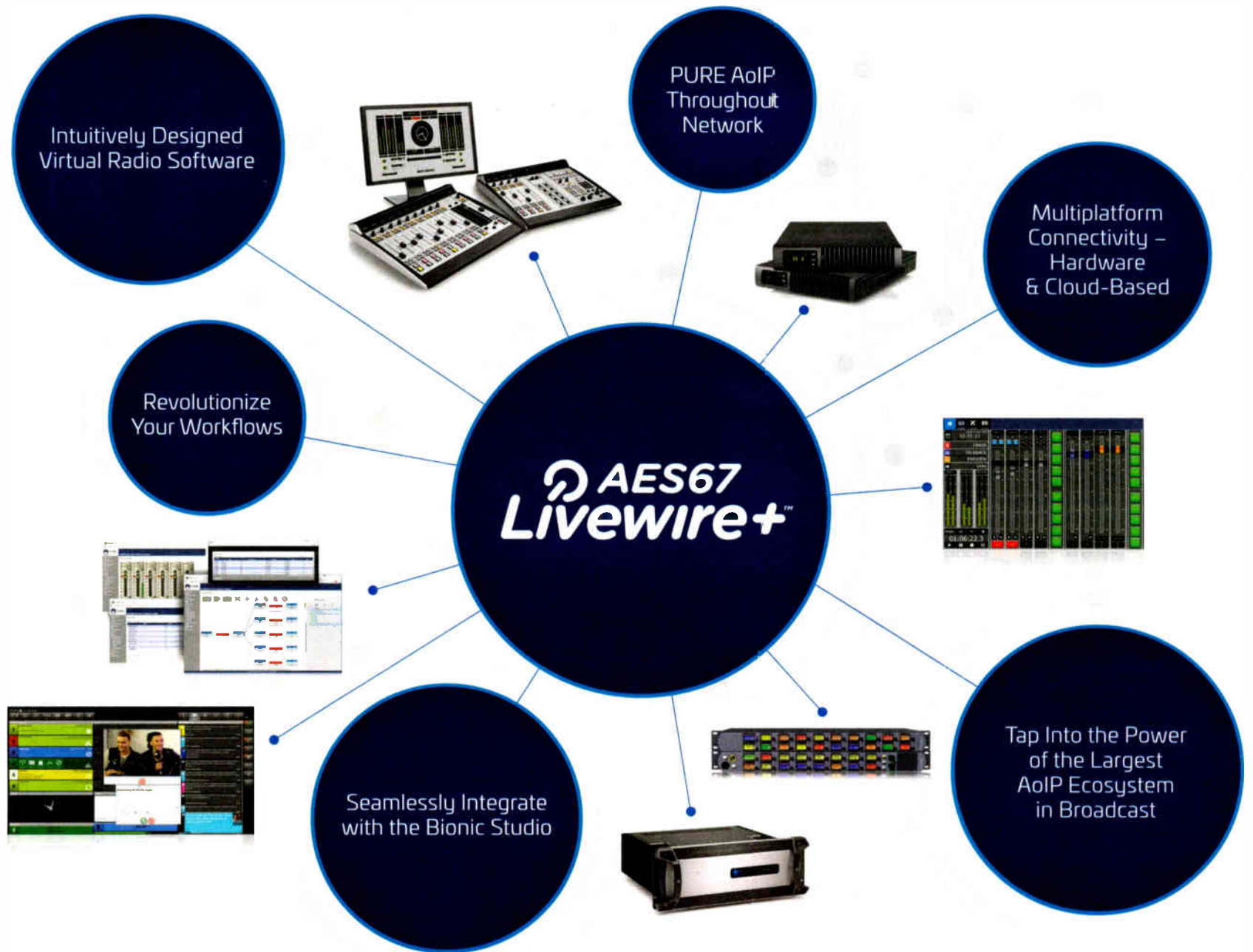
"I am not saying they should be counted as much as a full-service station, but they should factor into the mix to some degree. Many FM translators



Write to RW

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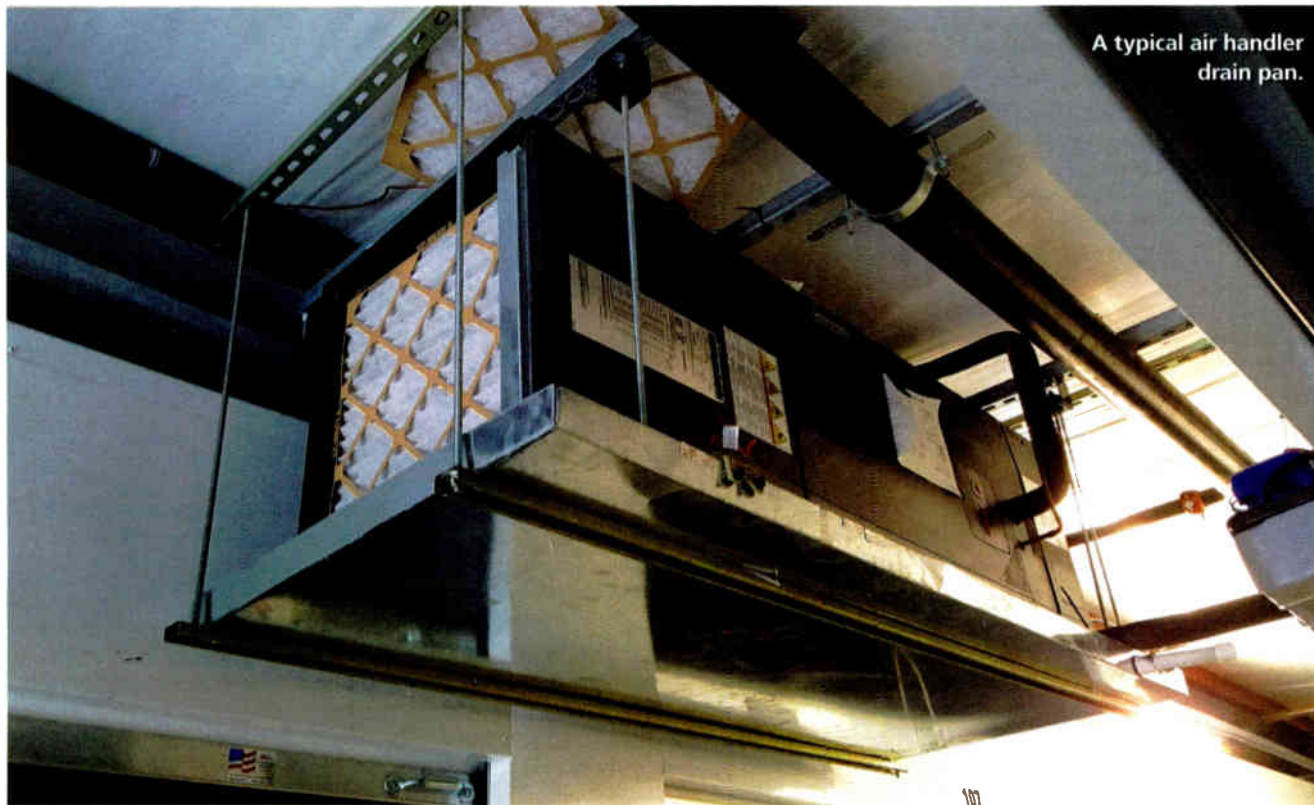
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A Better Way to Catch the Stream

Figurative and literal techniques to troubleshoot capture issues



A typical air handler drip pan.

Newman-Kees Consulting Engineer Frank Hertel noted quiet unhappiness among users regarding Microsoft's updates killing some features in its Audio Mixer Options.

Frank wonders if the recording industry quietly urged Microsoft to kill

the "Record What You Hear" feature, also known as "Stereo Mix." It gave users the ability to record internet audio streams. Frank is surprised that a class action suit hasn't been filed in this matter.

Curiously, XP users are still able to

use the "What You Hear" stereo mix, but most Windows 7 and newer users will find those features have been or eventually will be crippled.

However, there is some relief available. NCH is an Australian firm that has software that will enable Windows

7 and higher users to once again record Internet audio streams, and it yields additional features, as well.

Find Sound Tap online: www.nch.com.au/soundtap/index.html.

Frank initially loaded the free version, which seems to have no time limit. He says it was painless and quick to install and works flawlessly. Frank eventually purchased the full program because of its additional useful features.

Frank has used NCH products over the years and says he has never been disappointed — their software is compact and typically intuitive in its use.

Do you have a drip pan? It's essentially inexpensive insurance.

One additional point is this Sound Tap software does not do anything to the Windows Sound Mixer, but rather acts as a standalone program, one that only uses the resident sound drivers for whatever sound card you have installed in your computer.

NCH's Sound Tap will be a useful tool for radio newsrooms and other station needs, as well as recording streams and online news conferences.

There will no longer be a need for the producer/source of the program to record and post their feed for download. Now stations can "catch the stream" as it is happening.

Have you paid attention to your air conditioner condensate drains lately? This is the time of year that air conditioning is working overtime. Here are a couple of maintenance suggestions.

First, if your air handler is mounted in the ceiling — above a studio, rack room or transmitter — do you have a drip pan? It's essentially inexpensive flood insurance.

If yes, add a half cup of bleach to the drain and pan ... or purchase a pack of SimpleAir Clean Flow tabs for under \$10 from Amazon. The tabs are time-release and last a couple months. The bleach or tabs prevent build-up of algae, which can clog condensate drains and cause a flood. Not what you need above a studio or transmitter!

One last thought: If you install a pan, spring for a water sensor alarm. If the condensate drain gets clogged, and the water spills into the pan, you want to know about it.

(continued on page 14)

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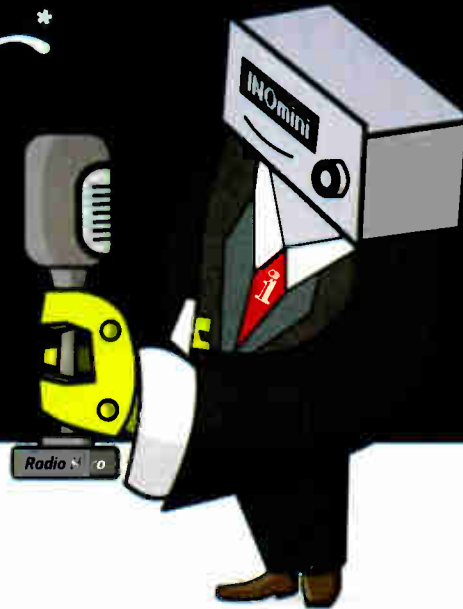
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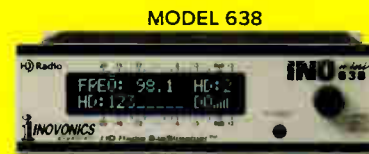
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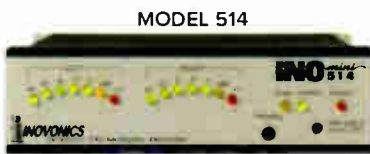
MODEL 633
FM/RDS Monitor Receiver



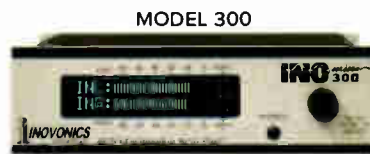
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AFRTS Radio Shows Now Online Thanks to Two Vets

Thom Whetston has uploaded many of the programs saved by talent Roger Carroll

PROGRAMMING

BY KEN DEUTSCH

Beginning in the early 1940s and for more than 50 years, the U.S. armed services produced long-form radio programs on vinyl disc to broadcast to troops overseas.

These were usually recorded by the top voice talents in Los Angeles and were heard over the American Forces Radio TV Service. Many of the same talent later created other shows specifically to aid the military with recruitment. The latter programs were then distributed to American radio stations for free on-air use.

Until recently, this trove of historical programming had been M.I.A., but now thousands of hours are

available for online streaming, thanks to Army veteran Thom Whetston, who served in Panama and Korea.

"For years, AFRTS recorded many hours a week of personality-oriented music shows, and these were sent all over the world," Whetston said. "The guys that hosted them got complimentary copies, and luckily one air talent in particular, Roger Carroll, saved most of his albums in his garage. For the last 10 years I had been writing a blog about AFRTS, and about a year ago, with Roger's help, I began building a website where people can hear these shows again."



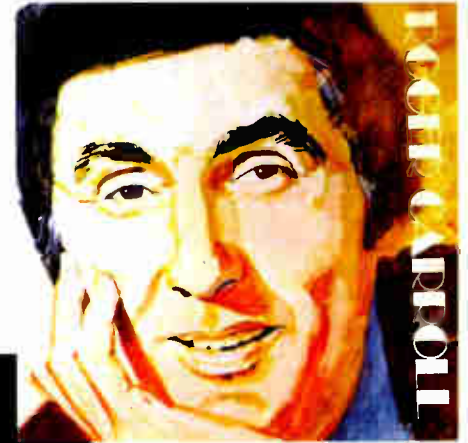
Thom Whetston

ROGER THAT ...

Roger Carroll had a long run hosting these programs, beginning in the 1950s and continuing into the 1980s (but more about that shortly). At the time, he was known as one of America's most-respected announcers, having had his own shows on the ABC Radio Network,

KMPC(AM) in Los Angeles and other radio outlets. Carroll was also the voice we heard introducing CBS TV network shows featuring the Smothers Brothers, Dionne Warwick, Nancy Sinatra, Perry Como, Steve Allen and many others.

Today, at age 89, Roger Carroll is long retired, but happy that so many hours of what he and others created can now be heard again via the internet. He shared some of his broadcast memories with Radio World.



Roger Carroll

"I had an older brother who worked at WCAO(AM) in Baltimore," he said. "He was killed in World War II, but I always wanted to be an announcer like him. I got my chance while I was still in high school at WFMD(AM), a station in Frederick, Md., at age 15."

From the East Coast, Carroll moved across the country to attend school. He inquired about a job as a page at NBC in Los Angeles. At the time, NBC Radio had just been forced to

(continued on page 16)



WORKBENCH

(continued from page 12)

After publishing pictures of the splicing tents that the phone company used, I've received a number of comments from engineers who remember them or shared what "lit the broadcasting flame" in their hearts.

Roy Humphrey is a transmitter engineer in Pittsburgh, working for WPGH(TV), WPMY(TV) and WPTS(FM). He writes that one evening at age 17 he was at the home of a transmitter engineer for WJAS(AM/FM). The engineer informed Roy that he had to run up to the transmitter building for a few moments and asked if Roy would like to go along. (What a dumb question!)

The transmitters were on the second floor, as many were in those days. When Roy climbed the stairs and entered the dimly lit room, he was greeted by the purple glow of nearly 20 mercury vapor rectifier tubes. He took one look and told himself, "This



Roy Humphrey

is what I want to do."

The Western Electric AM transmitter had a mesh front, so much of the inner workings were visible. The Western Electric FM unit had glass doors, and the same was true of it.

This March, Roy began his 66th year in broadcasting. He is 82 and still serving as a transmitter guru!

Contribute to Workbench. You'll help fellow engineers and qualify for SBE recertification credit. Send Workbench tips and high-resolution photos to johnpbisset@gmail.com. Fax to (603) 472-4944.

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Who says small can't be mighty? ruby's mixing engine, Power Core, is equipped with redundant IP networking, dual-redundant power capability, and tons of built-in I/O — 384 stereo channels, standard — with room to add even more. There are dozens of DSP channels, and a built-in routing switcher, too. It's like 12 rack units of power, packed into only 1RU.

www.lawo.com

World Radio History

AFRTS

(continued from page 14)

sell off one of its two networks, so NBC Blue was renamed ABC. NBC Red continued for many years as the NBC Radio Network.

Because a woman there saw potential in Carroll, she sent him over to the ABC side, and through a set of fortuitous events, Carroll found himself doing summer relief work on the ABC Radio Network at age 18.

“Sixteen guys auditioned for the job,” said Carroll, “but I got it because I was the only one who could pronounce ‘cal-liope.’”

His career then took him to KMPC in Los Angeles, where he spent 22 years working for owner Gene Autry, whom employees affectionately referred to as “The Cowboy.”

During the late 1950s, Carroll served in the army and began recording shows for AFRTS as part of his regular duties. About six years later, after his release from service, he heard about an opening for recording more of these programs, and he took the job to continue to serve his country. His last shows were recorded in the early 1980s.

DISCERNING DIGITIZING

“The announcers who hosted these programs all received copies of their own AFRTS shows, and they were told they could use them as they pleased,” said Thom Whetston. “Thus we are able to post these on our website for the public.”



More USAF paraphernalia.



Roger Carroll

crates, but that doesn't do anyone any good now. That's why I'm putting it online.”

Whetston enjoys connecting with other people who served in the military and particularly those who worked for service-run radio stations all over the world. He said he has met hundreds of them thanks to his blog and now the website.

To keep the site fresh, Whetston rotates various programs in and out, and he is even beginning to record a few similar shows of his own, updating the music slightly to include more of the 1980s and '90s.

In addition to programs hosted by Roger Carroll, the site offers entertainment from other announcers including Gene Price, Roland Bynum, Wink Martindale, Jim Pewter, Chris Noel, Robert W. Morgan and Frank Bresee. Hear what it all sounded like at <http://rogercarrollbestsoundsintown.com>.

Ken Deutsch salutes anyone who served his or her country and appreciates what they do every day.

Whetston has been handling the massive project of digitizing these vinyl discs so that they can be preserved and played on the website. But how much of this material was produced?

“Take about 80 hours a week times 52 weeks per year, times 30 years,” said Whetston. “The Library of Congress has all of it, but that place is like that warehouse in ‘Raiders of the Lost Ark.’ In 200 years, it'll still be there in



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It's new equipment season again! Radio World's "Summer of Products" feature is all about new gear that has come onto the market in recent months, especially during spring convention season. Over several issues we are featuring equipment that caught our eye.

Stage Tec Debuts Fiber and IP Interface

Console and broadcast production network equipment builder Stage Tec is adding an AES67 fiber optic and IP network interface board.

Called XFIP, it is AES67-compatible, supporting a maximum of 256 channels in and 256 channels out. The board is configured via a web interface and is backward-compatible with legacy Nexus network equipment.

The onboard AES67 module was developed with Stage Tec partner DirectOut Technologies.

XFIP supports redundant audio transmission according to SMPTE 2022-7. Stage Tec adds that "developing the XFIP router board, Stage Tec is following recommendations for the standards-based AIMS roadmap with the objective of SMPTE ST 2110."

Info: www.stagetec.com



RFE Broadcast Offers Compact Power

The RFE DS6000 range of transmitters offers up to 6,000 W in a compact 4RU box. With a promised power efficiency of greater than 70 percent, the DS 6000 FM transmitter features a signal-to-noise ratio of under -80 dB and stereo performance of 60 dB. The unit weighs less than 25 kilograms/55 pounds and provides low distortion.



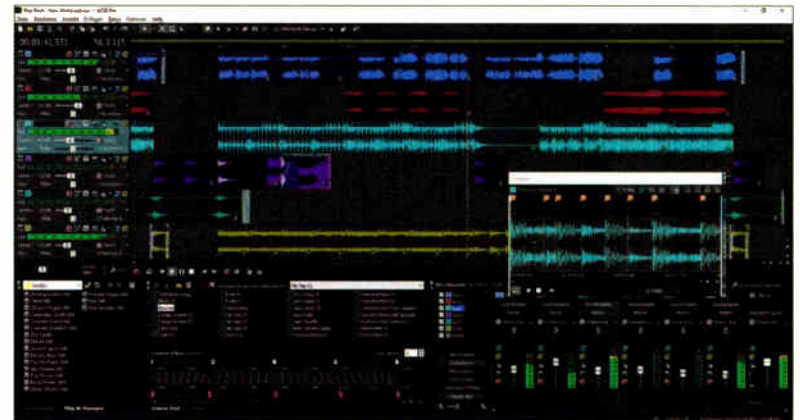
Other features include AoIP and RDS operation as well as SNMP v2 and GSM remote control. In addition, the DS6000 offers hot-swappable power supply, sixth-generation LDMOS VSWR and a LCD color touchscreen panel.

RFE says that while it is focused primarily on the FM sector, it supports the expansion of digital radio and places priority on IP technology integration through the design of dedicated receivers and transmitters.

Info: www.rfebroadcast.com

Magix's Acid Trip

Another old Sony Creative Software title acquired by Magix Software has been resurrected. This time it is the Acid music production digital audio workstation platform.



Acid Pro 8 is the first major upgrade to the DAW since 2008, according to the company. Given that it now sports 24-bit/192 kHz multitrack file specs on a 64-bit processing platform and a new GUI, the term "major upgrade" might be an understatement.

Not surprisingly, courtesy of Magix's stable of music production programs, there's a wealth of productive digital instruments onboard. Magix ships \$1,000 worth of instruments, loops (9 GB), samples, processors and effects with Acid Pro 8.

The company says that it will be adding VST3-compatibility, for tapping into plugins, later in the year as a free update.

Info: www.magix.com

Kintronic Picks Up Dummy Loads

Big news this year for transmission equipment maker Kintronic Labs is its new line of air-cooled dummy loads,

The power ratings range from 5 kW to 75 kW with peak envelope power expected to be twice the rated power. The five models all feature 3-1/8-inch inputs with 1-5/8-inch also available on most.

The dummy loads originate from the acquisition by Kintronic of intellectual property rights of former manufacturer Electro Impulse.

Info: www.kintronic.com



DM Engineering Merges Products

DM Engineering says it has combined two of its popular products, the Silence Sense Jr. and the Studio Solid State Relay Pack, into one versatile unit.

The Silence Sense — A.C. has both relay contact output to activate a notification device such as a remote control or indicator, and a 120VAC switched output so that auxiliary equipment may be activated when there is a failure in the audio chain.

Input and silence thresholds can be set. Once tripped a set of relay contacts are activated. According to the company, these contacts may be a momentary pulse (1 second) or

constant (remaining activated until the audio is re-established), depending on the front-panel switch selection.

In addition, silence will activate a 120 VAC outlet on the rear panel to provide power to needed equipment such as emergency playback equipment. An onboard battery backup keeps the silence detector and relay powered in power failures.

An internal jumper may be moved to change the relay output from normally open to normally closed contacts.

Info: www.dmengineering.com



ERI Introduces Directional Couplers

Electronics Research Inc. recently introduced a series of directional couplers.

This line of coaxial directional couplers is adjustable and externally terminated.

The orientation of any sampling port can be changed from forward to reflected by reposition the external termination load on the coupler.



These couplers are available in 3-1/8-inch, 4-1/16-inch and 6-1/8-inch, 50-ohm, models. In addition, with flanged input and output connections.

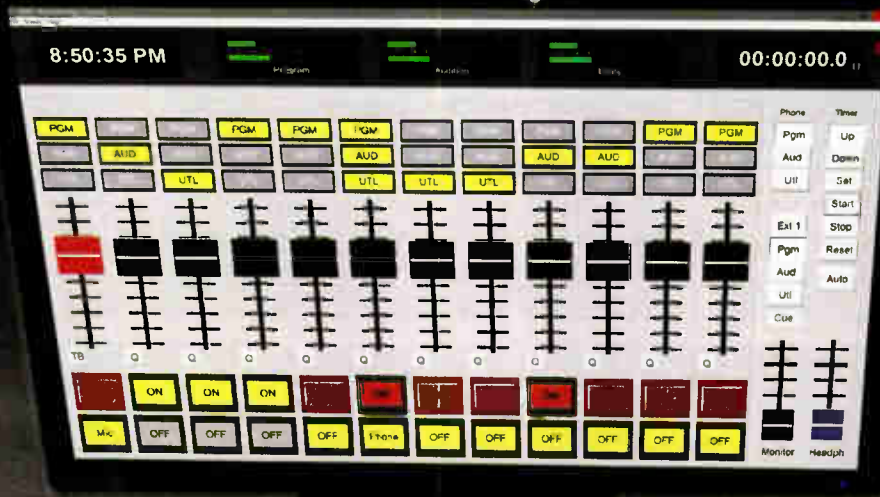
The 3-1/8- and 4-1/16-inch models are also available with an unflanged male connection at the coupler input.

Models available with one to five adjustable couplers with Type N sample ports.

One external termination load is supplied for each sample port. Directivity and coupling level are dependent on operating frequency.

Info: www.eriinc.com

NEW D.A.R.C. Virtual Radio Console



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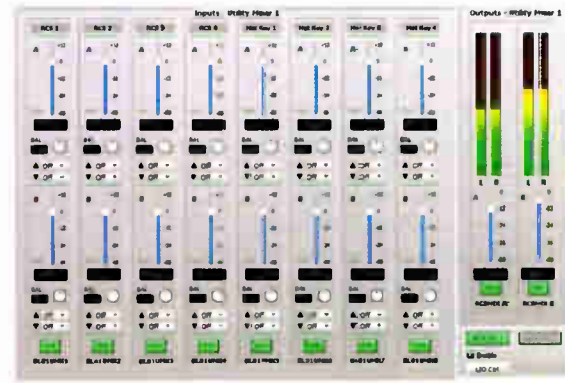
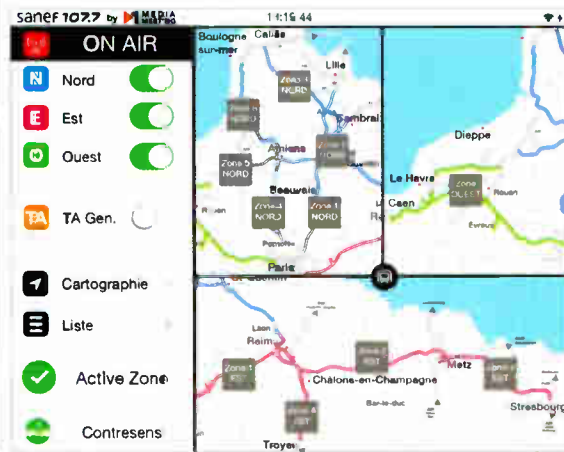
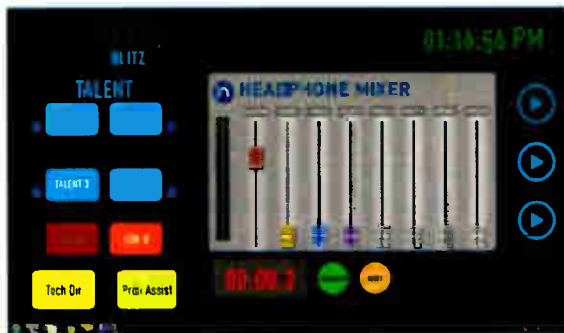
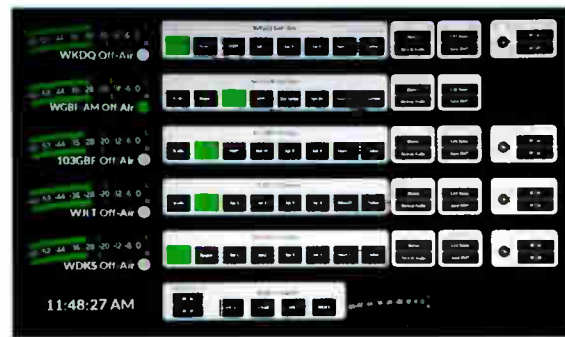
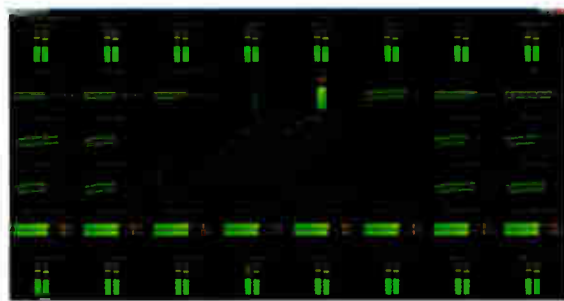
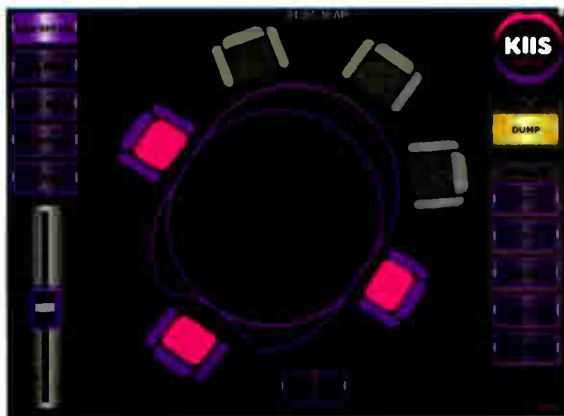
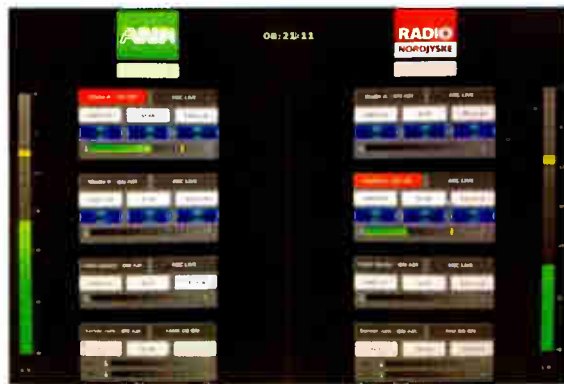
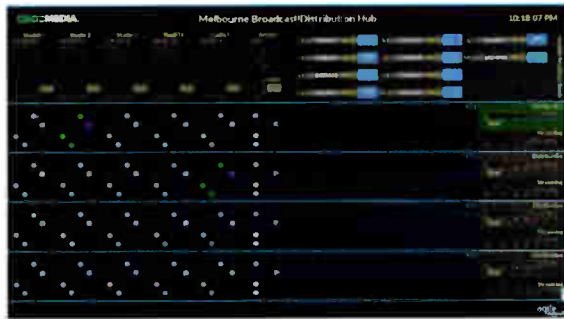
With phones, tablets, and PCs all touch screens, Virtual is the wave of the future. So, Arrakis introduces DARC, the NEW Virtual Radio console that works right out of the box, like a console should. DARC software on a Windows PC is the mixing engine for the console, which is connected to Arrakis Simple-IP IRU boxes (by a single cable) that have all of the analog, digital, and AoIP connections to your station. No network to configure. Just plug it in and you are on air. And yet DARC features world standard Dante AoIP connectivity so interconnecting studios is just an ethernet cable away. Available in 4, 8, 12, and 15 channel models, amazing Digital Virtual consoles at traditional analog console prices

\$3,900

DARC-Virt 12 (list price \$4,900) (PC not included)

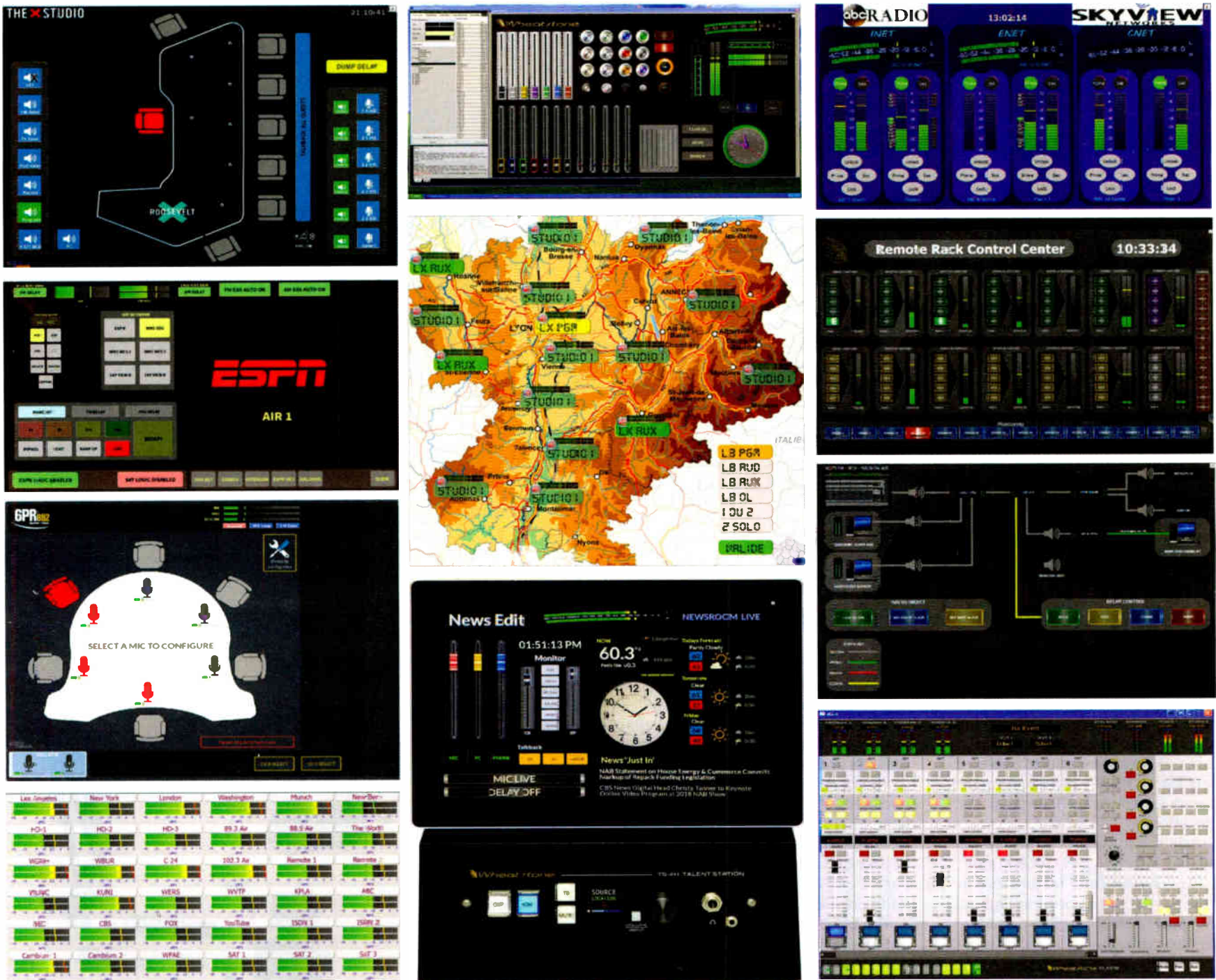
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WHEATNET-IP INTELLIGENT NETWORK



Pasternack Launches New coaxial surge Protectors

Here's an item from Pasternack that could find a use in protecting your STL, TRL, RPU or low-power FM transmitter.

The California-based RF equipment maker has launched a series of coaxial surge protectors to guard valuable communications equipment from power surges and indirect lightning strikes.



There are 46 new coaxial lightning and surge protectors, also suitable for use in cellular base stations, public safety systems, Wi-Fi networks, active antenna systems and GPS system applications.

It said the surge protectors are available with 7/16 DIN, Type-N and 4.3-10 connectors and feature VSWR as low as 1.1:1, max power as high as 2 kW, multistrike capability and low insertion loss.

"Additionally, these models support a frequency range of DC to 6 GHz and are CE and RoHS compliant," the company stated.

"Most of these new surge protectors are IP67-rated for outdoor use and some models offer low-PIM performance."

The company added, "Furthermore, models are available with bracket mounting options and flexible bulkhead designs."

Info: www.pasternack.com



Announcer's consoles From Studio Technologies

Manufacturer Studio Technologies isn't always on the radar of radio broadcasters when it comes to equipment choices. A new line of Dante-based interface boxes might be worth a look.

Labeled as announcer's consoles, the Dante network interfaces can operate as talent boxes in a studio or as inputs and associated controllers at remotes such as sports broadcasts.

Models 205, 206 and 208 feature phantom power (48V), talkback functions, headphone/monitoring operations along with Dante network presence. They utilize steel boxes and low noise pushbuttons. All three units operate with PoE.

In addition, all three are compatible with Studio Technologies' STController Application, a remote control program. Studio Technologies President Gordon Kapes called them dependable, space-conscious on-air solutions. "The 205, 206 and 208 use well-tested circuit designs and rugged components to ensure long, reliable delivery of excellent audio. When used in both Dante and analog environments, broadcasters can be assured that audio signals will have low distortion, low noise and sufficient headroom."

Info: <https://studio-tech.com>



Marshall and MXL Team for Podcaster Bundle

MXL Microphones, a division of Marshall Electronics, offers turnkey equipment bundles targeted to the podcaster and independent internet radio markets.

Its Visual Podcasting Station Bundles feature MXL microphones, mic arms, adapters and interfaces along with Marshall cameras and equipment.

The heart of the bundles is the MXL BCD-1 live broadcast microphone, a dynamic cardioid mic, and its companion articulated boom arm. Also included is the MXL Mic Mate Pro, an XLR-USB adapter and the MXL USB Hub, a four-input USB network interface. The CV502-U3 POV camera offers high-definition (1920 x 1080p) resolution into a USB environment. In addition, included is the CV-4706 6mm interchangeable lens.

The bundles are called MXL VPS Solo, consisting of one set of everything, and the MXL VPS Duo, featuring two.

Info: www.mxlmicro.com



Meet Type R From Calrec

Returning to the radio broadcast industry after a hiatus, Calrec Audio says its new Type R range of customizable, expandable, flexible radio systems is a response to the rapidly-shifting technological landscape and is designed to help radio broadcasters adapt.

According to the company, Type R is built around flexible IP connectivity and has simple, widget-based controls. Physical control panels are limited to three slim-line panels: a fader panel, a small soft panel and a larger soft panel, all powered over Ethernet to minimize cabling via COTS hardware.

Capable of running three independent console systems from one central processing core, Calrec says, Type R is easy to expand. Flexible touchscreen control panels can be quickly adapted to suit any production environment.

The company highlights a complex feature set, concise control and affordable price point. Bussing, including mix-minus feeds, is quick to assign; EQ and dynamics control are clear and fast.

Info: <https://calrec.com>



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Moseley uses proprietary technologies and owns more than 50 patents and has delivered more than a million radios deployed in over 120 countries.

RME Speaks Dante

Audio interface manufacturer RME is bringing its attention to Dante networks.

The latest in its Digiface series of digital audio interfaces is the Digiface Dante. It is a Dante interface bringing in and converting a variety of digital flavors for use on Dante digital networks.



Capable of handling up to 128 bidirectional channels at 192 kHz, 64 channels of MADI Digiface Dante interfaces with USB 3 and MADI on the high end for Dante networks. There are multiple/redundant Dante ports for bidirectional signal routing. There is also word clock I/O. The Digiface Dante can operate via a power supply or USB.

Info: www.rme-audio.de

Lawo Adds SPS for Radio Consoles

Lawo's Radio Software v6.0 update will incorporate SMPTE ST 2022-7 as standard for Ruby and Power Core radio consoles — the first to do so, the company says.

According to the company, they've released this update because "SMPTE 2022 defines ways for IP networks to cope with the unexpected, ensuring delivery of critical real-time digital audio."

Seamless Protection Switching, or hitless merge, SPS "enables AoIP simultaneous transmission of dual, identical audio streams via independent network paths, providing instant, undetectable switching to backup should the primary link be interrupted."



Lawo said the update will "ensure that unexpected network problems don't result in dead air."

The Radio v6.0 update also includes user interface and feature enhancements for

all Lawo radio products.

Info: www.lawo.com

Free Phone Codec App From Comrex

Comrex has released FieldTap, a free codec app designed to use the Opus codec to get audio from cellphones back to the studio. It is available for both Android and iOS.

The company said that it has designed FieldTap with a simple GUI. "With a

COMREX

one-button control screen, users of any technical ability can connect from the field to the station by simply pressing a single button."

It adds, "FieldTap is a simple SIP client that uses voice over IP to make it possible for field users to

send wideband audio from their cellphones over cellular and Wi-Fi networks." It can be downloaded at the Comrex website, Google Play or the App Store.

Info: www.comrex.com

Inovonics Ships New RDS Encoder

Radio equipment manufacturer Inovonics is now shipping its 732 RDS encoder. Described as an advanced dynamic RDS encoder, the 732 packs in the latest RDS tools along with broadcasting song title, artist information and station IDs.



A top feature is enhanced RT+ tagging with variable replacement capability. It offers a dynamic web interface for control and monitoring; a flexible scheduler to program static PS or RT messages; SNMP and UDP-multicast support; security with IP whitelisting for automation data ports; alarms and notifications; and RDS data delay to match profanity or diversity delays.

Inovonics President and CEO Ben Barber said, "The new 732 is a great replacement product incorporating new features that were not possible with the 730."

Info: www.inovonicsbroadcast.com

Neutrik Goes Outdoors

Connectors specialist Neutrik has announced a line of weather-resistant connectors built around current offerings.

The True Outdoor Protection or TOP series consists of weatherized versions of powerCON True1, etherCON and XLR connectors. These toughened-up connectors are IP65-rated and UV-resistant and are certified to connector standards IEC 61076-2-103, IEC 60320, UL 1977 and UL 498 as well as UL 50E.

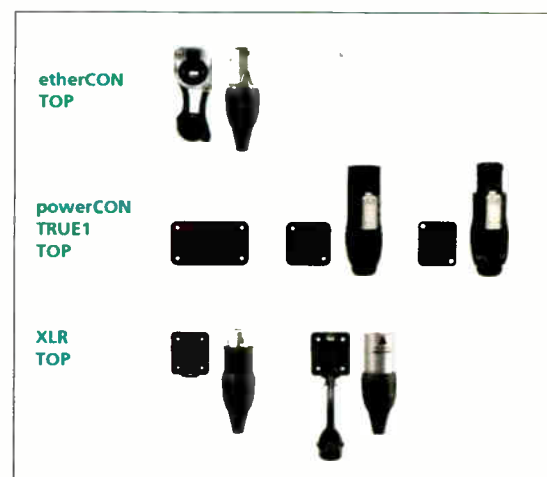
The powerCON TRUE1 TOP offers the same input and output cable and chassis connectors as the standard powerCON TRUE1 series and has the same features including breaking capacity under load, IP65 weather resistance, direct cable-to-cable coupling and a variety of input, output and duplex in/out chassis connectors.

The etherCON TOP products feature RJ45 cable carriers in two colors; Cat-5 chassis connectors for vertical PCB mounting, horizontal PCB mounting and D-size feedthrough; and an SE8FD-TOP outdoor assembly kit.

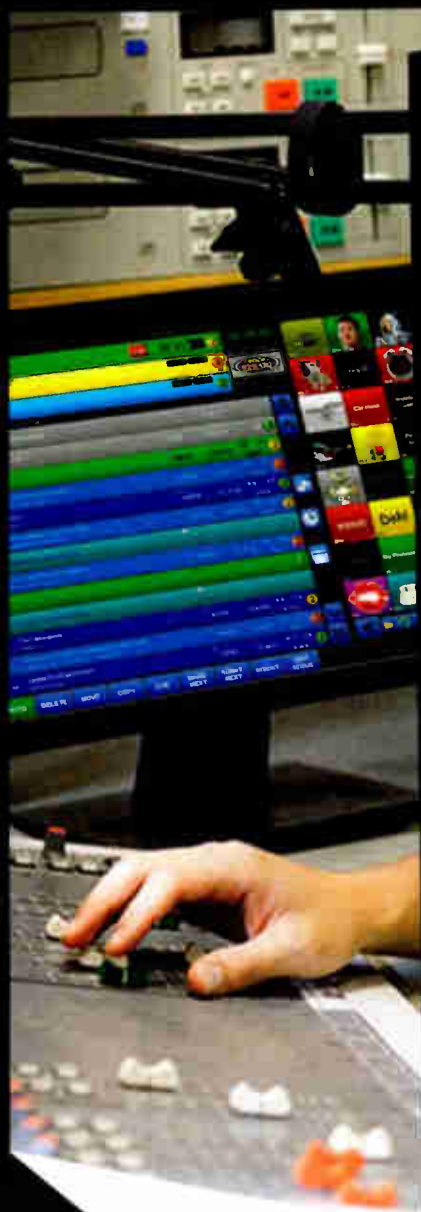
The XLR connectors come in three- and five-pin versions along with male and female D-size chassis connectors and a UV-resistant chassis connector protection cap and gold-plated contacts.

Neutrik USA President Peter Milbery said, "Weather influences — particularly moisture, dust and the sun's ultraviolet rays — can have a profound impact on the quality of signals commonly found in live event production." He said the True Outdoor Protection products are intended for such challenging conditions.

Info: www.neutrik.us



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USERREPORT

BY PETER QUINN
Director of Engineering
Newcap Radio Halifax

HALIFAX, NOVA SCOTIA — I have worked in broadcasting with Newcap Radio since 2009, starting out as an engineer in Ottawa. My current responsibilities are to oversee network maintenance and the technical budget for three markets in Nova Scotia.

Newcap Radio broadcast to 72 sites

and 29 repeaters throughout Canada, including Halifax and Kentville, Nova Scotia, and Saint John and Moncton, New Brunswick. Most programming is local; however we also simulcast a classic/active/local rock show called "Rock of the Atlantic," from 7 p.m. to midnight across the network.

As we all know, distributing programming over satellite is expensive. I was interested in any solution that delivered flexibility and high quality to

replace these expensive links. Newcap Engineering Director Chris Maclaurin told me about a Tieline Genie codec solution that was working well in Newfoundland, so we decided to implement this in Nova Scotia.

Newcap owns roughly 120 Tieline codecs and most markets have one Tieline Commander G3 field unit and rack unit codec per call sign for remotes. We now also use Tieline Genie Distribution codecs for Halifax's network

program distribution.

We installed a Genie Distribution codec in Halifax and it transmits "Rock of the Atlantic" to the Genie Distribution codecs at Saint John, Moncton and Kentville. Our ISP is Eastlink and they have delivered a fiber WAN for transmission paths across our provinces. Our Genies reside on a private subnet and the IT guys have configured QoS priority over the WAN to our audio packet traffic. Our WAN is extremely reliable and I attribute that to the high quality of the ISP.

I like the sound of Tieline's Music Plus codec and connect in stereo at 48 kHz/256 kbps. Using the auto jitter buffer settings in Tieline's codecs, we are able to obtain exceptional low latency of between 40–80 ms.

GPIOs are also very useful and I believe Music Plus encoding delivers the most reliable GPIO functionality. Our automation system creates a pulse and sends it to our audio server, which produces a closure which is routed to a physical relay. The pulses tell the affiliates to switch to local audio and begin a local stopset. When complete, the local market switches back to the main show feed.

The Genie Distribution ranks well for configurability and its distribution feature set, which includes multicasting, multicasting and multiple bidirectional peer-to-peer connection options. The network is impeccable and Tieline's browser-based HTML5 Toolbox web-GUI makes it simple for one person to manage connections throughout our entire affiliate network.

Broadcasting over IP has definitely lifted the overall audio quality of our transmissions and significantly reduced satellite transmission costs. Overall the Tielines work well for our broadcast application and will continue to be our company standard for IP codecs.

For information, contact Dawn Shewmaker at Tieline USA in Indiana at 1-317-845-8000 or visit www.tieline.com.



NM-250 MKII - Newsroom Mixer

Features:

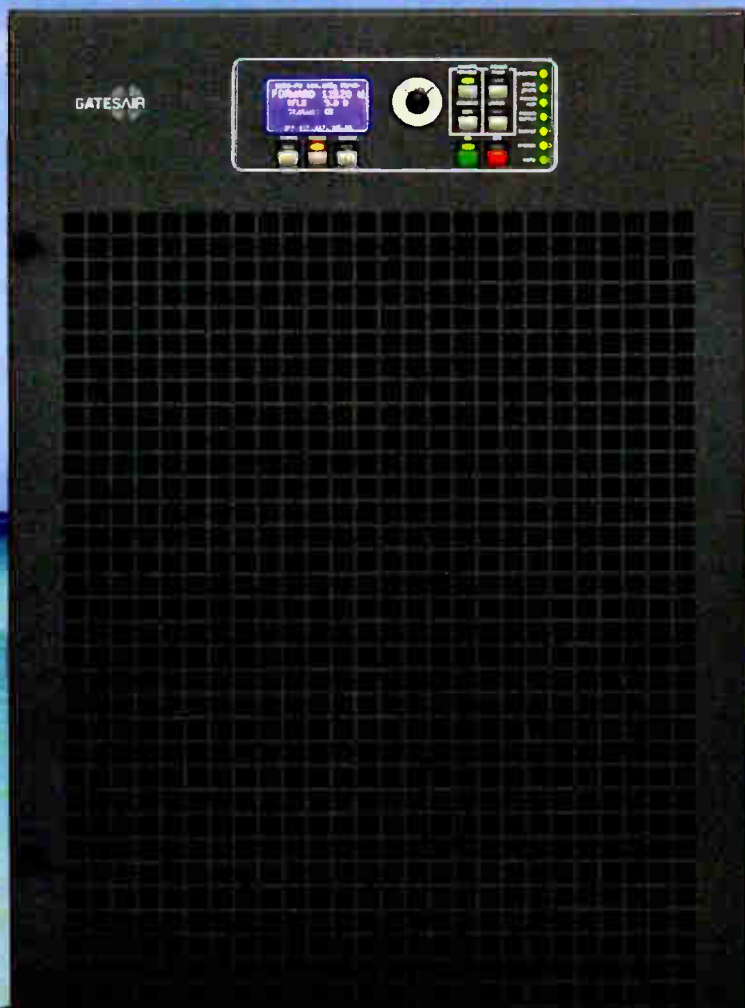
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ABOUT BUYER'S GUIDE

Radio World publishes User Reports on products in various equipment classes throughout the year to help potential buyers understand why colleagues chose the equipment they did. A User Report is an unpaid testimonial by a user who has already purchased the gear. A Radio World Product Evaluation, by contrast, is a freelance article by a paid reviewer who typically receives a demo loaner. Do you have a story to tell? Write to brett.moss@futurenet.com.

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BUYER'S GUIDE

Audio Transport/STL: Codecs, Internet & Satellite

AGM Chooses Wheatstone for Bakersfield

WheatNet gives flexibility to operations while also interfacing with other Wheatstone equipment

USERREPORT

BY RUSTY W. BURCHFIELD
Corporate Director of Engineering
American General Media

BAKERSFIELD, CALIF. — I was out of town and enjoying a mini vacation from my duties as American General Media's corporate engineer when I got the call. Two politicians had shown up unexpectedly at our studios in Bakersfield at the same time, and staff wanted to do a "town hall meeting/mini debate." The main studio was too small, and they needed to move things to our larger performance studio down the hall.

I asked when they wanted to make the switch, and they said about six minutes after the news. No problem. I pulled out my iPad, VPNed into our WheatNet-IP network server and, using the system's Navigator software, I set up a cross point between the performance studio and the main studio about 300 feet away. I then mapped each mic to its own console channel and routed talkback from the studio to the host headphones.

I was able to do this faster than they could have walked down the hallway and done a mic check.

FLEXIBLE

This sort of flexibility is why I decided to go with WheatNet-IP audio networking after a fire destroyed American General Media's Bakersfield studios almost two years ago. The fire started with faulty electrical in the TOC, melting the servers there. The smoke damage was so extensive, the studio facility for all six of AGM's stations in Bakersfield, California, was a total loss.

AGM, which has stations throughout California, New Mexico and Colorado, had WheatNet-IP in the Albuquerque facility so I was more than familiar with the system. For Bakersfield, I did look at other systems but decided for certain to go with WheatNet-IP when I ran across a WheatNet-IP system installed by a European vendor to showcase their on-air lights. It says something when a vendor buys a product to make their product look good.

I purchased IP-12 consoles for the six on-air studios, each with talk studios and a shared central mixing studio with glass all around, plus a large production studio and a performance studio complete with a stage and lighting. The entire facility was outfitted with

Wheatstone's modular QuickLine furniture and networked together through the WheatNet-IP audio network. There's not a soundcard or relay box in sight. Through IP audio drivers, I was able to tie in critical pieces of audio gear. For

In addition, I was able to add video to our webstreams using camera automation tied into WheatNet-IP in each studio, and enhance shows and sportscasts with graphics from its new digital content department complete with green-room. It's all controlled and managed through one IP audio network platform accessible from phones or laptops.

As expected, the installation was

ponents that are reversible, so you can get up to 32 functional configurations. Hooking up the WheatNet-IP system was straightforward. They're not kidding when they call it plug-and-play. I simply plugged the Cat-6 cable into a Blade (I/O unit) and it self-installed into the network.

This was certainly a lot easier than most of the studio projects I have managed in the past — and I've been involved in 900 studio projects in my career as a broadcast engineer. I can recall the enormous amount of time and engineering spent on tracing, stripping and punching down wire and making up connectors. By the time you add in time and labor, plus the punch down tools, shrink tubes, external relays and matchboxes, it can easily cost four times as much to do a punchblock routing system as an AoIP system. In the case of WheatNet-IP, I just put the Blade in a rack, got the premade XLR cables sitting on the bench and plugged it in. Just about everything is done using software; and by the way, we ordered all the connectors through Amazon, so it all came right to our door. The hardest part was ripping out the copper wiring that had been installed for the punchblock routing system used back in the day.

For information, contact Jay Tyler at Wheatstone in North Carolina at 1-252-638-7000 or visit www.wheatstone.com.



example, VoxPro digital audio recorders/editors are in every on-air studio, networked through WheatNet-IP for intense show productions requiring shared files and editing functions.

fairly stress-free. It took about 10 minutes per studio to install the QuickLine furniture, which is why they call it QuickLine. This is Wheatstone furniture that comes in five modular com-

TECHUPDATE

AVT'S MAGIC ACIP3 2M SUPPORTS STL APPLICATIONS

AVT Audio Video Technologies GmbH has introduced ModNet, a DSP-based hardware management platform for use with Magic ACip3 (2M) audio codecs and designed for STL applications.

ModNet can be equipped with one E1 (2 Mbps) interface and/or three independent Ethernet interfaces, which can be used for the main audio signal distribution, for backup and also for control and monitoring.

With the standard version, one stereo ISO/MPEG Layer 2 audio codec is available. With the optional two-codec upgrade two independent stereo audio signals can be transmitted with one system. If low latency is required, the system can be upgraded with the optional Enhanced apt-X 16-/24-bit algorithm. Using the 24-bit format the highest quality for compressed audio transmission with the lowest delay is possible.

Via the E1 interface, the system allows the transmission of multiple stereo or mono audio signals depending on the selected bitrate. Additional codecs can be connected to the main scheme via E1 using the Drop & Insert feature (which the company says offers low latency) or alternatively via IP.

With the IP version, each encoder can transmit five remote sites simultaneously. One network can consist of up to 99 systems, all of which can be managed via the ModNet application.

With the optional Backup upgrade, users can secure remote sites with an automatic backup functionality if a network fails. Operators can also assign E1 as main distribution signal and IP as backup network or vice-versa.

Also possible is a pure IP transmission via two independent IP networks. If main and backup networks fail, you still have the possibility to play out an audio signal from an SD card.

For information, contact AVT in Germany at +49-911-5271-0 or visit www.avt-nbg.de.



BRIC-Link Leaps Over Mountains for KSUT

IP codec reliably handles STL duty for multiple transmitters

USERREPORT

BY SCOTT D. HENNING
Independent Engineer

IGNACIO, Colo. — KSUT(FM) is a public broadcasting organization that serves the Four Corners area in the western United States, with studios and offices on the Southern Ute Indian Reservation. As an independent engineer, I recommend equipment, help with configuration and troubleshoot any technical problems that may arise.

STREAMS

KSUT produces two broadcast streams from their headquarters in Ignacio. The Four Corners/NPR programming is delivered to five transmitter sites around the Four Corners, while Southern Ute Tribal Radio programming is delivered to two transmitter sites.

About six years ago, KSUT installed the first BRIC-Link IP codec as an STL for the tribal programming service. I



liked the BRIC-Link's reliability and AAC compression, so we went on to add five more BRIC-Link pairs as primary STLs.

For years, KSUT ran a Comrex ISDN unit as an STL to a remote transmitter site. The Comrex units were so reliable that after a lightning strike, which

blew out the main output, it continued to work for several more years. When we started having interference problems with our radio STLs, KSUT began using Comrex BRIC-Links to bypass the interference issues.

One of the reasons I chose Comrex equipment is the great support. I always

read the manual, but it's helpful to be able to call and speak with a person who has a wealth of knowledge about our equipment. The Comrex support team has been especially helpful in configuring our BRIC-Link infrastructure. We have some challenging connections — for example, there's a 10,000-foot mountain between our studio and one of our transmitter sites. The internet pathway is punctuated with microwave hops. Despite the geographical challenges, our BRIC-Links reliably run at 128 kbps and I rarely have to do anything to the connection or the equipment. The BRIC-Links have a GUI interface that allows troubleshooting from any computer.

KSUT has been very happy with the Comrex products and support. The BRIC-Links have been reliable and so far, we have had no major failures. Because of the dependability and excellent support from Comrex, I would recommend a BRIC-Link system to anyone.

For information, contact **Chris Crump at Comrex in Massachusetts at 1-978-784-1776 or visit www.comrex.com.**

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Telos Has the Right Codec for the Job

Z/IP ONE comes through in the clutch at Rhema Central Coast



USERREPORT

BY STEPHEN WILKINSON
Technical Operations Manager
Hope Media Ltd.

SYDNEY — I've been with Hope Media Ltd. for 14 years as technical operations manager; during that time I think I've seen it all, or at least most everything.

Hope Media is a not-for-profit organization that runs Hope 103.2 on FM and Inspire Digital on DAB+ in Sydney. As one of the largest nonprofit community radio stations in Australia and due in large part to the resources that it has at its disposal, one of Hope Media's missions is to foster, encourage and provide technical assistance to many smaller stations. These stations are located all over Australia and attention is given specially to rural areas, to help improve their content, fundraising and sponsorship.

As a part of this ongoing mission, Hope Media loans me, generally at no charge, to stations in the community sector to help them with various techni-

cal projects.

Recently one of these projects brought me to 94.9 FM Rhema Central Coast. It's situated about 1.5 hours drive north of Sydney in Erina, and has a population somewhere in the neighborhood of 300,000. A couple of years ago they had to move transmission sites due to the land being reclaimed where their tower stood. Unfortunately, their existing 850 MHz STL wouldn't work with the new transmitter location due to a hill being in the path and they weren't able to install a big grid pack antenna to the

new tower as they were collocating with existing broadcasters.

As a result, there was going to have to be a two-hop link to get to the new transmitter site, and there weren't any extra STL frequencies available. They installed a two-hop 5.8 GHz Ubiquiti link — the first hop is 8 kilometers/5 miles and the second is 3 kilometers/2 miles.

It's a small Axia Livewire facility. When I was brought onto this project I recommended running Livewire over the Ubiquiti link and installing their Omnia One processor at the transmitter site.

This was reasonably successful, except that they were suffering from interference at times with the 5.8 GHz link.

So an alternate backup path was needed in order to achieve the stable signal that they desired. We tried 4G in the short term, but data plans would be prohibitive for the station in the long term. The transmitter site was hard to get an internet connection to. Like most transmitter sites it was a bit remote, but we eventually were able to get an ADSL connection installed with limited bandwidth and differing amounts of latency. Due to the station having limited funds, we tried multiple cheaper codecs over nine months, but unfortunately due to the ADSL conditions, it proved difficult and we were not getting the results that they needed. Fortunately, the station had applied for a local government grant for codecs, and they were awarded it.

Because of the ADSL conditions, I recommended Telos Z/IP One IP codec, which I have used extensively for backup paths and program distribution with Hope Media. The Z/IP Ones are great because of the Agile Connection Technology (ACT). It adapts to the connection's conditions, you can set a minimum and maximum bitrate and also a minimum and maximum buffer. It will try to use the highest quality bitrate and lowest buffer, but if packets start dropping it will increase the buffer or reduce bitrate, all on the fly.

Since installing, the Rhema Central Coast connection has been rock-solid, running at AAC 320 kbps without any dropouts, and they couldn't be happier.

For information, contact Cam Eichler at The Telos Alliance in Ohio at 1-216-241-7225 or visit www.telosalliance.com.

TECHUPDATE

ZWCOM INTRODUCES MM04C

Zwcom says its new MM04C AoIP codec is a one-stop solution based on know-how the company gained through its work on the MM01 codec and MM08E encoder.

Developed for STL and SSL applications, the unit is designed to ease a broadcaster's daily cross-media tasks.

Equipped with four channels, the point-to-point or point-to-multipoint codec offers compatibility to all interfaces and supports a range of protocols for streaming, control and status. These include EBU Tech 3326, AES67, Ravenna, Livewire+, Dante, SMTE ST 2110, PTPv2, RTSP, SAP, SIP, Discovery, Bonjour, SNMP, HTTP, HTTPS, FTP, FTPS and Ember+.

Furthermore, the exchange of additional information such as GPIO and ancillary data between the audio networks is possible. Another advantage the MM04C offers is the implementation of a variety of algorithms such as MPEG and AAC (extended HE xHE, Opus, Ogg Vorbis, Enhanced aptX, Dolby Digital Plus and PCM). In addition, the unit allows users to combine audio streams to multichannel streams with one device able to generate multiple streams independently.

To simplify operation, features and applications are configurable via software. The MM04C can integrate into existing systems and third-party applications. To enhance transmission robustness, the MM04C is equipped with a flexible redundancy concept, which includes individual configuration of alternative input sources, Pro MPEG-FEC, Dual Streaming and Stream4Sure.

For information, contact Zwcom in Germany at +49-461-662830-0 or visit www.zwcom.com.



WOLD Flies Logitek JetLink

Soft codec efficiently replaces dedicated copper lines

USERREPORT

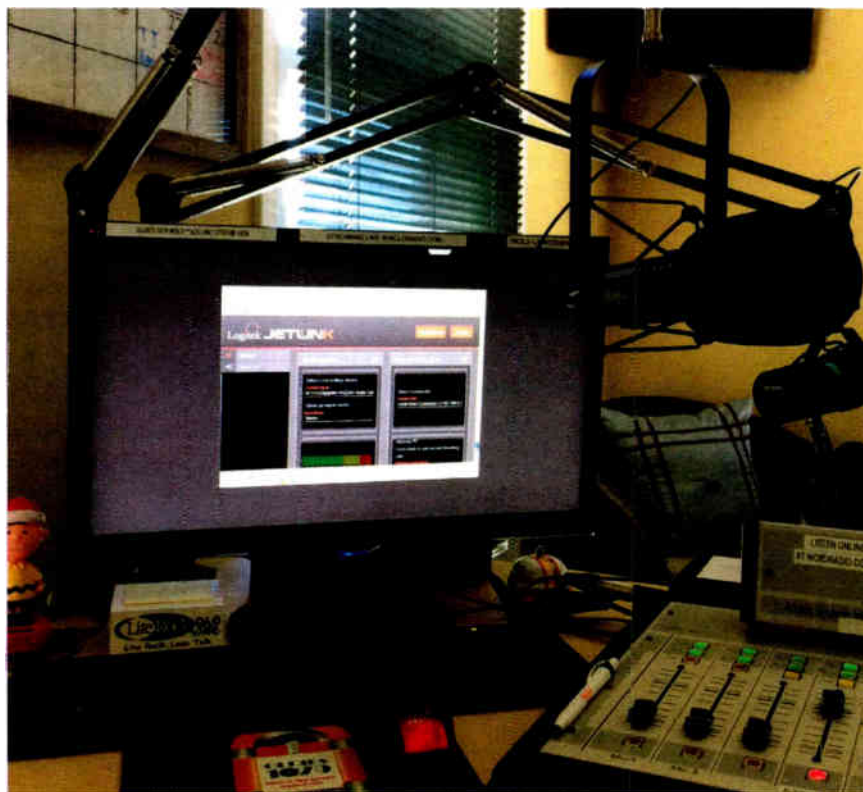
BY TOM LAWLER
WOLD(LP)
Engineer

WOODBIDGE, N.J. — Having a reliable audio path is a bare-bones necessity for any radio station. With most phone companies getting rid of copper lines dedicated to audio services (like our fractional T1), it gets even harder unless you have a clear shot for a microwave link or reliable internet to work with.

Here at WOLD(LP) in Woodbridge N.J., we ran into an issue getting any sort of connectivity at our tower site. Our studio site cannot have a tower for a microwave dish, the local phone company copper DSL line would go out at random intervals at the transmitter site, and the cable company wouldn't service our address without paying a couple thousand dollars up front to run coax. Being an LPFM, that money wasn't available to us.

SOFTWARE

We suffered through our hardware codec stuttering while I began researching a solution that would work over an LTE link, since our site has solid service from the major providers. I discovered Logitek's JetLink software codec after seeing one of their employees post about it on Facebook, and signed up for the beta. Since this was just a test, I used an off-the-shelf Dell PC and a Digigram sound-



card to make it plug-and-play, thereby replacing our old hardware codec.

So the Saturday after last Thanksgiving, we configured the routers at the studio and transmitter site (JetLink runs on our streaming PC there), and in no time we had 96 kbps audio from point to point.

Why 96 kbps? According to my calculations, 96k running 24/7 uses roughly 22 GB per month — right around the threshold where our LTE provider

throttles us during times of congestion, giving us the ability to avoid being throttled while still retaining audio quality.

This was my other gripe with our older hardware box: We were limited to MP3 as the codec choice, and the audio quality was lackluster compared to the Opus codec JetLink uses, even at 96 kbps. The better codec also allowed us to adjust our processing to better compete with all the other stations in our

area, including the flamethrowers from New York City.

We installed JetLink in the fall of 2017 and it has been our primary, and only, STL since. We haven't had any issues with dropouts setting the latency to max, which was a big improvement over our old hardware box. But what impressed me the most was the resiliency of the software — it really is set it and forget it. The only time we have had to reboot is due to extended power issues — we even tried other browser-based audio links, but they would have trouble reconnecting if there was any glitch over the connection, while JetLink would reconnect seamlessly.

Another feature I love is that since JetLink can run as a service when the machine starts up, you don't need to log into Windows for it to crank back up after a power interruption. That is helpful since our transmitter site doesn't have a generator.

I gave my feedback to John Davis and the team at Logitek as to how I liked the beta software, what was buggy and what features I would like added. They worked with me debugging sound card setting gremlins as well as adding the ability for JetLink to use a friendly URL instead of an IP — we don't have a static IP at the studio end, so I use a No-IP URL redirect to make sure it can always connect to the studio in case the router reboots.

Overall we couldn't be happier with JetLink, and thanks to the team at Logitek we're able to keep cranking out New Jersey's Greatest Hits with nary a blip or hiccup coming out of the speakers.

For information, contact John Davis at Logitek Electronic Systems in Texas at 1-713-664-4470 or visit www.logitekaudio.com.

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AoIP Evolution With GatesAir at Washington's WAMU

Intraplex IP Link codecs and Dynamic Stream Splicing technology solidify signal chain

USERREPORT

BY MIKE BENONIS
Assistant Director of Engineering
WAMU(FM)

WASHINGTON — The American University-owned WAMU(FM) has been the primary NPR member station for the Washington area since the birth of NPR, broadcasting a mix of a national content, hourly NPR news and locally-produced public affairs programs.

In recent years, WAMU has transitioned almost exclusively to IP for audio production, contribution, and distribution. This includes our AoIP studio plant, studio-to-transmitter links, and backup links to NPR's Network Operations Centers. We rely heavily on GatesAir's Intraplex IP Link codecs to ensure uninterrupted audio delivery.

Intraplex IP Link codecs provide audio connectivity to all of our transmitter facilities. Our IP Link codecs are the primary STL paths to our auxiliary transmitter site, collocated with WETA(FM) in Arlington, Va., as well as to our satellite station WRAU(FM) located in Ocean City, Md. Both sites are fed via diverse public internet links. Dropped packets are inevitable even with the most stable internet connections, but Intraplex IP Link codecs have a feature called Dynamic Stream Splicing, which virtually eliminates audio dropouts.

Dynamic Stream Splicing works by combining packets from multiple streams to reconstruct any missed audio frames. This can be done over separate internet connections, or even a single internet connection by delaying one stream by 50-100 ms and adding forward error correction (another built-in feature of the Intraplex IP Link codecs). We also use Dynamic Stream Splicing on the return path from WRAU so we know that what we hear at the station is what listeners hear over the air 150 miles away. We've been blown away at how well this feature works, and it's extremely rare that the Intraplex IP Link cannot deliver flawless audio.

FAILOVER

Another great feature of the Intraplex IP Link is the ability to set up multiple failover audio sources. These can be additional RTP streams (from a different source Intraplex IP Link device), AAC or MP3 web streams from a CDN, or even a USB drive preloaded with audio. This flexibility enables us to deliver continuous audio to listeners even in the event of audio or total primary stream loss.

Audio from our Intraplex IP codecs is delivered to AES switching networks and ultimately the audio processors located at each transmitter site. For our main site, which maintains a native Livewire path as its primary connection, the Intraplex IP provides a redundant backup via diverse links in case of interruption to the leased fiber link that conveys our Livewire connection. It's a very robust setup.

We also convey our nationally distributed program, "1A," to NPR's primary NOC in Washington and backup NOC in Saint Paul, Minn. While we still rely on legacy T1 technology to get us across town to NPR, we

are working to transition to a new standard that would utilize the Intraplex IP Link over the public internet at 256 kbps AAC to reach both the primary and backup NPR NOCs, which makes the Dynamic Stream Splicing application that much more valuable. At each NOC, IP Link codecs receive the signal and provide the same stream reconstruction service as we use at our transmitter sites.

This is a fairly straightforward operation, though once again the reliability and stability of the IP Link has proven exceptionally valuable. If the main NOC in Washington were to go down, the backup NOC in Minnesota picks up the stream to ensure an uninterrupted national broadcast. Once decoded, the signals are then re-encoded in IP Link devices for national satellite delivery.

Our most recent use of the IP Link codecs involves reimagining our main program channel streaming service. We've begun experimenting with the IP Link hardware to eventually replace Microsoft Windows-based stream encoders to deliver the audio to StreamGuys, our CDN and streaming media service provider. Like many stations, we were often faced with the typical performance glitches that come with computer misbehavior.

We believe that moving to dedicated hardware for audio encoding with the IP Link 100 will eliminate the shortcomings of a computer-based encoder. We plan to utilize the IP Links in a true redundant configuration so that our web stream remains on the air if either of our wide-area network connections is lost, or if we need to perform updates on the Intraplex IP Link hardware.

A common benefit across all of these applications is

ease of setup and use. GatesAir has made the process very simple to understand, and easy to replicate across any application. It is consistently the same process regardless of the network characteristics or type of connection.

As T1 and ISDN become more difficult to maintain and IP solutions continue to evolve, there is no question that broadcasters should aggressively complete the transition to IP. Having redundant connections will provide excellent protection, while advanced error correction and mitigation techniques in products like IP Link will ensure the best possible quality and performance for any audio contribution and distribution needs.

For information, contact Keith Adams at GatesAir in Ohio at 1-513-459-3447 or visit www.gatesair.com.



TECHUPDATE

APT MOBILE SURESTREAMER HANDLES FIELD AND STL DUTIES

The APT Mobile SureStream (MSSr), a technology from WorldCast Systems, is a mobile network access solution for live and local remotes and OBs for sports broadcasters and journalists.

The company says it improves the quality and reliability of IP audio remotes to maximize on-air time while delivering pristine, uninterrupted audio and video from the field.

SureStream works by utilizing two different LTE or 3/4G carriers and replicating the IP packets across both networks. Using toolsets and features incorporated within SureStream, the MSSr delivers broadcast audio from anywhere on any network. Some of its features are zero field-configuration for high user-friendliness and high speed and simplicity of connection, a TCP-free signal chain for optimal latency of milliseconds for real-time on-the-air broadcasting and a single hardware unit approved for all networks. The company says it is compact, light and robust, and comes in a protective bag so broadcasters are ready at all times to deliver live and local content to their audience.

WorldCast says its SureStream technology set an early precedent delivering flawless audio over affordable public internet links and is now well-established for professional AoIP STLs.

For information, contact WorldCast Systems in Florida at 1-305-249-3110 or visit www.worldcastsystems.com.



Audio Transport/STL: Codecs, Internet & Satellite

Barix Redundix Aid Vectis Radio

Dual stream technology greatly reduces audio glitches for island broadcaster

USERREPORT

BY KELVIN CURRIE
Director
Vectis Radio CIC

NEWPORT, ISLE OF WIGHT, ENGLAND

— Serving as “The island’s voice” for the Isle of Wight off the south coast of England, Vectis Radio delivers news, weather forecasts and community programming about the local economy and culture. Launched as an internet-only radio station in 2009, we went live with our first FM broadcast on 104.6 MHz in November 2017.

We faced a number of challenges in linking our studio to our 25 W transmitter, which is located basically in the middle of nowhere. The transmitter site is a rented space at a golf club at the top of a hill — a rather unusual place for a golf course, I’ll say! We could not use a direct microwave link, as the studio is almost at sea level, and part of the hill is in the way. Dedicated private circuits were cost-prohibitive, so we chose an internet-based approach.

We purchased Barix equipment for our STL encoder and decoder based on

a recommendation from another community radio station. They were reasonably priced and straightforward to operate, so we deployed an Instreamer for our studio and an Exstreamer at the transmitter site. The encoder and decoder worked great right away, but I can’t say the same for the internet con-

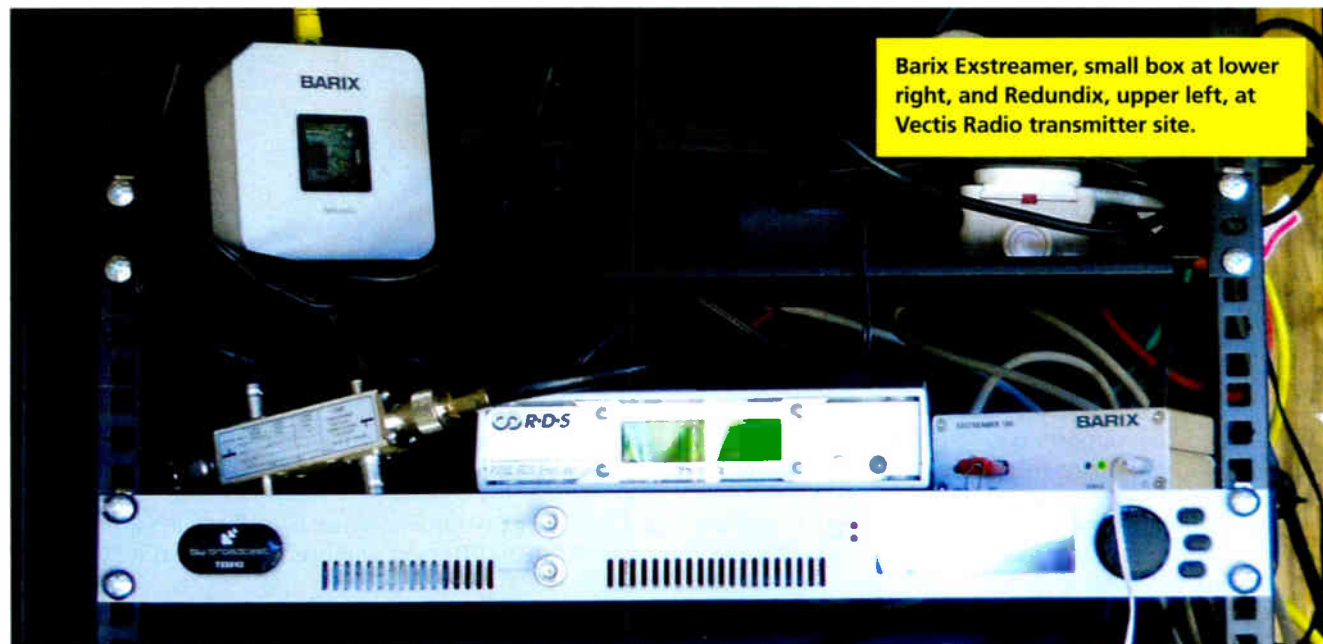
nectivity between them.

The internet service provider we use at the studio is reliable but could not provide a high-speed connection at the transmitter site, as it’s so far from any main communications highways. The local ISP near the transmission site put in a short microwave link to the trans-

mitter, but like any such link, it is subject to issues like packet loss and rain fade. Those turned out to cause a lot of headaches for us.

Our on-air signal has suffered from sporadic, unpredictable audio glitches. Working with Barix support and Andrew Nordbruch, the managing director of local IT consultancy Wight Computers Ltd., we identified the cause of the glitches as significant, irregular packet loss on our internet link.

The packet loss varies considerably



Barix Exstreamer, small box at lower right, and Redundix, upper left, at Vectis Radio transmitter site.

TECHUPDATE

MOSELEY STARLINK TRANSPORTS FOUR STATIONS ON A SINGLE STL FREQUENCY

Moseley Associates says its Starlink SL9003QHP-8SLAN overcomes overcrowded 950 MHz STL channels in any market by concentrating multiple stations on one licensed 950 MHz STL frequency.

This new eight-channel Starlink features four stereo audio streams and a one-way Ethernet channel for HD Radio. The model is suitable for group owners of multiple stations in one market with collocated studio and transmitter sites;

AM stations adding one or more FM translators to a common site; and HD1, HD2, HD3 and analog discrete audio streams.

Moseley says the Starlink SL9003QHP-8SLAN is suitable for main or backup service and touts its cost when compared to several individual single STL links.

The eight-channel model features AES and analog I/O. Choices of audio coding from linear uncompressed to AAC compression provide flexible bandwidth usage while delivering clear digital audio. It sports metering, diagnostics and control of parameters from the front panel and as well as a web browser interface and SNMP for networked monitor and control. Starlink 950 MHz models have a new 5 W power output for what Moseley describes as improved robustness in challenging RF environments.

The open architecture offers customization and adaptability to changing requirements and technologies. It is user-reconfigurable from two to eight channels with no additional purchases necessary.

Moseley says it offers wireless solutions from 9.6 kbps to 3 Gbps covering the 250 MHz to 90 GHz spectrum for point-to-point and point-to-multipoint applications for the broadcast, carrier, broadband enterprise and service provider marketplaces.

For information, contact Moseley Associates in California at 1-805-968-9621 or visit www.moseleysb.com.



for no good reason. Weather does play a factor, as we get more packet loss when it’s very windy and rainy, but we’ll sometimes experience a great amount of loss even in clear conditions. The problem was so erratic that the ISPs were unable to resolve it for us.

Barix offered to let us test their new Redundix product, and we jumped at the opportunity. Redundix is designed to avoid such audible glitches by repairing lost RTP packets in the stream. It can do so using temporal redundancy on a single network link, and/or by sending a redundant stream over a second path.

With just one connection, we chose the former approach. A Redundix unit at the studio sends the 128 kbps MP3-encoded RTP stream from our Instreamer twice, once with a time delay; the second Redundix at our transmitter

(continued on page 34)



TECHUPDATE**DIGIGRAM IQOYA *X/LINK OFFERS FLEXIBLE OPERATION**

The Iqoya *X/Link from Digigram is a 1U rack audio codec for the delivery of one or several audio programs over IP networks. The unit can be used in legacy analog and AES/EBU audio infrastructures, as well as in full-IP infrastructures, thanks to the support of Livewire, AES67 and Ravenna technologies.

Using Digigram's FluidIP technology, Iqoya *X/Link provides for the transport of audio content over managed and unmanaged networks and for continuity of audio service on transmitter sites.

According to the company, unique features include its four RJ-45 network ports, allowing for the integration into full IP infrastructures (full separation of IP traffic: AES67/Ravenna, dual streaming on WAN, control). The multi-encoding and multiprotocol streaming lets users stream a radio program simultaneously to transmitter sites, DVB multiplexers — MPEG-TS/IP, web radio CDNs — Icecast/Shoutcast and other studios.

The system can support up to 16 I/O channels (four analog I/O channels, four digital I/O channels on AES/EBU, and AES67/Ravenna I/O channels) and has a full AES/EBU transparent transport through PTP or external 10 MHz synchronization.

Iqoya *X/Link is based on a low-consumption, fanless dedicated hardware platform powered by two redundant power supply units. It features four analog audio I/Os and two stereo AES/EBU I/Os, and supports synchronous AoIP I/Os (Livewire, AES67, Ravenna).

The unit supports one to eight stereo I/Os, and allows for multi-format and multi-protocol encoding and streaming of each audio source. The four network ports allow for the separation of IP traffic: control and monitoring, redundant dual streaming through two network paths, and synchronous AoIP (Livewire, AES67, Ravenna).

The Iqoya X/Link range also includes the X/Link-LE, X/Link-Dual and X/Link-AES67.

For information, contact Digigram/Point Source Audio in California at 1-415-226-1122 or visit www.digigram.com.

**BARIX***(continued from page 33)*

effectively merges the two into a single "healed" stream. Working together, Andrew and I determined the optimal time delay to be 800 ms. That introduces a bit of latency, but we can live with it to give us stable, high-quality delivery.

The Redundix units work well and clean up the transmission considerably. Our packet loss is severe enough that we still get glitches on occasion, but Redundix has eliminated at least 90 percent of them, and the glitches are significantly shorter as well — to the point that most listeners won't even detect them. If we have the money in the future, we may add an ADSL link to the transmitter site as a backup and enable Redundix's path-based redundancy as well, which I expect would eliminate the few tiny remaining glitches.

The Redundix interface provides a lot of valuable information about our network connectivity, and I love that I can access all of the Barix boxes — the Instreamer, Exstreamer and both Redundix units — through web-based interfaces. As the sole technical guy for the whole station, being able to troubleshoot any issues remotely from home is convenient. But the Redundix units themselves have helped us overcome our biggest issue, minimizing the impact of network packet loss and thus improving our audio quality for our listeners.

For information, contact Will Schmidt at Barix Technology at 1-866-815-0866 or visit www.barix.com.

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TECHUPDATE

AETA μSCOOP SIMPLIFIES STL TASKS

AETA's μScoop full-duplex IP audio codec, available with analog or digital input/outputs, is designed to utilize IP connections over wired IP networks.

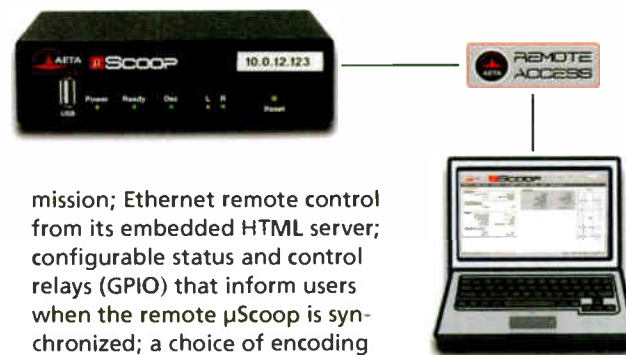
Two types of packet duplication functions ensure transmission. This, says AETA, makes it possible to improve the resistance to packet losses, thus increasing connection reliability.

The auto redial feature lets users configure the number of redial attempts in case of a con-

nection loss along with a waiting time before each attempt. If the link is dropped, the codec relaunches the call and sets the link up again. This feature is also effective in the case of a power failure, with μScoop recalling the remote unit as soon as it restarts.

Thanks to the new AETA Remote Access feature, μScoop can now be controlled remotely and in real time via the internet. The system relies on using a remote access server as an intermediary between the codec and the control device. It allows the user to access the embedded html servers of the codec, and thus to control all the settings and parameters of the codec in real time.

In addition, μScoop features multicast trans-



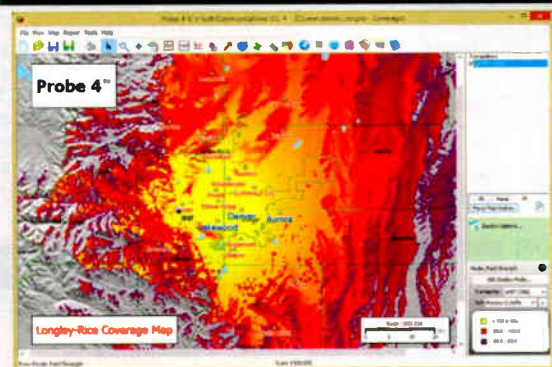
mission; Ethernet remote control from its embedded HTML server; configurable status and control relays (GPIO) that inform users when the remote μScoop is synchronized; a choice of encoding algorithms including Opus and MPEG AAC; and SIP or direct RTP modes.

For information, contact AETA Audio in France at +33-1-41-36-12-01 or visit www.aeta-audio.com.

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MISCELLANEOUS

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Radio broadcasts of Major League Baseball, NFL, and some college football games that are on cassette tapes, approx 100 to 125 games, time period of entire collection os from the 1950's - 1970's, BO. Must purchase entire collection. Contact Ron, 925-284-5428 or ronwtamm@yahoo.com

WYBG 1050, Messina, NY, now off the air is selling: 250' tower w/building on 4 acres; collection of very old 78s dating back to 1904; 12' satellite dish on concrete base; prices d rastically slashed or make offer. 315-287-1753 or 315-528-6040.

WANT TO BUY

Collector wants to buy: old vintage pro gears, compressor/limiter, microphone, mixing consoles, amplifiers, mic preamps, speakers, turntables, EQ working or not, working transformers (UTC Western Electric), Fairchild, Western Electric, Langevin, RCA, Gates, Urei, Altec, Pultec, Collins. Cash - pick up 773-339-9035 or ilg821@aol.com.

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I'm looking for KFRC radio special of Elvis Presley which aired on January 8, 1978. I'd be willing to pay for a digital copy. Ron, 925-284-5428.

I'm looking for the Ed Brady radio show in which he did a tribute to Duke Ellington, the station was KNBR, I'd be willing to pay for a digital copy. Ron, 925-284-5428.

I'm looking for KTIM, AM,FM radio shows from 1971-1988. The stations were located in San Rafael, Ca. Ron, 925-284-5428.

I'm looking for San Francisco radio recordings from the 1920's through the 1980's. For example newscast, talk shows, music shows, live band remotes, etc. Stations like KGO, KFRC, KSFO, KTAB, KDIA, KWBR,

KSF, KOBY, KCBS, KQW, KRE, KTIM, KYA, etc, I will pay for copies... Feel free to call me at 925-284-5428 or you can email me at ronwtamm@yahoo.com.

Looking for a broadcast excerpt of a San Francisco Giant's taped off of KSFO radio from 1959, interviews with Willie Mays, Dusty Rhodes & some play by play excerpts, also features a homerun by Willie Mays and Felipe Alou stealing second base, running time is 18:02, also looking for SF Giants games and/or highlights from 1958-1978 also taped off KSFO Radio. Ron, 925-284-5428 or ronwtamm@yahoo.com.

Looking for KFRC signoff radio broadcast from 1930 Andy Potter, running time is 0:22 & also the KLX kitchen the program guest is Susanne Caygill, a discussion of women's affairs with a long promotion for Caygill's appearance at a local store. Anne Truax, Susanne Caygill, running time is 13:44. Ron, 925-284-5428 or email ronwtamm@yahoo.com.

Looking for KSF radio shows, Disco 104 FM, 1975-1978. R Tamm, 925-284-5428.

Looking for KTIM FM radio shows from 1981-1984 if possible unscoped. R Tamm, 925-284-5428 or ronwtamm@yahoo.com.

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Schnader telecriptions 16 mm musical films produced in the early 50 s. Bill Cook, 719-684-6010.

Standard Short-tune series. Bill Cook, 719-684-6010.

(2) LPFM radio stations for sale, located in the NW part of central Florida on the gulf coast, covers the county, get out of the cold weather, come to Florida, call or write for particulars, 352-613-2289 or email boceey@hotmail.com or Bob, PO Box 1121, Crystal River, FL 34423.

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I Don't Need Special Status, Just Give Me Access

We broadcasters need to check our egos — we are not “first responders”

BY DAVE KLINE

After reading the Chris Imlay commentary “Are Broadcasters First Responders? Let's Not Confuse Roles” in the May 9 issue, and the counterargument laid out by Rod Ziegler in “Yes, Broadcasters Are First Responders, Volunteer Fireman Argues” in June 20, it seems to me that Mr. Imlay presents the more convincing argument for designating broadcasters as something other than first responders.

While I agree that there needs to be a way for broadcasters to have access to their stations in times of emergencies, I think it a bit presumptuous to conclude that those in our profession rise to the same level as our men and women in uniform, be they military or civilian.

My daughter and son-in-law both worked in law enforcement as cops on the beat in the Denver area. There was not a night that I didn't go to bed and wonder if that phone call — the one you never want to get — would come in the middle of the night. Do your loved ones lose sleep over you for the same reason?

Those who walk the walk and have earned first responder status put their lives on the line every day. In a typical day, how many times have any of us had to rescue someone from a burning fire, apprehend an armed and dangerous criminal or bring someone back from the brink of death?

I want to be clear that I have the utmost respect for those who serve as volunteer firefighters. You provide a vital service to your community. But this is not about what someone does outside of his or her day job.

If you take a hard look at the real motivation behind getting back on the air, would it be about disseminating emergency information, or is it about something else?

Regardless of the reason a station is off the air, we will do whatever we can to restore things to normal. Broadcasters are generally self-motivated in their response to a station outage. It's in our nature to want to restore service as quickly as possible. But are we more deserving of some special status that elevates us to the same level as someone who is personally and directly responsible for saving lives and property? I think not.

There is a need, however, to access our stations more easily at times like this.

A type of “first informer” status that allows us into areas that otherwise would be off-limits is appropriate. I support the idea that we are “essential service providers” and that we need to have some means to access our stations in times of disaster.

But this should assume that the station is making itself available to disseminate real-time information that can make a difference to the community it serves. Just continuing normal programming and parroting EAS alerts does not, in my opinion, meet the standard of first informer status.

I've been in broadcasting for nearly 45 years and involved in EAS in my community. I spent many years as a ham radio operator providing communications for first responders during and after emergencies.

I also spent many years as a weather spotter, eventually becoming an assistant emergency coordinator for our county ARES group and rewriting our emergency procedure manual. In 1988 my spotter report confirmed the observations of a law enforcement officer and triggered the sirens for the tornado that eventually ravaged

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My Experience With First Responder Status

There are good reasons that engineers should be considered “response” personnel

BY DAVID SEAL

I want to clarify the status of broadcast engineers as to emergency responder status. I have some knowledge about the subject, at least as someone who: lives or work in the state of Indiana and is a member of the Indiana Broadcasters Association; works as an engineer or IT professional responsible for the continued transmission of their designated stations and, by extension, the EAS system; and has completed the required training and seminars provided by the IBA, Department of Homeland Security, Indiana DHS and Federal Emergency Management Agency, as outlined and required by Indiana law.

These requirements being met qualifies a person to be present during an emergency, but only in the capacity of keeping the EAS system and their relevant facilities on-air. In Indiana, someone who has met all these qualifications is also issued a card by the IBA for status ID, similar to the old one of mine shown here (page 39).

This applies to federal, state and local emergencies of all types. A good example: It assures the right to freely travel the roads during a snow emergency, which is the most common type declared in my work area.

We had to pass about four hours of online training and testing before the initial seminar, just to qualify to attend. The seminar was held at the Peru Ivy Tech campus in 2015. Representatives were present from the state police, IDHS, DHS, FEMA and the local sheriff, who also served as the area's EMS director. There were approximately 45 broadcast chief engineers, assistant engi-

neers and several IT engineers in attendance.

Some discussion in the seminar focused on issues you might not expect. All of the agencies wanted assurance that the engineers themselves were going to be the only ones at the scene of an emergency. Their biggest fear was that they would be exposing themselves to GMs, reporters, live video or any “coverage” at the site of a potentially chaotic and dangerous scene. Besides the obvious PR problems, they were most concerned with the liability of entrance to a site by untrained people with no business being there.

The engineers all laughed, including me. The GM on-site at a transmitter meltdown? An engineer's worst nightmare — not likely to happen.

WHY RESPONDERS, NOT INFORMERS

The status of “emergency responders” over “first informers” was conferred upon us after that seminar, by said agencies, due to these facts:

1. Many broadcast engineers are going to be the ones who first know about an emergency. A weather emergency, for example, would often be first noted by engineers when their transmitters go off the air or onto backup power during the weather event.
2. They will often be on-site *before* an emergency can be declared. That is because the “machines” can call them for assistance when there is a problem. A typical engineer drops whatever they are doing and goes immediately to the site.
3. When asked how many of us were on 24/7 call-ins, every single engineer raised their hand.

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KLINE

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much of Council Bluffs, Iowa. That was on a Friday afternoon. I spent the balance of my weekend doing damage assessment work for the Red Cross and FEMA. I had unencumbered access in areas where I wasn't sure I really wanted to be driving — for the simple reason that I had ham radio plates on my vehicle.

I have some experience with the importance of easily recognizable access to areas affected by disaster.

Folks often refer to me as the station's chief engineer. I will correct that, reminding them that I am the designated chief operator. I tend to avoid the term engineer when referring to myself. And while many of us are more than technicians, not all of us have actually earned engineering degrees. I prefer to call myself what I am: a technician. I do so out of respect for those who have done the work and earned the degree. I don't need special status that might confuse what I do from the important work of others. I just need the tools to do my job. Likewise, I don't think we need to confuse the issue of who is a first responder. First informer access is the right tool for this job.

I do support the idea of some kind of first informer designation so that we can do what we need to do. But we must be realistic about this. Calling ourselves first responders is just not what we are about.

Mr. Imlay learned that lesson the hard way and from the very people he represents. I don't think this is splitting hairs at all. Let's focus on being what we are and not worry about what many of us are not.

Let's check our egos at the door before we head out to do the job we would normally do anyway. When it comes to restoring communications in the face of a disaster, there is really no room for any of that.

The author is chief operator of UNO-TV, Mav Radio, KVNO licensed to the University of Nebraska at Omaha.

SEAL

(continued from page 37)

4. When asked how many of those midnight calls were from an automated machine at a studio, facility or a remote transmitter remote site, every engineer raised their hand for "always."

5. If an engineer isn't there when there is a problem to make the station work, the closest source of an EAS broadcast to said disaster cannot be used to declare a local public, state or even national emergency in the first place.

6. Great emphasis was put upon the public EAS system, how the engineers actually "own and operate" this system and are the ones directly responsible for its continued and accurate response to a wide variety of emergency situations.

If you really want the scoop, Gwen Piening, former director and lobbyist for the Indiana Broadcasters Association, is the one to ask. Now retired, she is the one who shepherded the laws that put this system in place. We engineers all miss Gwen — she is a force of nature.

Comment on this or any story. Email radioworld@futurenet.com with "Letter to the Editor" in the subject field.



This was the ID David Seal was issued after he completed was in the "First Class" of broadcast engineers to receive these IDs.

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READER'S FORUM

OLD-SCHOOL BROADCASTING

There are those among us who can be really considered broadcasters. They've been "radio-active" all their life. From being behind the mic to building a station, they've done it all.

One of those people is Garry Brill, who celebrated six years as host of "Juke Box Saturday Night" on KPRL in Paso Robles, Calif., this past Memorial Day.

Garry got his start in the late '50s. He did a tour in Vietnam hosting a show on Armed Forces Radio. He and his wife Virginia later brought Atascadero, Calif., its first hometown radio station.

Now in semi-retirement, he plays the oldies of the '50s, '60s and '70s every Saturday night from 7-10 pm,

and he does it "old school," playing the original vinyl and threads the music together with the familiar story-line patter DJs used. No "time and temperature" liner cards that passes for the human presence in so much of today's robotic radio.

I joked with him that this was probably his longest DJ gig at any station knowing how DJs never stayed too long anywhere. There was always another market to conquer, another adventure. His reply was "You're right. Too many people think of radio as a computer. They missed all the fun!"

Want to hear how "old school" radio is done? They stream the show on the web.

KPRL has its own historic right to be proud as a community fixture since 1947. I'm proud to say I was one of the original staff at KIQO Atascadero, Calif., and worked with Garry and Virginia, who also just celebrated their 50th anniversary.



Garry and Virginia Brill

Jay Alexander
Lompoc, Calif.

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