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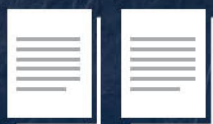
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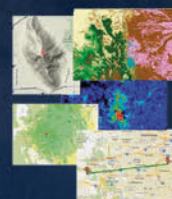
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After the masks come off



Paul McLane
Editor in Chief

There's nothing like walking into a radio station. I wrote a column about that experience years ago — about the mystique and romance, the sense of potential and creativity that I felt when entering any radio station but particularly one where I had a role to play. Similarly, few things were as exciting as opening a microphone, knowing that a big beefy transmitter a few feet away was about to blast my voice all over the surrounding countryside.

I still find the physical experience of radio to be thrilling.

However, it turns out that a radio station doesn't have to be a place.

It can be in the energy shared by a morning team. It can be in the skilled storytelling of a newsperson in the field. It can be in the personal dynamic of two sports announcers or the intimacy created between an evening talk host and her callers.

This is one of the lessons of COVID-19 that has been learned by radio people. And that lesson has implications for radio businesses and for the technologists who support them. Indeed we see it reflected in the news in late October that industry biggie iHeartMedia has adopted a hybrid model under which many employees will not return to the office full-time.

For this ebook, Radio World asked leading radio engineers to comment on how the pandemic may have changed radio workflows and radio infrastructure planning in the long term.

As you will see, many of them answered in similar ways.

Good radio, it turns out, can happen anywhere — in part because technology now allows it to be so.



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At Audacy, footprint reduction is the new normal

DTOs also continue to face the challenge of merging broadcast and IT

The past couple of years have been a time of great change at Audacy, even without considering the impact of a pandemic. Only seven months ago the company changed its name from Entercom Communications Corp. It raised its profile in podcasting by partnering with brands like HBO and Netflix, acquiring Cadence13, Pineapple Studios and Podcorn and launching 2400Sports. It launched its BetQL Network, a digital destination for sports betting content.

It also announced partnerships with Major League Baseball and American Public Media; launched 350 exclusively digital stations on its streaming platform; and in October acquired the digital audio streaming technology and operations portion of WideOrbit's business.

But radio remains a central part of its mission; and due to the 2017 acquisition of CBS Radio it is one of the two largest radio broadcasters in the United States, now with about 235 stations in 47 markets.

John Kennedy is senior vice president of technical

operations. He oversees about 150 market engineers and market IT staff. He told Radio World that the pandemic experience definitely will affect radio facility and workflow planning.

"For relocations or new buildouts, we're looking at a much smaller footprint than we would have three years ago. For instance we'd been talking about relocating one market from a footprint of 50,000 square feet down to about 25,000 to 30,000. That was in February of 2020. The project was delayed; now we're revisiting it and we're closer to 20,000 square feet."

In general, he said, the number of studios in future projects will be reduced and they can be used more efficiently.

"Broadcast infrastructure is going to be significantly changed because we have production people working from remote locations, we have on-air people who don't need to be in the facility physically. We know that some staff will continue to be remote or hybrid workers.

"The sales team for example may be coming in only a couple of days a week; so instead of building a sales pit with 30 workstations, now maybe we'll have half the physical footprint, and a couple rows of workbenches and cubes that are used for the day on a schedule," he said.

"In future, do I need an air studio and one or two production rooms for each brand in a market? I look at a facility that we built four years ago that has five on-air studios and six or seven production rooms; if I built that tomorrow, it may have two or three production rooms. And I would have to really dive into whether I need all five on-air studios at this point."

Technical managers also will continue to face the challenge of operating enterprises that demand a unique combination of broadcast and IT skills.

Audacy uses Axia infrastructure and WideOrbit automation in its studios, and Kennedy said that for the longer term, he and the company are keeping an eye on the possibilities raised by virtualization and cloud management, without having immediate plans for major adoption anytime soon.

Yet team members increasingly need to be fluent not only in audio, RF, AoIP and virtualization, but in cybersecurity, VPNs and the use of employee communication tools like Google Workspace and Office 365.

"A number of years ago we started changing titles in the markets from chief engineer to director of technical operations, because that line [with IT] increasingly was blurred. They are almost one and the same at this point." He noted that when a veteran director of technical operations in Los Angeles retired, Audacy promoted an IT manager to the post.

"Granted, he's a ham radio operator, he's got some RF background and had worked in television years ago; but his focus for the last decade had been IT. We felt that with his IT prowess and the future of broadcast infrastructure, it just made sense."

Below

John Kennedy





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Alpha Media focuses on efficiency

"It doesn't make sense to keep doing things the way we've been doing things"

Alpha Media has operations in 42 radio markets around the United States, stretching from Alaska to South Carolina, comprising about four dozen physical studio locations and 200 or so FM and AM licenses.

Director of Engineering Mike Everhart says its management and engineering leadership have been putting lessons of the pandemic into practice.

"You'll see it in future iterations of our studio builds. We're entering a right-sizing operation in the Portland, Ore., market right now; and we're looking at a move-

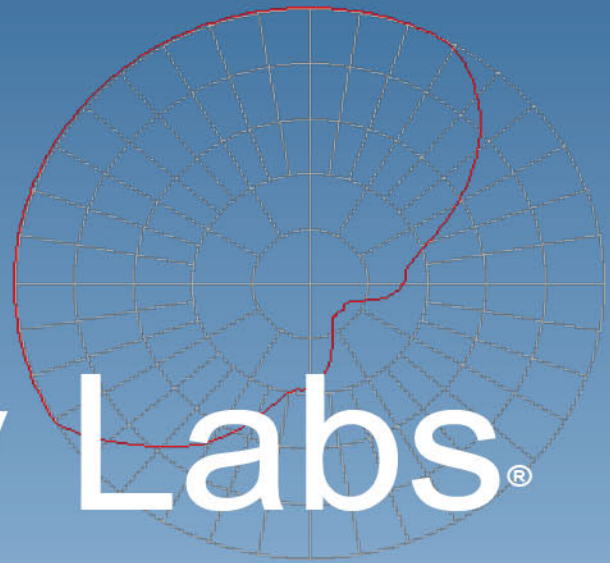
and-build in another market in the next year or so that will take a lot of those lessons into account."

The company was already heading down this road, he said, due to several factors: the cost of construction, which Everhart said has ballooned well above the rate of inflation; a general decline in radio revenue in recent years; and the possibilities that technology brings for enabling remote work and creating more flexibility in the use of infrastructure.

"Those forces have come together and forced us to rethink the way we do these facilities," Everhart said.

"We've been reducing the physical footprint. We've

Above
Mike Everhart



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been reducing studio counts. We've been looking at hoteling workspace as opposed to dedicated individual workspaces, in the office as well as the studio. A person does not have a dedicated workspace all the time."

A design principle of good engineering is to seek efficiency, he said; but Alpha Media's analysis has shown that radio stations often are inefficient in their use of space, with low occupancy rates of desks and studios. He attributes this to a cultural paradigm in which a brand's identity is wrapped up in the control room, where you build a culture to share with an audience.

"What we've found is that the culture and feel of a brand is what comes out the speakers and the feelings engendered in the audience members. It doesn't come from the space, it comes from the head and the heart of the people producing the programs."

With all that taken into account, and given the costs of building facilities and the expense of commercial real estate, "It doesn't make sense to keep doing things the way we've been doing things."

What may be different?

In the future, Alpha's regional engineering leads — Mike Everhart, Jeff Caudell and Geary Morrill — will plan a studio with the idea that it may serve four or five different functions during a day.

"You design for ultimate flexibility. With an Axia or a Wheatstone infrastructure, that work surface can be a production surface, it can be a voice tracker or a live on-air board. Or you can move the on-air operation into a virtualized environment, where people can operate all of those controls from home if they need to."

The audio plant itself is changing, with significant portions being virtualized. "I don't know that we're ready to consider virtualized automation or mixing engines yet, but I think that's coming as the connectivity continues to improve."

The cloud brings options, too. "When you're working with a cloud service provider, even when you're working in a radio studio you're working remotely. It doesn't matter where you physically are. And it reduces the amount of remote access management and risk that we take as an enterprise, because we don't have to poke holes in our firewalls for people to get into a service that we host hosting at our facilities. They're going to a Google or Amazon Web platform that is hosted for us."

He points out that the internet increasingly is used as a viable studio/transmitter link.

"There is enough speed and redundancy available in the public internet that codecs to the transmitter are acceptable as a primary STL. In some cases it's the only path available; and it's the most expedient in a short-

notice situation. If that's acceptable, why isn't switching and processing in the cloud acceptable? It probably is."

His team is rethinking other aspects of the process.

"We've already made the shift from linear to file-based workflows. Now we're taking a look at the real-time elements of what we do. We're so used to going into a room and speaking into a microphone, stacking elements to be played by automation in a given space in a given time. We don't have to think that way anymore. It opens possibilities for how these programming segments are contributed and offered out to the listener."

We've already made the shift from linear to file-based workflows. Now we're taking a look at the real-time elements of what we do.

The TOC infrastructure changes considerably too. With so many remote contributors, the number of codecs and codec connections at a given operations center have increased.

"Jeff, Geary and I spend a considerable amount of time trying to envision what the operations center of the future will look like. We try to come up with a standard studio layout and a standard NOC layout. What we find is that the target is moving constantly.

"But it's an exciting time. These changes are as big as some of the technology shifts we've seen in the past, like when solid-state devices first became available."

Everhart says the one word that keeps coming up in Alpha Media's conversions is "local."

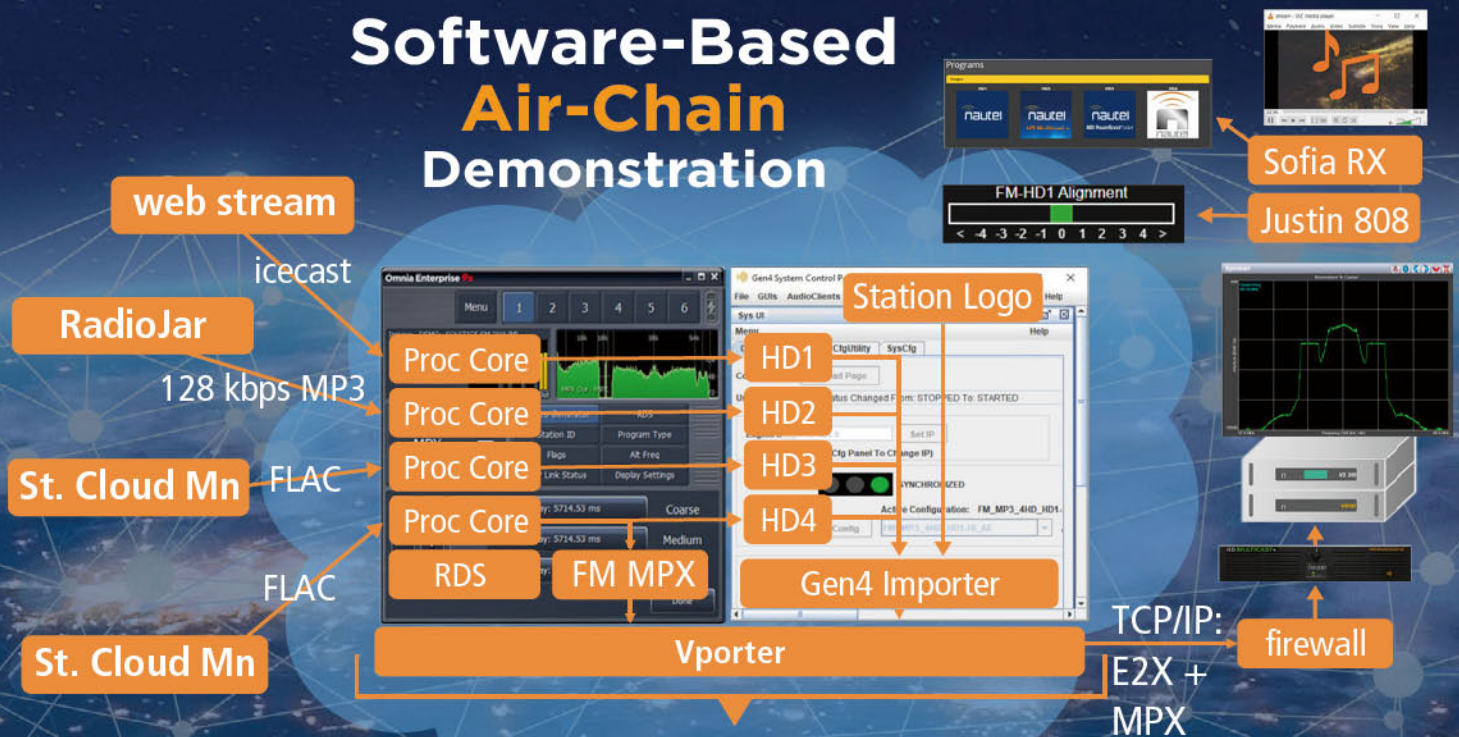
"How do we maintain that strength in the face of the increasing flexibility, the technology and the economic temptation to standardize across multiple stations? If you're just a jukebox, you're competing with streaming services, and that's a battle you lose."

Localism, he concludes, is one of radio's greatest strengths. "Radio does that better than any other media."

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Expect smaller booths and more centralization

Gélinas: "Codec systems and even the internet are way more reliable than they've ever been"

"My personal opinion is that standard radio, the way it's been operating for the last hundred years, is changing, and we've got to see things in a different way. Because

ultimately what's important is what's delivered to the listener, not the way you make it happen."

So says Pascal Gélinas, director of technology for Cogeco Media in Montreal. He questions whether studios will even be needed in the future; and coming out of the pandemic, he expects the industry to challenge its familiar models.

"Just because you're a radio station in a specific city, does it mean that you have to produce in that city? Does it mean you have to go on-air from that city?"

If he were setting out to launch a station, especially in a smaller market, he would think hard about the benefit of having studios at all. "Really all you need is to pick up the feed from a microphone, which could be anywhere, and your host could be at home. The pandemic proved it to be possible. It's reliable. It's working now. Codec systems and even the internet are way more reliable than they've ever been."

He doesn't mean audio necessarily will be fed directly from the talent home to the transmitter. "Maybe there will be an operator somewhere who does quality control on the air feeds, with a rack of equipment somewhere and a sound card or AoIP, and feeding it to the transmitter. But the model of radio stations, with eight people including a producer and the air talent all sitting together in one studio — that model could change easily."

He acknowledges that show teams generally prefer to be in the same room, to create a mood and play off one another. "But we've seen that it's possible to do it. I don't think we need to buy studios anymore. Or it could be just really small booths. Smaller booths and centralization should be the key."

Cogeco owns 23 radio stations across the province of Quebec, including the highly rated 100 kW talk station 98.5 CHMP(FM) in Montreal. The company has approximately 50 studios and 800 or so employees in total. It uses

Wheatstone surfaces and AoIP infrastructure, with a combination of Tieline and Comrex codecs, and Dalet and WinMedia automation systems.

COVID-19 has accelerated change in other areas of the business.

"Just as an example, we used to use printed bills and had to sign them manually. I'd been pushing management to make the whole process digital but it never happened. And then COVID-19 came, and it took literally like three days to do it.

"Cogeco Media is not the only company like that; it's all across the industry. Similarly, in one day we had to install 25 or 26 codecs at our announcers' places. If we had tried this a few months earlier, the engineers would have said, 'Uh, we don't have time, it's not enough notice.' But in 24 hours, those 26 codecs were installed."

As technical managers look ahead, he said, the importance of IT training will be more important than ever.

"Our broadcast infrastructures have been fiber optic. I'm pushing AoIP as much as possible. We got rid of the Krone blocks, all of those terminal blocks and cables. Now it's network protocols as opposed to analog or digital audio. You have different types of audio over IP, different protocols and different standards," he said.

"I don't know if this is a challenge for other people in the industry, but for us it's really hard to find new people, because they're either IT or they're broadcast — and even the traditional broadcast is disappearing, you don't see schools that does teach it. Broadcast is a specific mindset; and IT people don't have it. So you have to find a way to make things happen with the staff you have."

Below
Pascal Gélinas



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Burk: Remote management is a tool for our times

The pandemic placed new emphasis on remote access and remote site management systems, according to Peter Burk, president of Burk Technology.

"Today, many devices at the transmitter site include an IP interface," he said. "We have expanded our coverage of non-traditional I/O, and engineers are leveraging our systems to monitor and control a much broader range of equipment. We see working remotely continuing to grow in the post-pandemic environment."

Burk said the company has experienced increased client interest in remote site access for all levels of management, not just engineers.

"This has driven the need to tailor access rights for monitoring and control channels based on user roles and authorizations," he said.

Above
Peter Burk in
his remote-
controlled
observatory.

"We are also seeing increased deployment of Network Operations Centers to improve management of engineering resources and reduce reliance on on-site activities. NOCs don't have to be physical facilities but can be distributed across multiple offices and home-work locations."

Burk said this has proven valuable when backup NOC operators need to come online quickly, and even to allow on-the-job quarantine.

Current technologies also mean that NOC operators can now look more deeply into the cause of problems at their sites and dispatch technical assistance more precisely, he said; having better site data allows field engineers to respond quickly with the appropriate resources.

"Late-night trips to the transmitter to perform routine testing have given way to automated testing using Jet Active Flowcharts. Engineers can review the results in the morning."

He adds that the Burk Arcadia system has, in a sense, come of age during the pandemic.

"We are currently deploying Arcadia with both large and small radio and TV groups and find that it just naturally fits the pandemic requirements. Engineers and managers can access all their sites via their smartphones or tablets, based on authorization profiles. NOCs, both physical and virtual, share a common communications and database infrastructure that allows coordination of NOC activities regardless of each operator's location."

Flexible control

Asked about the role of cloud in radio installations, he replied, "Cloud solutions allow stations to focus on the business of broadcasting without the need to develop and support complex data centers. On the other hand, many broadcasters prefer to have everything 'on their own soil.' At Burk we support a wide range of network topologies, with Arcadia installations running on AWS Virtual Private Cloud instances as well as on physical and virtual on-premises servers."

As for the extent to which radio is shifting from capital expenditures to buying its services on an operating-expense basis, Burk says he has seen some of this, as with cloud-based system deployments, but probably not to the extent reported in the broader IT industry.

Meanwhile, network security has become a top priority for broadcasters at the same time the pandemic has driven demand for greater and more flexible remote access.

In addition to recommending best practices such as the use of firewalls and VPNs, Burk continues to implement security features across its product line.

"ARC Plus now uses data link encryption and HTTP request filtering to enhance security," he said. "Arcadia web links are encrypted and secured using Transport Layer Security (TLS) with users authenticated via Microsoft Active Directory or AD LDS. Each user's access is limited to specifically authorized sites and channels."

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At Salem, learning to think virtually

Mission-driven broadcaster manages for efficiency and explores its options

Scott Foster has been with Salem Media Group for 22 years. He remembers learning early on that when it comes to new facility projects, the company's mission is more important than the money.

So where another company that bills \$25 million a year in a market may have the luxury of spending \$3 million to build a studio cluster, Salem's team typically must plan around significantly smaller numbers.

Salem owns about a hundred stations in roughly 35 markets, including most of the largest cities. Some carry

teaching and talk programs that are purchased by Christian ministries; much of this content is delivered to Salem via IP using XDS receivers from ATX.

Other stations carry Salem's conservative talk format, distributed through Westwood One to XDS satellite receivers. And in major markets, Salem FM stations carry the company's Fish format.

Efficiency was already a byword. "We have found that when we get several stations together, we can leverage the same salesforce, the same production force and board ops. Where another company with a three-station market might build 10 or 12 studios, we probably have five or six."

In the long term, the company wants to downsize space further (though regional NOCs are not in its plans). And while remote work will grow, at least some in-person work will continue. For example, engineers and operations managers generally need to work on site. And sales teams benefit from the camaraderie and competition of working together.

But Foster expects that more air talent will work remotely and that future facilities will involve fewer studios, fewer seats and more "flex" space.

Even 20 years ago, before virtualization was a thing, Salem was thinking about operating lean. It would install a "station in a rack," with Broadcast Tools switchers stacked on one another.

"We started it in Seattle; we had four radio stations there using five or six studios, all of which showed up on the switcher. When a studio went live, it was brought up on the switcher; when we didn't need it, it was a satellite-driven."

Those stacks of switchers, of course, are gone now. Foster recently managed a buildout in Washington and says, "I have one 25-pair Cat-5 and four punchblocks in that entire facility. Everything else is patch blocks, a biscuit box with network connections in it."

Efficiency also means careful management of how rooms are used. Salem has many clients who come in and record half-hour shows on various topics, so even before the pandemic, scheduling was important, and only more so now.

"Nothing is worse than having [company executives] Dave Santrella or Ed Atsinger walk through a facility and see seven studios but four of them are dark with nobody in them. You're wasting rent, you're wasting capital. So we're on a drive to shrink and push staffs to optimize the usage of their facilities."

Exploring virtualization

Thinking centrally has been a long-term trend.

Until the early 2000s IT functions were managed locally at each Salem cluster, but this left the company vulnerable to security issues, so it began standardizing and consolidating back-office functions such as sales and management computers, traffic and VoIP phone systems.

"I watched the IT closet in our corporate office go from

Above
Scott Foster

seven racks to one rack as they took all this stuff and they dropped it in our data centers,” Foster said.

Then about six years ago Foster read about the BBC project exploring centralized local virtual radio, called ViLOR, and was inspired.

“Our stations run the same content in 35 markets. Why do I have 35 markets running these things, 35 people babysitting them and 35 facilities to keep up — 35, 35, 35? Why couldn’t I do it with two or three and distribute it across all of them?”

He approached Telos Alliance and a project integrator in Great Britain, both of which were involved in ViLOR, to learn more. As a result Salem has performed some tests of virtualization in a “sandbox” project that involves a console engine, automation and codecs in Dallas that are run virtually through a data center and can be controlled from Seattle.

While this is a beta concept right now, Foster expects that Salem will continue to move in that direction.

“We are starting to transport a lot of content between studios and transmitter sites via IP; having that infrastructure already in place is one of our stepping stones.”

Standardizing on automation is another step. Salem was using systems from four vendors, but with virtualization in mind, it settled on WideOrbit.

“We’ve virtualized in our own facilities; the machines in the rack are where the audio takes place. Machines in the studios are just a GUI interface — a Wyse terminal interface back to the rack to give feedback, to see and manipulate the log.” Most stations, he said, will use Livewire infrastructure in support of the virtualization of the automation.

“The biggest fight is the microphone delay, right? Everybody is so used to hearing themselves in the microphone. You have a half-second delay and it drives them nuts.”

But giving a flavor of what’s to come, Salem has one local talk host who lives far from his market and manipulates WideOrbit automation remotely. “He could voice track in real time if he wanted to. It’s like the studio has been extended to his office halfway across the country.”

But for now, automation resides on servers in each facility, rather than moving it to remote data centers.

“Your troubleshooting changes then because you can’t just clip leads on a wire and hear the audio; you’ve got to be able to track packets and delay.” But once the technical staff has become accustomed to working with virtualization, Foster suspects Salem will make that jump.

Workforce issues

Some broadcasters have said that the pandemic accelerated radio’s move toward workflows being built around service agreements rather than one-time capital equipment purchases. Is Salem seeing that trend?

“On the software side of things, our Adobe Acrobat and

Adobe Audition are annual pay. But the automation we’re buying outright.

“But yes I’m being asked to analyze it, and generally if we can show that it’s cheaper to do something as op-ex over four or five years, we’ll do it. But it has to pay off quickly.

“I’m not seeing it in transmitters or console systems — though if somebody like a Telos or a Wheatstone offered service via a centralized data center, it could be an interesting model. A station that reaches 10,000 people probably isn’t going to drop \$15,000 on an audio over IP system, but a manufacturer might be able to get them signed up for a hundred dollars a month.”

Interestingly, Foster even hears from vendors who offer tower lighting as a service — “Hey, for \$6,000 a month, we’ll put the lights on the tower, we’ll monitor it, we’ll do all the filings and fix them when they go bad. We just ask that you sign up for five or 10 years.”

He says this idea might be appealing if a station is looking at a 1,200-foot tower in Omaha that needs new LED lighting, in which case the engineer may have to weigh whether it would be better to pay someone a monthly fee for a predetermined number of years, or spend \$140,000 up front and bet that he can keep those new lights operational for longer than that.

One other unexpected impact of the pandemic is the difficulty in sourcing good tradespeople and working with utilities.

“I’m having a hard time finding electricians who will come wire up generators or do concrete pads. Likewise, I’ve got a major power project in Philadelphia, and PECO wouldn’t even come to the facility for a walkthrough because of COVID until just last week.”

Whether it’s for landscaping or paving a parking lot, tradespeople may just be too busy or are dealing with COVID issues of their own. Foster said it’s hard enough to locate one good vendor, much less three to all quote on a job.

“Nothing is worse than having Dave Santrella or Ed Atsinger walk through a facility and see seven studios but four of them are dark with nobody in them.”

Working with clients to manage timeframes carefully

Shively says pandemic has obliged it to stock and manufacture in a tighter format

Dale Ladner, CBT, is sales and marketing manager for antenna manufacturer Shively Labs.



How close back to “pre-pandemic normal” are most of your radio

clients now?

Dale Ladner: I believe that many of the owners and engineers have had to continue working through the pandemic, being tagged as “essential businesses,” as we at Shively did. So I am not sure that we have seen a change in contacts but certainly some hesitation in expenditures.



How will radio workflow and technical infrastructure be different compared to what it was before, particularly in the area of antennas and the RF part of the air chain?

Ladner: Shively is hopeful that post-pandemic business will smooth out. With station engineers working around rotating schedules, retirements and sadly, some COVID deaths, the amount of sites vs. engineers keeps increasing. I am expecting more maintenance and repair work over the coming year to correct issues that may have been set aside.

We are still seeing a slower quote-to-order timeframe than in years past. I would say that many of the station owners are holding back of much of the expenditures unless they have emergency or necessary projects.

When revenues come back to higher levels, perhaps we will see the trend increase towards new and maintenance work.



Do you have major projects in the works or planned, where your approach, or that of your client, has changed because of the events of the past two years?

Ladner: Absolutely. Our normal projections have been turned upside down. We are working with clients to better understand the timeframes they require and planning our stocking and manufacture in a tighter format. Internally that has given us the opportunity to revise processes and workflow systems.

Many of the projects have been delayed and some cancelled for the time being.



Above
Dale Ladner
working the
Shively booth at a
trade show.



What does a typical “hybrid” operation look like now, for a company like yours?

Ladner: Shively Labs and our parent Howell Laboratories have not stopped working throughout the pandemic. Some of the staff has had the ability to work from home over the last year.

The manufacturing and hands-on approach we have does not allow much opportunity to stay away from the plant. As a result we have been able to maintain our manufacturing facilities all along.

One of the largest factors we have had more recently is getting the appropriate materials in-house to do our jobs. Many of the supply chain companies are in a world of hurt. They are short-staffed, not receiving materials to provide parts to us and have huge delays. As well, many machine shops and specialty suppliers are having the same delays that get passed down the line.

“ I am expecting more maintenance and repair work over the coming year to correct issues that may have been set aside. ”

Diverse skill sets are more important than ever

Bohn: There are so many options out there when it comes to remote functions now

Josh Bohn says most clients of The MaxxKconnect Group are operating in person again but also continuing to employ a significant level of remote services.

"Real-time voicetracking is showing up in places it previously hadn't, as well as pre-produced shows being loaded remotely in near-real time," said Bohn.

"A lot of remote functions will continue long-term. They have discovered that you don't need salespeople sitting around a bullpen at the station when they can do the same thing from home, or their vehicle."

MaxxKconnect is a technical services company that offers wireless connectivity and high-speed internet services, and it does broadcast integration work. Bohn is president/CEO.

The remote infrastructures that his clients built out, he feels, will continue to be used in a lot of cases.

"Maybe not as a permanent, full-time solution, but I don't see companies dismantling remote studios for talent that they built, or talent themselves getting rid of their home studios. It adds a layer of versatility that radio has now fully embraced and will be utilized.

"It's also allowing broadcasters to downsize studios to save on real estate costs, and put more critical functions in the cloud."

MaxxKconnect has quite a few integration projects in the pipeline. "A lot of capital dollars were put on hold during the throes of the pandemic, and companies are reinvesting in their infrastructure."

Below

Josh Bohn at WAPR(FM) in Selma, Ala., with the station's modified Continental 816R-3C.



General COVID precautions during projects are now part of its routine, including masks, more social distancing and general handwashing.

"With more talent working from home, studio projects are typically less hectic than they were pre-pandemic. Transmitter projects, of which we've got at least five scheduled currently, haven't changed much."

Bohn, who also owns WIEZ(AM) and its FM translator in Decatur, Ala., sees more cloud solutions being employed, including at his own company.

"Recently, with the assistance of Alex Hartman of Optimized Media Group, we installed redundant VM servers and a RAID server for our MaxxKconnect Group offices and the operations of WIEZ.

"In the near future, my plan is to virtualize many of the dedicated PCs we've got in our operation, as well as the DJB Zone automation system I'm running for WIEZ." Some of his clients are working on similar setups for their back-office functions.

"We've also deployed a lot of MaxxKconnect Wireless units for remote studio setups due to the pandemic. Obviously internet access is the key component to any cloud-based solution, so multiple sources of internet are necessary. Diversification of those sources between wireline and wireless helps reduce the chances of any one failure taking out all your internet options."

So what does a typical "hybrid" radio operation look like now?

"We see them from something as simple as VNC into an automation PC and file drop to insert items, to full-on AoIP via VPN with in-studio level functionality at the remote location," he replied.

"I don't know that there is a 'typical' hybrid operation in 2021. There are so many options out there when it comes to remote functions now, it makes it easy to be picky and get what you want from the a la carte menu!"

Bohn says good engineering practice after the pandemic looks a lot like it did before the pandemic, with an emphasis on backups, connection diversity and improving reliability.

"Radio needs to stay relevant to stay profitable, and that's a struggle if you're off the air or operating in a reduced capacity," he said.

"Engineers need to continue to be more IT-savvy to understand virtualization, the cloud, network diversity and infrastructure security — and still know how to fix the old tube backup transmitter.

VPM looks ahead to its next multimedia hub

Planners try to get a handle on whether “this is the way it’s going to be”

VPM, Virginia’s home for public media, currently leases studio and office space in Richmond for its station WCVE(FM), which is branded “VPM News,” in a facility called the Arboretum.

“The lease is up in May of next year,” said Broadcast Engineer Mike Friedman. “And just like everyone else in COVID, we have hardly anyone here most of the time. So we’re going to bring the staff closer to home at our main location, 23 Sesame Street.”

Thus one more media organization has discovered it doesn’t need as much space as it used to.

Friedman said VPM — an NPR and PBS affiliate with a half-dozen radio signals plus extensive television operations — plans to build a new multimedia home in the next couple of years.

“Since we’re going into our second year of the pandemic and we’ve decided we’re going to make this move, the big question is to make certain that the vision we have during the pandemic is the same vision we’ll have post-pandemic.”

Which means Friedman has been pressing management and staff to think about whether they expect things to change again. Is 2021 representative? Or will more staff return to the office eventually? Or will even more remote operations need to be accommodated on a permanent basis?

“For example, we have a voice talent who now exclusively works from home. She ended up putting a shack in her backyard and made it a studio. Her presence at our facility now is nothing more than an automation computer and our TOC. She will not be returning.

“So I ask over and over: Is that the way it’s going to be? I need to know because we’re accounting for studio space.”

He feels fortunate that at VPM, upper management and the programming department lean on engineering to play a leading role in how workflows are designed and supported.

He’s confident that the organization will be looking to plan space for maximum efficiency.

In its next home, he said, most studios will have the capability of going on the air. “And because we’ve got some time to figure this out, we’re debating whether we even will have control surfaces in every room. We’re at the point where you can operate the station from home if necessary, full tilt — and you’re not going to need a console at home, either.”

Friedman said VPM also plans to equip one office with



sound reinforcement so that if necessary, a team member who needs to record a story but doesn’t have a studio available can use the room. “A reporter or a person with a podcast show can go in there. We’re absolutely making our rooms and studios multi-purpose.”

He said the pandemic has opened eyes to what can be accomplished from home in unexpected situations.

“Sometimes things will occur at NPR that we have to react to, maybe in the middle of the night — a program that didn’t go as planned, or silence from one of their providers. That will be much easier with our new facility because we’ll have more capability from home, even from a laptop or tablet. And for breaking news, it’s going to be great.”

Because VPM has substantial television assets, the radio

“The big question is to make certain that the vision we have during the pandemic is the same vision we’ll have post-pandemic.”

operations should be able to benefit from upgrades on the video side of the house. But decisions about how to build the new radio infrastructure also don’t need to be made for a while, he said, which means there may be even more capabilities coming later from radio AoIP and automation providers, solutions that will provide yet more options.

“We’re getting familiar with all of the technology and options out there, and we’re further refining what our needs will be at the facility as we keep evolving through COVID.”

When it comes to using the cloud, though, Friedman takes a conservative view.

“I’m fearful of what can go wrong. Even if you have two or three different pathways I still have concerns. What if there’s a compromise that affects internet over the entire planet or the United States?”

He has also been advised by at least one technology supplier that if VPM does decide to adopt a cloud-based infrastructure, it should budget for an experienced IT person on staff with high-level networking skills who can deal with unexpected situations. So for now he is more interested in solutions that allow infrastructure flexibility while keeping assets within the VPM enterprise and its IT rooms.

Another interesting potential impact of the pandemic involves the tradition of radio stations allowing third parties to use their studios, either as a commercial venture or because a national news organization like NPR needs a local facility for a while.

“We’re not getting as many of those calls now. Will people who are interviewing do their shows the same way? Or will they be using smartphones and Comrex Opal or Tieline ReportIT?”

The post-pandemic world may even create some strange bedfellows. He’s aware of at least one situation in Virginia where two commercial radio broadcast companies are in the process of moving into a shared facility as a cost-saving measure. That is sure to raise additional questions from the engineering angle, not to mention programming or corporate cultures.

In any event, VPM has a year or two to figure out its own next-generation infrastructure. But Friedman said the lessons of the pandemic — when radio people were called on suddenly to be as flexible and efficient as possible — won’t be forgotten by the VPM team.

“They will never forget. Neither will I. Let’s be prepared for the next incident, whether it be something medical, or you just need to stay home and be safe.”

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「 FUTURE 」

Pandemic highlighted the power of AoIP

Integrator Greg Dahl says considerations of remote audio are now front of mind

From Greg Dahl's perspective, the pandemic has accelerated certain trends that were already underway. For instance, as the severity of the crisis increased and as mandates from employers to work from home became more urgent, the flexibility of audio over IP systems became more evident.

"Studios that we had upgraded with AoIP consoles provided remote access to run their air product, mainly with automation, satellite and voicetracks," said Dahl, the owner of systems integrator Second Opinion Communications. Now, any discussion of new projects is likely to include consideration of expanded remote operation.

He believes that operational modifications that the industry has made in the past year and a half are likely to become permanent because of the potential cost savings.

"If you're able to operate a radio station completely from home, with close to the quality of a studio, it's a done deal. You look at the cost to build a studio vs. providing a setup that remotely would sit on somebody's desk, and it's considerably different."

A period of acclimation

AoIP systems, he said, allow such thinking. An infrastructure that is created at the time of installation

Below Greg Dahl, right, is with syndicated radio host Glenn Beck, center, and Dave Kerstin of Broadcasters General Store at the Dallas stop of the Next Best Thing tour.

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can be changed easily later. An engine that's used in the studio can also be used for remote access. Broadcasters in smaller markets can start using AoIP without having to do it all at once; they might develop a project plan but execute it over several years, and they can add remote access from home when they're ready, as long as they have enough ports in their network switch.

"That's our biggest problem. So I always recommend a 48-port network switch, not a 24 or a 10. We will always run out of ports! So you might as well put in the maximum amount for the 1U; and when you get to that 48, you can add another one with a stacking cable or load balancing between Ethernet ports."

Dahl thinks more broadcast companies will structure their assets not as full studios but as kits to be located at the homes of air talent.

"The challenge still is how to get live audio on the air while controlling it from home, without a significant

Thinking beyond the TOC

Dahl thinks more radio groups will establish hubs from which multiple markets are managed. The TV industry, he said, has used technical operations centers for years.

He still thinks of the TOC as the locus of a station's work and infrastructure. "But we may get to the point where we decide to get rid of the TOC," he said.

"We still use wireless bridges right now, which I enjoy because I can extend my AoIP and my office network out to the transmitter site and have full control. I can establish my satellite farm at the transmitter site, and the audio comes back to the studio and you can't tell the difference because it's all over an AoIP system, one that is selectable and accessible to your automation system to route satellite sources to your air product."

So the time may come when managers ask whether they need even the TOC. "Why do we need that? Just put it at the transmitter site. There are transmitters that will accept AoIP now. We're all working in that direction

— it's not just about the console. It's the entire system up and down."

Migration of systems to the cloud is another definite trend, whether it's traffic, automation or audio delivery.

"But automation in the cloud is just another source that comes into the home studio, and they can control it just as they do a console, controlling a hub with a studio engine."

The pandemic has proved that radio can do it from home and provide a quality product, without having to use overly expensive equipment.

delay. That's still what's holding us back — the amount of delay for the operator's live mic and headphones. But it's getting better all the time with the codecs we've been using, and once we get there, it's my opinion that studios will become obsolete."

Meantime, talent will have to become accustomed to working with the latency. "The on-air person has to learn to time it better, to ignore the micro-seconds of delay. It's not unlike when we starting using digital audio processors — there was suddenly a delay and we all had to adjust. We'd put in an in-house audio processor to reduce the time, or we'd back off the processor so they could listen in the studio in real time.

"Similarly, going between Livewire and AES67 there's a little bit of a time difference — but again, its milliseconds. At a recent installation we did that runs on AES67, the engineers picked up on it, but the majority of the air staff aren't aware there's a little bit of delay now. It's just re-acclimating."

Such systems increasingly are sold on the basis of licensing per seat. He said this approach has really only taken hold in U.S. radio in the past few years.

"We're used to getting 'free' tech support vs. paying an annual fee. Companies that charge such fees sometimes are chastised. But that's the direction we're heading in how we keep software up to date and how manufacturers will keep their businesses going."

Finally, Dahl said, the post-pandemic radio industry is likely to put more emphasis on video.


"We've played around with video in studios — not TV-quality with a lighting grid and expensive cameras, but for streaming. We've been playing with this for some years now, but it's getting better."

At a time when TV, newspapers and podcasting are all developing multiple ways to distribute content, he said, "The pandemic has proved that radio can do it from home and provide a quality product, without having to use overly expensive equipment."

Radio as a service is our shared future


Generali of RCS says a cloud infrastructure brings cash savings in three ways

Philippe Generali is the president/CEO of RCS.


P  How close to “pre-pandemic normal” are most of your radio clients now? Are most of them fully back working in person; if not, what kind of remote or hybrid operating model(s) are you seeing?

Philippe Generali: We’ve found that between many of our clients, there was an equal split between how they handled the pandemic. Many clients continued to have staff in the studio on varied schedules while others introduced remote configurations, such as Zetta2GO, for their team to continue to work remotely.

As some of the remote workers began to return to their studios, many have chosen to continue to work from home simply due to the flexibility of their current working environment and the ease of job functionality powered by RCS technology.

 How will workflow and technical infrastructure be different after the pandemic from what they were before, particularly in the area of automation and other key software services?

Generali: Now, with the evolution of technology, not only can many everyday radio tasks be completed remotely, but with Zetta’s user flexibility and scalability, we can now remotely connect multiple stations or sites, maximizing our client’s resources. The radio sector has embraced these new remote workflows. It has also shined a light on modern infrastructure and disaster recovery preparations.

 Do you have major projects in the works or planned, where your approach or that of your client has changed because of the experience of this past year or two?

Generali: RCS had already developed remote tools, like Zetta2GO, that were available to our clients and implemented in the field. When COVID caused restrictions, our clients could already control their Zetta playout system from any internet browser.


Now, with the introduction of RCS Disaster Recovery, we can incorporate cloud redundancy to combat cryptoware and natural disasters.

Since we’ve continued to release multiple versions for each of our products during COVID, we’ve addressed



remote-friendly workflows and enhancements.

For example, now Zetta2GO has an expanded Voice Tracker so that talent can set markers, like Trim In, Trim Out and Volume Points. Or with RCS Disaster Recovery enabled, users can assign email usernames and passwords for talent that may not have VPN access with the ability to record into empty voice tracks that land back in your local Zetta.

 What impact might these changes have on the trend toward infrastructure being purchased as a service, with op-ex budgets, rather than cap-ex hardware?

Generali: Eventually the old rules always apply. “Cash is king” is one of them, and a cloud infrastructure means cash savings in three ways:

You only pay for the resources you need; no need to size for the maximum use case. Also, you pay as you go; there’s no need for a huge cash outlay or increasing debt to buy equipment. And you can save on other expenses such as real estate footprint or technical resources.

These advantages combined to form a powerful cash-flow booster that will make any broadcaster financials shine. Radio as a service is our shared future.

Right

Philippe Generali

“Make sure that you are all on the same page”

Toven says it's crucial to keep the dialogue open with programming and management

A final word of advice for engineers who are planning projects for tomorrow or whenever the pandemic is truly over comes from Shane Toven, senior broadcast engineer at Educational Media Foundation.

“Keep the dialogue open with your programming staff and with your management. Make sure that you're all on the same page,” he said.

“If you're building this great thing but they don't know about it, or if they have needs that this thing you're building doesn't meet, it's really not a great place to be.”

EMF has to practice that philosophy right now. The big station owner and parent of the K-Love and Air1 radio networks is in the early stages of a three-year project to relocate its headquarters from Rocklin, Calif., to the Nashville, Tenn., area.

Many of the key decisions about its future workflow haven't been made yet, but Toven said the concept of hybrid operation is probably a permanent part of radio's landscape now. Meanwhile, the organization needs to stay on its collective toes.

“We're prepared for various scenarios depending on what the pandemic conditions dictate, like if suddenly there's a massive outbreak. Right now, for example, we're in a fundraiser for K-Love and all of the DJs are in their own little bubble, so to speak; we're seeking to minimize exposure, keeping unnecessary people out of studios for example. The last thing we need is DJs getting sick in the midst of fundraising.”

The Tennessee facility will be AoIP-based and equipped for both audio and video. It will have a lot more studio capacity than EMF currently enjoys, and Toven doesn't expect that plan to change given the amount of content it plans to produce.

“You know how quickly production capacity gets consumed. Every time I turn around, it seems like we're launching something new, and I have no doubt that, as many studios as we build, we're always going to need more.”

“But at the same time, we recognize there are going to be people choosing to work from home or remotely. We've always had a kind of a distributed workforce, especially with the field engineers in their particular markets and with the transmitters that they're responsible for. But it's a new thing for a lot of other departments within EMF.”

As discussed in a [previous ebook](#), Toven also has an



Above
Shane Toven,
working on a
combiner at WJKL
in San Juan, P.R.

active interest in the virtualization of radio air chains and what the next generation of racks may look like. “How much of it's going to be software, how much of it's going to be discrete hardware and where is that split between audio delivery and the actual transmission?”

“Right now it's still very hardware-driven, the traditional model. But I've envisioned a kind of transmitter site appliance where maybe you have Docker containers running and each one of those is an individual component of your transmission chain.

“There are still components that can't be brought into the software realm yet, but we're getting there bit by bit. I see the rack turning from hardware to a software-driven entity.”