NewBay Media

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NEWS & OPINION

- Veteran radio owner and engineer Jim Withers remembers Gates Radio Company, Harris, in the old days of Quincy, Ill. broadcasting. — **Page 4**

Courtesy Bob Maguire

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Is Royalty Deal a Game-Changer?

Industry Tells Lawmakers: Streaming Rate-Setting Process Is a Mess

Photo by Leslie Stimson

From left: Commonwealth Broadcasting President/CEO Steve Newberry, NAB President/CEO Gordon Smith and Emmis Communications Chairman Jeff Smulyan compare notes before the House Communications & Technology Subcommittee hearing on the future of audio.

BY LESLIE STIMSON

WASHINGTON — Is the royalty deal between Clear Channel and Nashville indie record label Big Machine a game-changer? And what's to become of radio's efforts to persuade the wireless industry to embed FM chips in cellphones?

These topics are separate yet related, and both are very much on the minds of industry executives. In fact, some radio executives spoke about the issues during a House Communications & Technology Subcommittee hearing on the future of audio last month.

The royalty deal makes Big Machine the first record label to receive royalties from radio for not only digital airplay

(continued on page 6)

FM SSBSC Faces Questions

Critics Call Early Testing Anecdotal, Say More Rigorous Testing Is Needed

BY THOMAS R. MCGINLEY

Does FM single-sideband suppressed-carrier modulation outperform conventional double-sideband suppressed-carrier modulation?

Many observers say the evidence in favor of FM SSBSC is anecdotal and that more rigorous testing is needed. Now the debate has taken the next step, with more testing to be conducted.

Frank Foti, president of Omnia Audio, has always liked to give impressive comparison demonstrations at his NAB Show presentations over the years. An audio clip of Greater Media's WMJX(FM) in Boston — played at this year's convention, showing dramatic FM reception improvement with SSBSC — did not disappoint. Find a link to the video at *radioworld.com/July-04-2012*.

That clip was one of a number of road test comparison recordings conducted by WMJX engineers in difficult multipath areas of suburban Boston.

Greater Media Vice President of Engineering Milford Smith told RW, "The single drive test … was never

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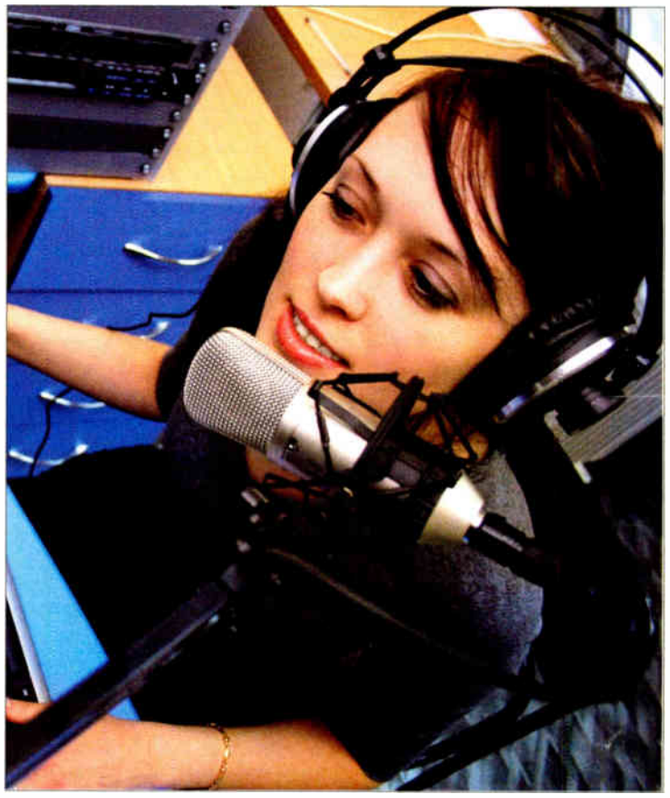

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FM SSBSC

(continued from page 1)

intended to be the poster child for SSBSC. Its primary purpose was to provide an exhibit accompanying a report to the FCC for the experimental authorization issued to us by the commission."

Besides the Greater Media tests, a number of significant stations and experienced engineers have tested SSBSC. Most whom we contacted said SSB does generally perform better. These include Mike Oberg of Zoe Communications, Brian Kerkan of the Cayuga Broadcast Group and Gary Kline of Cumulus Media, which is using SSB at several stations.

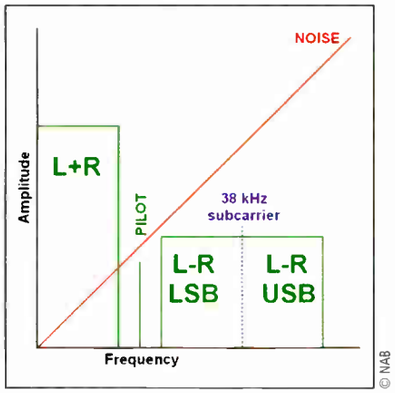
Dave Whitehead at KBHH(FM), in Fresno, Calif. says that without SSB, he can't even properly reach part of his service market area with a listenable signal.

BENEFITS

SSBSC is a different way of adding stereo to FM broadcast transmissions. The conventional DSBSC method modulates the 38 kHz stereo subcarrier with both a lower sideband (23 to 38 kHz) and an upper sideband (38 to 53 kHz); SSBSC does not generate the upper sideband.

In 1987, Bob Tarsio, a longtime New York City broadcast engineer and president of Broadcast Devices, studied and wrote about SSBSC as an alternate method of generating FM stereo, one that potentially can achieve reduced noise and multipath. Other engineers — including Bill Gillman, chief engineer with Gentner Electronics (in 1997), and more recently Brian Beezley, a retired design engineer, along with Foti and Bob Orban — have evaluated the technology in detail, as RW reported in our March 28 issue.

The underlying theory of why SSB appears to perform better is based on the realization of less bandwidth of the RF carrier, thanks to a reduction in sideband pairs within the FM channel. Sideband pairs are generated based upon the highest frequency transmitted. DSB will generate a spectrum of up to 53 kHz, whereas SSB only requires 38 kHz; this is where the reduction in sideband pairs occurs.



FM System Noise Plot. All images are from Frank Foti's presentation to the Broadcast Engineering Conference.

Less RF bandwidth equates to fewer signals becoming annoyed during instances of multipath.

Foti states, "Under program modulation and because of the triangular 6 dB/octave rising noise characteristic of the FM stereo sub-channel, the perceived SNR improvement is closer to 10 dB." Further, he says, "There is a significant reduction in multipath artifacts and reduced interference to SCA and RDS reception."

Omnia said station personnel in a dozen or so markets have conducted field tests using Omnia.11 or Omnia.9 processors and reported the results. These boxes have a firmware upgrade that enables SSB.

Foti said the results largely confirmed that SSB in its modern implementation appears to perform better than DSB and is compatible with proper stereo decoding on most receivers being used by consumers. Only a few models have been identified as possibly blending to mono more quickly with SSB.

NYC FIELD TESTS

However the idea has critics. They include Tarsio and Beezley. Since Foti's 2010 paper and user field testing, those two engineers, working independently of one another, have examined SSB vs. DSB performance using mathematical analysis and multipath generation modeling. They have emerged as perhaps the most notable and outspoken naysayers in the debate.

After modeling SSB and presenting the findings in his 1987 NAB paper, Tarsio spent considerable effort testing SSBSC in the field on three New York City FM stations. His methodology included the use of a modified Optimod 8100 using normal programming received on several stock models of car radios.

"My own anecdotal testing, which went on for a period of six years, did not yield dramatic improved results with SSB," Tarsio said. "Quite to the contrary, what we encountered was an increase in noise 'in close' to the transmitter site, within five miles. My mathematical treatment ... indicates that this should have been the expected result."

Tarsio has written a paper that clarifies his original analysis; it includes multipath simulation using discrete tone modulation. A link is posted at *radioworld.com/July-04-2012*.

"It is my conclusion that the proposed SSB stereo system seems to indicate that there is not a significant benefit to reception. In fact in some cases it may actually provide worse reception characteristics due to dynamic modulation conditions."

Beezley is a software/hardware design engineer who has worked in the past as a consultant to DaySequerra. Recently he applied analysis and modeling skills developed writing simulation software and designing real-time DSP systems to improve the performance of FM receiving systems. His writings on SSB and other topics are available at *ham-radio.com/k6sti/index.html*.

Beezley has criticized Foti's claims about SSBSC, saying they are not mathematically provable. "I read Foti's article in RW in the fall of 2010 and immediately realized that his assertion that there was no stereo separation penalty for SSB was false," he said. "I was so appalled at the unscientific nature of the SSB YouTube video, the absence of quantitative experimental results and at the handwaving offered as theoretical justification for an SSB multipath advantage that I

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End of an Era … Beginning of Another?

Jim Withers Recalls Working in Quincy, Where 'If Gates Made It, We'd Use It'

BY JIM WITHERS

The author is a veteran radio owner, engineer and contributor to Radio World.

In 1967, with my framed FCC First Class Radiotelephone License practically hung around my neck on display, I reported for my first day of work at WGEM(AM-FM-TV) in Quincy, Ill.

Crossing over the Mississippi River on the "Old Bridge," as everyone called it, I turned onto Hampshire Street. There at 123 Hampshire, one block up from the river's edge, was an old three-story brick building. As I passed, I could see a faded sign painted on the side proclaiming it to be the "Gates Radio Company."

This was hallowed ground for any broadcast engineer, matched perhaps only by the original RCA building in Camden, N.J.

Although founder Parker Gates sold the company to Harris Intertype Co. in 1957 (which pretty quickly dropped the "Intertype" from its name; and what is Intertype anyway?), the company made Gates consoles and Gates transmitters and Gates turntables well into the 1980s.

UNWRITTEN RULE

I admit it might have taken me longer than most to make the transition from Gates to Harris. Maybe that was because of my stint working in Quincy.

Gates himself never moved — he would die in Quincy in 1986 — so several engineers with whom I worked knew him.

A view of the Gates plant in the late 1940s.

Courtesy Bob Mayben

To me, Quincy *meant* Gates, and vice versa. I was practically family. The BC250 at my first radio job, all the way through the FM-5G at the first FM station I bought in 1989, were Gates. Even though their logos shared the proud name with Harris Intertype, they were all Gates transmitters to me. Not until 1997, when I was at FM station 102.3 in Corpus Christi, would I catch up. The FM-20H3 there was a Harris.

WGEM, though, had an unwritten rule: If Gates made it, we'd use it.

This worked out well for all concerned. The company could (and did) use the station as a convenient beta test site; the station got the latest and greatest of everything Gates.

To me, Quincy meant Gates, and vice versa.

– Jim Withers

I well remember turning off the M-6095 tube-type FM exciter in favor of the brand-new TE-3, which was astonishingly small (by 1968 standards) and foolproof. Power "on," AFC switch "on," and rock n' roll!

We had also gotten one of the first Gates Sta-Levels. These were remarkably agile AGCs that quickly convinced an entire generation of disk jockeys there was no harm in "burying the needle" in order to squeeze every last drop of sound out of the transmitter and into the ether.

Over the years, thousands, maybe tens of thousands, of broadcast engineers learned tricks of the trade on Gates/Harris equipment. I suspect that many radio engineers over age 40 have adjusted the "monkey bars" inside the PA cavity of a Harris FM transmitter. Any jock old enough to have spun actual records surely did so on a Gates CB-11 turntable. With driver motors as powerful as the starter motor on my '56 Chevy, a CB-11 could endure the most brutal back cueing.

Some stations used circular metal weights on top of the record itself, since the limiting factor in getting the disc up to speed wasn't the turntable but the slippage of the disc on the felt. No problem ... you could turn pottery on a CB-11 and it wouldn't slow down.

The turntables often fed a Gates console — a Yard (supposedly named because it was that wide) or, for the big kids, a Diplomat. It had round faders, as opposed to slide pots; and operators did better with wheeled chairs behind that one because it was a long reach from the mic on Fader 1 to network news on Fader 10.

STUNNED

Parker Gates was a radio guy, but Harris took the company into all lines of broadcasting. In 1991, after a Marine Corps F-4 took a bite out of our tower at KDFW(TV) in Dallas, we rebuilt the entire transmitting facility and bought a Harris Platinum solid-state transmitter.

For a guy who'd grown up twisting and turning knobs on Harris, RCA and even GE TV transmitters, this was a scary thing — a controller with a few buttons, and 45 drawers with green (and very, very occasionally, red) LEDs. The "First Phone" finally was superfluous. My 10-year-old son could run a Platinum.

Along the way, Harris, like GE, RCA and Ampex before it, made a few missteps (anyone remember Harris studio cameras?). But it embraced HDTV aggressively, including systems for multicasting and distributed transmission systems. The company remains, of course,

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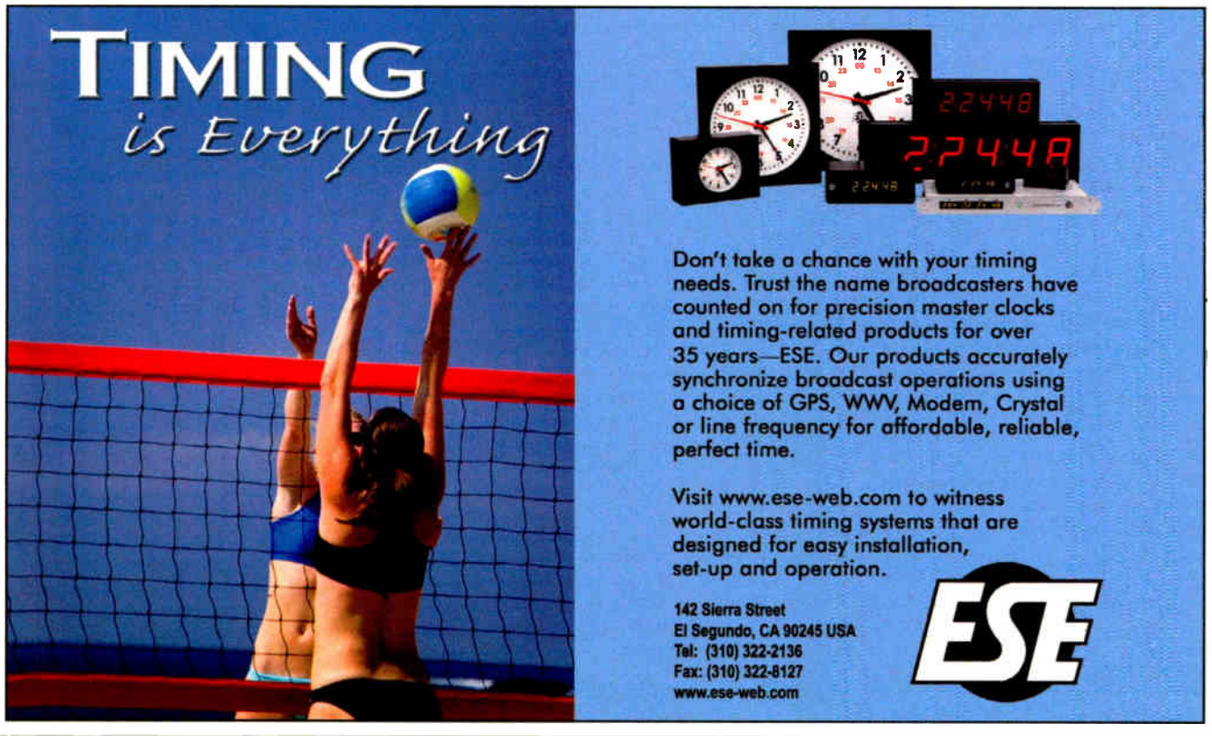
I'LL BE BACK

Thanks to Jim Withers for filling in for me on Page 4 today. I'm on vacation but I'll be back next issue. Stay cool this Independence Day!

— Paul McLane



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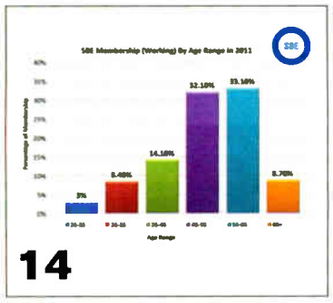

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FM SSBSC

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decided to write the simulation to see what I could determine for myself."

Beezley offered a critique of the WMJX video clip: "The tests were made on different days. VHF propagation sometimes changes in minutes, and can easily change in an hour. This factor alone is enough to invalidate the tests. I have conducted many tests of multipath propagation. Its most general properties are its variability and instability. These must be taken into account in any real-world test by verifying that propagation has not changed during the test period. Otherwise the results are worthless."

Responding, Foti said: "We ran in-field tests, independent of the WMJX tests, using a plotted route, and constant speed, where known multipath existed. Then we did an immediate A/B switch between DSB and SSB along the route, and captured the results. One of those examples was demonstrated during the NAB presentation. In all cases the SSB signal contained noticeably less multipath. This example eliminated any quandary about achieving different results on a different day, atmospheric conditions or propagation effects."

Milford Smith says the WMJX SSB field tests were controlled and repeatable and defends their methodology.

"We do have other examples and intend to collect additional samples. All of these are collected in the same manner. Generally we select a route over which multipath is known to be present. The route is driven twice in the same direction, at the same speed — with and without SSBSC — and the audio and video from both runs is recorded. A conventional HD receiver and a likewise typical factory installed antenna are used for the tests."

Smith also is unequivocal about SSB's advantage over DSB in most of their tests: "We did not encounter any areas to date where DSB was judged to be superior to SSB. There were many areas where the performance of both was roughly equivalent. The example being circulated probably exhibited the most improvement noted in our limited testing."

Like Tarsio's mathematical analysis, Beezley's modeling suggests that SSB offers no consistent advantage over DSB."They indicate that the system that best suppresses multipath distortion depends on the delay and amplitude of the multipath replica," Beezley stated. "Sometimes DSB is better, sometimes SSB. Averaged over a wide range of delays and amplitudes, the simulation shows no significant advantage for one system or the other. But for a particular propagation situation, one may work better."

Foti believes Tarsio's early over-the-air tests in New York were not capable of demonstrating SSB's advantages fully because Tarsio used legacy analog SSB generation and processing equipment.

"Our digital implementation does not suffer from any lost modulation, due to overshoots, whereas the Tarsio method required a reduction of overall modulation — due to overshoots that were hard to manage in an analog implementation — and it's quite possible the reduced modulation level ... may have brought on other reception issues that gave the impression of exaggerated multipath," Foti said.

"Recall, Bob Tarsio's tests were done 25 years ago, and I believe much of those results do not hold up in today's environment. We can accomplish so much more doing this in the digital domain with DSP, as compared to the analog implementation Bob did back in the 1980s."

MODELING VS. FIELD TESTS

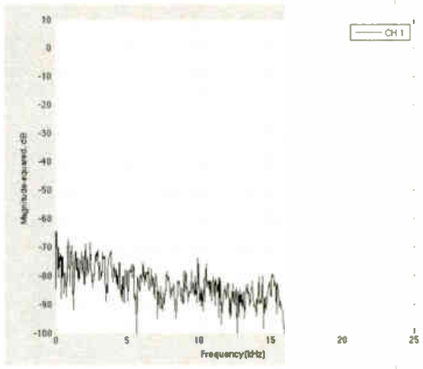
Bob Orban appears to agree with that assessment.

"Because Tarsio's SSB generator of necessity used an analog 90-degree phase difference network with non-linear group delay, there may have been additional modulation overshoot artifacts."

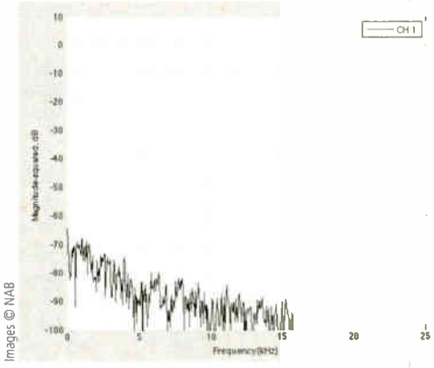
Orban offered the following observations regarding Beezley's SSB vs. DSB mathematical analysis:

"Beezley's model is accurate for the transmitter side. He did not simulate a radio that uses one of the many multipath mitigating algorithms used by real-world radios, although he did model a real IF. His multipath simulation was not necessarily as complex as a real-world scenario. ... He discovered multipath scenarios where SSB was better and also scenarios where it was worse, assuming a relatively simple receiver with a real-world IF but no signal-dependent blend or other multipath mitigating algorithms. Because multipath creates nonlinear distortion in the FM detector, superposition does not hold and use of multiple tones will not necessarily predict what a radio would sound like with real program material."

Foti sought to counter Beezley's simulations by running real-world stereo separation tests with the same equipment Beezley cited. He found a "huge" disparity between the Beezley simulations and the actual system tests. His NAB presentation offered a few examples of these differences. Foti contends Beezley has not validated his methodology by comparing it to a known end-to-end actual system.



Recovered Noise, DSB



Recovered Noise, SSB

Images © NAB

Radio World asked all of the engineers involved in the debate what they thought might be the basis for the disparity between the math modeling and the real-world field tests that have demonstrated SSB's apparent advantage.

Both Tarsio and Beezley state there should not be a disparity or any such advantage for SSB. Orban suggests, "It is possible that the problematic areas in the Foti/Greater Media tests were those where the details of the multipath (delay time and magnitude of the reflected wave) happened to make the situation better."

Other factors may be involved. The Tarsio and Beezley models and the early Tarsio field tests included only pure SSB

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GATES

(continued from page 4)

a major player in radio. So when the announcement came on Tuesday May 1 that the company plans to sell its broadcast business, I was stunned.

"The decision to divest Broadcast Communications resulted from a thorough review of our business portfolio, which determined that the business is no longer aligned with the company's long-term strategy," stated William M. Brown, president and chief executive officer.

The company's radio and TV transmitters, audio consoles, cart machines and turntables have broadcast news and entertainment in some cases as far back as before the Communications Act of 1934. I found it sad to hear the decision put in such analytical terms. But Harris had a good run. We can only hope the next owner of this historic broadcast company will continue in its tradition — and in the tradition of Parker Gates.

World Radio History

AUDIO FUTURE

(continued from page 1)

but also broadcast. Big Machine agreed to a cap on earnings from digital stations like Clear Channel's iHeartRadio streaming service — at what Wall Street analysts believe is a lower rate than other record labels are getting.

Both companies said the deal is about growing revenues for digital in the future. Terms were not made public.

The agreement bypasses the political fight that's been going on for years between record companies — who want royalty payments for on-air performances — and broadcasters, who say such royalties woujld be another "tax" on top of what they pay to organizations representing songwriters and music publishers, like BMI, ASCAP and SESAC.

The deal also allows Clear Channel and Big Machine to bypass SoundExchange, the nonprofit organization tasked by Congress to collect online radio royalties for performers of streamed music.

The recording industry loves the deal. But Recording Industry Association of America Chairman/CEO Cary Sherman told lawmakers there should be an industry-wide solution; he questioned whether other radio groups could structure a deal as Clear Channel could.

Commonwealth Broadcasting President/CEO Steve Newberry, testifying for NAB during the hearing, spoke carefully about the deal. He described it a "free-market transaction" between two entities. NAB has taken no position on the arrangement.

Speaking of the performance rights issue in general, Newberry said NAB remains opposed to radio paying another royalty. Music airplay "is the engine that drives the sale of music," said Newberry. "We believe the promotion is equal to and exceeds" the value of a proposed royalty for airplay, he said.

Newberry said the current process for setting copyright royalties is dysfunctional and actually hinders stations' ability to innovate in the digital arena and should be changed.

Pandora Founder and Chief Strategy Officer Tim Westergren agreed; but he wants Congress to treat all forms of audio the same when it comes to setting royalty rates. Last year, with revenues of $274 million, Pandora paid out half of that amount, $137 million, in performance fees to artists or labels.

Pandora Founder/Chief Strategy Officer Tim Westergren says Congress should treat all forms of audio the same when it comes to setting royalty rates.

As each new form of audio was invented, copyright law was changed. As a result, Westergren said, new media are penalized in the rules for music royalties, while old media are advantaged. "It's time to level the playing field."

When Pandora goes before the Copyright Royalty Board in 2014, it plans to push for a rate based on percentage of revenue instead of per-track, CFO Steve Cakebread recently told Wall Street analysts.

FM CHIPS

Meanwhile radio clearly has a ways to go in persuading wireless carriers and manufacturers to embed FM chips in mobile devices. The industry hopes Congress will provide more muscle.

Broadcasters want discussion and a congressional study, though Emmis Communications Chairman Jeff Smulyan reiterated several times during the hearing that NAB is not asking for a chip mandate.

Photos by Leslie Stimson

CEA President/CEO Gary Shapiro suggests that radio can create demand for FM chips in phones by promoting it aggressively on stations.

CEA and CTIA don't believe that. CEA President/CEO Gary Shapiro asked rhetorically why radio doesn't seek an FM chip in lights, pillows and other objects. He calls the issue a reaction to radio's declining listening over the years. Smulyan refuted that, saying listening is not lower.

Christopher Guttman-McCabe, vice president of regulatory affairs for CTIA, The Wireless Association, said numerous cellphones offer FM capability; a June Best Buy circular listed 29, he said. According to a recent count by CTIA, FM radio capability is available in 59 models in the United States.

But that's out of thousands of devices sold, said Smulyan, who acknowledged that the number of FM-equipped models has increased since broadcasters began pushing for it. CTIA blames low consumer demand; but Smulyan said the feature isn't promoted in domestic cellphone stores as it is overseas.

To make his point, he displayed two new Samsung Galaxy Notes, a smartphone with some of the features of a tablet. The model purchased in London has an activated FM chip; the one purchased here does not, he said.

Shapiro, though, suggests that radio can create demand for FM chips in phones by promoting it aggressively on their stations.

Emphasizing the importance of the discussion as consumers use more technology, committee member Rep. Mary Bono Mack, R-Calif. said, "Nobody cares what's under the hood anymore. We care about what's in the dash and about cupholders."

In a show of how important the discussion is, several NAB executives turned out to support Newberry and Smulyan. Among those in the room were President/CEO Gordon Smith, Chief Technology Officer Kevin Gage and Executive Vice President of Radio John David. Eddie Fritts, former NAB leader and now a lobbyist, was there as well.

NEWSROUNDUP

TOWER LIGHTS: Federal wildlife researchers believe migratory birds get disoriented by steady red warning lights on communications towers; now the FAA has decided it's okay to turn those off and that pilots can still see the towers with flashing red warning lights. The FCC hasn't made the new light scheme mandatory, but officials said they would honor the change, the Wall Street Journal reports. In December, the commission began requiring formal public notice before construction for new towers taller than 450 feet, with an environmental assessment of the potential impact on migratory birds.

EAS: FEMA increased the frequency of required tests over the IPAWS system, to prepare stations for the June 30 deadline by which new EAS-CAP encoders/decoders had to be installed and working. In a message on the SBE-EAS listserv, IPAWS Program Manager Al Kenyon noted that several parties had asked FEMA to increase the number of RWT messages sent via the IPAWS OPEN CAP EAS Atom feed leading up to the CAP implementation deadline. FEMA proposed increasing the required tests origination cycle from once a week to five, Monday through Friday, and received a mostly favorable response.

SCRAP METAL: Florida has tightened regulations on scrap metal dealers, which should make it harder for thieves to unload stolen copper, aluminum and other metals. New rules were to go into effect July 1 making stealing copper from a utility or communications services provider a first-degree felony; this could net a thief a 30-year prison sentence and a $10,000 fine. Purchase of stolen metals becomes a third-degree felony, which could mean five years in prison and a $5,000 fine. Cash payments for scrap metal purchases now are banned. Under the rules, payments must be made by check or an electronic payment system, and may be delayed by up to three days.

WWVB: NIST radio station WWVB(AM) near Fort Collins, Colo., was testing the addition of phase modulation to AM carrier in June to improve its signal penetration. The station continuously broadcasts time and frequency signals at 60 kHz.

FRANKEN FM: A new so-called "Franken FM" was expected to go on the air in Ohio. Venture Technologies was testing the 87.7 MHz signal in Cleveland, according to Ohio Media Watch. The station is operating on the aural carrier of an analog low-power TV Channel 6 station. Radio industry vets call these "Franken FMs" after Frankenstein, due to the perceived unnatural result of TV stations essentially operating as radio stations, including advertising and websites. They'll sunset when the FCC requires low-power TV stations to convert to digital in 2015.

World Radio History

THIS CODEC HAS BEEN THROUGH TWO WARS, MULTIPLE ELECTIONS, FLOODS, FAMINE, EARTHQUAKES, HURRICANES, MARATHONS, CHAMPIONSHIP GAMES, REGATTAS, LOTS OF CONCERTS AND WAY TOO MANY CLUB EVENTS TO ADMIT.

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The result: Axia xNodes, smart new AoIP interfaces that transform your audio devices into an intelligent network. Use them to turn analog, digital or mic-level signals into routable IP-Audio, with associated GPIO logic. They're so advanced, they won two major awards at their NAB debut.

WHAT CAN YOU DO WITH THEM? HERE ARE A FEW IDEAS.

» **BUILD A ROUTING SWITCHER.** One stand-alone xNode is an 8x8 (4x4 stereo) routing switcher. Connect 8 xNodes to a switch and make a 64x64 routing switcher. Need more I/O? Connect more xNodes. Like all Ethernet-based networks, Axia systems are naturally scalable, up to 10,000 stereo signals (plus logic).

» **STL OVER IP.** Today's cluttered RF spectrum makes IP a great alternative. Put an xNode at either end of a fiber run, OC-3 circuit or a pair of inexpensive Ethernet radios to send eight channels of uncompressed audio to your TX – and get eight channels of audio backhaul too.

» **SAY SO LONG TO SOUND CARDS.** PCI, PCIe, USB3, FireWire... who needs 'em? Load the Axia IP-Audio Driver onto your PC workstation and connect it to an xNode to get eight professional, balanced outputs and eight inputs. Use an industry-standard DB-25 breakout cable for pro XLR connections. You'll get studio-quality audio and save some green, too.

» **ADD MICS TO THE MIX.** xNodes make awesome multiple Mic preamps. They have ultra-low-noise, ultra-high-headroom, studio-grade preamps with selectable Phantom power. Put your Mics in, bring your analog line level out. And that IP-Audio network jack? Ready to be used whenever you upgrade to a full IP-Audio network.

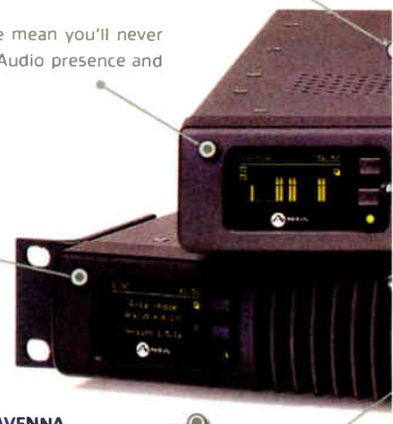
» **MAKE AN A/D/A.** Take one analog and one AES/EBU xNode and rack-mount them side by side. Voila! Eight precision A/D converters and eight precision D/A converters, in just 1RU. Studio-grade, 48 kHz, 24-bit Delta-Sigma A/D and D/A convertors, with 256x oversampling, make difference you can hear.

» **SLIM DOWN YOUR SNAKE.** Connect two analog or AES xNodes with a single Ethernet cable for an instant 8x8 bi-directional snake and bid the multi-pair bundle goodbye. Add a few more xNodes on each end for a 16x16, 32x32 or 64x64 snake. Use off-the-shelf media converters for long-haul fiber connections.

XNODES ARE SMALL. Mount them on your wall, under the counter — mount 'em on the ceiling if you like. Optional rack- and wall-mount kits provide plenty of options.

CONFIDENCE METERS on every xNode mean you'll never have to wonder where the audio's at. Audio presence and levels are both displayed at a glance.

INFORMATION OVERLOAD? Not here. Sharp, high-rez OLED displays put all the information you need right on the front panel, without the need for a distracting multi-colored lightshow.



xNODES WORK WITH BOTH LIVEWIRE AND RAVENNA
AoIP networks — making them compatible with IP-Audio gear from over 40 major broadcast companies.

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xNodes calm, cool and collected using air-condition
air (instead of that hot air in the back of the rack).

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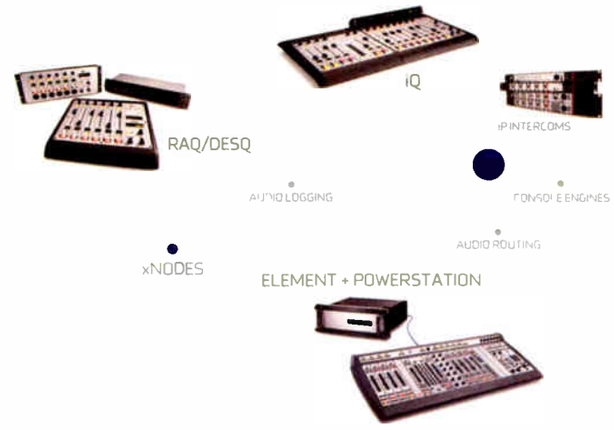

RJ45 OR DB-25? xNodes give you I/O both ways, so you can choose whichever industry-standard breakout cable you prefer.

DUAL ETHERNET PORTS for redundant network links. The overnight jock kicks out a connection? No problem; the other one takes over so your programming never skips a beat.

FAST, ONE-BUTTON SETUP. Hit the switch and plug 'em in — your xNodes will be streaming audio in under 30 seconds.

xNODES HAVE AUTORANGING INTERNAL POWER SUPPLIES, but can use PoE (Power over Ethernet) too. Perfect for those out-of-the-way places where a power cable is inconvenient. Hook 'em both up for redundant, auto-switching backup power.

VERY VERSATILE. 5 different xNodes handle nearly any signal type. AES/EBU, Analog, Microphone and GPIO xNodes are perfect when you've got a lot of one audio type to work with. But what if you need a little of everything? This is the Mixed Signal xNode. Think of it as your utility MVP, with a switchable Mic/line input, 2 dedicated analog ins, 3 analog outs, a digital AES/EBU input and output, and 2 GPIO logic ports.

TWO xNODES MOUNT SIDE-BY-SIDE, so you can create your own custom mix of I/O types within a single rack space. Pair up an AES/EBU xNode with a microphone xNode, or match a GPIO xNode with an analog unit. Or combine a couple of Mixed Signal xNodes for the ultimate mix of mic, analog, AES3, Analog and logic I/O.

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FM SSBSC

(continued from page 5)

transmission. The current Omnia.9 and Omnia.11, and the Orban 8600 processors, employ a vestigial sideband approach, in which the first 150 Hz to 200 Hz of audio spectrum modulates the 38 kHz stereo subcarrier with DSB. According to Foti and Bill Gillman, this technique helps to preserve stereo separation depth, mitigates early blend-to-mono and should reduce multipath distortion in receivers.

Foti asserts, "There's a huge difference between simulations using steady state tones, and on-air tests with dynamic program material. Multipath behaves extremely differently between the two. Remember, multipath generally occurs on a short-term momentary basis, and dynamic program audio exists in a random manner too. Making a correlation about multipath using tones as compared to program material is a bit ponderous.

"There might be some merit to the simulated results — if an all-tone broadcast format were to exist."

Another consideration is the effect of psychoacoustic noise masking under heavy modulation. Listeners do not hear noise and multipath artifacts as easily on a densely modulated and peak-limited transmission as they would on a less processed signal.

NRSC ACTION

But people with an interest and stake in SSBSC seem to agree on one thing: More theoretical and field testing is needed to better understand what is really going on.

At the NAB Show, the National Radio Systems Committee established a task group of the AM and FM Analog Broadcasting Subcommittee to tackle this assignment. Bert Goldman, a former broadcast director of engineering and now vice president of engineering consultancy Independence Broadcast Services, chairs the task group.

The group planned to meet at the end of June and discuss finding a way to do the tests as well as test criteria.

Orban offered ideas regarding how testing should proceed:

"I believe that NPR Labs has the best available equipment to do the tests, as they have a full-bore multipath simulator that can include Rayleigh fading. Doing the tests properly requires total repeatability between the SSB and DSB transmissions, so exactly the same RF path degradations occur at exactly the same time in the audio program material used for testing."

Foti said Omnia engaged the services of NPR Labs and specifically its senior technologist John Kean, who determined that SSBSC does not cause any increased co-channel interference. That was the most important hurdle to be cleared so the FCC would grant experimental STAs to stations that want to test SSBSC over the air, according to proponents.

Regarding further testing, Orban said, "Getting valid results absolutely requires double-blind testing of the multipath-induced audio quality degradation at the output of the receiver." Orban plans to join the NRSC AM and FM Analog Broadcasting Subcommittee and said, "I am keeping an open mind about this, but I am unwilling to be convinced without rigorous testing. Anecdotal evidence is interesting but insufficient."

Foti says he's in full agreement. "I've made requests to the NRSC about how to go about testing this. They listened, and now we're about to embark on what testing is needed. In the meantime, it was also suggested by NRSC to go out and see if the concept has merit. We've done that, and based on comments from broadcasters, it does."

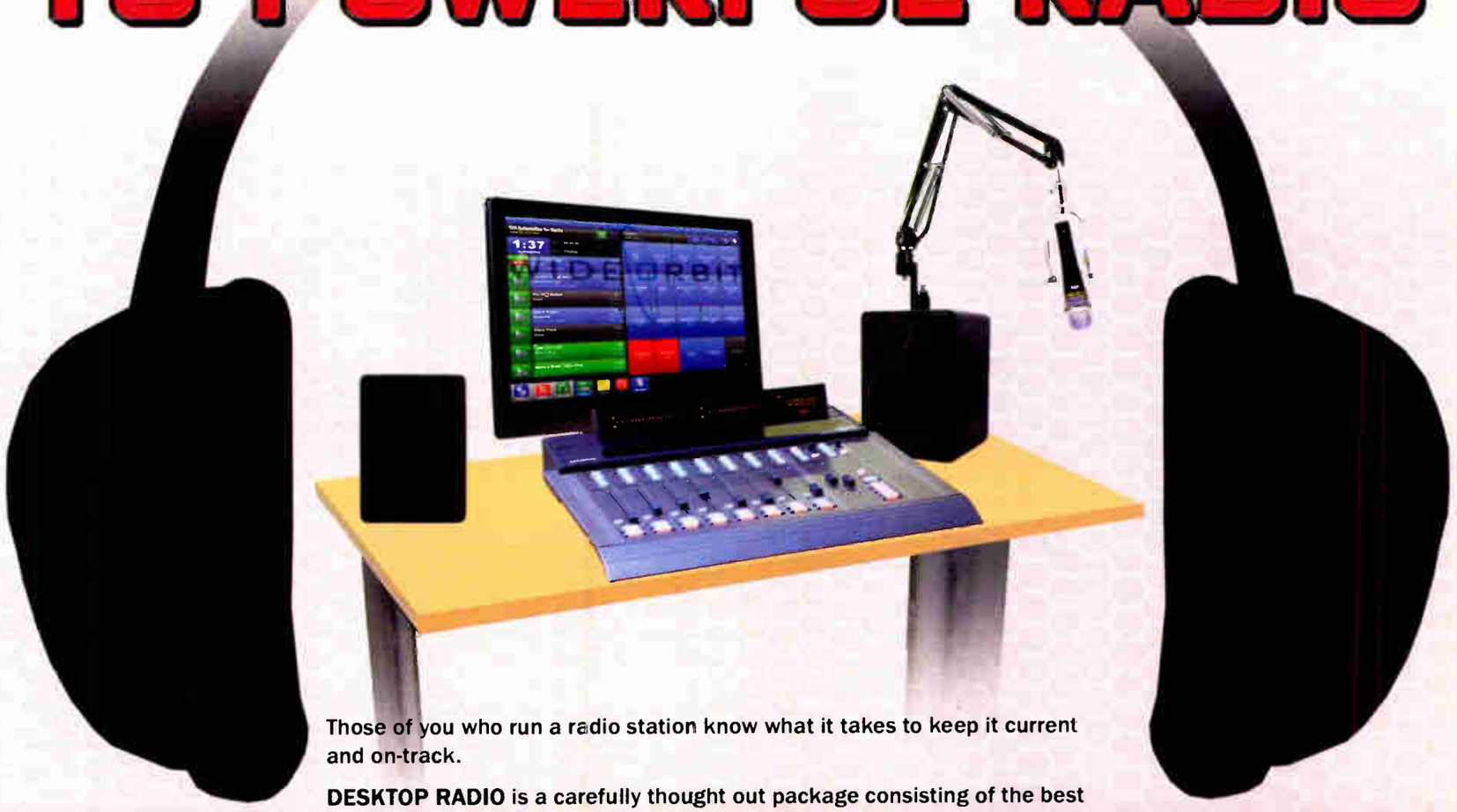
NEWSROUNDUP

PENALTY: Don't bounce a check, and don't ignore a consent decree. That's the lesson for A Radio Co., licensee of WEGA(AM), Vega Baja, Puerto Rico. The station earlier was to make an $8,000 "voluntary" payment to the U.S. Treasury in 2008; that was to settle a $15,000 fine and stop an FCC investigation into possible violations regarding antenna tower fencing, public inspection file requirements and operating with an unauthorized antenna pattern. But now it has morphed into a $25,000 fine. The licensee bounced a check and didn't make its compliance reports to the FCC. The agency says the action demonstrates bad faith and disregard for FCC rules. It wants the money within 30 days.

PUBLIC FILE: Vision Latina faces paying $40,000 in fines for alleged public file violations at KBPO(AM), Port Neches, Texas. During an inspection of the Class D station in 2010, FCC agents found an incomplete public file. Vision Latina said it had hired a consultant to review the file and had received assurances it was complete. Vision Latina certified in 2011 that the missing items have been replaced, but the FCC says they weren't, and proposed a $25,000 penalty plus an additional $15,000 not making a complete public inspection file available during the inspection. The broadcaster had 30 days to appeal or pay.

World Radio History

A SIMPLE APPROACH TO POWERFUL RADIO



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Stay Safe Around AC Disconnects

An Infrared, Point-and-Shoot Temperature Meter Can Be a Help

Greg Muir commented on Steve Franco's submission in May showing burned breaker-panel wiring.

WORKBENCH
by John Bisset
Read more Workbench articles online at radioworld.com

Greg is chief engineer of STARadio Corp. in Great Falls, Mont. He's an electrical specialist who works with many insurance companies.

His first advice to the "do it yourselfer" station engineer: Remember that Allen head set screws are hot when they're holding conductors to the breaker. Unless you have a fuse box or disconnect switch prior to the breaker panel, be careful. We don't want crispy engineers here.

Second, in Greg's private practice, he has one client whose insurance carrier actually requires a periodic temperature measurement of connections in breaker panels and fuse boxes as a precaution against fires.

This process is easy using an infrared point-and-shoot temperature meter commonly available at reasonable cost. Greg carries one in his briefcase and makes it a habit to perform checks on panel connections at least once a year, recording the results on a piece of paper inside the panel. A hot connection will jump out at you given consistent temperatures in an evenly loaded three-phase system.

Fig. 1: Black & Decker makes the TLD-100 infrared thermometer, with a street price under $30. Use a tool like this to check temperatures of surfaces you can't touch.

The expense of a burned-out, high-amperage breaker is still significant but a lot less than that of a smoldering building followed by a peeved insurance carrier. Given the cost of infrared temperature meters, why not? The examination also is a value-added service that can provide revenue from your contract clients. Group stations would be wise to cycle a temperature meter around through all the stations in the chain, to catch problems before they turn into major fire disasters.

Visit our links page at *http://radioworld.com/July-04-2012* to find some popular infrared temperature meters.

Greg also weighed in on our duct tape discussion. He writes that there is another product available that he finds far superior to duct tape for general applications. It is made by Scotch: Series 2000 Electrician's Bundling Tape.

Greg found 150-foot-long rolls of 2-inch-wide tape at the local Home Depot. The tape has a fairly low tear resistance but is non-fabric and sports a low adhesive residue. It does not dry out in a matter of months like duct tape can and is far cheaper than many available gaffer's tapes.

Reach Greg Muir at *engineering@mt.net*.

Next time you visit your local hardware or electrical supplies store, pick up a voltage detector.

As seen in Fig. 2, this simple "volt pen" senses the AC electric field around a live wire. Broadcast Engineer Paul Sagi in Malaysia found one that beeps at about 3 Hz. The "business" end flashes bright red when it senses a wire with 90 to 1000 VAC.

Some models have a push button to operate the built-in LED flashlight, useful when working on an electrical panel in the dark or poor lighting.

A voltage detector is a good piece of safety gear. You should never assume that power is off, even when a circuit breaker is switched to the "off" position. In rare cases a breaker can suffer a mechanical failure or contacts welded closed. Or perhaps a situation develops in which power feeds back through some other wiring and equipment.

Fig 2: A volt pen, indicating the presence of AC voltage, is a 'must-have' for your transmitter site.

Paul Sagi can be reached at *pksagi92@gmail.com*.

From retired Cox Radio Richmond Engineering Manager Jon Bennett comes an interesting report about the failure of the largest tower east of the Mississippi due to ice loads. Find the link at *http://radioworld.com/July-04-2012*.

The television station that owned the tower prepared the documentary.

Reach Jon at *motexa@verizon.net*.

Ira Wilner, chief engineer of Monadnock Radio Group/Saga Communications Inc., has a tip following up on our little primer about mirrored meter scales in the June 6 issue.

Add clear labels made with a P-Touch or similar labeler, to indicate which slug/meter range is used on your power meter. With all that stations engineers must handle, it's difficult to remember which slug is used in which line section. Identifying the meter scale will save you from grabbing a stepladder and crawling into the ceiling to read the slug in the line section.

For a variety of labeling machines, again see *http://radioworld.com/July-04-2012*. Ira Wilner can be reached at *iwilner@monadnockradiogroup.com*.

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

John Bisset has spent 43 years in the broadcasting industry, and is still learning. He is SBE certified and is a past recipient of the SBE's Educator of the Year Award. He recently joined Elenos USA, an FM transmitter company based in Miami.

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2012 PICK HIT Radio

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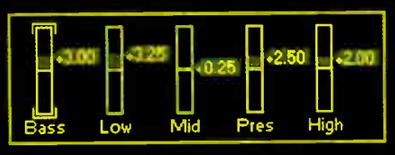

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World Radio History

Broadcast Engineers Growing Older

BY SCOTT FYBUSH

Gather a bunch of working broadcast engineers in a room, and two things are almost inevitable. First, the median age of the group will probably be somewhere well north of 50; and second, they'll spend some time bemoaning the lack of younger engineers entering the business.

Leaders of the NAB and the Society of Broadcast Engineers tried to address this conundrum during the NAB Show in Las Vegas in April, with a Broadcast Engineering Conference discussion about the future of radio engineering as a career.

One of the biggest challenges for would-be engineers, says SBE Executive Director John Poray, is the reduced number of jobs in the field.

"There are fewer technical jobs in broadcasting today than in the past," Poray said, citing Bureau of Labor Statistics research that shows the number of broadcast "establishments" (separate workplaces) dropping from 10,287 in 2001 to 9,739 in 2011 — a five percent decline. In 1999, the BLS reported that 25,570 people were working in technical jobs at radio and TV stations, but by 2008, that number dropped to 22,200.

Some of that decrease can be blamed on deregulation and ownership consolidation, but Poray says that's not the only factor. Another important consideration, he said, was the changing nature of the engineering field itself.

"When I get a call from a would-be employer, there are two questions," he said. "Where can I find a broadcast engineer, and do I hire somebody with an IT background, an RF background or both?"

ADDRESSING THE AGE BUBBLE

As broadcast technology increasingly focuses on IT skills instead of the traditional RF specialties, Poray says there's a growing shortage of engineers both willing and able to take on the jobs that remain.

Over the last decade, he says, broadcast engineers haven't been as willing to change markets to advance in a career in the field, in part because of the increasing value of their IT expertise.

"There was less of a desire to move from one market to another, and consolidation reduced engineering jobs. If they were cut from the industry, they left rather than move towns. They could take their skills (to other industries) and do just as well," Poray said.

That's a challenge to employers as well; Poray says many can't afford the engineers who are available, since they're looking for "financial incentives" to leave situations and communities where they've become comfortable.

As the scope of a broadcast engineer's duties expands, some engineers say employers are simply setting the bar too high to find the candidates they need. Rich Parker, director of engineering at Vermont Public Radio, says many employers are now asking for advanced degrees along with an unrealistic level of RF and IT experience.

"You see a lot of job postings these days where the only thing that's left out is, 'Can you walk on water and fix the toilets,'" Parker said, noting that wireless telecommunications carriers are grabbing many engineers with those skill sets who'd once have been limited to traditional broadcasting jobs.

Of the engineers who have remained in the broadcast business, Poray says SBE research shows a significant age gap: While almost 28 percent of working engineers were between the ages of 35–46 in 2001, only 14 percent were in that age bracket in 2011.

At the other end of the age spectrum, about a quarter of all working broadcast engineers in 2001 were 56 or older, a number that had ballooned to 42 percent a decade later — a reflection that many older engineers have simply stayed put instead of retiring.

That, says Poray, is partially a reflection of a dwindling pool of potential replacements for older engineers seeking to leave the business.

"There are fewer jobs, but there are jobs available. Often there are not enough qualified candidates, and jobs go unfilled," Poray said, adding "a more severe shortage is probably coming in the next 10 years, if not sooner."

The SBE's own enrollment numbers provide some insight into the shrinking number of new engineers. Poray says among all professional organizations nationwide, the average age of new members is in their mid-30s. Among the 500 to 600 new members the SBE enrolls each year, though, he says only 25 percent are under age 31.

The organization has been trying to address the problem in several ways, including the SBE Jobs Online program. The program is free to employers posting their openings, but only SBE members have access to the full job postings. The SBE's Résumé Service also allows members to post their résumés anonymously; employers interested in a particular résumé can obtain full contact information by paying a small fee to SBE.

The SBE is also working with the NAB Education Foundation (NABEF) on a Technology Apprentice Program. The six-month program for interested college seniors includes a summer internship at a broadcast facility, a visit to the NAB Show and the opportunity to take the SBE's Certified Broadcast Technician (CBT) examination.

'A SELF-CURING PROBLEM'

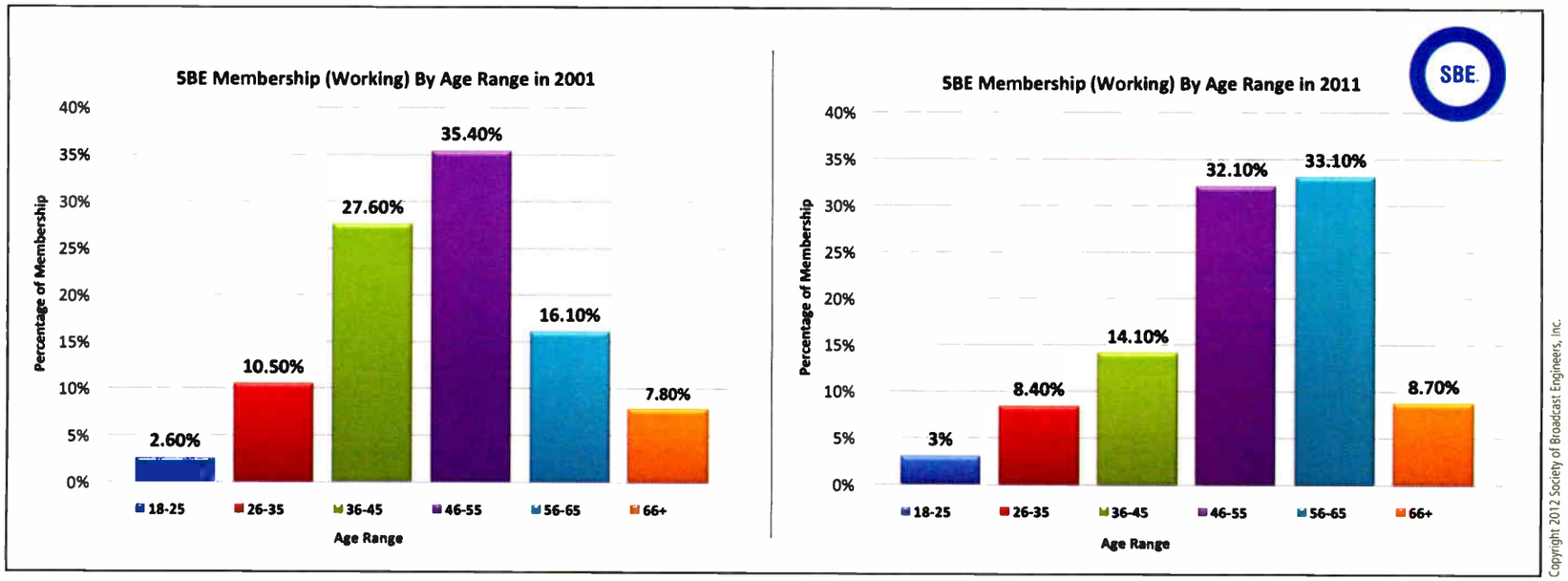
Veteran engineer Fred Baumgartner, who's now the director of broadcast operations at Harris Corp., says that throughout the history of broadcasting, there has always been an opportunity for the most skilled, most talented engineers to find good jobs.

"The guys I knew at the top end of the broadcast spectrum made a lot more than electronic engineers did," Baumgartner said. So while lower-end jobs and unpaid internships may end up sitting empty, Baumgartner believes "no real broadcast engineering jobs will go unfilled."

"The truth of the matter is, it is a supply and demand issue," he said. "If the demand is there, it attracts more people to the industry. It's a self-curing problem; I'm not going to worry about the next generation of broadcast engineers."

Based in Rochester, N.Y., Scott Fybush is the editor of NorthEast Radio Watch and a longtime RW contributor.

See related letters on this topic, pages 37–38.



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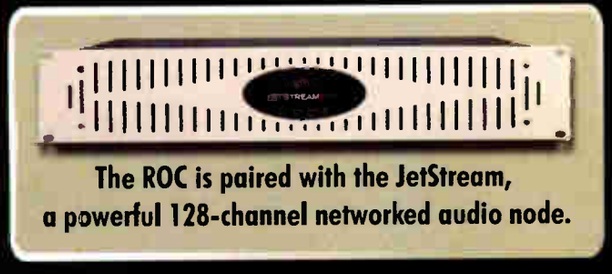
World Radio History

The new ROC console from Logitek



The ROC is paired with the JetStream, a powerful 128-channel networked audio node.

When Logitek introduced its first ROC console back in the 1990s, it marked a revolution in audio console design. One of the industry's first router-based digital consoles, the original ROC boasted simple wiring and access to multiple sources at each fader.

Over the years, the router-plus-console Networked Audio concept has become the standard in console architecture. Although the original ROC was retired years ago, Logitek has continued to develop systems for both TDM and AoIP audio networking. The new ROC takes the best of the original design and pairs it with the latest technology and styling.

Available in multiples of 6 faders (up to 24), the ROC is housed in an attractive tabletop enclosure. Durable Penny & Giles faders, OLED source indication and intuitive controls make the ROC a natural for on-air, production rooms or even in temporary studio setups. Two monitor feeds, front panel headphone connection and user-assignable softkeys will please even your fussiest operators.

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World Radio History

High summer is when many companies begin shipping the new products they introduced in the winter and spring convention season. Over the next several issues, Radio World is featuring new notable products that manufacturers have introduced to serve the U.S. radio broadcasting industry.

IP IN THE FIELD: ALCO PROFESSIONAL

ATC Labs offers an IP software codec for field use, ALCO Professional. It works with Internet connections and aims at optimizing 2G/3G wireless connections. It operates as an SIP client using an ATC Labs SIP server for flexibility in connecting from the field. Bitrate selection provides 32/64/128 kbps performance including high-fidelity stereo. ALCO uses its own low-delay audio coding and processing algorithms for enhanced sound fidelity, clarity and robustness, according to the company. Standard codecs such as G.711 are supported.

A chat channel allows for text messaging to field users while they are connected. The ALCO Professional also has a mixing function for creating conference calls with multiple users in the field; bitrate selection can be configured independently for each user and the return channel.

ALCO Professional is being used with Windows PCs, netbooks and tablets. An Android version is planned. A free one-week trial is available. Starting price is $579 for a pair of one base and one field license.

Info: www.atc-labs.com/

"RoboBoom"

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Welcome to "RoboBoom" the world's first interactive robotic microphone arm!!

This patented system employs super quiet robotic motors and special facial recognition technology to determine the distance between the person's face and the tip of the microphone. Once the "RoboBoom" is engaged, it automatically positions the microphone at an optimal distance from the talent for best audio quality pickup.

Contacts:
Brian Clark
bclark@kumotek.com

Mathew Fisher
mfisher@kumotek.com

KUMOTEK ROBOTICS

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Richardson, TX 75081 • 972-436-3867

BARIX ANNOUNCES ANNUNCICOM PS1

Audio networking hardware maker Barix has the Annuncicom PS1, designed as an intercom module akin to a beltpack. But unlike a standard intercom module, the PS1 uses Ethernet as its signal carrier rather than RF or a dedicated cable com. The PS1 also uses power-over-Ethernet for power thus eliminating batteries.

The PS1 has a volume control thumbwheel along with two push-to-talk buttons. Connections are available for Ethernet (LAN), mic input and a headphones output. Onboard mic and speaker should prove handy.

With MP3 and AACplus decoding, the PS1 can be used as a confidence monitor as well. There is an optional beltclip.

Barix also introduces the Exstreamer 105 IP audio decoding device for radio broadcast, saying it retains the features of predecessor Exstreamer 100 while adding a MicroSD slot to the front for a sleeker design and enhanced content protection. It is particularly useful in broadcast operations where the device is streaming content direct-to-air, including small studios, unmanned operations and in-store networks.

Info: http://www.barix.com

V-SOFT UPDATES XFIELD, FM COMMANDER

V-Soft FM Commander performs FM channel searches and produces maps suitable for filing an application with the FCC. New features include interactive operation with user input. Incoming contour overlaps are displayed in pink and lined through if they are irrelevant in the study, such as the case with translators. The values remain displayed since excessive overlap could render the translator's coverage useless.

Call	Type	Ch	Location		Az	Dist	In	Out
WVOF	LIC	203A	Fairfield	CT	62.8	14.03	-13.5	0.3
WEDW-FM	LIC-D	203A	Stamford	CT	238.6	11.61	-11.3	1.5
W203BB	LIC-D	203D	Norwalk	CT	0.0	0.00	-10.6	-10.6
WKWZ	LIC-D	203A	Syosset	NY	187.6	34.13	2.1	20.9
U.N.	VAC	206B	New York	NY	230.5	61.21	53.4	7.8
1218909	APP-D	203A	Brewster	NY	341.8	33.10	8.8	17.6
WPOB	LIC-D	203A	Plainview	NY	187.6	34.13	9.1	22.7
WMNR	LIC-D	201B1	Monroe	CT	28.1	27.43	23.8	11.2
1395522	APP-D	203A	Brewster	NY	340.1	36.37	15.4	24.2
WEDY	CPM	06 1E	New Haven	CT	58.8	49.04	31.8R	17.3M
WEDY	LI	06 1E	New Haven	CT	58.8	49.04	31.8R	17.3M
WFRS	LIC-D	205A	Smithtown	NY	149.5	37.58	34.7	17.4
WNHU	LIC	204A	West Haven	CT	60.4	43.06	19.3	24.5
WWES	LIC-D	205A	Mount Kisco	NY	301.0	29.78	27.4	22.4
WNYU-FM	LIC-D	206B1	New York	NY	237.5	50.39	46.1	23.4
WFCR	LIC	203B	Amherst	MA	29.9	162.39	23.6	96.7
WARY	LIC-D	201D	Valhalla	NY	264.0	32.25	30.2	24.0

Interactive features include a 73.207 minimum spacing map which allows the user to select a new spot on the map with recalculations for that location. Stations failing to meet minimum distances under 73.215 are flagged with the call letters in magenta. Contour to contour studies will see an instantaneous greatest point of overlap distance between the reference station's contours and automatically selected databases contours.

V-soft's XField is a program to calculate the location of FM translator interference contours and determine the locations of FM IBOC host interference when separate antennas are employed for main-channel analog and IBOC carriers. XField 2.0 can be employed when relocating FM translator stations to new channels that are second- or third-adjacent to full-service or otherwise protected translator stations. XField 2.0 considers the translator antenna's vertical elevation field in its calculations of U to D ratio to determine compliance with FCC Rules. Results are shown in graphic and tabular form, the latter in a 74.1204(d) showing, identical to those employed by the FCC. XField 2.0 may be used with any V-Soft terrain elevation databases, provided as an option.

Info: www.v-soft.com

World Radio History

Which is better for streaming: hardware or software?

Telos ProSTREAM:
Internet streaming in a box.

Everyone knows the answer is *hardware* — like a Zephyr! Introducing Telos ProSTREAM, the professional netcoder for Internet streaming, with Omnia multi-band processing built right in.

ProSTREAM makes sending programming to the Net easier than ever. Simple and bulletproof: analog or digital audio goes in, compressed audio streams out. Just hook up your input, select a bit rate and Omnia processing preset, send the output to your Shoutcast or Wowza server, and *Shazam!* Streaming audio, simple as 1, 2, 3.

And such audio…amazing. Thanks to our partnership with Fraunhofer (FhG), we were able to build a processing architecture that's specially optimized for MP3 and MPEG-AAC encoding algorithms. The result: detailed, commanding, blow-you-out-of-your-office-chair streaming audio, even at aggressive bit rates.

Telos

Telos-Systems.com/ProStream/

Omnia A/XE:
Internet streaming in a server.

Obviously, the correct answer is *software*, with the power to stream multiple channels from a single PC. Meet Omnia A/XE, the professional all-in-one software solution for Internet streaming.

Omnia A/XE can turn a couple of lonely servers into a supercharged streaming network. It runs in the background as a Windows service and can process and encode multiple streams in various formats simultaneously. Just hook up your audio, choose a bit rate and processing preset, select your Shoutcast or Wowza server, and *Voila!* Streaming audio, simple as A, B, C.

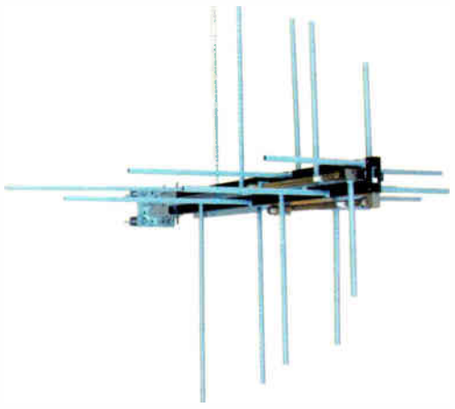
And that audio packs the clean, clear competition-crushing punch Omnia is famous for. Each stream is sweetened with its own adjustable wide-band AGC with three-band compressor/limiter, EQ and low-pass filter, and precision look-ahead final limiter. The result: clean, clear streams with more presence and character than you ever thought possible.

Omnia

Omniaaudio.com A/XE

World Radio History

SUMMER OF PRODUCTS



ALDENA AIMS FOR BETTER RADIATION CONTROL, COVERAGE

Aldena offers the ALP0502920 five-element, log-periodic directional antenna, suitable for low- to medium-power FM stacked-array antenna systems.

The ALP0502920, said the company, boasts exemplary electrical performance thanks to high gain, front-to-back ratio and reduced side lobes.

With an aluminum body and parts as well as galvanized steel brackets and bolts, the ALP0502920 can be used for circular, mixed or linear polarization. Mounting directly on the mast, the average gain of the lightweight antenna is 5.5 dBd.

Info: www.aldena.it

ENCO IMPROVES WEBLIB

ENCO Systems premiered the Weblib2 version of its browser-based library search/download utility.

Weblib was created to allow numerous users within a facility access to primary or backup DAD libraries for the purpose of downloading samples, using audio for production and basic playout. The new version provides enhanced search, cut modification functions, audio import functions and wider support for multiple libraries. Also added is the ability to preview and make changes to playlists at a given site.

Also, RemoteVT is a new process for sharing voicetracking resources. The Remote Tracker Server continuously looks for new playlists at the "head end" facility and, upon detecting a new item, begins processing it for remote voicetracking. It takes pieces of the playlist and audio and sends it to a shared FTP site (public or private). The Remote Tracker Client (running on any Windows XP or Windows 7 session) scans the FTP site and, when new content arrives, stores it locally to that machine. A user can voice track into that playlist as if sitting at the primary facility. When the VTs are complete, they are uploaded back to the FTP site and RTS automatically pulls them back to the main facility. Several people can voicetrack in the playlist at the same time, even the same hour of the playlist that's currently "on the air."

Info: www.enco.com

DAWNCO TACKLES TI INTERFERENCE

Dawnco offers the C-BandPass-Wimax filter, which inserts between the LNB and dish to eliminate interference from airport, military and marine radars as well as new Wimax transmission sources.

Specifications of –70 dB rejection above and below the desired bandpass with 0.4 dB maximum insertion loss virtually assure interference free reception of desired satellite signals.

Dawnco also introduced DawnFlex.6QF quad shielded coaxial cable for distances up to 500 feet between the LNB and receiver. The low-loss cable is suitable for direct burial. Connectors feature integrated ground lug for lightning protection.

Dawnco, based in Michigan, is a provider of satellite, broadband, fiber optic and other specialty products.

Info: www.dawnco.com

World Radio History

SONNOX FRAUNHOFER PRO-CODEC

An upgrade is coming to the Sonnox Fraunhofer Pro-Codec Plug-in for digital audio workstations.

The new version of the plug-in enables mastering engineers to use the iTunes Plus codec for real-time auditioning of their mix. This makes the plug-in a time-saving tool to mix directly for the "Mastered for iTunes" program, including clipping detection and the possibility for real-time corrections while mixing. For this new functionality, Sonnox has added the Apple versions of the AAC and HE-AAC codecs to the plug-in so that the clipping behavior of the iTunes encoding chain may be monitored.

The plug-in will support the latest multi-channel audio codecs such as MPEG surround.

Fraunhofer IIS also says it played a major role in development of the ISO MPEG DASH (Dynamic Adaptive Streaming over HTTP) standard. The company recently demonstrated how the HE-AAC Multichannel and MPEG Surround codecs can be used to enable the DASH streaming experience from bit rates as low as 48 kilobits per second for 5.1 audio with MPEG surround up to transparency with AAC-LC at 320 kbit/s.

Fraunhofer won an NAB Innovation Award for its dialogue enhancement technology, which enables radio listeners and TV viewers to control the audio volume of speech and other sounds. The company demoed the technology using clips from an experiment with the BBC during the 2011 Wimbledon lawn tennis tournament. Visitors could control the relative volume of commentary and court sounds.

Harald Fuchs is shown with NAB's Gordon Smith at the NAB Show.

Info: http://www.iis.fraunhofer.de/amm

JAMPRO HAS FM BANDPASS COMBINER

Jampro Antennas rolled out the new RCCC-102-FM Constant Impedance FM Bandpass Combiner (shown). Jampro says these modular combiners "use temperature compensated bandpass filters with integrated heat sink tops to keep filters cool and locked on their frequencies."

Jampro also has a new compact 8-inch RCEC mask filter that is "designed to provide superior mask filter performance at an affordable price and an output power of 5 kW."

The company also recently acquired Alan Dick Broadcast Ltd., an antenna systems maker and contractor in the United Kingdom.

Info: www.jampro.com

World Radio History

"Considering the LX-24's attractive good looks, modularity, traditional console layout and functionality, I can't wait to get my hands on one!"

Greg Landgraf, Senior Engineering Manager, Corus Radio Western Canada

"A high performance, reasonably priced, great looking console integrating common sense features such as overload indicators for meters and ergonomic controls. Very impressive and well thought out."

Benjamin Brinitzer, Regional VP Engineering Clear Channel Media & Entertainment

"Wheatstone continues to hit balls out of the park and this year they did so again with the LX-24 control surface. This new product marries the best of the old (modular design architecture) with the new (Audio-over-IP). Continuing in that theme was a Wheatstone module that marries their bridge router system to the new "BLADE" audio-over-IP system. This has the potential to extend the life of bridge router facilities indefinitely."

W.C. Alexander, CPBE, AMD, DRB, Director of Engineering Crawford Broadcasting Company

"Leave it to the exquisite design talents of Gary Snow and the Wheatstone team to really hit the nail on the head. The LX-24 is not only the most functional, feature-laden IP based console for radio, it also raises the bar for the finest ergonomic radio command center on the planet."

Tim Schwieger, President / CEO, BSW- Broadcast Supply Worldwide

"Wheatstone's innovation continues to make AoIP a viable product for professional broadcasting facilities. Just a few things that make the LX-24 stand out to me are the clear and decisive metering, individual fader modules, and "out of the box" thinking with faders for the headphone and monitor volume controls instead of rotary knobs."

Phillip Vaughan, Chief Engineer KFROG, CBS Radio

"The LX caught my attention on the NAB Show floor. The look, form and function are unlike any other IP console available today. The easy-to-read buttons and displays are just second to none, not to mention the most bang for the buck. I can't wait 'til I have the opportunity to deploy my first LX."

Anthony A. Gervasi, Jr., Sr. Vice President Engineering & Technology, Nassau Broadcasting

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World Radio History

"gotta have it!"

"Wow, Wow!"

Rick Hunt, Vice President & Director of Radio Engineering, Entravision Communications Corporation

"I didn't think Wheatstone could improve upon the E-Series of consoles, but they have done it with the new LX-24. This is a beautiful, well designed console and the individual faders, integrated meters with overload indicators and low profile table-top design make this a must have for our facilities."

Michael Cooney, Vice President of Engineering & CTO Beasley Broadcast Group, Inc.

"Cool and sexy (I sound like Bruno from Dancing with the Stars). A great addition to the WheatNet-IP family."

Norman Philips, Vice President of Engineering, Townsquare Media

"By far the most elegant and feature rich control surface on the market. The attention to detail and functionality is remarkable. Its architecture, such as "hot swappable" modular design, is a winner. A traditional meter bridge is appreciated by users and your millwork guy will appreciate the fact that it's a table-top design."

Kris Rodts, Director of Engineering, IT & Facilities, CKUA Radio Network

"I am very impressed with the sleek new design that incorporates single channel-strip architecture, integrated metering and stereo cue speakers in a thin, sloping chassis that needs no cabinetry cut out. Well done."

Erik Kuhlmann, Senior Vice President of Engineering, Clear Channel Media + Entertainment

LX-24

ADVANCED MODULAR NETWORKABLE CONSOLE

Wheatstone

World Radio History

MONITOR WITH CONFIDENCE WITH BELAR

From Belar Electronics Laboratory Inc. comes the FMCS-1, a precision digital all-in-one FM modulation monitor.

The unit combines features and functions of a frequency agile RF amplifier, down-converter, FM demod, stereo demod, RDS decoder, SCA decoder and FFT spectrum analyzer. Using DSP techniques, the processing takes place in the digital domain, resulting in FM analog performance that Belar says was not possible previously.

The FMHD-1 digital FM HD stereo monitor/analyzer is an HD Radio monitor; it decodes HD Radio and analog FM signals simultaneously, displaying HD Radio status, data, time-alignment, along with total, pilot, L, R, L+R and L-R metering and RF spectrum analysis with mask and sideband power measurements.

Info: www.belar.com

KUMOTEK GOES ROBOTIC

A common problem faced by hosts are guests who are not "microphone-smart." They tend to wander from the studio microphone, producing a variation in audio level and frequency response.

The RoboBoom robotic microphone boom addresses this. A camera employs facial recognition technology to determine the distance from the person's face to the tip of the microphone. Once engaged, RoboBoom's quiet robotic motors automatically move the microphone to an optimal position and distance from the voice artist for the best audio quality pickup.

Whenever the performer moves their head, fidgets or otherwise moves away from the microphone, the RoboBoom adjusts itself to the optimal position for receiving sound.

RoboBoom model RB-1 is expected to be available in August. Developer Brian Clark is shown.

Info: email bclark@kumotek.com

ARRAKIS: A NEW ADAPTABLE AUTOMATION SYSTEM

The New~Wave Pro automation system from Arrakis permits broadcasters to play live broadcasts, automated broadcasts and podcasts, as well as carry out Internet radio streaming, simultaneously. It features dual-monitor support for live assist as well as an unlimited amount of adaptable hot key pages.

Offering customizable music scheduling, the software solution lets users connect to five on-air studios from the production room to schedule, voice track, manage audio libraries and reconcile one's logs. It also includes a simplified segue editor to create tailor-made voice tracks.

New~Wave Pro, the company says, is designed for applications from live assist, music on hard disk and ball games to satellite automation and timed records. It includes a 16-channel switcher (with built-in professional grade sound cards) for connecting to up to 16 satellite feeds. Users can also associate New~Wave Pro software to the Arrakis ARC series desk for an integrated radio workstation.

Info: www.arrakis-systems.com

BURK LINKS SYSTEMS

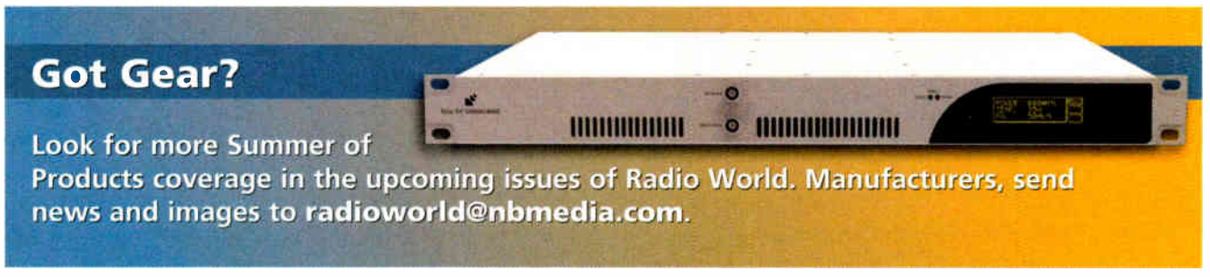
Owners of legacy Burk Systems GSC3000, VRC2000 or VRC2500 installations can benefit from a new I/O expansion module, the Plus-X GSC Adapter. The adapter makes those units compatible with ARC Plus remote control systems, providing an easier upgrade path.

The Plus-X GSC Adapter, shown, connects directly to existing GSC/VRC Command Relay and Wiring interface panels, eliminating the need for extensive rewiring or replacing previously purchased equipment.

The 1 RU GSC Adapter can connect to an ARC Plus over Ethernet, easing installation. ARC Plus systems include built-in Web and smartphone access, email and SMS alerting and onboard macros that the older systems do not have. Burk also offers an adapter to replace ARC-16s with the ARC Plus. In both cases, the upgrade takes less than an hour. A trade-in allowance is offered to encourage upgrades this summer.

The company also highlights the new Plus-X 600 Ethernet I/O accessory, available for the ARC Plus transmitter remote control. It offers 16 status inputs, eight metering inputs and six raise/lower relay pairs in a one-rack unit package. The company says this option, especially paired with the ARC Plus SL, makes the ARC Plus both budget-friendly and rack-efficient.

Info: www.burk.com



World Radio History

OP-XAUTOMATION

SIMPLE • POWERFUL • REDUNDANT

"OP-X is very functional and easy to use. Log merge on our old system took minutes and OP-X it takes seconds."

-John O'Dea, Ops Mgr
WNNK-FM, Harrisburg, PA

- Modular Operation in Op-X allows for a tiered system at a fraction of the cost of its competitors.
- Each studio client is capable of accessing all Audio Server modules on the network.
- Remote voice-tracking allows for creation of content for remote studios also running Op-X.
- The revolutionary design of Op-X's clock builder turns the previous task of scheduling satellite programming into a few simple clicks.
- Share serial devices from any machine using the Op-X Serial Server.
- Importing logs now gets its own module that takes confusion out of the process.
- Engineers will enjoy Op-X because it's easy to install, maintain, and has automatic backup features.

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2011

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World Radio History

Arrakis ARC-15 Flies for Eagle Radio

Simple Design and USB Input Make Console the Right Fit

USERREPORT

BY BING BRUCE
Television and Radio
Producer/Engineer
Mt. San Jacinto College

SAN JACINTO, CALIF. — I was 17 years old when I got into radio in 1979.

The station was a small local operation in Washington state. Its console looked like a 1950s Navy surplus radio console … utility gray sheet metal construction with Bakelite knobs so big you could use them for stools. The switches were clunky and the dual VU meters were aged to a rustic orange. Adding to the ambience were shelves full of LPs making the studio look like an antique store.

From that day, I knew I wanted to be a part of radio.

My training was simple: "Here, sit down. This one is your mic, and these are your turntables. No dead air. See ya."

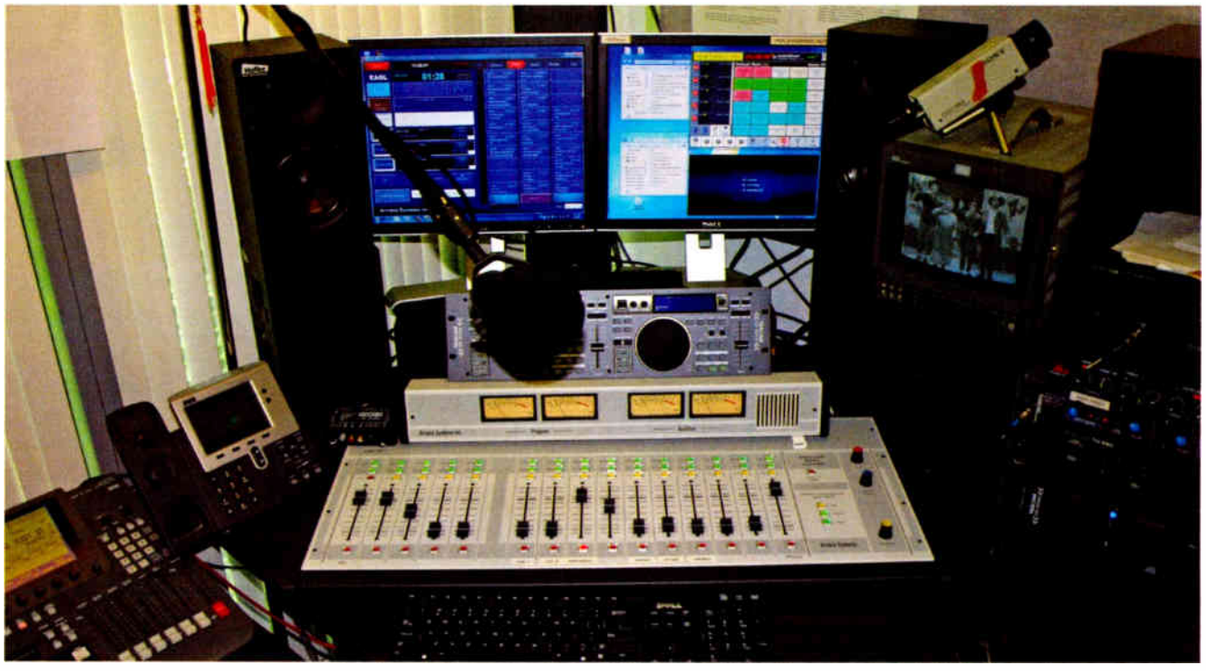
Today, radio stations are far more complicated, with network satellite downlinks and digital remote systems and studios. It is great to see Arrakis Systems design a console that can handle the complex tasks of routing and recording but keep that simplicity of use to operators.

The Arrakis ARC-15 is our newest acquisition at Mt. San Jacinto College's Eagle Radio Network. Finding a 15-channel radio console in the $3,500 price range seemed too good to be true. The ARC-15 has a neat, modern look to it with a textured gray and black color scheme. It fits into any studio design and is built as rugged as its forefathers. The channel faders are silky smooth and have an impressively straight fade slope to them, keeping the mixes smooth and consistent.

I also like the way Arrakis designed the control surface, separating the mic faders from the rest of the channels. The ARC-15, like its more expensive cousins, has a dedicated channel for the telephone hybrid, or it can be switched to a normal line input. The USB input connecting the Arrakis automation software works seamlessly unless you use the Arrakis Bridge. You can't connect both to the automation computer at the same time. However, leaving the bridge connected to the computer via USB and using line out of the computer for audio gives you greater flexibility for audio control for cue channels and audition.

The low power consumption on the ARC-15 is impressive too.

Connecting the ARC-15 console to your studio equipment is much easier with standard, balanced XLR mic inputs and RJ-45 line inputs. The program outputs are balanced XLR and unbalanced RCA connectors. The line inputs on Channels 6 through 15 use the RJ-45 connectors making it easy to install into larger studio operations.



How does it sound? The Arrakis ARC-15 is transparent. Its 20 Hz–20 kHz frequency response makes it competitive for the digital broadcast market, especially if you are using studio-quality condenser mics as we do.

A problem I have had with other consoles is that while they are built like a tank they often sound like one too. They tend to have noisy gain structures or narrow dynamic range. Not so with the ARC-15. It broadcasts crisp, clear audio even when we have to push the gain all the way up for some of our lower level inputs.

Over all, this is a great console for small to medium-sized radio stations. The simple design makes it easy to use for lesser experienced operators yet maintains the power and quality expected by seasoned professionals.

For information, contact Ben Palmer at Arrakis Systems in Colorado at (970) 461-0730 or visit www.arrakis-systems.com.

World Radio History

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*Qualified Omnia models for trade-in: Omnia Classic, Omnia Hot, Omnia 4.5, Omnia 05, Omnia 06.
Offer ends September 28 or may be withdrawn earlier if Frank Foti returns from his vacation and gets wind of this.

World Radio History

Ireland's iRadio Chooses Axia Audio

In the Entire Installation We Used a Single 985-Foot Roll of Cat-6 Cable

USERREPORT

BY ANDY LINTON
Director
Total Broadcast Consultants Ltd

WATERFORD, IRELAND — When iRadio, Ireland's new regional, CHR radio station was built in Galway, the owners along with my company, Total Broadcast Consultants, decided it should be the country's first all-digital radio station.

That meant that after the mics, the entire transmission chain would not leave the digital domain until it hit the transmitters (all 10 of them!).

SIMPLER THE SECOND TIME

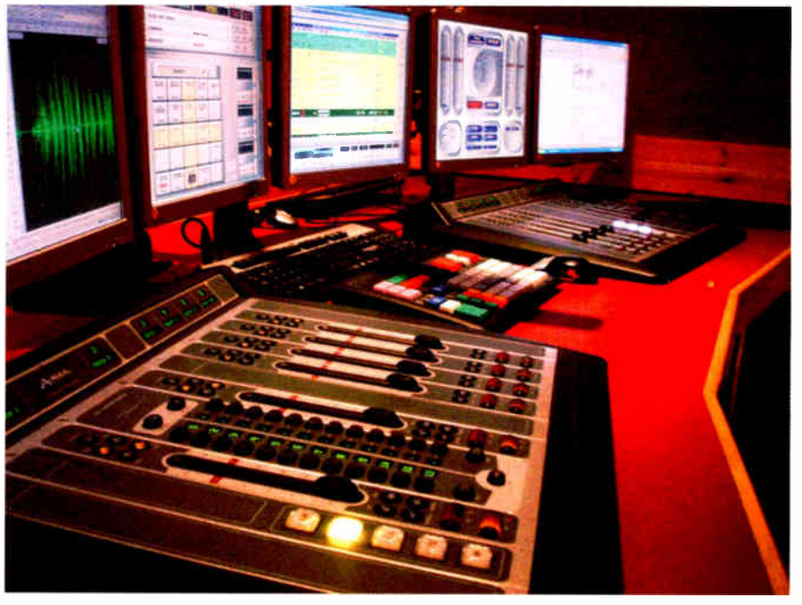
In that five-studio installation in 2008, we used over €4,500-worth (~$6,000) of multicore cabling, punchblocks, connectors, terminations, etc. The studio installation took a five-man team five weeks to complete, what with running the cable throughout the facility and soldering countless connectors. One wall of the central rack room was taken up by a Krone punchblock field and we had to use countless boxes like distribution amplifiers, word clock generators and switchers to make it all work.

The results were good, although there were many problems along the way, chiefly in getting the consoles to talk to other equipment and programming the consoles themselves, which wasn't easy. I was not impressed with the support from the console manufacturer — often there being no call-backs, which I regarded as inexcusable for a company in the same time zone.

In fact, it was a huge headache!

A year later, the broadcast company secured a second regional licence, this time to cover the midlands and north-east of Ireland using a second base, in the town of Athlone (the site of the world's first national broadcast transmitter nearly 100 years earlier!) with four studios feeding eight transmitter sites via satellite. They wanted to go all-digital again.

In the interim my company had formed a partnership with Axia, and given what I'd learned from talking with the guys from Cleveland, I was pretty confident that if we used the Axia IP-based console and routing system, it would be a lot more straightforward this time.



With this installation, using Axia Element consoles, mixing engines, nodes and more, in the entire installation we used — wait for it — a single 300-meter (985 feet) roll of Cat-6 cable (cost: €100= $130).

I got the IT contractor to run the cable and terminate and test it.

I personally carried out the installation with two other men. After just one week we had audio playing in the studios. The guys from our automation provider, RCS, had never used the Axia IP-drivers instead of soundcards before, and were amazed when it just worked.

I had never programmed an Axia system. I was fortunate that Kirk Harnack of Telos/Axia was visiting Ireland at that time and gave me a brief starter course.

I was able to get the whole facility programmed and working in two days, even getting some complex studio switching and intercoms working using the company's Pathfinder Pro — with the excellent assistance of Axia tech support.

The station management was delighted, and the on-air staff loves the studios. This was Ireland's first IP-based radio facility — still perfect "digital" quality all the way through, and it showed off Axia's networked audio well.

And aside from a headache endured after the opening party, I had no need for pain killers at any time.

For information, contact Clark Novak at Axia Audio in Ohio at (216) 241-7225 or visit www.axiaaudio.com.

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World Radio History

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The best part? The Nx6 package including Assistant Producer call screening software and one Desktop Director is yours for only $4,295 MSRP.

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Telos

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World Radio History

KPBS Adopts Harris VistaMax Networks

Upgrade to Digital Networking Provides Flexibility That SoCal Broadcaster Desires

USERREPORT

BY LEON MESSENIE
Director of Engineering & Information Technology
KPBS Public Broadcasting

SAN DIEGO — KPBS(FM) is a public radio station licensed to San Diego State University, broadcasting local news and public affairs, NPR, American Public Media and PRI programming to listeners in San Diego County, Calif. Our sister station, KQVO(FM) in Calexico, Calif., simulcasts KPBS in adjacent Imperial County, Calif. — occasionally breaking away to broadcast programming specially produced for the local audience.

Our studios on the San Diego State University campus, shared with sister station KPBS(TV), have remained analog since adding HD Radio services in 2005. A recent PTFP grant enabled us to implement a major facility upgrade that dramatically improved three of our five control rooms along with our network routing infrastructure.

Completed in March, 2012, the upgrade included three Harris PR&E RMX*digital*-20 radio broadcast consoles, each outfitted with 18 faders. We also replaced a legacy hard-wired system with an innovative Harris PR&E VistaMax network routing solution based on a distributed architecture. The concept localizes source sharing, simplifies wiring and enhances network control in each studio.

The end-to-end Harris VistaMax network solution includes six single-rack-unit Harris PR&E VMXpress "edge devices," ordered in a variety of analog and digital I/O configurations with bidirectional logic control. A central 4 RU VMConnect "hub" enables resource sharing and distribution of any I/O on the VMXpress boxes.

The upgrade has delivered unprecedented operational flexibility to route audio signals, share media resources and reconfigure the control rooms as needed. On-air sources previously were hard-wired to console faders and the complex network wiring scheme locked each control room into a specific function. This meant that one studio was restricted to on-air while another was designated for news production.

The VistaMax distributed architecture gives us the freedom to devote any network control room for more than a single purpose. An operator in one control room can access microphones, ISDN lines, satellite feeds and other signals from any networked device or location. Operators can move shows from one control room to another. And VMXpress logic controls can take control of any networked device — like disk recorders or servers — from any room.

The new distributed network topology greatly simplifies wiring, cabling and equipment maintenance in comparison to using a centralized routing system. It also simplifies the process of adding equipment or studios to the network. The distributed architecture brings the network devices within a few feet of the console in most situations and it simplifies the connection of every local control room. Sources connect to the analog or digital I/Os of the nearest VMXpress device.

Gone are the miles of cables that ran down the hallways, connecting every individual source to the central router in our terminal room. The VMConnect hardware lives in the terminal room, requiring hard-wired connections to the six VMXpress edge devices (three in the studios and three in terminal room) — and nothing else.

The VistaMax network-enabled RMX*digital*-20 audio consoles can be networked, introducing another level of resource sharing. The Session Recall feature is a hit with our operators, especially for local news shows like "KPBS Morning Edition" or "KPBS Midday Edition." Operators can configure the console according to their production requirements, store the settings and then recall them at any of the three consoles.

A Harris PR&E VMReact 1RU logic-processing device automates status monitoring and system control in each studio. The device serves many functions including automatic, user-defined corrective action when it detects dead air.

The grant money covered three studios and the distributed architecture upgrade, although two additional control rooms remain tied to the old hard-wired system. Having the VistaMax distributed network in place means that we'll only have to connect the local sources in each room to a VMXpress when the budget allows, and wire them to the VMConnect hub. It is difficult to imagine a simpler way to bring new studios onto the network.

For information, contact Brian Clifford at Harris in Ohio at (513) 459-3714 or visit www.broadcast.harris.com.

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 **bmoss@nbmedia.com.**

World Radio History

1664: Just what it looks like. Two tin cups and a string. But it transmitted sound!

1876: Alexander Graham Bell's commercially viable telephone.

1900: Phones become fixtures in more well-to-do and steam-punk homes.

1920: Every home is working toward having a telephone!

1936: The advent of the dial desk phone. No more asking the operator to connect you.

1963: Push buttons usher in the thoroughly modern world. Touch tones enter pop culture.

1983: The mobile phone is a reality. Plots in all TV shows get a boost!

2004: IP Telephones begin to become the staple of modern business.

2007: Smartphones are complete communications centers. AND they can sound great!

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TECHUPDATE

MAYAH C1191 IP CODEC ADDS LIVEWIRE OPTION

Codec maker Mayah Communications has added an Axia Audio Livewire option for its C1191 IP codec making it compatible and operational with Livewire IP-audio networks.

Livewire is a LAN technology for in-facility IP-audio networking. It provides transportation and switching of uncompressed 24-bit/48 kHz signals. In a Livewire environment all studio gear, analog or digital, will have Livewire ports (standard Ethernet), each connected to a switch using a Cat-5 cable.

Mayah says that its Livewire option benefits include reduction of the number of failure points in a system; reduced maintenance and cabling needed; and ultimately fewer physical nodes required and reduced cap-ex.

For information, contact Mayah Communications in Washington at (360) 618-1474 or visit www.mayah.com.

WHEATSTONE LX-24 MARRIES ELEGANCE, FEATURES

Wheatstone says that its latest radio console, the LX-24, marries traditional modular design with a modern low-profile networkable control surface sporting an ergonomic, operator-oriented layout.

Each of the console's 24 input channels has a source display, four stereo bus assigns, four aux sends, four mix-minuses, mode select, A/B source select and two programmable soft buttons.

Designed for use with Wheatstone's WheatNet-IP Intelligent Network, the LX-24 allows channel access to any source on the audio network. Four dual high-resolution LED meter displays monitor signal levels and circular LED indicators clearly show aux send levels. A pan indicator, digital timer and left and right stereo cue speakers round out the console's meter bridge.

The monitor section of the LX-24 has an array of features: control room and headphone levels are handled by long throw faders. A CR/HDPN source display calls out which signal has been selected, and five fast-select buttons instantly call up the four stereo output busses plus an external source. The headphone panel houses the console timer controls, cue master level and switched meter assign (the meters can access any signal on the network).

Two studio monitor panels have their own source select, talkback and rotary level controls. The Studio 1 panel houses the console's named Event Snapshot function, while Studio 2 handles Send Talkback and features 12 programmable soft buttons. An accessory switch panel with 16 large-format lighted buttons can be programmed for a multitude of functions, including (but not limited to) source preselects, logic functions, firing salvos, daypart configuration, intercom communication, etc.

A tabletop control surface requiring no counter cut-out, the LX-24 connects to a rackmountable Wheatnet-IP console Blade via an RJ-45 connector to access audio mix functionality and basic I/O. Additional Blades can be added for more inputs and outputs in a variety of digital and analog formats. All I/O, as well as output mixes, can be shared with other consoles and devices throughout the network.

For information, contact Wheatstone in North Carolina (252) 638-7000 or visit www.wheatstone-radio.com.

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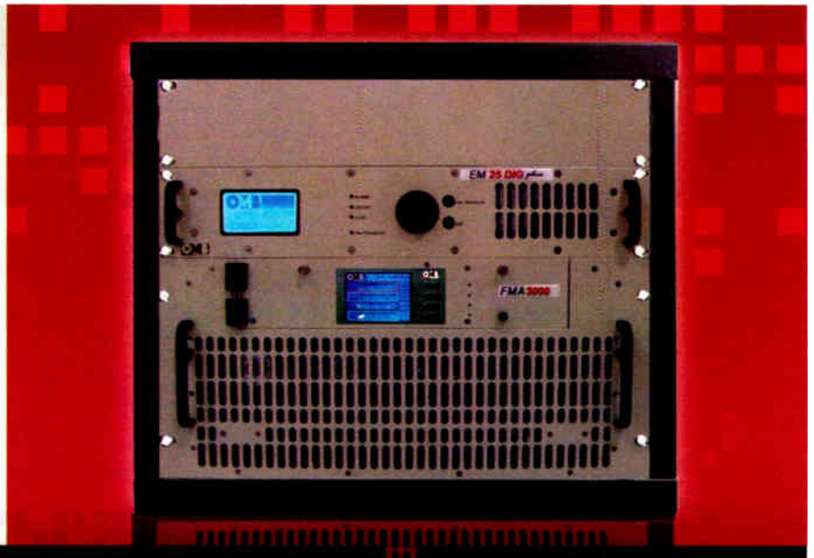

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World Radio History

Lawo Rings Well for Bell Media

Canadian Adds Sapphire Consoles to Installed Lawo Gear

USERREPORT

BY DAVE SIMON
Director, Radio Engineering
Bell Media

TORONTO — Since 2009 Bell Media Radio has been using Lawo consoles and routers in its Toronto radio operations. The main Toronto system is based on zirkon consoles for the stations' master control rooms and crystal consoles used for edit and production rooms. The backbone of the system is a Lawo Nova 73 router, backed up by a smaller Nova 17 router. There are two zirkon and 14 crystal consoles connected via fiber MADI to the Nova 73 and Nova 17 routers.

Our reasons for choosing Lawo for our radio operations include its robust architecture and the ability to scale. Lawo also is the primary choice for many of Bell Media's TV production consoles, which means that engineering staff can draw on technical expertise from elsewhere in the company.

LAYERS

This year, we have expanded our Toronto radio operations to include TSN Radio 1050, an all-sports station. The decision was made to collocate TSN Radio with the TSN TV operations at Bell Media's Agincourt campus in the northeast end of Toronto.

The plans called for a main on-air control room, a news booth and three edit stations. Once again, we decided to utilize Lawo systems. In addition to the familiar crystal consoles for the news and edit/production areas, we used two new products from Lawo — the sapphire console in the control room and the Nova 29 router as the backbone.

The TSN Radio system was designed to support TV simulcasts, which requires that the console and router be able to scale in order to handle the additional sources required for integration with TV production. These include video router feeds and outputs from various video clip servers.

The sapphire was an ideal audio console for this purpose with its dual-layer functionality, which effectively doubled the number of fader sources that can be assigned to the console, while also providing a logical grouping between frequently accessed and occasionally accessed input sources.

In our case the most frequently accessed radio sources are found on the A Layer, while the TV only inputs were placed on the less frequently accessed B Layer. Note that both A and B sources can be active simultaneously. We utilized a 28-fader control surface for this project because, in addition to the TV sources, it is necessary to manage a large number of satellite and codec sources for our broadcasts. The Lawo sapphire systems, along with the backend router, handle all our mix-minus requirements.

The core of the router is the other new Lawo product, the Nova 29 MADI router supporting up to 16 bidirectional 64-channel MADI connections, which provides an overall routing matrix capable of 1,024 inputs x 1,024 outputs. Two Nova 29 routers in a redundant configuration provide the core router to the TSN Radio system. All the consoles have dual fiber connections back to the redundant Nova 29 core. In addition, a Nova 17 frame provides the additional AES and analog I/O in our equipment racks for centrally located codecs and the RCS master control automation systems.

Bell Media has found Lawo consoles and routers to be flexible and very reliable. The versatility continues to improve as we now have ability to add Ravenna audio-over-IP cards to the existing system.

For information, contact Herbert Lemcke at Lawo in Ontario at (416) 292-0078 or visit www.lawo.ca.

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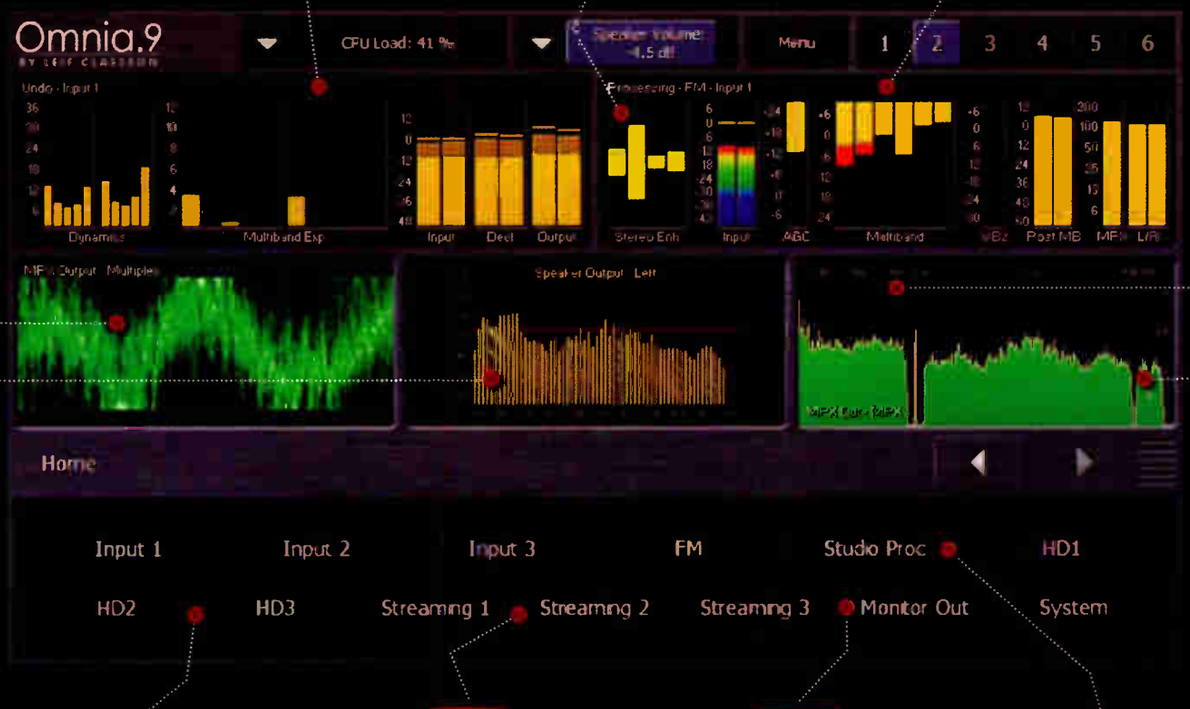

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TECHUPDATES

AXEL OXYGEN 4 IS DIGITAL

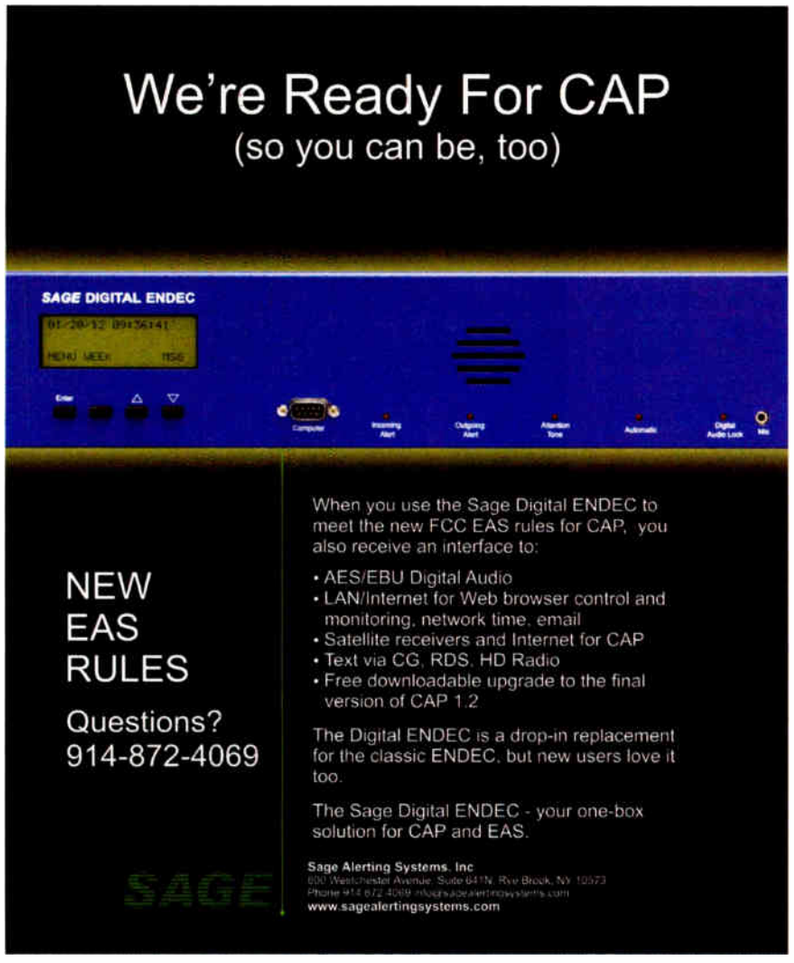
Axel's Oxygen 4 Digital is a digital, standalone mixing console system powered by Texas Instruments DSP processors. It has 18 digital and analog inputs, a crosspoint router, 32-bit processing, sampling rates up to 96 kHz, sample rate converters on the digital inputs and EQ and dynamics on every channel. All of these tools can be accessed from the control surface as well as a PC connected to the mixer via an IP network.

The 2 RU rack-mounted engine handles processing and routing. The engine features four mic inputs, two mono and five stereo ins, seven digital stereo in/outs with a sample rate converter. There are dedicated analog outs for program, subwoofer, auxiliary, control room monitor and headphones.

Signal processing is all-digital. Processing uses floating-point calculations at a word-length of 32 bits. The audio paths within Oxygen 4 Digital are programmable thanks to the presence of an input router. This eliminates the need for an external patch-bay.

Ethernet connection allows control from anywhere. Oxygen 4 Digital is user-friendly thanks to a memory card slot that can save desk configurations for recall and individual customization.

For information, contact Axel Technology in Italy at 011-39-05-1736-555 or visit www.axeltechnology.com.



NEW LOGITEK ROC CONSOLE AVAILABLE

Logitek's ROC console is an advanced control surface for the JetStream networked audio platform. Available in configurations of six, 12 or 18 faders (including split fader configurations), the ROC includes Penny & Giles faders, OLED source indication and a durable reverse-printed overlay surface in a tabletop enclosure. RGB-addressable lighting in the console's on/off and softkey buttons allow users to specify any desired color for console functions.

The console's monitor control module includes controls for source selection, timer start/stop, two monitor feeds and headphone output along with 12 user-assignable softkeys. Additional modules with 12 softkeys per module are available as an option. Front-panel headphone jacks (both 1/4-inch and mini) are provided. An optional onboard Logitek router control panel with OLED source/destination indication allows fast access to router functions with simultaneous display of five sources.

Logitek offers several metering options. The ROC-S Bridge is a four-color LED stereo meter with OLED display that indicates the current meter source. Two color LCD screens show metering data, text, clock or timer information; LED "On Air" studio tally and "Mic Live" mic tally indicators are provided. A larger bridge with 7-inch diagonal LCD display, dual vertical LED stereo meters and OLED source indication will be available soon. Meters can also be presented via Logitek's vScreen user-configurable GUI.

For information, contact Logitek in Texas at (800) 231-5870 or visit www.logitekaudio.com.

STUDER ONAIR 1500 OFFERS OPTIONS

Studer says that its OnAir 1500 for radio broadcasting and production reflects demand from customers for more versatility and connectivity, but at an affordable entry price point.

The OnAir 1500 is a 12-channel, six-fader console (expandable to 12 faders), aimed at studios needing an additional professional-grade fader unit and additional I/O or a compact and cost-effective mixing console for a production room or on-air studio.

Integrated USB playback and record functions make the OnAir 1500 a compact production unit and mixer. With point-to-point connectivity it can be moved around as a backup or secondary unit.

Flexibility is increased with the addition of a six-fader extension bay, creating either a 12-fader surface or an additional six faders that can be placed remotely in a producer's bay or used as a redundant surface.

Channel parameters such as EQ and dynamics can be edited using console controls in combination with the OLED channel displays without requiring an additional screen or PC. For more advanced operation and configuration, the console provides interfaces for connecting a PC screen, keyboard and mouse.

The master section gives the operator comprehensive access to the signal monitoring and switching for control room and studio with an internal speaker preconfigured to output cue and talkback signals. Audio monitoring is augmented by two 29-segment stereo bargraph PPMs, providing constant overview of signals; six meter standards are available. Unique features such as "Headphone Split" allows the user to listen to two sources, one through the left earpiece and the other through the right. Preset buttons also allow one-touch control of all monitoring. Additional monitoring for separate studios is available via an external monitoring/talkback unit for added flexibility.

For more information, contact Studer at (888) 286-9358 or visit www.studer.ch

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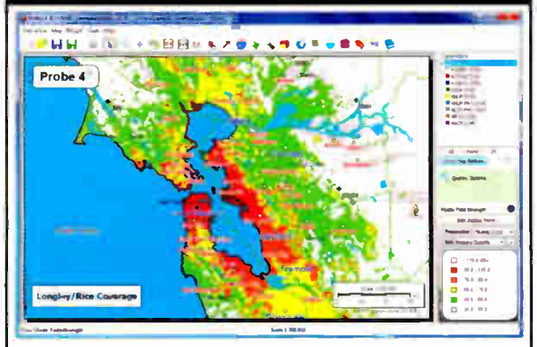

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If you're looking for a hard working, dependable, radio school graduate, I'm your girl. I'm funny and energetic. My board work is tight and I have an excellent voice. Interested in announcing, operations, production/copy writing and sales. Call Jamie, 918-951-2617 or jthomas479@yahoo.com.

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My knowledge is in the sounds of an angel singing, a devil screaming, the pounding of creations hammer upon the anvil of time otherwise known as heavy metal. Jacob_mattingly@hotmail.com.

Great observational wit and great production work with excellent copywriting skills all in one. I am Joe Longwith, you will get all this. Just contact me at 405-924-7284 or joe_longwith@yahoo.com.

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Equipment Wanted: obsolete, or out of service broadcast and recording gear, amplifiers, processing, radio or mixing consoles, microphones, etc. Large lots preferred. Pickup or shipping can be discussed. 443-854-0725 or ajkivi@gmail.com.

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

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READER'SFORUM

Numerous readers wrote to Radio World in response to Mark Persons' column about the future of engineering in the May 9 issue. Selections:

AN INVESTMENT, NOT JUST AN EXPENSE

The ranks of radio engineers are getting smaller every year. I keep hearing this over and over again from people in radio.

To find and keep your next engineer, offer a good compensation package; be considerate of the times he (or she) has to work overnights; and allow for time off the next day.

To find engineers, you can start at the SBE website, *www.sbe.org*, which list job openings. You can also look at the list of local SBE chapters in your area on that website and ask the local chapter if they know of an engineer looking for work. You might ask other radio station engineers in your market if they know of someone who might be interested in your opening.

Before you offer someone a job at your station or group, take a look at what other engineers are getting paid, via this recent Radio magazine survey (find the link at *radioworld.com/July-04-2012*).

Remember: Engineering is an investment, not a dreaded expense.

Steve Tuzeneu
Director of Engineering
Sonshine Media LLC
Abilene, Kan.

THE PAY IS THE PROBLEM

I can explain the basic nature of the problem in one word: pay. I tell kids that I've been working in the business for 30-some years with a master's degree in EE, and what I am making; and their jaws drop. "I could make that much fixing computers right out of high school," they say. And they can.

People with good troubleshooting skills are in demand in all industries, and they are becoming harder and harder to find. As they keep getting harder to find, broadcast engineering salaries stagnate. Pretty soon all of the old generation of engineers will die off without passing their skills on.

Many in the older generation learned electronics and diagnosis methods in the military, a route that now no longer exists because military electronics are seldom repaired at the component level in the field and at the depot. Perhaps then, when skilled people are simply no longer available, salaries will begin to climb to levels comparable to other industries.

Scott Dorsey
Owner
Kludge Audio
Williamsburg, Va.

WHO VALUES ENGINEERS?

Over the course of 44 years in the field, I have become aware of Mark Persons and all that he has done to be the voice of those of us who toil in obscurity to keep the music, news, weather and sports — and commercials — flowing.

Mark succinctly has asked us why there are so few people who want to become broadcast engineers. He notes that wannabe engineers aren't getting the technical training they need and muses that it might be because people are now focused on designing equipment.

He also correctly notes that stations are trying to have engineers do transmitting and studio systems as well as IT work, which includes maintaining the computer network.

But let's put this into proper perspective: The fault lies squarely in Washington and the FCC, which doesn't value engineers and small operations.

I am "retiring" from broadcasting this summer and moving on to other, more lucrative endeavors where I can at least enjoy respect and make enough money to pay my bills.

David C. Schaberg
Radio Consultant
Lansing, Mich.

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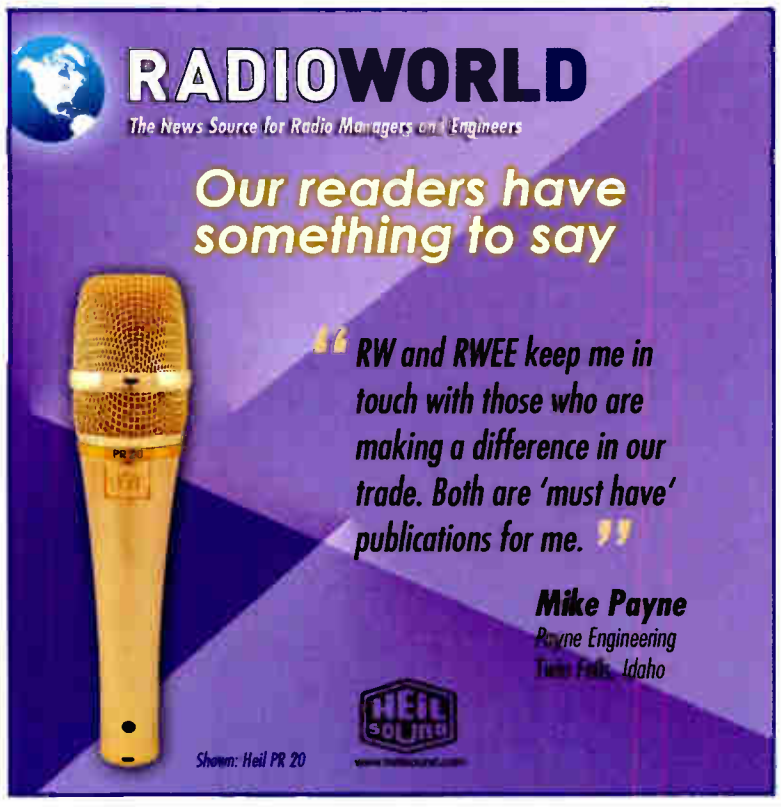

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FROM PAGE 37

IT'S NOT JUST ENGINEERS

Mark Persons is a valuable asset to many broadcasters in the upper Midwest. If I came across a radio station at which Mark had been the contract engineer, I knew I was looking at one that was technically sound.

Mark laments the shortage of new, young folks coming into the engineering ranks. Unfortunately the radio industry is facing the challenge in many job categories. And I don't see a soon-to-be solution.

Back in the 1950s and '60s — when Mark and many others of us were aspiring to learn, conquer and enjoy a career in radio — there were local station owners and managers who came from the "ranks" of radio types, who many times had learned the biz on the job. A good share of them would have been willing to do radio even if they weren't paid. And I guess we could agree: Some were not paid very well.

Today's radio station management is hired for the ability to generate cash flow. In a good share of the companies that own radio properties, this includes many phones calls per day to a superior and to headquarters. The paperwork and reports involves yet another person. Managers are dedicated to holding their jobs, which often means communicating with the home office way too often. At least that's what I have observed.

Mark suggests that "older engineers" could mentor these youngsters. It's really a responsibility of all our staff and all ages. Thanks, Mark, for nudging us to address the issue.

Dean Sorenson
Sioux Falls, S.D.

DIFFICULT? ALMOST IMPOSSIBLE

I've built and operated 17 radio stations myself and now develop new facilities for others. The most difficult position to fill was always that of engineer.

Now, difficult approaches impossible. One of the most common questions is whether I know of an engineer who can help in a particular market; the caller can't find one. Often, neither can I.

Jerry J. Collins
President
F & L Broadcast Development Corp.
Lake San Marcos, Calif.

A UNIQUE BREED

New Jersey is heavily involved in STEM education (science, technology, engineering and math); my alma mater, The College of New Jersey, holds a STEM conference every spring.

Getting young people involved in electrical engineering is a challenge. Besides erasing the stigma that engineers are responsible for the world's technological ills, our other challenge is restoring industrial arts education into the secondary schools. (You don't want me to get started on that topic!)

My local ham radio club (*www.w2zq.com*) has been running informal classes to teach new or less experienced hams how to do practical things like solder, apply RF connectors, design and assemble antennas. These skills are no longer taught in junior high school or high school.

The kinds of engineers you and I deal with in the broadcast industry are not the laboratory or armchair engineers who never get their hands dirty. Broadcast engineers not only have to have a strong foundation in electronics and FCC regulations, but also have hands-on practical experience with power distribution, telephone systems, plumbing, even mowing the grass.

Broadcast engineers are a unique breed with a panoply of skills, most of which are taught by the mouth-to-ear method of mentoring (can you hear me, Ron Simpson and Larry Will?). I don't see how we can replenish these engineers unless the secondary schools come around to a new way of thinking.

I'm going to share Mark's article with my colleagues.

Robert Schroeder
Carversville, Pa.

The author is founding chapter chairman of the IEEE Education Society's Princeton/Central Jersey Section. He recently retired as communications and warning officer for the New Jersey Office of Emergency Management.

ZERO APPLICATIONS

We're a high-tech station with high standards in a small market. Since consolidation took place in the '90s and the digital transition hit in 2009, I've had zero applications from qualified people with reasonable wage requests. I've had no minorities in well over 20 years.

The best I can do is look for someone who maybe is laid off from a factory job in maintenance, and perhaps they have a ham ticket or mess around with electronics. But finding someone in Market 191 with a General Radio-Telephone or SBE credentials is like trying to find an honest politician.

Frederick R. Vobbe
Vice President/Chief Operator
WLIO Television
Lima, Ohio

A CRYIN' SHAME

"Where Have All the Engineers Gone" literally brought a tear to my eye. I, too, am one of those now-gone broadcast engineers who among other positions spent 30 years at KTTV (aka Fox 11) from the era when it was Metromedia

I'm 70 now and planned to retire at 65 to follow my dream. But my then boss and close friend asked me to hang in through the digital conversion. So what was supposed to be just five months turned into more than a year, and by the time I completed my office job, there was no maintenance department to return to.

In my case, I was lucky. I had for years been a relief operator in TOC so I asked if I could work my last seven weeks there.

As to the overall industry, as far as I can tell most staff engineers have been fired and replaced by outside contractors who will charge by the repair rather than being a day-to-day cost of doing business.

Today's management mentality, in all aspects of broadcasting, is that computers can do anything people can. It's funny, though. I thought I would miss the job, but I don't. It's the people I miss: those 30 years of friendships that made us a large, extended family.

These are the words I spoke at my retirement party in 2009: "When I came to Los Angeles in the early 1970s, the No. 1 song on the radio was the Captain and Tennille's cover of 'Love Will Keep Us Together.' Now I predict it won't be love that will keep us together. It will be Facebook."

How right I was on that one.

Bill Pasternak, WA6ITF
Editor
Amateur Radio Newsline Inc.
Saugus, Calif.

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World Radio History

BOSTON, MASSACHUSETTS

left:
The "TIC" newsroom airs a Public Affairs Program
below:
A graduate of Talking Information's' Voice Training Program; Kati Crocker is now the Public Service Director
below left:
Janet LaBreck; commissioner for the blind and creator of the VOICE program with her guide dog, Osborne

A V.O.I.C.E. FOR THE VISUALLY IMPAIRED

Special software provided by Radio Systems allows the visually impaired to operate their broadcast consoles unassisted.

From high above Boylston Street, at their new custom studios at the Massachusetts Commission for the Blind in Boston, four blind or visually impaired students are the first class of VOICE, or Vocational Opportunities in Communication Education.

The program was created by Janet LaBreck, commissioner of the Massachusetts Commission for the blind as an intensive, interactive and hands-on learning experience with longtime collaborator Ron Bersani, executive director of the nearby Talking Information Center.

To build the new studios, Bersani contacted long-time supplier Radio Systems. Says Bersani; "their StudioHub+ wiring system made meeting our multiple deadlines easy and when we needed special software to aid our visually impaired operators in using the console, Radio Systems provided it at no charge."

VOICE program participant Kati Crocker, 24 says: "In a way I think this is life-changing. I didn't think I could do this before, but it has really broadened my scope for employment."

Commissioner LaBreck feels they've all worked closely to develop a curriculum that bolsters students' confidence in broadcasting but also "diminishes the isolation" felt by many blind people entering the job market.

below, from left to right:

Gerrett Conover
Vice President

Daniel Braverman
President

Michael Sirkis
Chief Engineer

Dennis Greben
Manufacturing Manager

Jo-Ann Dunn
Sales Manager

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