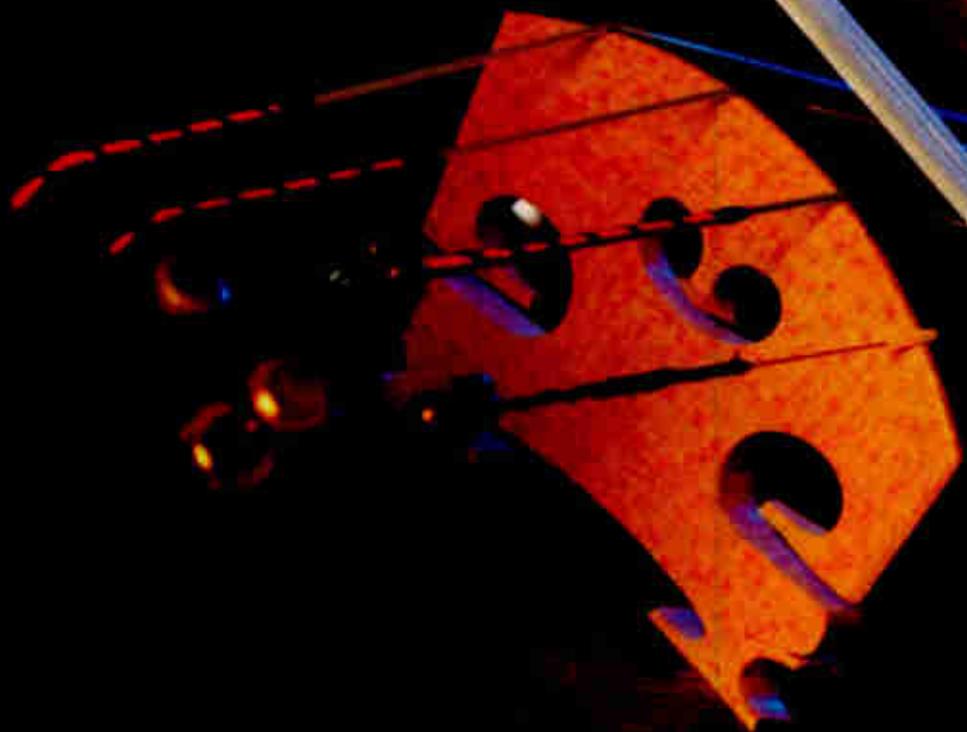


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It's All About the U.S. Dollar Sign

The mystery of getting the \$ symbol to display properly in RDS is solved

RADIODATA

BY ALAN JURISON

It's all about the U.S. dollar symbol — \$.

If you are a reader of Radio World, you may have seen my series of articles regarding optimizing RDS displays over the past few years (radioworld.com/RDS). While I have focused on implementation, I never communicated how this interest of mine came to be.

RDS was really a marriage of two interests in life, radio and computers. I was involved in the early 1990s with Bulletin Board Systems — a world that existed before the Internet that we know today came to be (<http://bit.ly/1eCEecG>). I started as a user, later as a System Operator at age 13 no less, and that interest grew into participating in interconnecting BBSes into networks, and even delving into beta testing and programming for my preferred BBS Software, T.A.G. ([http://en.wikipedia.org/wiki/TAG_\(BBS\)](http://en.wikipedia.org/wiki/TAG_(BBS))).

I was "bit by the radio bug" around this same time. The Internet we know today would quickly end the world of BBSes, and I transitioned into the beginning of my radio engineering career. I started getting involved with RDS when it finally started to gain in popularity in the United States in the early 2000s.

Other broadcasters had started implementing the technology. Eventually my company became interested in doing some RDS deployments.

The building blocks of RDS and BBSes were really the same. Both used RS-232 serial connections to devices and used special command sequences to configure properly. Of course, RDS encoders produce a data stream that can be decoded by many radio receivers at the same time. So, I had the building blocks, computers, data links, and this new RDS encoder sitting on my bench.

At that point, I was learning RDS along the way, catching up with the groundwork many others had laid in the 1990s. I started like many engineers who get involved with new technologies, I took RDS encoders out of the box and started bench-testing them. I used the manual as my guide on how to set things up.

We eventually put stations on the air, and I would watch how what we were sending over the air appeared on receiver displays with RDS. If you ask

my co-workers at the time, someone would get a new car with RDS and I'd ask to borrow their keys and be out in the parking lot watching, learning — and essentially adapting techniques

required to transmit it.

But the problem is, if you wanted to state a price point for an advertiser, the \$ issue became a hindrance. If you wanted to promote your own brand and talk about that \$1,000 cash giveaway Monday morning at 7:20 a.m. — you really couldn't do that effectively, either.

While I may have picked up on a lot



Example of a station transmitting 0xAB to the RDS encoder as recommended in NRSC-G300 to display the U.S. dollar sign (\$) in a 2014 Toyota Tundra.



Example of a station transmitting 0x24 (\$) to the RDS encoder in a 2014 Toyota Tundra, international currency symbol is displayed instead as per the RDS specifications.

used in the transmission of RDS to be most compatible and visually appealing across a range of receivers.

DIFFERENT RESULTS

One of the things that always perplexed me was that the U.S. dollar sign (\$) often produced different results, depending on what radio receiver I used. Many stations just avoided its use altogether — which sometimes hurt efforts to monetize RDS to recoup the investment in the hardware and software

of tricks on how to optimize RDS displays, the dollar sign problem escaped me. It wasn't until this series on RDS in Radio World started that some of the industry's engineering leaders reached out to me to get involved in the National Radio Systems Committee. Barry Thomas, then with Lincoln Financial Media, and Steve Davis of CCM+E said the NRSC was starting to work on a guideline document to pool together all the best ideas of RDS technologies from (continued on page 5)

About the Best of Show Awards

In this issue we feature winners based on exhibits at the NAB Show

This spring, Radio World and several of our sibling publications at NewBay Media announced a new awards program to honor products introduced at the annual NAB Show. Congratulations to the winners, whose pictures you'll find throughout this issue.

What happens to "Cool Stuff?"

The NewBay Media Best of Show Award replaces several programs including the Radio World "Cool Stuff," Radio magazine Pick Hits and TV Technology STAR Awards.

I know that this approach will represent a cultural shift for companies and readers who have been accustomed to our way of managing awards for many years. We worked hard to make the "Cool Stuff" program fair, and I have a great deal of personal affection for that program; I believe we've carried forward the best of it to the new one.

Which publications gave awards?

Awards at the spring show are given by Radio World, Radio magazine, TV Technology, Digital Video and Video Edge.

What were the mechanics of submission?

Exhibitors with new products at the show submit one or more products via a nomination form. Nominations are in written form, up to 750 words, and are due prior to the convention, as is the fee required for entry. Not all who enter are chosen for awards.

There was no cap on the number of products an exhibitor could enter, or on the number of publications from which it could seek consideration.

You can read a FAQ and see the actual nomination form here: <http://goo.gl/wEkOPH>.

Who chooses winners?

Winners for the Radio World awards are chosen by a panel of experienced engineers, with editors acting as tie-

breakers. The engineers are given nomination text provided by the exhibitors in advance, and visit the company booths anonymously during the convention.

What are benefits to this new approach?

The new system formalizes a process in an effort to make selection fairer. While our past awards program was popular and reflected a great deal of planning, the selection process sometimes did not give equal weight to all companies, due to the unstructured and volunteer nature of the judging process. International companies, for example, were less likely to draw attention.

Also, in the past, "Cool Stuff" products were judged solely on the basis of one booth presentation. At times, I sensed that a product might not have won simply because the person giving

FROM THE EDITOR

Paul McLane



the demo to our anonymous judge was not fully up to speed on his or her own company's equipment.

A written nomination helps overcome this problem. Under the new system, companies are able to present their best formal explanation as to why a given product might deserve an award.

What was the reaction to this program from companies at the show?

The most common question I heard was: "Will readers know that companies paid a fee to enter?" It was important to manufacturers — particularly those that did not enter — that readers be aware of this.

Note that the fee is simply for entry to the program. It does not guarantee an award; many nominated products were not chosen as winners.

How can the program be improved in the future?

I'm interested in hearing from readers and manufacturers with thoughts on this; write to pmclane@nbmedia.com.



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World Radio History

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Stock photo/Christophe Heylen



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RDS & \$

(continued from page 3)

many different viewpoints into one document to be, in essence, as a guide for the station engineer taking that RDS encoder out of the box for the first time. I was intrigued and was happy to start participating in the meetings.

As we worked on what was to become NRSC-G300, the RDS Usage Guideline, in one of our discussions, I mentioned the dollar sign issue to the group and that brought up varying experiences from other broadcasters as well. Mike Bergman, then of Kenwood and now with CEA, used his experiences of implementing RDS in receiver designs to put the pieces together and solved the puzzle.

He noticed that the U.S. dollar sign or \$ is denoted as 0x24 in hexadecimal format in ASCII but is a different value — 0xAB — in the RDS standard. Mike and I later did some field-testing using several RDS encoders and RDS receivers. Finally, we got to the bottom of this.

Around this same time, recording artist Ke\$ha became frequently played on many stations, and her popularity also helped highlight this issue even further. The end result of our RDS research is in NRSC-G300 released Sept. 2012, Section 8.

If you are interested in learning more about this problem, the section covers RDS and character/font sets, and I encourage you to review them. As the NRSC investigated, we discovered several other characters that have similar issues.

Focusing on just the dollar sign, here are some excerpts from NRSC-G300:

The two most common faulty behaviors are due to the following:

1) Receivers sometimes are displaying the ISO-8859-1 or Arial font equivalent graphic for 0xAB (which is ‘‘’ rather than the RDS Standard graphic at 0xAB (the U.S. dollar sign, ‘\$’). However, other character sets have also been observed on radios;

2) Broadcasters sometimes are using the ISO-8859-1 value of 0x24 for transmission of ‘\$’, leading to RDS-compliant radios displaying the international currency symbol, ‘¤’. Broadcasters should be transmitting 0xAB for the U.S. dollar sign ‘\$’ in the RDS character map.

NRSC-G300 offers guidance on how to best tackle this problem with specific recommendations for RDS equipment vendors (Section 8.2.1), broadcasters (Section 8.2.2) and receiver manufacturers (Section 8.2.3). It is our hope that this information will fix both the transmission and the receiver implementation issues surrounding this problem.

NRSC-G300 was released about a year and a half ago, and I still see this

NEWS

problem in my travels across the United States. With the globalization of many automotive OEM receivers, I have found that many new receiver designs today are following the guidelines in Section 8.2.3.

However, I have found that RDS equipment vendors and broadcasters have not adopted the recommendations

fy their systems to make the translation. This is the path that Clear Channel Media + Entertainment chose, and we implemented this across all our RDS enabled stations in early 2014. I personally hope that the rest of the industry can work towards transmitting the proper character 0xAB via RDS PS and RT when a dollar sign is to be displayed

One of the things that always perplexed me was that the U.S. dollar sign often produced different results, depending on what radio receiver I used.

the NRSC outlines in G300. I'm hoping this article raises awareness so we can solve this issue once and for all.

Specifically, the NRSC suggests that RDS encoders and RDS software solutions used in the United States have a feature added that could be enabled to translate 0x24 to 0xAB so that the character would display properly. This seems to be the best solution to this problem; however I am not aware of any products sold on the market doing this currently.

Alternatively, broadcasters can modi-

and, over time, as more internationalized RDS compliant receivers continue to be released, we can finally solve this problem.

Alan Jurison is a senior operations engineer for Clear Channel Media + Entertainment's Engineering and Systems Integration Group. He also chairs the NRSC RDS Usage Working Group. He holds several SBE certifications including CSRE, CBNE, AMD and DRB. His opinions are not necessarily those of Clear Channel, the NRSC or Radio World.

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Best of Show

Inovonics Aaron



The translator/rebroadcast market is evolving. Aaron from Inovonics is a new FM receiver for that sector.

The company touts sensitivity and selectivity performance as superior to those of elite professional and consumer receivers. Aaron also features an FM band scanner, spectrum analyzer and failover audio options via SD card or Web stream.

Aaron operates in either a composite pass-through or composite-regeneration mode. Composite pass-through eliminates retransmission delay (latency), and composite-regeneration lends the ability to reconstruct your baseband signal, including altering RDS messaging prior to rebroadcast. Self-logging alarms constantly check for audio loss, RF loss, and RDS loss or hijacking.

Onboard processing allows for bandwidth, stereo blend and HF blending. Aaron can be operated via the front panel, PC, tablet or smartphone.

Shown: Lukas Hurwitz, Ben Barber, Jim Wood and Josh McAtee (rear) join RW's Paul McLane.

Info: www.inovonicusbroadcast.com

RCS Zetta

The Zetta radio automation program is in full bloom now and has added useful tools and improved integration with other RCS programs.

A multitrack editor and a media player are new along with tweaks to hot keys, the sequencer, library and log functions, smoothing satellite interfacing and WANcasting capabilities and overall improvement of the GUI. Zetta can also work with other RCS programs such as the music scheduler GSelector4, RCSnews and the Acquila traffic system.

Zetta can also go mobile with Zetta2Go, a mobile device app for controlling Zetta remotely via a smartphone or tablet.

Philippe Generali, right, accepts.

Info: www.rcsworks.com



Nautel GV Series

The new GV series of high-power solid-state transmitters from Nautel can scale from 3.5 kW to 80 kW.

Features include HD Radio compatibility and high digital efficiency. The company says that its HD PowerBoost technology is built in.

Operational capabilities include RDS/RBDS encoding, SCA encoding, IP Audio I/O, USB audio input and PushRadio scheduler/playlists, automatic loss of signal failover, MPX over AES support and LiveWire support. Onboard Modulation Error Ratio instrumentation includes oscilloscope and spectrum analyzer to help the PhoneHome self-diagnostic and analysis program.

Each GV transmitter has an LCD touchscreen for Nautel's Advanced User Interface. Like other Nautel transmitters, the GV can be operated remotely via IP. Nautel's Orban Inside processing is an option.

Shown in blue Nautel shirts, from left, are John Whyte, Brian Walker, Mike Woods and Chuck Kelly.

Info: www.nautel.com

DEVA Broadcast Radio Explorer II

Who amongst us didn't discover radio by exploring the dial? DEVA Broadcast takes that practice a step further with the Radio Explorer II, a portable FM broadcast band analyzer designed to cater to all markets and their requirements.

The Radio Explorer II can measure RF level, MPX deviation, left and right



audio levels, RF field strength, RDS and pilot injection levels. Tools included are RDS decoder, stereo decoder, spectrum analyzer and a GPS receiver for making geographical location stamps.

It can store information for later analysis if necessary. Measurement targets can be programmed or done in real time with a PC.

Todor Ivanov, right, shakes hands with Radio World's Paul McLane.

Info: www.devabroadcast.com



Broadcaster:
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DASHBOARD

(continued from page 1)

double by 2015, according to Burnell.

THE BUTTON

Indeed, Ford predicts by 2017, 80 percent or more of vehicles here and in Western Europe "will be connected in some way," he said at the recent NAB Show. The year 2017 is also when experts predict millennials will out-spend baby boomers for the first time.

"One of the things you should be scared about" — and something that should persuade radio stations owners to adopt so-called "hybrid radio," he believes — is the level of customization automakers offer to customers now, and what they plan to offer, on these big-screen infotainment systems such as Ford Sync. "We've got the button in the car," he said, and, "while AM/FM will



Photo by Leslie Simpson

Just you having "sticks" is not going to do it anymore.

— Scott Burnell, Ford

always be in the vehicle, the question is where?"

Customization means that instead of relying on a hardwired button, an owner can choose FM as the first preset, for example. Drivers can arrange their big-screen apps and other functions the way they want to.

Some industry leaders believe that radio runs the risk of getting lost among in the digital dash as consumer choices increase. "If we don't fight for space in the dash, it's going to get real crowded," said NAB Executive Vice President/Chief Technology Officer Kevin Gage, endorsing what he characterizes as "the radio platform" of HD Radio, NextRadio and streaming.

Burnell said that buyers or potential buyers are "already in a Ford vehicle, and I want to give them every opportunity to stay there and have Pandora, as well AM/FM and other entertainment options on a level playing field." Using



SNL Kagan

3 Tiers of In-vehicle Infotainment Systems

- **Basic:** Good audio, CD, Aux-in, Bluetooth phone pairing, maybe USB, (Jaguar, VW, Volvo). Navigation, screen, satellite radio optional .
- **Midrange:** with touch screens that offer a few media selections and partnered content "hard-wired in." Content includes radio, local businesses, navigation. Can make calls from the directory in the phone, using voice command. Hyundai, Toyota, GM w/Onstar.
- **High-end:** All of the midrange functionality, but app enabled, with a wider range of apps, including Internet radio, partnered search with Google or Bing, and multiple local content options. Some of these systems also support text messaging and email from the dash, including text-to-speech reading and speech-to-text message dictation. (Ford, BMW, Audi, Kia, Porsche, M-B). Some are open to external software developers.

if they still have a tower, they don't have to worry about this. Just you having 'sticks' is not going to do it anymore," he said. "Every automaker in the next 18 months will have some level of connectivity" in the vehicle.

To that end, NextRadio app supporters urge all broadcasters to adopt the FM cellphone app.

Eric Williams, product manager for Sprint, says the NextRadio app has really taken off, saying it provides "more robust options for our music customers."

Since launching on two Sprint handsets in January, the NextRadio smartphone app is now pre-loaded on 13 models. The app was on some 285,000 handsets as of April.

Prepaid growth is "phenomenal" across all devices, proving "people aren't worried about over-spending their

data plan," said Williams.

Sprint preloads the app onto a smartphone. Then the user clicks on the icon and is taken to the correct place to listen to an FM station.

RAMP UP

Emmis Chair, President and CEO Jeff Smulyan said the response from consumers to the NextRadio app has been "great." At the behest of NAB, Emmis is the company that created the app.

"Now we're at the next level, talking with NAB. You'll see the industry and NAB ramp this up."

Smulyan told Radio World all the major commercial radio ownership groups are on board and so too, are NPR and American Public Media. We reported in March that CBS Radio,

(continued on page 10)

Best of Show

Wheatstone L-12

The L-12 is a new 12-channel control surface for Wheatstone's WheatNet-IP Intelligent Network. It follows in line with boards such as the L-8 and flagship LX-24 control surfaces — a low-profile tabletop IP control surface that requires no cutting. It offers assignable sources to any fader and with hot-swappable individual fader modules.

Wheatstone says that its newest console has just enough faders to be effective in most on-air or secondary production studios, but not too many that it's unwieldy to use and difficult to place. Other features include LED meters and programmable soft buttons.

The L-12 is fully conversant with other equipment in a WheatNet-IP environment.

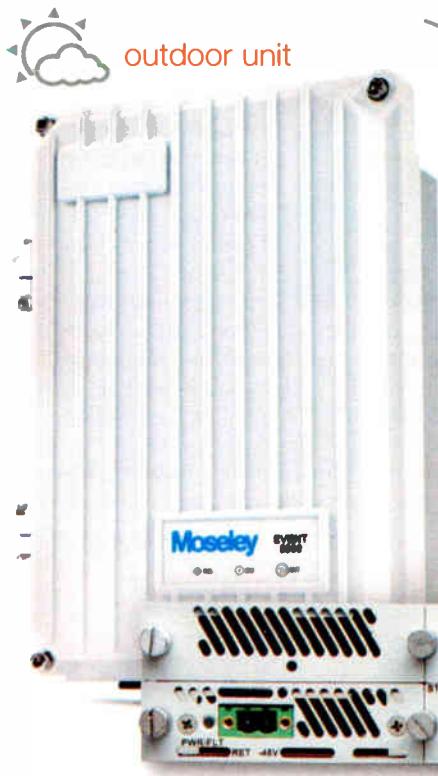
Show: Dave Breithaupt, Paul Picard, Kelly Parker, Jay Tyler, Phil Owens, Darrin Paley.

Info: www.wheatstone.com



Photo by Jim Peck

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EVENT systems are fully bi-directional including a Software Defined Indoor Unit (SDIDU) and Outdoor Unit (ODU), eliminating the need for costly waveguide hardware. The ODU is available in the license free 5.8 GHz band, or licensed 11, 18, or 23 GHz bands. Appropriate external antennas are selected based on path length.

INTELLIGENT SYSTEM DESIGN

Spectrum-scalable digital radios with user-selectable data rates enable broadcasters to have greater flexibility in STL planning and future growth. The integrated T1/E1 and Ethernet interfaces allow for a combination of T1/E1 and IP packet data.



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DASHBOARD

(continued from page 8)

Cox and Entercom are implementing the advanced interactive data features of NextRadio; now, Clear Channel and Cumulus are too, according to Smulyan.

Emmis Senior Vice President/Chief Technology Officer Paul Brenner said broadcasters will see more marketing to

MORE DASHBOARD

This is one in a series of articles about radio's role and future in the evolving automobile dashboard. To read more, visit <http://radioworld.com/dashboard>.

promote consumer awareness of the app.

SNL Kagan is keeping an eye on online radio and the connected car. "NextRadio is something we're looking at and could potentially be a [revenue] growth driver," said Nielson. He predicts radio will continue to see stable annual growth of 1 to 2 percent regardless, but potentially more if the industry can leverage digital audio and associated mobile advertising, depending on how many connected auto receivers and smartphones come to market, he added.

"Radio has to play defense and offense in terms of mobile expansion and on the connected car," said Nielson.

Proponents continue to urge broadcasters to go beyond the free logo and

use more of the interactive backchannel capabilities of the FM cellphone app. While some 35 percent of FMs in the U.S. are participating in NextRadio using TagStation, only some 3 percent of those are providing interactivity, according to Emmis.

Brenner told Radio World it is time for stations to go beyond the free logo and implement the interactive features of the NextRadio app. He characterized 2017 as a "generational pivot," referring to the rise of millennial spending, and urged broadcasters not to wait.

Given the fragmented state of the digital dash, Gage asked, what should radio owners do? Burnell answered by echoing Brenner's sentiment, saying "Forget the 'how' and work on the 'what.' Take the decision out of it." That's like asking "Why would I go FM if I've got AM?" or "Why would I go to the Web?" he asked rhetorically.

"That puts you behind the competition." Burnell advised broadcasters to focus on "content, talent, advertising and the connection to your listeners and the 'how' will disappear."

Brenner also suggested that stations trim typical spotloads of 12 to 14 minutes per hour; he said millennials want to hear fewer commercials.

How can radio companies better position themselves in the evolving dashboard? Write to radioworld@nbmedia.com with Letter to the Editor in the subject field.

NEWSROUNDUP

KENWOOD: Aftermarket receiver manufacturer Kenwood features smartphone "mirroring" on eight new receiver models shipping to retailers. With a multimedia interface and mobile link smartphone connectivity, both Android and Apple phones port their phone screen to the Kenwood receivers. That means if you see an image on your smartphone, you can see it on the receiver, according to Kenwood. For



safety reasons most touch screen control functions require the parking brake to be engaged to work. The HDMI/MHL connectivity that transfers audio and video from iPhone4/5 and Android phones is featured on these Kenwood multimedia receivers: DNN991HD, DNX891HD, DDX8901HD, DNX771HD, DDX7701HD, DNX691HD, DDX5901HD and DNX571HD. Using "AppMode" consumers can access iTunes, Pandora, iHeartRadio, HD Radio, as well as Garmin and Kenwood's Route Collector on their smartphone.

Best of Show

Tieline Codec Lounge



The Codec Lounge is a desktop application or iOS app that utilizes cloud computing technologies to deliver real-time monitoring and remote control of Tieline IP codecs and iOS or Android devices running Report-IT Enterprise from anywhere you have an Internet connection.

Tieline Codec Lounge allows for

real-time online/offline status monitoring of both codecs and users logged into Report-IT Enterprise along with monitoring of connection and recording status and audio levels. It can remote-control codecs and Report-IT Enterprise functions such as dialing and hangup of connections, recording and adjustment of remote audio levels.

Accepting from RW's Paul McLane are, from left, Tieline's Anthony Sizer, Jake Daniluck, Charlie Gawley and, at right, John Lackness.

Info: www.tieline.com

Orban Opticodec 7700E/D

Orban has turned its sights on the composite-over-STL question.

The Opticodec 7700E MPX Encoder and 7700D MPX Decoder system transparently transmits the Optimod-FM composite baseband signal between studio and transmitter over Ethernet, using UDP or TCP/IP, the company says.

To ensure reliability, each Opticodec 7700 has two 100 Mbps Ethernet interfaces, one for the control LAN and one for the IP composite signal transmission packets. This allows the audio to run on a dedicated LAN, maximizing throughput capacity.

The Opticodec 7700E carries the Optimod-FM encoded stereo signal, the stereo pilot tone and subcarriers like RDS that may have been applied to the studio-based Optimod-FM's subcarrier inputs. The Opticodec 7700D has the same composite mixing functionality as the Optimod-FM; there are two composite baseband outputs and two SCA inputs, allowing additional subcarrier generators to be located at the transmitter.

Both the 7700E and 7700D have a reference input (10 MHz) that can be used to lock the MPX encoder and MPX decoder to a high-precision external reference like a GPS-based frequency standard.

Jay Brentlinger and Bob Orban accept the award from Paul McLane.

Info: www.orban.com



NEWSROUNDUP

IHEARTRADIO: Clear Channel Media and Entertainment announced the debut of the iHeartRadio Hispanic Network. The broadcaster is expanding a partnership with Mexican owner Grupo Radio Centro; GRC will provide live broadcasts from some of its stations, according to the companies. GRC parent Grupo Radio Mexico owns 51 stations; those will be available on iHeartRadio on multiple platforms, including the Web, mobile, gaming, home entertainment and automotive. Later this year, iHeartRadio will get digital distribution rights for GRC stations. Clear Channel plans to replace local Mexican station ads with U.S. ads.

PANDORA: Internet audio company Pandora has beta launched promoted stations.

Driven by advertiser demand, promoted stations suggest curated, branded stations to Pandora listeners who are seeking a new listening experience, according to the company. The new offering launches with approximately 10 advertisers in beta, including Taco Bell, Skechers and Toyota.

NPR: Jarl Mohn will become the new president and chief executive officer of National Public Radio. Currently chairman of Southern California Public Radio, Mohn begins his new Washington gig in July. The 62-year-old Mohn takes



over for Acting President/Chief Executive Officer Paul Haaga, who has held the role since Gary Knell left to head National Geographic last fall. Mohn began his career as a disc jockey in 1967 and was on the air on WNBC(AM) in New York in the 1970s. He's held management positions with MTV and VH1, created E! Entertainment Television, and was the founding president and chief executive officer of Liberty Digital, a public company that invested in interactive television, cable networks and Internet enterprises.

GEO-FENCING: A Virginia-based radio broadcaster and SoundExchange are squaring off over streaming royalties. The results of the litigation could lead to big changes in webcasting copyright law, which could affect any broadcaster that streams its content, according to legal experts. VerStandig Broadcasting believes geo-fencing technology qualifies for an exception under webcasting copyright law. Geo-fencing enables a webcaster to limit program access

based on the location of the listener's computer. VerStandig claims it owes no performance royalty as long as the technology allows the company to limit the program access to computers within 150 miles of its transmitter. SoundExchange, which distributes streaming royalty payments, disagrees. VerStandig has now taken the fight to federal court and asked for a judgment.

DIGITAL: Entercom created a new division devoted to obtaining digital advertising revenue.

Called SmartReach Digital, it will focus on creating and implementing local digital business marketing strategies. Ad campaigns for Entercom Internet radio stations, as well as marketing on its station websites, contesting and text marketing are some examples, according to the company. Entercom has rolled out SmartReach Digital in six markets and plans to add more over time. It's supported by a digital agency formed by Entercom; the company will also employ dedicated sales reps and campaign managers in each Entercom market.

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This Box Could Kill You

Consider the risks of injury from an incident like this one

WORKBENCH

by John Bisset

Read more Workbench articles online at radioworld.com

The conversation during a spring NAB Show workshop turned to tightening fuses and disconnect box connections.

Routine inspections are always a good idea, but should nevertheless be performed only by licensed professionals.

Wayne Eckert of Channel 1 Images sent in this picture of a three-phase electrical service, fed underground via the PVC conduit at the bottom of the panel. Cabling runs up to the knife switches at the top of the panel, then down to the fuses and finally into the building through the lower conduit exiting the rear of the panel.

There was a hard fault on the leftmost phase (phase A); its fuse failed to extinguish or contain the arc and exploded. The plasma from that explosion caused a phase-to-phase arc between phases A, B and C. This vaporized the fuse holders and burned up the B and C phase fuses, the shells of which can be seen lying in the bottom of the panel (Fig. 2). The current finally rose to a point that the power company's distribution

transformer primary fuses dropped and killed the circuit.

Think about the risk of personal injury here. Plasma pressures inside the panel were sufficient to bend the cover. Heat vaporized the rear of the panel, exposing the wall behind it. This

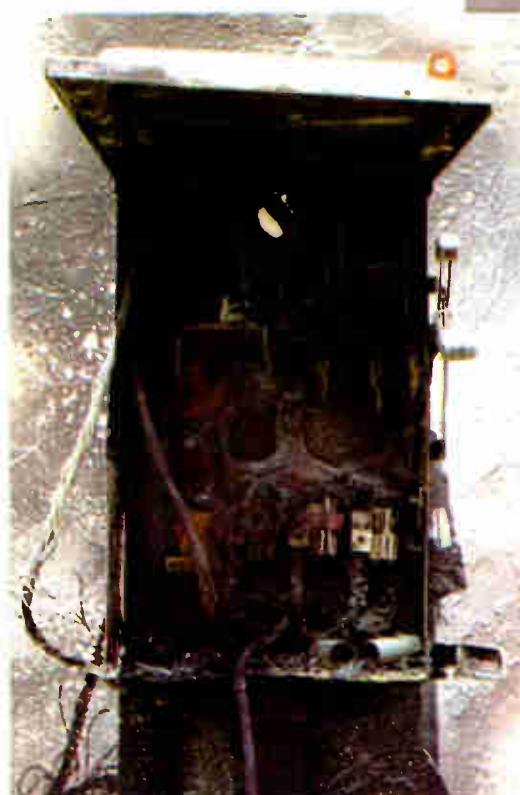


Fig 2: There's not much left after this fire.

Fig. 1: The results of a hard fault on a three-phase disconnect.



all happened as a flash, not a long-term arc, lasting only 30 to 60 cycles or a second or less.

Imagine what this level of energy would do to flesh, muscle and bone had the panel been opened when an engineer was standing before it and not

wearing proper protection equipment.

Wayne's advice? Leave electrical panel work to licensed electricians. You certainly may know how to maintain electric panels; but operating as an unlicensed electrician can still leave you open to liability, should something occur.

Reach Wayne Eckert at w.eckert@channelimages.com.

David DeSpain hails from Fort Worth, Texas, and is a registered professional engineer. He writes to warn engineers about using even very fine sandpaper to burnish relay, contactor or switch contacts.

Yes, the sandpaper may clean off the dirt, but disastrous results will follow. The abrasive used in the sandpaper will embed itself in the relatively soft contact metal, preventing complete contact closure. This can result in intermittent operation or accelerated failure. Sandpaper also

(continued on page 15)

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FEATURES

A 73-Year-Old Listens to a 93-Year-Old

Jim's antique Philco radio spurs some reflections about AM

FIRSTPERSON

BY JIM WITHERS

My brother John knows my affinity for old radios, and he gave me an old Philco tabletop last year. It's a Model 41-221. The "41" denotes the year of manufacture, which makes the radio 73 years old, about 20 years shy of being as old as the medium it was built to receive, using the licensing and broadcasts of KDKA as its birthdate.

I love the thing, and my grandsons are fascinated by it. My oldest, Isaac, shown right, age 8, had the best question so far. "Hey Grandpa, what are those little orange lights inside?"

Curiosity about vacuum tubes aside, this little (for its time) AM radio, with its dimly lit dial and dusty tubes, got me thinking about the events and programming AM radio has brought to the masses over the years.

The Philco Corporation made several dozen radio models in 1941 and most sold quite well. The Model 41-221 was advertised for \$23.50, and according to information at www.philcohistory.com, 37,116 were sold. Higher-end floor model radios from the company sold for up to \$250.

The company also built battery-operated models for rural listeners, who often had no commercial electrical service. Battery-operated radios are common enough today, but in 1941 they were a big deal, since Bell Labs was still six years away from inventing the transistor.



Battery-operated tube-type radios used as few tubes as possible because tubes are "thermionic" devices; they only conduct and amplify when heated up.

In other words, they are power hogs. Four-tube battery sets were common, and they needed at least two batteries to work: a 6 volt "A" cell (about the size of a modern lantern battery) to power the filaments, and a "B" battery, which output 90 volts or more, to provide "high" voltage to the plates of the tubes. The whole deal was good for about 20 hours of listening before the Sears Wish Book had to come out and batteries were reordered. (A bit of trivia: Even today, electronic circuits that use tubes refer to high voltage as "B+", in reference to the B batteries that powered early equipment.)

AM radios of the time often included the ability to receive shortwave broadcasts, and the 41-221 had that feature. The rotary dial shows recommended frequencies for receiving London, Paris, Berlin, Rome and curiously, considering the increasing likelihood of war in the Pacific in 1941, an area around 10 MC (for "Megacycles") on the dial simply labeled "Japan."

Edwin Armstrong had proved the viability of wideband FM in the 1930s, and the FCC authorized that service in 1940 on a band from 43–50 MHz. That spectrum had been occupied by channel one of a new experimental medium called television, which got moved up to 50–56 MHz to make room for the new service.

Only 27 FM stations were on the air by January of 1941, which turned out to be a good thing, because they all had to move when the FCC decided in 1946 to play musical spectrum again. FM went to its current band between 88 and 108 MHz and TV Channel 1 was deleted completely in 1948 to make way for two-way radio. That is why over-the-air

(continued on page 18)

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Best of Show

Wheatstone Blade 3

Wheatstone says the new Blade 3 input/output node stands apart from its predecessors by adding built-in audio clip storage for emergency broadcasts or other specialty uses, a multiband processor for spot processing where needed, updated routing functionality, AES67 compatibility for interoperability with other gear, full-color high-resolution OLED interface displays and double the virtual logic ports for more control.

The Blade 3 is compatible with Wheatstone's WheatNet IP network. An optional SD card slot allows more storage of audio for use in loss of signal episodes.

Left to right: Paul McLane, Darrin Paley, Phil Owens, Kelly Parker, Jay Tyler, Paul Picard, Dave Breithaupt.

Info: www.wheatstone.com



WORKBENCH

(continued from page 12)

can remove too much of the contact metal and change the contour of the contact.

Use a diamond contact cleaner or a piece of typing paper instead. David also recommends a strip of crocus cloth, which is similar to emery paper but softer and sometimes hard to find locally. It's not cheap but can be found online at a source like Olsen Industrial (www.olsenindustrial.com).

A 3-inch by 50-yard roll is about \$60, but a little goes a long way. Maybe buy a roll and divide the cost among your market engineers.

Reach David DeSpain, PE, at ddespain@firstva.com.

On the last day of the NAB Show, the Telos Alliance celebrated the wedding of Janis and Inga (Jahimcika) Timma. Janis is a software engineer at the company's Riga office.

It reminds me that 25 years ago, Delta Electronics' AM stereo technician Chris Wilk married Delta sales secretary Michelle Howe at the NAB Show.

Judith Gross, then Radio World's editor, and I witnessed that wedding at Circus Circus. It's hard to believe that many years have passed. Chris and Michelle are still happily married, have three grown girls, and Chris is now the chief engineer for Delmarva Broadcasting's Delaware and Salisbury/Ocean City Maryland properties.

Good things do happen in Vegas. We extend our congratulations to both couples!

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.

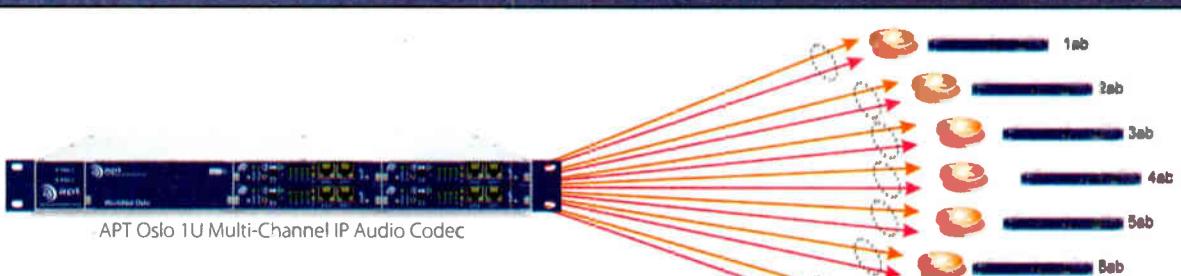
Author John Bisset has spent 44 years in the broadcasting industry and is still learning. He handles West Coast sales for the Telos Alliance. He is SBE certified and is a past recipient of the SBE's Educator of the Year Award.

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Wheatstone Takes Home Five Industry Awards at NAB 2014!



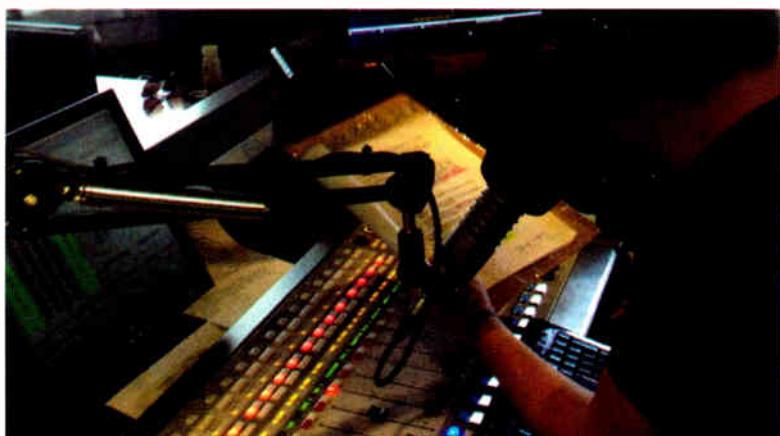
Wheatstone introduced some exciting new products at NAB 2014, and it appears that the industry noticed!

Wheatstone was presented with an unprecedented five Best of Show awards for its BLADE 3, L-12, SG-192, Dimension Three, and Series Four products.

Among the broadcast industry's most prestigious technology awards, NewBay Media's Best of Show Awards are evaluated by a panel of engineers and industry experts, and are selected based on innovation, feature set, cost efficiency and performance in serving the industry. The presentations were all made at the Wheatstone booth at NAB 2014 on the afternoon of Wednesday, April 9.

Read the rest of the story here: INN10.wheatstone.com

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BLADE Runner: 1341 Days and Counting

You see this shot of a working BLADE that has run for 1341 days straight? Incredible, right?

Wheatstone "Minister of Algorithms" Steve Dove thought so, too, which is why he included it as one of his slide presentations during his NAB Broadcast Engineering session.

Incredibly, someone watching the presentation recognized the BLADE as being one of his own and further commented that it probably would have gone on indefinitely if not for a routine reboot some months back. Find out who it is by visiting the link directly below.

[Click here to learn more: INN10.wheatstone.com](#)



D-76. Do You See the Family Resemblance?

One of the most beloved consoles in the Wheatstone Audioarts line — and, indeed, the radio industry — is the basis of our new Audioarts D-76 console.

It has all the practical style and rugged functionality of the D-75, which has been a staple in radio studios for the past 15 years, but with all the modern necessities such as a plug-in network module with OLED display for connecting into the WheatNet-IP Intelligent Network and a new RJ connector system for all your I/O. You will be amazed just how capable, and familiar, this tabletop console is.

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What the Perfect Control Surface Looks Like.

(Hint: Pretty Darn Close to the L-8, Only with 12 channels.)

We think we've arrived at the perfect balance between feel, size and features with the introduction of our new L-12 control surface. Based on all the same design principles as our popular L-8 and flagship LX-24 control surfaces — a precision-built, low-profile, tabletop IP control surface that offers assignable sources to any fader and with hot-swappable individual fader modules — this newest Wheatstone console has just enough faders to be effective in most on-air or secondary production studios, but not too many that it's unwieldy to use and difficult to place in the modern radio environment. Take a look and tell us what you think.

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OK, this spread is an advertising space paid for by Wheatstone. But hopefully you'll find it informative, entertaining and compelling.



FEATURES

ANTIQUE

(continued from page 14)

television tuners have always started at Channel 2. (A few experimental TV sets, like the ones in the RCA building at the 1939 World's Fair, had a Channel 1 dial position, but those were rare exceptions.)

All of the above frequency chaos, plus a freeze on station applications due to World War II, meant that folks who parted with \$23.50 for one of these utilitarian radios had many fewer stations to choose from than today.

The 1941 issue of the Broadcasting Yearbook, in fact, lists only 882 AM stations on the air as of Jan. 1. Four networks provided national news and programming: Mutual, NBC Red and Blue Networks, and CBS. Mutual is totally gone. The Blue Network was separated from NBC Red in 1942 and was sold outright to ABC in 1943 after the FCC filed antitrust action against NBC, and NBC has scaled back its remaining radio network to a shell of what it was in 1941. Of the original four, only CBS and ABC continue to provide meaningful programming to radio stations across the country.

I try to imagine where the little Philco was through it all, and who was listening to the epic events of the 20th century on it.



At 2:20 p.m. on Dec. 7, 1941, in Washington, the Associated Press "flashed" a message to all its member stations that the Japanese had attacked Pearl Harbor. Radio didn't get the attack live, but it wasn't far off. Franklin Roosevelt addressed Congress on Dec. 8, 1941 with his famous "Day of Infamy" speech to announce that the United States was officially at war with Japan; that was carried live on radio. Evening and "Extra" edition newspapers splashed 4-inch headlines report-

ing Roosevelt's speech, but didn't get the news out until late in the day.

All through the war, Edward R. Murrow originated almost daily radio broadcasts, each beginning with "This is London calling," reporting on conditions in England and throughout Europe. The broadcasts cemented Murrow's reputation as a reporter, as well as many of his handpicked team, including Eric Sevareid, Charles Collingwood, Howard K. Smith, Richard C. Hottelet and several others. After the war, "Murrow's

Boys," as they came to be known (some of whom were, in fact, girls), set the standard for radio news at CBS, and later on CBS television.

When Roosevelt died suddenly of a cerebral hemorrhage in April of 1945, radio microphones were there to report not only his death, but the funeral, Harry Truman's ascension to the presidency and Truman's reassuring words to the nation.

The Kennedy assassination, now 50 years ago, was covered on all media, but my first awareness of it came when an alert teacher held the high school PA system mic up to the speaker of a nearby AM radio, and the news crackled over the system into Mr. Wolfington's 11th grade English class.

In the entertainment arena, the Philco was around to hear the Tommy Dorsey Band (with a young featured singer named Frank Sinatra) make way for Bill Haley and the Comets. In 1951, Todd Storz inaugurated what came to be known as the top 40 format on station KOWH in Omaha and Bill Haley started getting a lot of airplay, along with 30 to 40 other "hits," played over and over, all day long (but not at night; KOWH was a daytimer). Hundreds of other stations quickly followed suit as the ratings for KOWH skyrocketed.

By the mid-1960s, FM radio had

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tools such as an audio spectrum analyzer and RDS/RBDS decoder.

In the event of signal loss the DB7007 can notify engineers and switch to a second RF source or back-up audio. It can be operated and updated via the Web and smartphones.

Info: www.devabroadcast.com



gained enough of a foothold that some listenership was slowly being siphoned off the AM band.

In a classic example of the mice in "Who Moved My Cheese," many AM stations clung to top 40 as the ratings were shaved off, day after day, through the turbulent 1960s and into the '70s. By 1980, it was clear that the major music formats would all end up on FM.

President Reagan came to the rescue, however, and the relaxation of the Fairness Doctrine rule in the deregulation push in the 1980s (along with sports) saved the AM band. The Philco (which might have been on the antique mall shelf by then) would have tuned to a new brand of talk radio, when an obscure broadcaster with the air name of Rusty Sharpe from Cape Girardeau, Mo., landed at an AM talk station in Sacramento, Calif. He switched back to his given name, and today, Rush Limbaugh is still a major — and mostly AM — radio franchise.

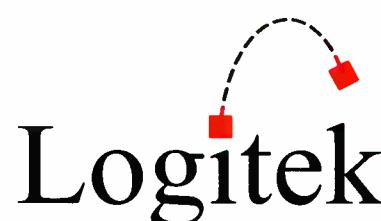
Sports is also still an AM powerhouse. I powered up the Philco last fall, in time to hear the St. Louis Cardinals whoop it up on LA when they earned a spot in the 2013 World Series.

Other formats and ideas have been tried. Radio Disney is a neat effort to create a niche listener group on AM radio. Foreign language programming, travel and visitor radio in markets like Branson, Mo., religious programming (around at least since Father Charles Coughlin took to the air in 1926), and retro oldies (in which the AM station not only plays old music, but tries to recreate the '50s and '60s sound in its entirety, complete with sonavox jingles, deep reverb and old commercials) all compete for listeners today. All on a medium that is more than 90 years old.

The 93-year-old medium has had quite a lot to say over the years. Thanks to my brother, my 73-year-old radio is still listening.

Jim Withers is owner of KYRK(FM) in Corpus Christi, Texas, and a longtime RW contributor. He has four decades of broadcast engineering experience at radio and television stations around the country.

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Mark Lapidus



At the student assembly for ninth-grade graduation, my middle school principal declared that by the year 2000 we would all own flying cars. Perhaps as remarkably, many of my classmates and I believed him.

I learned two life lessons from this experience, of which I remind myself regularly. First, it's dangerous to predict the future. Second, it's vital to understand the present, so as to not confuse it with the future.

A contemporary example: I hear people refer to the use of mobile devices as "the future." Sorry, but this is not correct. Mobile phones, smartphones, tablets — these are ubiquitous. They are so common that families are banning their use at meals. Want to impress a first date? Take out your mobile phone while he or she is talking and see what kind of reaction you receive.

We love our mobile devices. We hate our mobile devices. We have a relationship with our mobile devices. And if you're not thinking about the relationship between mobile and radio, you are missing a boat that sailed some time ago.

RWD

Your first mobile priority concerns your website.

If your website doesn't show up properly on a mobile device, it's time for an immediate change. The availability of mobile broadband and easily accessed Wi-Fi — at work, at the gym, at coffee shops and even over wide outdoor areas like college campuses — is expanding constantly.

You may not realize it, but without a mobile-optimized website, you are turning away audience every day. Furthermore, once someone has a poor experience, he may not revisit your website on a mobile device for a long time.

Take the time to research "responsive

Does Your Mobile Strategy Fly?

Radio managers should understand the present to know the future



©Stockphoto/Christophe Heylen

Web design," often called RWD. You'll learn how this technology sniffs out the device and properly sizes content from your current website to be delivered into a consumer's hand. For the budget-conscious, RWD also means you will not have to change your workflow.

In most cases, your mobile design will require a different look than your traditional website. It's essential for navigation menus to be bigger, buttons larger and a search box located easily. You should feature only your most significant content on your mobile site. It won't hurt to pore over all the content for search purposes, but that doesn't mean you need to link from your navigation.

SEPARATION ANXIETY

But wait ... aren't companies now building separate mobile sites that are completely different than their main websites?

Yes, this is an emerging trend, and it may make sense if you have underwriting from sponsors or funding from listeners as is the case in public radio. Building and operating a unique mobile

website has a huge impact on workflow because it means operating two content management systems and double-posting a lot of material.

THE SEXY WORLD OF APPS

Now that your mobile Web plan is in motion, let's dive into the sexy world of apps! I love 'em, and my bias is to state emphatically that radio belongs in the app game. In fact, I can't imagine some formats — such as news — without at least a basic app.

Why? Because an app assures your most upwardly mobile (forgive the pun) audience that you're ready to serve them with the best technology and become a permanent part of their mobile screen top experience.

Innovators in the mobile app space are creating app home screens that link to pages that actually reside on the mobile website. Most users will likely not notice that they are actually being moved off the app and into a mobile site. The click-through is quick, and if the look is the same, it's difficult to tell that this transition even occurred.

This type of development cuts down on costs and reduces technical issues. It also drives more page views/impressions to your mobile site, enabling you

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DYNAMAX MX SERIES

Best of Show

WorldCast Systems Audemat FM MC5

WorldCast Systems calls its Audemat FM MC5 an "FM measurement platform." The company says it can measure the performance of RF broadcasts in the field or at the transmitter site as well as those developing, producing and testing products for the FM market.

In a single, portable box are a spectrum analyzer, RF scanner, oscilloscope, frequency meter, distortion meter, AM noise meter, RF generator, MPX generator with RDS, sine wave generator, RDS decoder and most every RF measurement and analysis device imaginable.

Not surprisingly, the FM MC5 can work with a computer for real-time signal analysis or it can download stored logs for offline analysis.

There's also a GPS receiver for geographically stamping where measurements were taken. The FM MC5 was designed to be taken on the road, though it can be installed in a facility as well.

Shown from left to right in the photograph are: Paul McLane, Nicolas Boulay, Bruno Rost, Christophe Poulain and Kevin Campbell.

Info: www.worldcastsystems.com

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BEGIN AT THE BEGINNING

Now, budgets being what they are, if you're going to launch just one app, where do you start?

Android dominates in widespread use (as well as app downloads, for now), but Apple has its hard-core (oops, sorry, couldn't resist) advocates and heavy users.

I'd go Android first, then iPhone, and then move on to tablet development. A side benefit is the ability to push alerts directly to the consumer through the app. This drives app use and has the potential (if not abused) to drive listening to important events.

BACK TO BASICS

What other mobile basics could you be missing?

Although no longer the media poster child, SMS text messaging should continue to be an important part of your mobile communications plan. Radio needs to be offering news, weather and sports (score) alerts to mobile phones. Text messaging still has an amazing open rate, partly because it's hard to miss a text message on your phone if both visual and audio alerts deploy when texts arrive.

A big shout-out to those in the industry who continue to work with phone manufacturers to get radio reception chips into more phones and tablets. When I listen to streaming radio on my phone, it reminds me a bit of using a transistor radio. Sometimes the past does collide with the present!

Find more of Mark Lapidus' Promo Power column under the Business tab at radioworld.com.



Photo by Jim Peck

COOL-RUNNING PACKAGE

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The Mid-Priced OPTIMOD-FM 5700HD Digital Processor



Processing equivalent to OPTIMOD-FM 8500

Orban Opticodec 7700E/D Composite STL over Ethernet Wins Radio World's Best of Show Award - NAB 2014

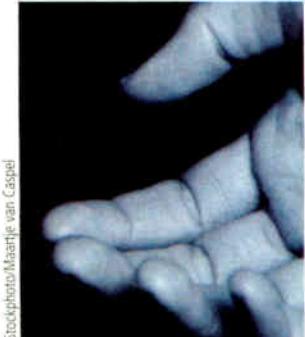
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Use Sensual Radio Advertising to Drive Sales

If you describe building it, they will come

SALES

BY JEFFREY HEDQUIST

Every advertiser would love to reach out and magically give each of its prospects the experience of visiting, shopping, buying and enjoying the benefits of what they offer.

Of course this is impossible.

Or is it?

Give listeners an audio "test drive" of the product or service. Trigger their imaginations to place them sometime in the future, when they are using and benefiting from your client's product or service.

Help listeners simulate the experience. The assumption is that the mind can't tell the difference between a scenario that's real and one that has been imagined in detail.

When your audience has rehearsed an experience in their mind, they're that much closer to doing it in real life. But don't ask your audience to "imagine"

- they've heard that cliché too often to respond.
- Show rather than tell.
- Involve all their sensory perceptions

resorts, retailers, educational institutions, direct response advertisers of all kinds and most recently for a blood service on the east coast, where we increased donations 21 percent at a time when they were traditionally down 4 percent.

parks, travel, hearing aids

Sight: Publications, beauty, vacations, amusement, media, home and garden, photography, art, fashion

Taste: Restaurants, bakeries, food, beverages

Touch: Bodywork, fitness, diets, tanning, hairstyles, yoga, dancing, athletics, clothing — anything involving touch or the body

Smell: Restaurants, food, beverages, cleaning, resorts, fragrances

This list is only a starting point. There's almost no limit to the types of advertisers you'll find for each sense.

Depending on the product or service, activate your listener's imagination with sense triggers about problems, then solutions.

For instance, touch-oriented advertisers may want a problem scenario with words and sound design about heat, cold, stinging sensations, muscle aches, bruises or itches. Then follow with a relief solution depicting temperature changing, soothing, releasing or healing.

STEPS FOR SENSUAL RADIO

Ask yourself: Who is the prospect? What senses would best convey the prospect's problem, pain or aspiration? What senses would best convey the advertiser's solution or benefit?

Some senses naturally compliment certain types of advertisements.

Here are a few suggestions:

Sound: Music, concerts, clubs, noise-canceling headphones, amusement

TIPS TO GET STARTED

- Use a search engine or thesaurus to find synonyms or qualities associated with each sense.

- Write a commercial that emphasizes only one sense. Then write one for another sense, then another. You'll quickly find which one(s) works best for your product or service.

- Involve as many senses as possible in your copy. If you're describing food, of course you'll want to think about what you taste, but also what you smell, see, hear and touch. Additionally, evoke feelings of relaxation, enjoyment, excitement, etc.

- If you find that the advertiser's story can be conveyed with many senses, create a campaign with one or more spots for each sense.

When you make radio a sensual experience for listeners, it can be financially rewarding for your client — and for you.

Jeffrey Hedquist is president and creative director of Hedquist Productions Inc. Contact him via email at jeffrey@hedquist.com.

Best of Show

Broadcast Bionics PhoneBox v4 and OASIS

Photo by Jim Peck



Dialing it up and dialing it in — PhoneBox Version 4 allows radio studios and TV galleries to manage social media, phones, prizes, codecs, email and SMS from one software application.

PhoneBox allows radio stations to tap into social media in new ways. Filter, select and queue Commotion posts, Facebook posts, Tweets, AudioBoos etc. View a running commentary in your studio on your chosen subjects and engage with potential new listeners on air. PhoneBox integrates with Telos Alliance telephone products along with Commotion, Stirlitz, WideOrbit, Lawo, Music Master and Newsboss products.

OASIS — for On Air Social Interaction Server — is Broadcast Bionics' solution for making radio as social as possible. It will hoover up social media data. When combined

with PhoneBox it's a powerful talk show content management system.

Duncan Smith, right, accepts the award from Paul McLane

Info: www.bionics.co.uk

Best of Show

DB Elettronica PFG 6 kW Mozart

Keeping elements separate is DB Elettronica's strategy for the PFG 6 kW Mozart Series, a line of modular transmitters.

The company says its design keeps the exciter separate from the amplifiers to ensure a level of redundancy usually only seen in high-power systems, while maintaining the lower price of integrated units. The design provides a cleaner signal thanks to that separation and allows for swapping out of failing elements without removing the whole package.



Shown from left to right: Josue Rodriguez, Beatrice Martin, Paul McLane, Didier Muragwabugabo, Elena Ditadi, Marco Giovannini, Andrea Valtulina, and Markos Kozelinski.

Info: www.dbbroadcast.com/db-elettronica-company.html

According to DB Elettronica the transmitters offer a total efficiency of up to 75 percent. The PFG 6 kW Mozart is made of aluminum and the electronic boards are tropicalized with a special resin to protect the circuits against air corrosion in seaside and other harsh facilities.



BW Broadcast RBRX Encore

Part of BW Broadcast's Encore line of products, the RBRX is the latest incarnation of the company's rebroadcast receiver. Built on the foundation of the RBRX1, the dual-tuner RBRX Encore uses Sony NXP dynamic digital filtering noise reduction technology to deliver top-of-the-line analog FM stereo separation, the company says.

Onboard are BW Broadcast DSPX limiting, an RDS encoder and decoder, stereo generator, IP audio streamer and a back-up audio function that uses internal memory or USB drives.

Options for AM, HD Radio, DAB/DAB+ reception make the RBRX Encore suitable for use as a rebroadcast receiver.

Shown from left to right: Neal Helly, Ricardo da Silva, Katie Murphy, Rob Kidd and Paul McLane.

Info: www.bwbroadcast.com

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Apogee MiC 96k Reaches the Apogee

Mac mic is a steal, and it might even work with Windows and Linux

► PRODUCT EVALUATION

BY ALAN R. PETERSON

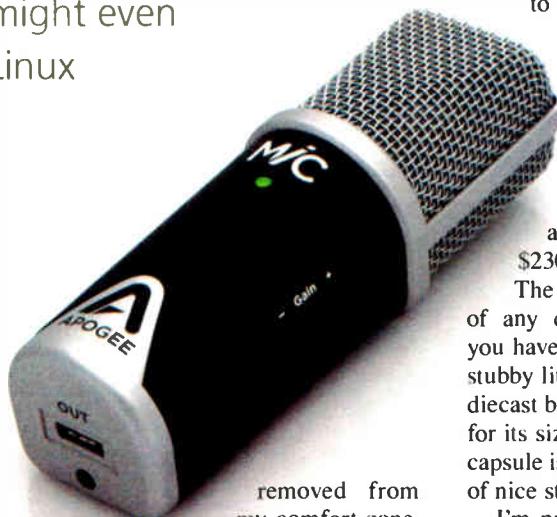
I probably am not the first person to call when it comes to any and all things Mac. I spend my days cranking out nationally syndicated talk radio programming on Windows and Linux machines, using the software with which I am most familiar. We have several iMacs at the network that we use for video editing, but I don't spend much time near them.

When I was offered to try out the Apogee Electronics MiC 96k professional digital microphone, I knew the company made audio hardware exclusively for Apple products. But I asked anyway: "Does it work on any computer?" and they told me, "We designed it for Mac hardware."

O-kay-y ... send it anyway.

A STEAL

I figured this was a good opportunity for me to get on good terms with Mac hardware and software and to see what I can get the MiC to do when I'm



removed from my comfort zone.

Going in without any notions or prejudices, I was bound to be impartial. Hard to imagine, given the experiences I have had with USB microphones from many other companies: low levels, noisy preamps, gritty A/D converters and low threshold for overload and distortion. Besides, there were plenty of people at work with iPhones that I could convince to plug in and try out the MiC on their own, then harvest their opinions.

Here's the quick read: If you are in radio and you have a Mac computer, iPad or iPhone, get one of these now.

The fact Apogee Electronics was behind the design of the MiC is enough

to go get the checkbook. I had hoped for the same in the MiC. The unit they sent me to try out is the 96k model, which can output a 24-bit/96 kHz signal. Add to that a responsive and detailed condenser capsule, and the street price of about \$230 becomes a steal.

The MiC has the looks and lines of any classic condenser microphone you have seen in your career, only in a stubby little 4.5-inch long body. Its zinc diecast body packs some surprising heft for its size, and that 3/4-inch condenser capsule is mounted inside a double layer of nice stiff screening.

I'm pretty certain the Apogee engineers knew the MiC was not going to be a coddled condenser mic that would be lovingly returned to its velvet bag and back into its lacquered walnut case every evening after a session, but stuffed randomly into the accessory pocket of a MacBook bag after an inspired impromptu recording, likely somewhere unusual. They built it to boogie.

Given that, I did notice the finish they gave the case is a bit prone to scratching. One of our staff missed when trying to plug into the output socket and left a long divot in the end cap.

The mic is supported by a clever little tripod accessory with a standard 1/4-20 thread as used on cameras. Apogee

PRODUCT CAPSULE

APOGEE ELECTRONICS
MiC 96k

Thumbs Up

- + Apogee guts inside, hard shell outside
- + Affordable
- + Up to 96 kHz sample rate
- + Cables, stand and adapter are standard accessories

Thumbs Halfway

- Exclusively for modern Mac hardware, but tests indicate it could work with Win or Lin machines

Thumbs Down

- Finish may scratch under moderate use

Price: \$229

For information, contact Apogee Electronics in California at (310) 584-9394 or visit www.apogeedigital.com.

also included an adapter that couples the MiC to a standard mic boom thread. Brownie points for not making us shop for an accessory that should be included.

Seeing how Apogee Electronics decided what went inside, I knew the preamp was going to be ultraquiet and the converter was going to be miles ahead of your basic epoxy blob. The company did more than that: they included a gain control on the mic body to dial in your recording level (rather than opening a mixer window on your hardware), and a tricolor LED on the mic body that tells you if you're connected (blue), if you're talking to your software (green), and if you're talking too loud (red).

Apogee packed the mic with good ole USB cabling, but also included Apple's proprietary eight-pin Lightning connector, as well as a cable for the earlier 30-pin version of Apple sockets. You are covered, no matter how you hook up to your Mac product.

TESTING 1-2-3

The first test recording we made was a tabletop setup: MiC on its tripod and plugged into an iPhone, recording a voiceover to be emailed to our production room.

Those of us present were surprised by how quiet the mic was — like I said, we have had experience before with digital mics and USB interfaces and had been less than impressed. But on the MiC, we had a clean, noiseless recording with lots of clarity. When no one spoke

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World Radio History

and only room atmo was evident, there was none of the graininess or fizziness we have heard in those aforementioned USB mics. The Apogee MiC 96k proved its worth right out of the gate.

What was noticeable was a bit of phasing honk — the mic was too close to the tabletop and picking up the reflected voice of our performer. Done a second time with a jacket under the tripod fixed everything.

Our second recording was done on a small boom to avoid the tabletop reflection, directly into Garage Band on one of our iMac video editors. Here we had greater control over processing (EQ, compression etc.). Same result: wonderfully accurate and airy tracks that we could further process into Billy Big Voice for the radio.

One last recording was a two-person interview sitting close together in a V-pattern in front of the mic. The big concern was that the cardioid pattern would be too tight to cleanly capture both of our participants without getting an off-axis sound and some roominess. But the pattern is somewhat generous and we did fine.

It is worth mentioning that, directly on-axis, the MiC is prone to plosives, as are nearly all condenser mics. Good practice dictates angling the microphone or using a pop filter. No doubt you already own one.

We did not attempt to record anything at the highest resolution settings, since our end users are affiliate radio stations, and the FM affiliates wouldn't reproduce much above 15 kHz anyway. Still, it's nice to know it's there when it's time for a critical recording.

Apogee Electronics is positioning the MiC 96k for musicians, voiceover folks and multimedia creators; all you need to do is check out the company website and see the demonstration videos. But I am finding the MiC to be a valuable addition to the arsenal of any broadcaster using Mac products.

Yes, we can record the mayor at a news conference via phone and send it back to the studio, but those recordings are thin and indistinct. Get a MiC up-front and get the best recording in the house.

Voicetracking jocks can simplify their rigs by using just a MiC and a Mac laptop at home, then switch gears and cut tracks in Pro Tools for agency ads, all on the same laptop.

And that band that can't meet you at the studio for the morning show? Hit their hotel room and grab an impromptu acoustic performance, without sounding like it's being recorded with a 1980s vintage dynamic mic into a Uher.

I've discovered a bit about Mac hardware this time out, and how to make one sound really good with an Apogee MiC. And for what it's worth, I got it to



work on my clunky old Windows XP machine. But this is one for the Apple crowd. I definitely recommend this mic: It is inexpensive, durable, and it sounds really good. Plus, it's American-made by Apogee Electronics, and that says plenty.

Alan Peterson has been the production director at the Radio America Network, Arlington Va., for ten years, and is a familiar name to long-time RW readers. He can be reached at apeterson@radioamerica.com



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Best of Show

Digital Jukebox DJB WebStream Logger



As radio broadcasters become more comfortable with the Web, tools are needed to monitor it. The DJB WebStream Logger is a multichannel URL and analog audio logger, competition monitor, mic skimmer, stream silence detector and recorder.

Digital Jukebox says that the software was designed to support a range of users. It can provide radio networks, groups, clusters, combos and standalones with the ability to monitor URL Web streams without need for physical audio cards. In addition each channel provides DJB Silent Treatment audio monitoring and email warning should any channel detect loss of audio. It is available in one-, two-, four- and eight-channel versions.

Ron Paley, right, issues his verdict.

Info: <http://store.digitaljukebox.com>

ters, combos and standalones with the ability to monitor URL Web streams without need for physical audio cards. In addition each channel provides DJB Silent Treatment audio monitoring and email warning should any channel detect loss of audio. It is available in one-, two-, four- and eight-channel versions.



Photos by Jim Peck

Axel Technology Wolf 2MS

Instead of howling, the Wolf 2MS listens. The rack-mounted box contains a dual-tuner FM monitoring system. It provides measurement and analysis of frequencies, FM reception, MPX audio encoding and RDS data streaming along with acting as a silence detector. The tuners can operate independently.

Up to 64 frequencies to be watched can be programmed. It can store data for later analysis with a PC and will issue alarms for select FM performance violations. It will even issue 24-hour logs.

Courtesy of an onboard Icecast server, the Wolf 2MS can also monitor Interest streams. Wolf can be operated from the front panel or by PC, tablet or smartphone via the Web.

Shown from left to right in the photograph are: Paul McLane, Giuseppe Vaccari, Christian Sighinolfi, Enrico Vaccari and Veronica Sanzaro.

Info: www.axeltechnology.com

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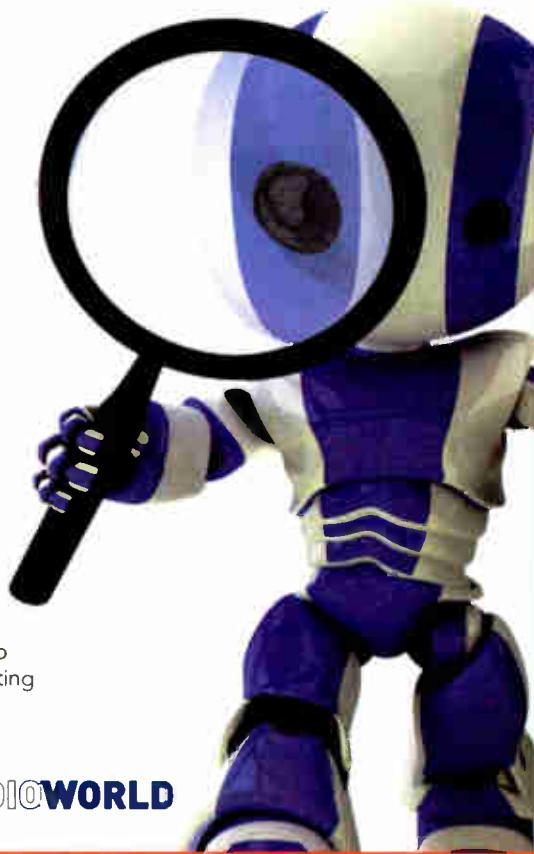
Not everyone has the time and resources available to see everything presented at the annual NAB Show in Las Vegas. Yet, keeping up with the news and significant technology introductions is vital to your job and career. We can help.

Join us for a FREE executive briefing, originally presented on May 7, on the 25 Things You Might Have Missed at the NAB Show. The Radio World editorial team traveled the sessions and exhibit floors of the Las Vegas Convention Center to find the people, news and technology certain to have an impact on radio broadcasting and station operations throughout the coming year and beyond.

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AEQ Systel IP4/IP12

AEQ has the answer when listeners call. The Systel IP4/IP12 is a talk show phone management system with multi-conference capability that the company says drastically reduces costs while improving audio quality, flexibility and integration with any existing telephone system at the station.

Systel IP is built around a digital router and uses IP telephone technology. Encoding algorithms include standard G.726, G.729 and low-bitrate G.711 along with HD Voice, G.722. AEQ has all the hardware and software, including the handsets. Systel can be used with tablets. The IP12 system can handle up to 12 lines simultaneously.

Shown from left to right are: Gustavo Robles, Rogelio de la Fuente, Antonio Picarra, Ramon Pascual, Miguel Sancho, Peter Howarth, Luis Miguel Sanchez-Migallon and Paul McLane.

Info: www.aeqbroadcast.com

Photos by Jim Peck



Rohde & Schwarz THR9

Rohde & Schwarz was making a bold move when it chose to use liquid cooling for its THR9 FM transmitter family.

The HD Radio-compatible box is aimed at high-power jobs — up to 40 kW per rack — with efficiency that the company says is up to 75 percent. R&S says the combination of liquid cooling and power efficiency is superior and cheaper "compared to air-cooled systems and their power-hungry, complex cooling infrastructure."

The TH9 also allows for multiple independent transmitters to be placed into a single liquid-cooled modular rack for even more efficiency and savings.

Thomas Loichinger, left, accepts.

Info: www.rohde-schwarz.us

FREE SOFTWARE

Satisfy the Meter Impulse

Many DAWs come with some sort of digital audio meters; but for a few of us, nothing beats a pair of good old-fashioned VU meters. They're great for showing average levels, and some also have peak indicators.

But those good old-fashioned meters can cost plenty. This month, we'll take a look at a few free plug-in versions that will get the job done.

Our first option comes from Naiant Studio's Jon O'Neil (www.naiant.com). The VU Meter VST plug-in comes in three versions, one mono meter, one stereo and one dual-channel. This plug-in can be placed anywhere in your DAW signal chain that allows it, and it passes audio unaltered. All versions have a virtual "set screw" to calibrate the meters to whatever dBFS standard you want between -36 dBFS and -3 dBFS. Another set screw adjusts meter ballistics. There's also a peak indicator. This classic design is easy to download and easy to use.

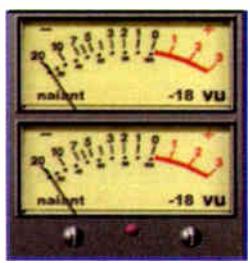
Next up, it's the LVL Meter from LSR Audio (www.lsraudio.com), led by Emmanuel Dubecq. This meter, available in both 32- and 64-bit versions, shares the simplicity of Naiant's design, but with a

more "retro" look. Installation starts with required free registration at the LSR Audio site. Once that's done, you receive the installer. Operation is simple, again just a matter of placing it in the signal chain.

In this case, the peak indicators are presented as red needles that operate behind the meters' black needles.



LSR Audio LVL Meter

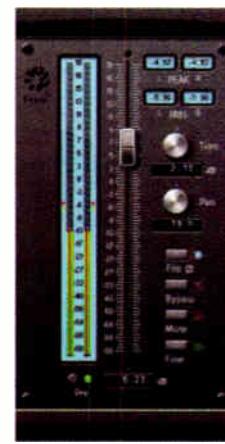


Naiant Studio VU Meter

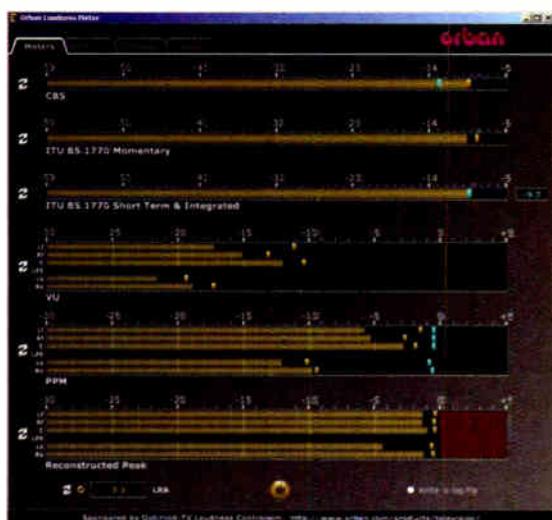
trol. This plug-in provides a virtual LED-based peak and RMS meter, plus a long-throw output level fader. The output fader includes pan, trim, polarity and mute controls. The meter also has bypass and pre/post fader selection. This is ideal for situations where no independent monitor controls are available.

Several other settings are available, including meter ballistics and pan law. As with the LVL Meter, download requires free registration at Sonalksis' website (www.sonalksis.com).

Finally, moving away from DAW Land, we have a stand-alone offering. The Orban



Sonalksis FreeG



Orban Loudness Meter

Loudness Meter is a free tool that looks at the input of your system's sound card (www.orban.com). It offers several meters for analyzing your audio, from CBS Labs to VU to ITU to PPM. All meter settings are adjustable, as are sound card settings. Even multichannel sound cards can be used by selecting which pair of inputs to use. If you need a quick check of how your audio conforms to various national and international standards, this is a handy, easy to install and easy to use, solution.

— Curt Yengst, CSRE

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WANT TO BUY

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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.

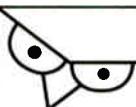
Looking for a broadcast excerpt of a San Francisco Giant's taped off of KSFO radio from 1959, interviews with Willie Mays, Dusty Rhodes & some play by play excerpts, at a local store. Anne Truax, Susanne Caygill, running time is 13:44. Ron, 925-284-5428 or email ronwtamm@yahoo.com.

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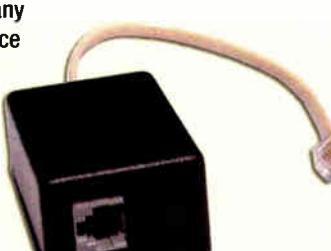
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READER'SFORUM

DON'T GIVE AM TO THE DOGS

Daniel Brown's reaction to the Scott Clifton commentary ("The TV Perspective," March 12 issue) gives me the impression that he went for the "send" button a little too fast.

As the owner of nostalgia-programmed KCCI(AM) in Morro Bay, Calif., he is delivering product to the very same demographic that probably listens extensively to AM radio — presumably not many millennials are tuning in to "I Married Joan." Yet he advocates tossing AM "to the dogs."

Does he mean to allow the band to go unregulated, unlicensed and just plain wild? Or just switch it off? Doing so is a huge slap against his very own audience.

Also, with seven fairly well-defined AM stations that can be heard in Morro Bay, and many others with marginal signals, I want to believe he did not just alienate every AM owner in his market by saying that.

Mr. Brown redeemed himself by suggesting opening up the band to LPAM pioneers. That makes better sense, as he and his three-person TV station are definitely pioneers in their own right.

I can appreciate the battles he is fighting with the hungry sharks wanting to pluck at his signal. But the idea here is to help AM, not throw it to a pack of starving canines.

Alan Peterson, CBT/CEA
Springfield, Va.

CODEC DESERVES ATTENTION

Thanks, Scott Clifton, for the good article ("AM, You Want a Fix? I Got a Fix!," Feb. 12 issue). Interesting to understand your experiences with mobile data in your area.

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Our readers have something to say:

"Radio World either expands my understanding of what's happening in radio or opens a new window I hadn't thought about. Thanks for keeping me sharp!"

Jon Vaught
Station Manager
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Milford, Conn.

OPINION
READER'SFORUM
THE TV PERSPECTIVE

I just read Scott Clifton's commentary on saving AM by expanding the FM band ("AM, You Want a Fix? I Got a Fix!," Feb. 12 issue). I still don't know where radio industry folks are coming up with the notion that VHF Channels 5 and 6 are little used. At last count, there were more than 500 licensed stations and CPs on those channels. There is no reason to assume that they will be gone anywhere else in the near future. As far as stations are concerned, Channels 5 and 6 will figure in more prominently as stations are moved. Plus, the FCC has clearly stated on their How to Apply for a Radio or Television Broadcast Station Web page that, "Expansion of the VHF or FM radio bands is unlikely to occur in the near future." End of discussion.

Further, expanding the FM band, but it does have everything to do with saving the AM stations. Here's a better approach. Since analog radio on both bands is not only in the future, but in analog FM stations escape far too much space per channel. I have no doubt that should FM get through such a digital repacking of its own double, if not triple, the number of stations would exist on the current band of 88.107.9 MHz. Keep in mind that when television went through its DTV transition, it lost 10MHz of UHF spectrum. And set aside, was without a channel assignment, FM could easily stand a similar belt narrowing and never effect use as allocated spectrum.

As for AM, toss it to the dogs. Or perhaps, a better approach is to allow an LPAM service and let first time broadcast station entrants apply for licenses. As television broadcasters, we are already in full battle mode against the telco, cable and wireless broadband rap tows who are hungry eyeing our spectrum. We certainly don't need radio overrunning our spectrum as well.

WORKABLE SOLUTION

1. Fine Fred Haungritter's idea a provocative, serious and suitable solution.
2. Commentary: Return MW to WWD. It Was Born to Do. (Feb. 1 issue)
3. Validly support opening unused VHF Channels 2 through 6 and UHF stations of existing not only for migrating AM stations but for noncommercial operations of various kinds. Repackaging the MW band using AAC+ suppressed sideband and why not include 1W to the expansion? It is a brilliant idea provided there are strict limits on the number of super power stations per customer — no more than one or two — use Clear Channel and their it will again monopolize it all.

The AAC-HEv2 codec deserves your attention. It operates very well at 56 kbps. Our industry friend Greg Ogonowski is a big proponent of AAC-HEv2, and has a terrific app (for iOS) that lists and plays thousands of stations streaming in this format. You'll be pleasantly surprised at the audio results. Looks for "StreamS+" in the App Store. It's well worth the asking price.

Here in Nashville, I regularly drive around listening to a variety of stations using the TuneIn Radio app. My phone (usually a Samsung Galaxy Note 2) is on T-Mobile and indicates 4G LTE service in most metro locations. Rarely a dropout.

Kirk Harnack
Vice President/Executive Director
Telos Systems
Nashville, Tenn.

CROWDED FM BAND

I completely support the idea of creating an FM Class C4 costs ("SSR Renews Push for FM Class C4," April 17). I would also support an equivalent FM Class B2, at the same proposed ERP, HAAT, etc.

The FM bandwidth has become inefficiently crowded with a lot of less-powerful Class A stations at the one end, and a lot of maximum Class B and C FMs at the other end. That inefficient "packing" of the FM bandwidth leaves out the potential for more stations in the middle.

Allowing more FM stations at a Class C4 (and B2), where technically appropriate, would certainly promote the FCC's policy of maximizing the American public's access to more broadcast "voices" over the public airwaves.

The FCC should very seriously examine this proposal, then put it into effect.

Robert Lee
Owner/General Manager
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Streaming Made Simple! With Simian 2.2 Pro & Lite

By Paul Anderson & David Bowman of KOUU



Idaho Wireless Corp is a small market group in Pocatello, Idaho, and we're the only independently owned and managed radio group left in our market. As technology evolves we evaluate the costs and benefits of each change, and streaming was one of those projects.

When we changed the format January 1st on our 50,000 watt AM KOUU to Country Classics the response was immediately positive, but our audience wanted to listen in their offices and on their smart phones. We had considered streaming KOUU in the past, but the expense and complexity meant it was always a project that got pushed back to "later".

In 2009 we installed our first Simian system, replacing a beloved but tired Scott Studios system. We were ready for the benefits of a Windows based system that had more features, and we found that Simian is easy to use, powerful, and installation was a breeze. Since then we've converted all of our stations from Scott to Simian.

Simian offers many options to set up streaming. Country KOUU audio streaming is being outsourced to a third party (Crystal Media Networks) using data provided by Simian. Using the Metadata tab in Program options is where all the set up takes place. Crystal Media Networks required certain parameters to interface with their streaming player. The majority of the setup is all contained in an .xml file.

To create an .xml file, use Notepad and type in the syntax for each parameter required by the streamer (Syntax for Artist is <artist><![CDATA[%ARTIST%]]></artist>). Simian support can help with this, or a template is pictured in the Simian Pro Manual. In the case of KOUU, Artist, Title, Filename, Category, and Length of each piece of audio was provided to Crystal Media Networks. This file becomes the Template File.

Some final setup is required. The template file is loaded in the Metadata tab in Program Options in Simian. The IP Address corresponds to the computer that will be accessed by the streaming software. This computer needs to be networked to the on air Simian computer. The port and TCP/UDP address is set up with information provided by the streaming company (in the case of KOUU, Crystal Media provided this information).

All of the programming for KOUU is played by the Simian Pro system. In order to stream with more than one source (i.e. switching from local audio to network audio like a satellite receiver) Data Repeater-available from BSI-can handle multiple metadata sources and destinations.

Our streaming project for KOUU was easier than we imagined. The support team from BSI and the streaming features of Simian made it simple.

Paul Anderson is the General Manager of KOUU, KZBQ and KCRR. David Bowman is the Operations Manager. KOUU uses Simian Pro, though the metadata output features of Simian Pro are also available in Simian Lite. Simian Pro & Lite contain built in metadata output templates for Windows Media Encoder, ShoutCast, IceCast, SAM Cast, Live365, Orban Optimod, and Omnia A/XE. Metadata output in Simian Pro & Lite is template based, so most stream encoders not listed are compatible.



Paul Anderson at KOUU in Pocatello, Idaho

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