CLEAR CHANNEL + MICROSOFT = DATA. Page 2

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Christian communicators convene and debate at NRB2007.
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A Veteran at 23
Kyria Timmons of Bonneville is a one-woman band in Frederick, Md.
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Radio World
$2.50 The Newspaper for Radio Managers and Engineers February 14, 2007

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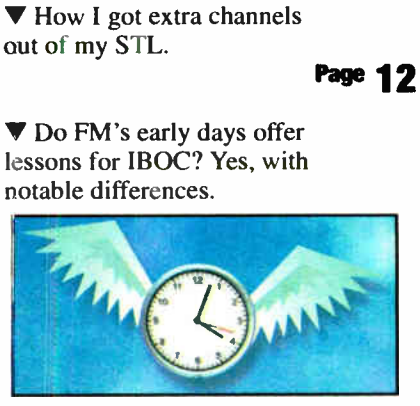

STUDIO SESSIONS

In This Issue

BUYER'S GUIDE

OPINION

What's up in IT? Visit radioworld.com and click on Radio IT Management

Radio Tested With Ford Coverage

News Operations Work Through Logistical Challenges for Funeral Events

by Randy J. Stine

WASHINGTON Radio news networks rolled out special reports and live coverage marking the week-long state funeral of former President Gerald R. Ford in late December. Their operations went smoothly in part because of what they learned from covering former President Ronald Reagan's funeral in 2004, and despite a personnel shortage because of the Christmas holiday.

Moving gear and field reporters on short notice from services in Rancho Mirage, Calif., to the state funeral in Washington and finally to Grand Rapids, Mich., for burial added a level of complexity to covering the major news story.

Major networks including ABC Radio News, CNNRadio, AP Radio Networks and National Public Radio told RW they planned in advanced and used pool coverage of specific funeral events to stretch their resources. In some cases the net-

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Alaska Pubcasters Proceed With HD-R Projects

APBI Embarks on Ambitious IBOC Conversion of Its 26 Stations

Photos courtesy Alaska Public Broadcasting Inc.

Service on the fly: Contract Engineer Bill Prendergast, left, and APBI DOE Chuck Lakaytis had to disassemble this transmitter on the tarmac at Anchorage Airport to make it fit in a DC-6.

by Leslie Stimson

ANCHORAGE, Alaska Completing an IBOC conversion in Alaska can be a rugged experience — beyond seeing the occasional polar bear or a moose outside the studio. Such engineering work requires special attention to detail even before the first piece of new hardware is taken out of the crate.

The harsh winter environment limits when and how materials can be shipped where they are needed, and the cold weather is challenging to equipment performance.

For example, an engineer for Alaska Public Broadcasting Inc. recently per-

See ALASKA, page 5 ▶

World Radio History

Microsoft, Clear Channel HD-R To Deliver Personalized Data

LAS VEGAS At next year's Consumer Electronics Show, Clear Channel Radio and Microsoft hope to show products based on their new agreement to build a nationwide data delivery service using HD Radio technology.

The companies hope to transmit personalized and localized content to a variety of HD Radio receivers and other devices. Terms of Clear Channel's new relationship with Microsoft were not disclosed.

Ibiquity Digital President/CEO Robert Struble told Radio World the announcement is significant and marks the first time the HD Radio technology will be used in something other than a purely broadcast approach.

The data could be transmitted to radios, TV or any devices that receive such information, said Jeff Littlejohn, executive vice president of distribution and development for Clear Channel Radio.

Still be decided is exactly what final form the data will take, Littlejohn said. Some receiver manufacturers and other device makers will use the transmitted data to display information, such as a navigation system. "It can be stocks or weather. It doesn't have to be audio."

The initiative will be branded MSN Direct HD, an extension of the Microsoft MSN Direct service, which transmits a variety of data information, traffic, weather, movie times, sports and stocks to Smart Watches, weather stations, GPS navigation devices and small home appliances.

The initiative will be branded MSN Direct HD.

The expansion of MSN Direct to HD Radio is part of the Microsoft Smart Personal Objects Technology, or SPOT, initiative. The companies are talking to consumer electronics companies and automotive manufacturers to offer MSN Direct content in HD Digital Radio format on their devices in 2008.

Littlejohn said receiver manufacturers were interested in the concept at CES.

Ibiquity will support field tests of the data delivery service.

"Nobody has done a real data service" with HD Radio, Littlejohn said. "We need to determine how much we can do and how often. Microsoft is good about taking a certain amount of data and putting it out over bandwidth." One of the questions the companies hope to answer with tests is how many times the information would need to be transmitted for the receiver to display it accurately.

If someone has the receiver on all day, determining how much data to send is easy, Littlejohn said. More challenging for designers is what happens when the user turns the radio on in the first place. The companies must figure out how to make the device display all the information initially.

Eric Lang, general manager of the SPOT initiative at Microsoft, said Clear Channel had demonstrated its commitment to the aggressive rollout of HD digital radio; he said the new project "will help further extend the MSN Direct-enabled product category and the realization of our vision of making everyday objects smarter through technology."

Clear Channel Radio is offering HD Radio primary broadcasts on approximately 340 of its radio stations; most of those are multicasting their digital channels.

Littlejohn said the Microsoft SPOT initiative has illustrated the ability to turn personal objects into mobile tools: "Combining Microsoft's existing technology and customer service background with Clear Channel's HD Radio delivery platform will provide customers with a world-class data service."

— Leslie Stimson

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World Radio History

Ford

▶ Continued from page 1

works had 24 hours to handle logistics and have correspondents and remote broadcast equipment in place.

"ABC News Radio has had a plan for the death of President Ford for years and has been updating the plan every several months. The extensive plans detailed virtually every action to take, from our first special report to where the correspondents should go," said Michael Rizzo, executive director for news coverage at ABC News Radio.

ABC News Radio's Vic Ratner, left, and Ann Compton, seated, take part in live anchored coverage of the funeral for Gerald Ford outside the National Cathedral on Jan. 2. Washington Bureau Manager of Technical Operations Steve Densmore, center, supports the correspondents.

Logistics

The seven days of memorials followed the announcement of Ford's death on Dec. 26 and triggered coverage plans for many networks. Events after Reagan's death helped prepare the networks for covering another presidential funeral.

"Logistically there is a lot to consider depending on where we need to go and where our staff is at the time. The funeral plan became a bit of an evolving creature," said Jerry DeMink, vice president of CNN News Services and CNNRadio. "We did have rudimentary plans in place since we knew [Ford] had been in failing health. We knew we would be live from Washington and Grand Rapids, but California did come as a bit of a twist."

CNNRadio, based in Atlanta with approximately 2,000 worldwide radio news affiliates, provided hundreds of customized correspondent live reports in addition to breaking news specials and regular updates, DeMink said.

The fact that Ford's death occurred during a holiday week and right after Christmas added to the challenges for radio networks.

"Some people did need to come back of vacation," said Harley Hotchkiss, operations manager for CNNRadio. "It was a week for big stories, too. We had the blizzard in Denver, James Brown's memorial and the execution of Saddam Hussein drawing manpower."

CNNRadio prepares for anything that could go wrong during live coverage, Hotchkiss said, and puts measures into place to ensure the capability to record, process and deliver audio.

ABC Radio News broadcast extensive live coverage of Ford's farewell hosted by Gil Gross and complimented with reporting from correspondents such as Ann Compton, Vic Ratner and Pam Coulter.

Christine Ianuzzi, vice president of broadcasting technology, engineering and operations for ABC News Radio, said, "On a technical level we immediately began evaluating having crews ready to go to support the coverage, prep remote gear, what we'll need for telecom lines and credentials to get into the venues."

Following the movements

ABC Radio keeps its remote kits well maintained, making sure repairs to gear are made before equipment is logged back into inventory, said Steve Densmore, manager of ABC News Operations in Washington.

The radio news networks spent many hours prepared for the busiest day of coverage on Jan. 2, as President Ford's casket was moved from the Capitol Rotunda to the U.S. Senate for a brief repose before a memorial service at the National Cathedral. His body was flown later that day to Grand Rapids, Mich., for burial at the Gerald R. Ford Presidential Library and Museum.

ABC Radio News used a combination of satellite and cell phones and UHF remote pick-up (RPU) gear, Densmore said.

"We relied heavily on RPU gear and riding piggyback on TV microwave and fiber paths during the funeral coverage."

Presidential funerals are managed by the Military District of Washington, which provides generator power at most venues for radio broadcasters. Densmore said ABC Radio used portable DC-to-AC con-

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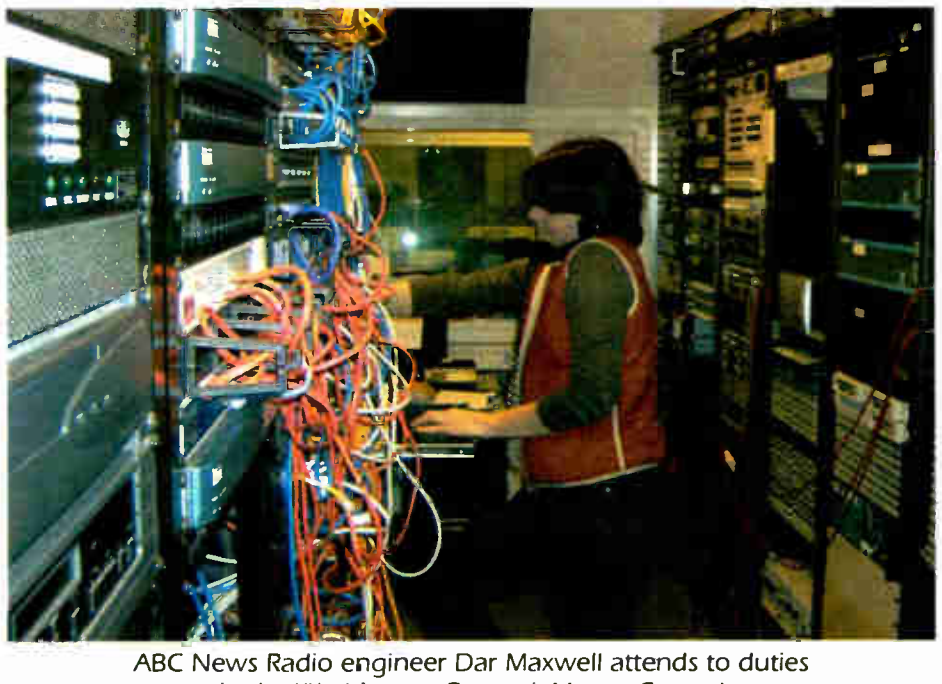

ABC News Radio engineer Dar Maxwell attends to duties in the Washington Bureau's Master Control.

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World Radio History

Saying You're Local Doesn't Make It So

Radio works best locally. But a former small-station owner reminds us that beneficial technology can work against that goal.

I heard from a reader — let's call him Jack — who sold a station in a small community recently. The buyer had assured him and others that he intended to keep the station just as local as it had been, "if not more so" — those exact words.

Among the factors in the decision to buy was the station's excellent local reputation. On a wall in the lobby was a "business of the year" award presented by a community organization. During the weeks before the transfer of license, the buyer was introduced to many community leaders. All told him how much they appreciated the station's local news, service and involvement.

The message — local, local, local — was unmistakable.

Unfortunately, according to seller Jack, what followed was a sharp reduction in local news. No more coverage of the borough council or school board. Weather now is downloaded automatically from somewhere off-site. There is no station presence at community events.

"A tornado warning was issued one evening a few weeks into the new owner's tenure," Jack told me. "It wasn't aired — this in a town that lost several lives to a tornado some years ago."

A fugitive cop-killer who had been at large in the area was captured one evening. "Were it not that the network reported the capture as a national story, it would not have aired on the station," my source said.

Callers to a trivia contest on the morning show now are routed to voice mail. The station, in a prominent main street storefront, is locked and dark after the morning announcer is done for the day, unless one of the sales people happens to be in.

"The commercial schedule is generated elsewhere and downloaded into the automation system," Jack continued. "There's no paper log. If an advertiser calls to ask when his next spot will run, whoever is in the station — even his own sales person — is unable to tell him."

Embarrassed

The seller says he and his wife still live in the community; they are flattered but also embarrassed when neighbors say, "We miss you so much, it's just not the same any more." Jack tries to avoid trashing the new owner: "We have a vested interest in his success. There is seller financing involved, and we're to receive monthly checks for a number of years. We really had hoped that the new owner would do such a fine job of serving local interests that people would just slowly forget about us."

Jack acknowledges that the station has a smooth, well-executed format. But it doesn't "sound like its hometown." It could just as easily be five states away.

"The new owner isn't stupid," Jack points out. "He has owned other small stations. He's plainly an intelligent man. He's a technical whiz. He knows a lot about computers and automation. He can make those digital boxes do remarkable things, without regard to what's outside that darkened show window."

Jack told me he had a dream reminiscent of the famous Wolfman Jack scene in "American Graffiti." In Jack's version, a listener went to visit his local station, found the door unlocked and stepped into a darkened room. But instead of the Wolfman, he found only a laptop computer, the screen of which displayed the name of the song playing, the next liner to play, a note that the weather forecast had just been downloaded, etc.

"My sleeping mind didn't need much originality to produce that dream," he said. "Some variant of it is the reality at many 'local' stations these days."

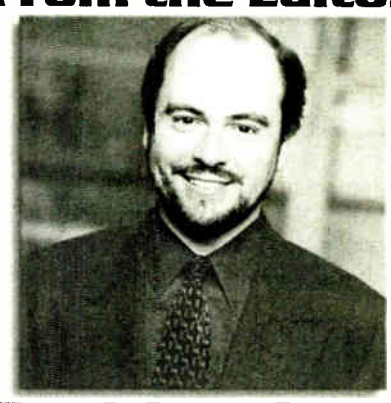
Jack's lesson to us: It's remarkable what modern technology can do. It can make our lives incredibly more efficient and enjoyable. It can generate great revenue.

It also can produce a program flow sufficient to modulate the carrier without any meaningful local involvement, regardless of the FCC's local studio rule. It can produce a smooth-sounding morning show that fails to relate to the interests, concerns and standards of the listeners in the community of license. It can spit out a weather forecast unrelated to what listeners observe by looking out the window.

And, as Jack reminds us, it can ignore the hundred and one activities that serve as glue binding a community together.

Jack wanted us to know. Just because you *can* doesn't mean you should.

From the Editor



Paul J. McLane

The Leslie Report is a new bimonthly e-newsletter from Radio World authored by News Editor/Washington Bureau Chief Leslie Stimson, based on her conversations with newsmakers and other sources.

Leslie digs deeper into industry headlines to tell you what's going on (and what will be) in the key areas of digital radio, consumer electronics, FCC and Capitol Hill regulation and other topics. In her first report in January, she reported on products and activities at CES, and she was first to report several stories about the NRSC, a new HD Radio from Polk Audio and other news.

Starting in radio news in 1978, Leslie spent nearly 10 years as an on-air reporter/anchor and news director for several commercial and public radio stations in and around Washington as well as a reporter/anchor for VOA and MPR. A print reporter now for 18 years, Leslie has worked for NAB's Radio Week, Radio Business Report, McGraw-Hill and other entities.

She earned a Bachelor's of Science in Journalism from the University of Maryland.

Leslie has been with Radio World for almost a decade and is deeply wired into our industry.

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World Radio History

Alaska

▶ Continued from page 1

formed an IBOC install at a station in Fort Yukon; the temperature was 38 degrees below zero.

"When he unrolled the power cable to hook up the transmitter, the first six inches of insulation cracked off, it was so cold," said Chuck Lakaytis, director of engineering for APBI. Lakaytis conducted the technical work to put one of the first rural public stations on the air, KANZ(FM) in western Kansas; he came to Alaska in 1984.

Some Alaskan pubcasters don't have a power supply utility available; those stations run generators 24/7.

In much of the rural areas of the state, a public station is the sole radio service for the community. Public stations are leading the IBOC rollout in Alaska; Clear Channel, the only other radio group converting facilities in the state according to Ibiquity Digital's Web site, has transitioned two in Anchorage.

Coastal conversions first

Alaska Public Broadcasting has embarked on an ambitious IBOC conversion of its radio stations, upgrading the analog transmission hardware of its stations as well as installing the HD Radio gear. This is the first analog upgrade for many of these facilities in quite a while, according to those involved.

All of the digital equipment for all 26 stations has been purchased and the majority of it is now in Alaska.

APBI, headquartered in Anchorage, provides technical and administrative support to 26 radio and four TV public stations in the state. APBI is a partnership between the Alaska Public Radio Network and the Alaska One public television cooperative. It is operated as a service bureau to provide staff support services to the Alaska Public Broadcasting Commission, the Alaska Rural Communications Service Council and the Alaska Satellite Interconnection Project Management Group.

The Douglas DC-6 with the troublesome clearance spec.

Transformer removed for shipping.

APBI has completed seven conversions — all FMs — and the majority of the rest are underway, said David Geesin, deputy director of APBI. He hopes to have all of the conversions completed by this time next year.

"Before we're done, we will have spent close to $3.5 million for the conversion of all 26 stations, from their old analog transmitters, to their new transmitters that do both analog and digital," said Geesin, who's lived in Alaska since 1960, when the Air Force transferred his father there.

To pay for its IBOC gear, APBI has cobbled together funds from three grants: $2.1 million from the Corporation for Public Broadcasting, about $1 million from the Rasmuson Foundation, a private entity founded to help improve the quality of life in Alaska and the remainder from the Denali Commission, a federal-state partnership designed to provide utilities, infrastructure and economic support to rural Alaska.

All of the digital equipment for the 26 stations has been purchased and the majority of it is now in Alaska, said Geesin. Harris supplied the gear, standardizing on its own transmitters, Moseley STLs, Shively FM antennas and Orban processors. [See equipment list, page 6.]

Standardization by product category will help the next generation of engineers in the APBI system maintain the gear efficiently, said Geesin and Lakaytis.

Transporting the equipment from Quincy, Ill., to each public station in Alaska has been challenging. Many of the stations in the APBI system are in remote, rural areas with no retail areas nearby.

For each install, every component, piece of equipment or tool needs to be shipped to the site.

"You're not buying heat-shrink tubing or crimp lugs in these places," said Hal Kneller, senior manager of marketing

See ALASKA, page 6 ▶

Ford

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verters that can power equipment for three to four hours.

Weather in Washington played a role in the radio network's coverage of the funeral, Densmore said.

"At the National Cathedral funeral, we were not allowed to broadcast from inside, so we set up the day before in pouring rain and kept gear dry under portable shelters. The next day, we had to cover the event in a blustery windstorm that blew many of the shelters away," Densmore said.

ABC Radio News correspondents carry MiniDisc recorders, shotgun mics, cell phones and laptops that contain wireless cards, which the personnel use to edit audio and file compressed audio over a VPN (virtual private network). Densmore said that ABC Radio News is migrating to flash drive recorders by late 2007.

The major television networks took turns providing pool coverage of events with CNN acting as overall pool coordinator, Densmore said. "We use the raw program feeds, or clean pool, and add our own commentary," he said.

National Public Radio offered live broadcasts and online feeds of the state funeral with Scott Simon hosting the majority of coverage from Washington.

Rich Rarey, master control engineering supervisor for NPR and a Radio World contributor, said the network moved fast to ensure remote capabilities and add redundancy. And since POTS, ISDN and DSL require adequate lead-time to install, Rarey said, NPR reporters mostly used satellite phones and cell phones from the field, and even pay phones when available.

NPR

"Sat phones need a clear view of the sky and cell phones need bandwidth to work. Both can be challenging to use in a crush of journalists. You always try to have a plan B," Rarey said.

NPR typically outfits its reporters with Marantz PMD660 portable digital compact flash recorders and Electro-Voice RE50 handheld interview mics for recording. Rarey said some reporters also carry Audio-Technica AT835B shotgun mics and AT822 stereo mics. Rycote Softie Mounts with pistol grip handles and windshields complete the NPR field reporter's travel mic package.

World Radio History

Alaska

▶ Continued from page 5

communications and public radio initiatives for Harris Broadcast. "You have to think about every thing you need for the install and come in self-sufficient. If you're missing a connector or an elbow or something, it isn't like you can get it shipped overnight. It takes longer to get things there."

Sometimes the equipment is shipped ahead of the installers, rather than at the same time and on the same flight. That's because the locations of many of the rural sites dictate how fast items can be shipped.

For example, for a batch of 14 pallets of equipment, Harris shipped the gear to Kent, Wash., south of Seattle, by plane. The pallets came to Alaska by truck, barge or prop planes. The pallets that were barged to Anchorage were then handed off to airfreight carriers.

In one of the more challenging shipping experiences, a pallet containing a DX 10 digital transmitter had to be disassembled at the airport, said Lakaytis. Span Alaska, the in-state forwarding company hired by APBI to ship the unit to the small town of McGrath, had redesigned its plane since the shipping plans were made.

In the redesign, Span Alaska raised the floor of the cargo plane by one inch. That change meant the transmitter wouldn't fit upright in the plane; it had to ship on its side.

Lakaytis and contract engineer Bill Prendergast had to remove some parts, including the transformer, so they wouldn't rip loose during transit. That took about a day and a half, Lakaytis said.

APBI sent four engineers to Harris for IBOC install training: Lakaytis, Matt Holmes, Julianne McGuiness and Michael Vaughn.

'It's been awhile'

Lakaytis is based at APBI headquarters in Anchorage while McGuiness and Holmes are assigned to the southeast stations. Vaughn is chief engineer for KTNA(FM), Talkeetna.

They started installs in a group of five stations in the southeast part of the state where the weather is warmer and transportation is easier. The FM station group, called Coast Alaska, consists of KTOO, Juneau; KRBD, Ketchikan; KCAW, Sitka; KSTK, Wrangell and KFSK, Petersburg.

The other two stations that have transitioned to HD Radio are FMs KHNS in Haines and KTNA in Talkeetna.

Using engineers from APBI staff and the southeast group, each of the five stations had three engineers working on its install, plus employees from Nolan Brothers Tower, which is experienced in high steel work in Alaska, said Geesin.

Each station has had much preparation work for the IBOC install. "For a lot of the stations, it's been awhile since anyone had been able to spend significant amounts of money on refreshing their transmission system. Inevitably, with every one of these sites we've had to do some work, either in preparation or at the same time we're doing the install, to make it worth the time and money to do the HD," said Geesin. Typical prep work would be correcting electrical and AC power issues at transmitter sites to make sure the new transmitters will have a high survivability rate.

Installs are taking anywhere from three days to as long as two weeks.

Fuel issues

APBI has about 17 engineers at the stations; half of those work for three joint radio-TV licensees: KSKA(FM/TV), Anchorage, KUAC(FM/TV), Fairbanks and KTOO(FM/TV) Juneau. The rest of the stations share the remaining eight or nine engineering positions, according to Geesin.

When a station goes off the air, APBI sends Lakaytis and frequently a station engineer to help the station get back on the air.

Three of the public rural stations are too far away from a community to be on the power system; those facilities burn diesel-fueled generators. At a recent price of $4.79 per gallon in McGrath, for example, Lakaytis said some of the rural stations need to budget $60,000 a year for generator fuel.

While some stations in the lower 48 find they have less coverage with FM HD-R than they do with their analog footprint, Alaska pubcasters are having the opposite experience, especially in the mountainous

See ALASKA, page 8 ▶

Alaska Public Broadcasting Equipment List

As of Jan. 17. All items supplied by Harris.

Harris FM/HD Transmitters: Models ZX500 (2), ZX1000 (2), ZX2000 (1), M1HDS (2), Z4HD (2), Z6HD (1), Z8HD (2), AM/HD DAX 1R (1), DAX 5 (1), DX 10 (6)

Harris Exciters: FM FlexStar HDx (12), AM DexStar (8)

Orban Optimod-FM 8500 Processor (12)

Omnia Omnia-5EX HD+AM Processor (9)

Shively Model 6813 FM Antenna (12)

Bird BPME Wattmeter (6)

DaySequerra M2.0 HD Radio Modulation Monitor (21)

Moseley Starlink SL9003Q 950 MHz STL (14)

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World Radio History

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For the complete story visit
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World Radio History

NEWSWATCH

NRSC Tackles AM Bandwidth Issues

WASHINGTON Why is radio still transmitting an AM signal with a 10 kHz bandwidth if receivers aren't decoding past 5 kHz? That's one of several questions the AM Subcommittee of the National Radio Systems Committee hoped to have answered by recent receiver tests.

The subcommittee had some 30 receivers tested to determine optimum audio transmission bandwidth, to see if the NRSC standards for AM need to be modified.

We've reported that some broadcasters, including Clear Channel, reduced their transmission bandwidth to 5 or 6 kHz in an effort to reduce interference in the band.

Testing was conducted with a variety of interferors, to simulate real-world first-adjacent channel interference, for example.

NPR Labs John Kean and Dr. Ellen Sheffield, now working part-time for NPR Labs in addition to her university employment, headed the project. They conducted a study to see if consumers noticed or had a preference from the current 10 kHz to 7 kHz or to 5 kHz.

The results were dependent on program content, said Jeff Littlejohn, co-chair of the AM group and executive vice president, Distribution and Development for Clear Channel Radio. In general, people were more annoyed by interference than by bandwidth reduction and in some cases, listeners couldn't tell the difference, he said.

The full report was due to be available at *www.nrscstandards.org.*

RCS and Prophet Systems to Merge

SAN ANTONIO, Texas Clear Channel will merge RCS and Prophet Systems, both of which it owns.

RCS President/CEO Philippe Generali will lead the combined company while Chip Jellison, former co-president of Prophet Systems, will head Technology and Development.

Clear Channel acquired RCS about a year ago and has owned Prophet since 1998. A spokesman said the two combined could provide a greater scope of products and services.

Offerings from the two companies include Selector music scheduling, NexGen radio automation and Media Monitors research services.

Combined, the two form one of the largest broadcasting software companies in the world, with 5,000 U.S. users and more than 4,000 international customers, according to the merger announcement from Clear Channel.

The merged entity will retain the name RCS and be headquartered in White Plains, N.Y., where RCS recently moved to new offices; it also will maintain operations in Ogallala, Neb.

Radio World reported last winter that RCS had 450 employees in 23 offices. The company would not detail specifics about employee changes in January.

Surround Sound Report Is Issued

WASHINGTON An "educational report" on surround sound was complete and details were to be released by the NRSC by the end of January.

RW reported earlier the tussles over whether or not to compare the Dolby, SRS, Neural and Fraunhofer systems.

In order to keep the Surround Sound Task Group going and generate results from its efforts, participants ultimately decided not hold a shootout to pick a best system compatible with analog or HD Radio, especially at lower bit rates. Factors including lack of a standard for testing multipath derailed the activity, sources told Radio World. How various surround systems could react in a reduced bit-rate environment is discussed in the report, but some participants said the group could have learned more in this area.

Overall, some participants felt more could have been accomplished; others say the compromise document will be useful.

The document describes the basics of each surround system and how it might be implemented in a facility, from the simple to the complex. It also discusses cross-compatibility, or what might happen if a station encodes a signal using one brand of surround sound but someone's receiver is set to decode another system, said Steve Fluker, co-chair of the task group and director of engineering for Cox Radio.

CEA to Move

ARLINGTON, Va. The Consumer Electronics Association is moving to Crystal City, Va. later this year.

The 2,100-member trade association is now headquartered in Arlington in leased space. It wants to own its building and needs more meeting space, according to staffers.

Office space was freed up recently in Crystal City when some federal government agencies moved. New spokesman Jason Oxman said the new digs on South Eads Street are being renovated and the company hopes to move by the end of March.

NAB: Tough Times Justify Easing Rules

WASHINGTON NAB says the FCC should continue to relax radio ownership rules in light of competitive conditions.

In reply comments to the FCC, NAB cited competitive pressures for radio. Lehman Bros. predicts 2007 will be radio's "worst" year since 2001; Bridge Ratings predictions for 2007, NAB continued, include "a continued decline in radio listening among the young" and projections that Internet radio listening will grow to reach more than 72 million unique listeners.

The record, states NAB, shows that jointly owned stations tend to experiment with innovative formats and adopt digital radio technology more quickly, and that both are good for programming diversity. "In the radio context there is overwhelming record evidence that existing combinations affirmatively serve the public interest," the association states.

"It is equally clear that relaxation of the local radio ownership rule will allow free radio to remain competitive and vibrant, and to continue to serve diverse audiences and local communities, in the sea of options available to today's consumers. By contrast, the record contains absolutely no verifiable evidence (as distinguished from unsupported assertions) of harm flowing from common ownership of radio stations."

Alaska

▶ Continued from page 6

areas off the coast.

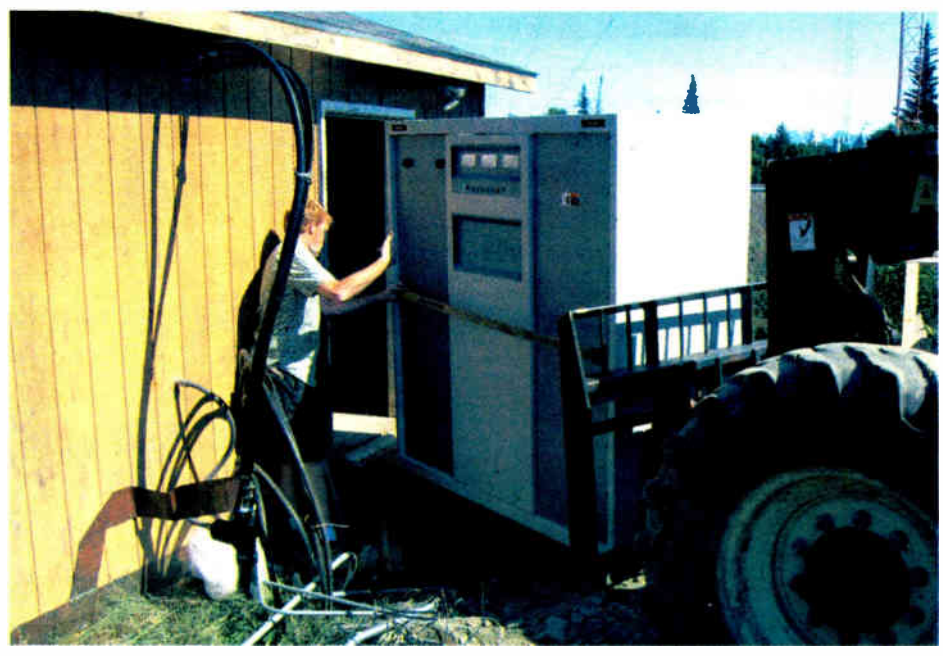
"So many of the stations on the coast have never broadcast in stereo because of the multipath problems," said Lakaytis. HD-R has improved the signal of those stations to the point where they can broadcast in stereo because of the installation of new, properly designed antennas.

Indeed, APBI stations are going digital for the opportunity to give a second program service to their communities. KTOO(FM) in Juneau is multicasting NPR's eclectic "Groove Salad" format.

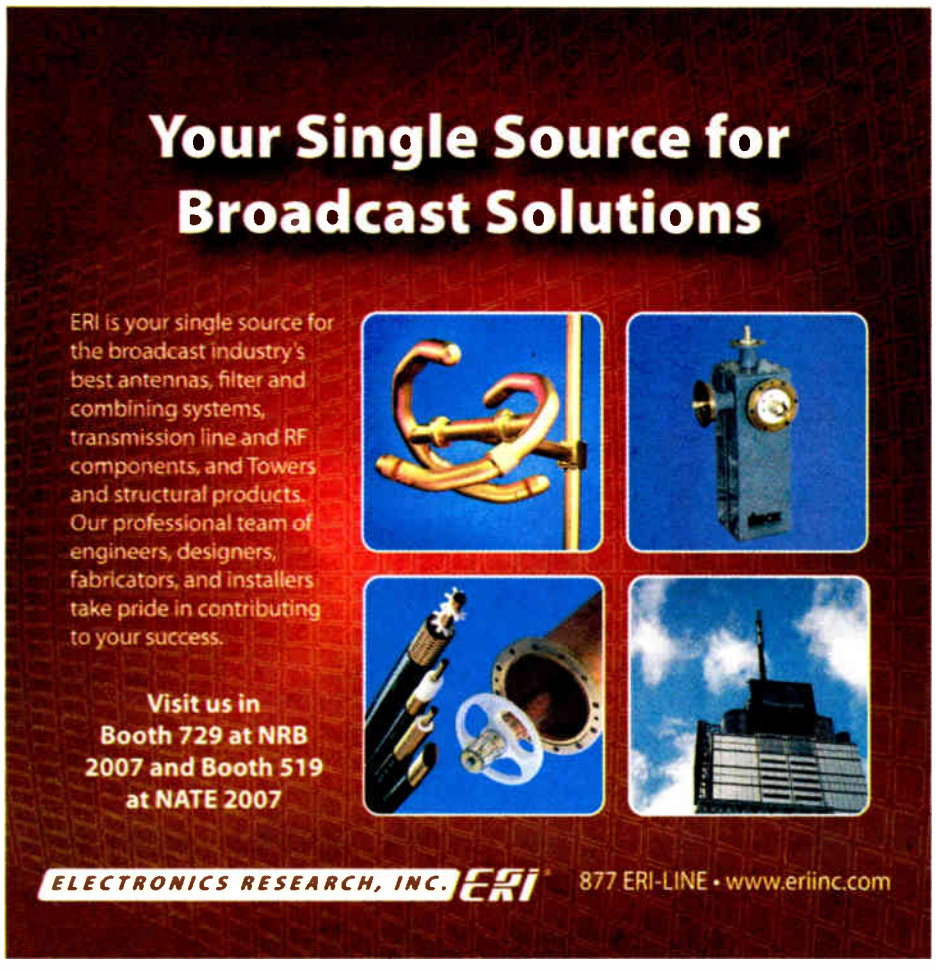
Asked about receiver availability, Geesin said APBI took advantage of the latest NPR receiver discount to buy two radios for each of its stations. HD-R receivers are sold in major consumer electronics chains like Circuit City and Best Buy in big cities; rural dwellers have to shop online, much as they do for many other purchases.

(Lakaytis said he asked some employees new to the state recently their impression of Alaska. At parties, one noticed, Alaskans swap catalogs.)

And lest they give the impression that IBOC installs are all work in Alaska, Geesin and Lakaytis relayed the tale of missing rubber sleeves. The necessary items were not shipped to the site for one facility so the engineering tem improvised. They convinced a shop to sell them one leg of a wetsuit. McGuinness cut the patterns and voilà, rubber sleeves for the install.



The new transmitter for KBBI(AM), Homer, Alaska, is loaded into the building — with two inches of clearance.



World Radio History

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Go (con)figure • The folks at MPR say they really love being able to configure and administer an entire building full of consoles and routing equipment from the comfort of their own offices. Put an Internet gateway in your Axia network and you can even log into Element (or any other part of an Axia system) remotely from home, where there's plenty of Cheetos and Pepsi. Great for handling those 6 P.M. Sunday "help me!" phone calls from the new weekend jock.

Who are these guys? • Why buy a console from Axia? Element was designed by Mike Dosch and his team of ex-PR&E renegades (who know a bit about consoles). And Axia is a division of Telos, the DSP experts.

Perfect timing • You can't have too much time. That's why Element's control display contains **four different chronometers**: a digital time-of-day readout that you can slave to an NTP (Network Time Protocol) server, an elapsed-time event timer, an adjustable count-down timer... and there's also that big, honkin' analog clock in the center of the screen (Big Ben chimes not included).

Screen play • Use any display screen you choose, to suit your space and décor. Get a space-saving 12" LCD, or go for a big 21" monster. (This is Dave Ramsey's favorite Element feature, by the way. Anyone want to bet he bought his monitors on sale?)

Lovely Rita • LED program meters? How 1990's. SVGA display has lots of room for timers, meters, annunciators and more — enough to show meters for all four main buses at once. Reboot to 5.1 surround mode and the light show is even cooler, with surround audio and associated stereo mixes all going at once.

Memory enhancer • We know how forgetful jocks can be. That's why Element remembers their favorite settings for them. Element's Show Profiles are like a "snapshot" that saves sources, voice processing settings, monitor assignments and more for **instant recall**. Profiles are easy to make, too: just have talent set up the board the way they like it, then capture their preferences with a single click for later use. (Hey, make *them* do some work for a change.)

Black velvet • Some things just **feel right**. Like our premium, silky-smooth conductive plastic faders and aircraft quality switches. We build Element consoles with the most durable, reliable components in the industry — then we add special touches, like custom-molded plastic bezels that protect on/off switches from accidental activation and impact. Because we know how rough jocks can be on equipment. And nothing's more embarrassing than a sudden case of *broadcastus interruptus*.

Split decision • No, you're not seeing double: Element gives you the choice of single-frame or split-frame configurations of **up to 40 faders.** Perfect for complicated talk or morning shows where the producer wants his own mini-mixer, or to give talent space for copy, newspapers and such. Solomon would be proud.

Swap meet • Element modules hot-swap easily. In fact, the **entire console** hot-swaps — unplug it and audio keeps going; an external Studio Engine does all the mixing.

Stage hook • This button activates the emergency ejector seat. OK, not really. It's the Record Mode key: when you press it, Element is instantly ready to record off-air phone bits, interviews with guest callers or remote talent drop-ins. One button press starts your record device, configures an off-air mix-minus and sends a split feed: host on one side, guest on the other, to the record bus. Like nearly everything about Element, Record Mode is **completely configurable** — its behavior can even be customized for individual jocks. Sweeeet.

How many? •
How many engineers does it take to change these light bulbs? None... they're LEDs.

Talk to me • Need some one-on-one time with your talent? Talk to studio guests, remote talent, phone callers — **talk back to anyone** just by pushing a button.

Missing features • Did we forget something? Program these **custom button panels** with any macro you want, from recorder start/stop to one-touch activation of complex routing and scene changes using PathfinderPC™ software. You could probably even program one to start the coffee machine (black, no sugar, thanks).

Great Phones • With Element, jocks never have to take their eyes or hands off the board to use the phones. Element works with any phone system, but really clicks with the Telos Series 2101, TWOx12, and new NX-12 that connects four hybrids plus control with a **single Ethernet cable.** Status symbol (cool little information icons) tell talent at a glance whether a line is in use, busy, pre-screened, locked on-air, or even dial out with the built-in keypad.

The Busy Box for jocks • Element comes standard with a lot of cool production-room goodies you'd pay extra for with other consoles, like per-fader EQ, aux sends and returns and custom voice processing by Omnia™, enabling you to quickly build and capture compression, noise gating and de-essing combinations for **each and every jock** that load automatically when they recall their personal Show Profiles. Context-sensitive soft-Knobs let production gurus easily tweak these settings while simultaneously satisfying their tactile fixations. (Don't worry: for on-air use, you can turn off access to all that EQ stuff.)

Mix-plus • If constructing a complicated mix-minus on-the-fly brings a big grin to your face, you're ex-used. But if you're like us, you'll love the fact that Element does mix-minus **automagically**. Forget using all your buses for a four-person call-in, or scrambling to set up last-minute interviews. When you put remote codecs or phone calls on air, Element figures out who should hear what and gives it to 'em — as many custom mix-minuses as you have faders.

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Shown: 16-position split-frame Element, nicely equipped, $12,558.00 US MSRP. Not shown but available: 4-, 8-, 12-, 16-, 24- and 28-position Element. Dual exhaust and whitewalls optional at extra cost.

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Element

World Radio History

Shocking Uses for 'Audio' Wire

by John Bisset

Joe Stack with Modulation Sciences (*www.modulationsciences.com*) is an occasional contributor to *Workbench*. In discussing poorly engineering sites, Joe says he has run across two scary uses for Belden 8451 audio cable. Both should make Belden's Steve Lampen cringe but won't surprise him.

Once Joe discovered the common audio cable being used to light up small, socketed 4 watt 115 VAC "night lights" above an audio patch bay. The installation was unique in that the lights were turned on and off via a lever switch that was depressed by the patch bay front-panel door opening and closing. After its discovery, this set up was replaced with low-voltage lamps.

Also, sometime in the mid-1980s, Joe's boss discovered a control line from a Gates BC-1T transmitter that was wired directly to a tie block with 8451. A punch-down tool was raked across these tie block terminals (while punching down an adjacent circuit) and the sparks flew.

The wiring melted inside the conduit all the way back to the BC-1T. Joe and his boss pulled new wiring and installed a 24 volt relay interface inside the transmitter, so that only 24 volts appeared on the tie block. No one was hurt and no other equipment was damaged.

Joe's nugget of advice is it's always a good thing to beware of the "sleeping serpent," electricity. This is especially true for older installations. Keep in mind that not everyone may use a connector or wire type as it was intended.

★ ★ ★

So did you get a digital camera for Valentine's Day? Tim Guentz, a regional engineer with NRG Media, won't leave home without his. We dubbed the digital camera perhaps the most useful tool for today's broadcast engineer, eclipsing the Simpson 260 VOM of a quarter century ago.

Tim writes that it's hard to believe he's worked without one for so long. He uses the camera for visually reaching into areas that cannot be seen, as well as documenting sites. How about viewing the rear of tube sockets, or just spotting details that the naked eye cannot see in a dark transmitter cabinet?

Price is certainly no longer a factor, and you can always wait for the next post-holiday sale. Added bonus: You can use your camera to contribute *Workbench* tips. RW Editor Paul McLane has a list of handy tips to help you avoid common photography problems when shooting such images. Drop me a note if you'd like a copy.

Tim Guentz can be reached at *tguentz@waittradio.com.*

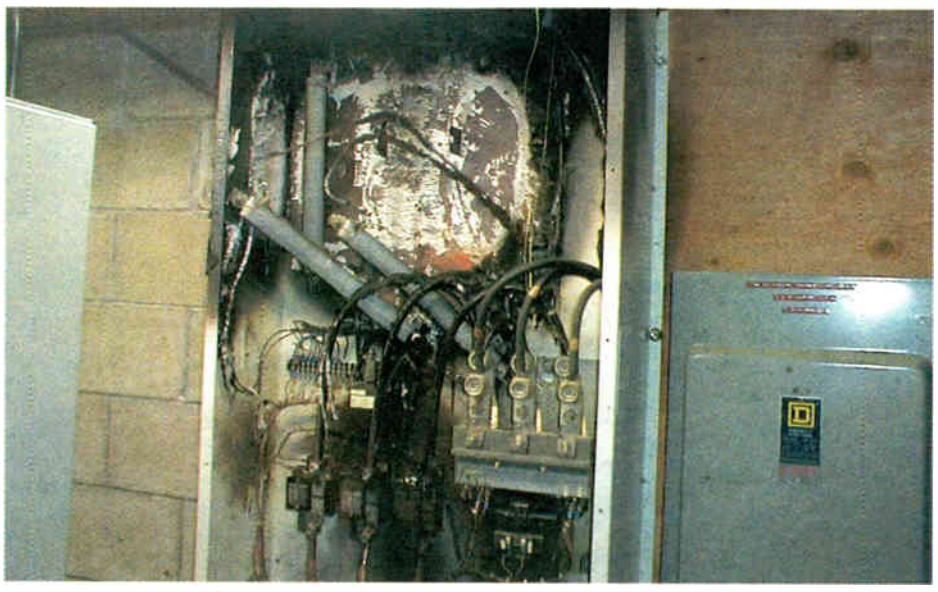

Fig. 1: Surges can cause catastrophic failures.

★ ★ ★

Speaking of making an engineer's life easier, Hank Landsberg's Henry Engineering always seems to come up with a new trick for the trades. It's said that Henry builds for today's engineer what old-timers used to build themselves. The difference is that back then, we handled one, maybe two (and AM and FM) stations. Today's engineer can certainly build customized boxes, but who has the time? The company has filled a niche with a variety of useful products, which can be seen at *www.henryeng.com.*

The wiring melted inside the conduit all the way back to the BC-1T.

Henry Engineering also distributes an effective surge suppressor or TVSS (transient voltage surge suppressor). The series was developed by Sine Control International for military installations in the early 1980s. Henry is the exclusive marketing agent for PowerClamp TVSS units.

These devices will help broadcasters solve AC spike and surge problems, and avoid the kind of damage seen in Fig. 1.

What makes these TVSS units different? Many such suppressors rely solely on metal oxide varistors to clamp voltages. The problem is that the MOV threshold must be well above the nominal AC voltage to prevent MOV overheating.

This margin can be 200 percent of the line voltage, which means that on a 120V line, a surge of 350 volts could pass before any attenuation occurs from the MOV. Henry's PowerClamp is a hybrid device that couples a rise-time sensitive circuit to the MOVs. The result is a 2 volt clamping level above the normal AC line voltage.

PowerClamp's attenuation circuitry responds to both voltage level and waveform rise-time. Hank's got a theory of operation paper, some case histories and a data sheet on the PowerClamp Series 8 at his Web site.

As I mention at transmitter workshops and BE/*Workbench* SBE programs, check with your station's insurance carrier

See TVSS, page 12 ▶

MARKET PLACE

Grace Broadcast Has Vignettes For Black History Month

Grace Broadcast Sales is featuring radio vignettes in honor of Black History Month.

The 28 cuts are formatted :40/:20 with room at the end for a station or sponsor message. Stations can schedule a new feature each day during February, or run them at will.

The company says broadcasters in college towns may find a student organization working on Black History Month events, willing to sponsor the series on their stations. Also "job and recruitment firms, performing arts organizations and other non-traditional advertisers might very well jump at the chance to be associated with something like this," said Rod Schwartz of GBS.

"I don't believe an audience has to be black to enjoy, and benefit from, learning about the individuals we've chosen to profile, or to appreciate their role in our nation's history."

Sample features are at *www.gracebroadcast.com/prodBHM.htm.* Stations can download them without charge to present to prospective sponsors before committing to the series.

For information call the company at (888) 472-2388 in Washington state or visit www.gracebroadcast.com.

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World Radio History

TECH TIPS

Utilizing Every Last Bit

How I Got a Couple of Extra Audio Channels Out of My STL

by Brian Clark

The author is director of engineering at KLAA(AM), 830 kHz in Orange, Calif.

The station that I work for is unique in many respects. My studio facility is 90 miles due west from the transmitter site; also the transmitter building is 25 feet off of the ground, on a platform resembling an oil derrick's.

My station is currently Spanish but is transitioning to English. With this change comes the need to receive several different sources via satellite.

Ordinarily this would be a simple matter of aiming a dish and racking up a series of satellite receivers and programming them to the appropriate channels; but not in my case. The 830 AM studios are in a large shopping mall complex; the landlord will not allow a dish to be installed. So this where my story begins.

Expanding T1

I have a satellite dish at my transmitter site; it would be a perfect secondary location to place the receivers, since I cannot have them at my studio location. But how do I get the receiver audio back to my studio location?

Conventional microwave STL is out of the question; there are many mountaintops in my path, and distance is a factor. I have to find a cost-effective way to get my satellite receiver audio back to my studio.

I'm using a Moseley T1 STL link to tie the locations together; this system is wonderful. I could have ordered additional audio modules from the factory and get two more audio channels back to my studios but to save the reconfiguration time I thought it would be slicker to use equipment I already had on hand.

I began to look at my options.

Saving time and money

Through my Moseley T1 link I have two Ethernet ports that weren't being used. I thought about using two Telos Systems Zephyr Xstreams as codecs at each end, utilizing the Ethernet connections on the back of two Zephyrs. I was fortunate to have two Xtreams lying around for testing.

I began the configuration stage on both units. First I needed to set up IPs for both units and a default gateway. Once completed I tied the units together using a crossover cable and tried to dial my secondary unit with my first and the units locked to each other.

I could see audio streaming between the two units. The only issue was that the default version of software in both of my Zephyr Xtreams was version 2.7 and this would only work in J-Stereo. I needed two discrete channels.

Rolf Taylor at Telos told me there was a new version of software for the Xtream that has much more flexibility; I downloaded and installed version 3.01 onto both units and could see that both L3-Stereo and AAC were options and just about any data rate I could think of.

I initially tried 192 kpbs through the Moseley, but the Xtreams took some hits, so I throttled things down to 128 kbps and things were rock solid. I had been running things in this configuration for several days before my IT Director Sascha Schleumer pulled the crossover cable while in operation, tying both ends together as a test and then reconnected the link. The connection re-established itself on its own without the need of a redial. This system is stable.

With the newly acquired channels back to my studio, I now can have one Starguide III satellite receiver setup on my default news source and the other available for other broadcast channels. And with switching software available compliments of Premiere Radio Networks, I now have the ability of scheduling channel changes for each upcoming program remotely to my transmitter site using my other Ethernet port on my Moseley T1 link and an Ethernet-to-Serial port device to control my Starguide III receivers.

By coming up with this system, I saved monthly line charges and saved having downtime while my system would have been out of commission being reconfigured. I also saved a lot of money on hardware.

Radio World welcomes your tech tips. Write to radioworld@imaspub.com.

The transmitter site of KLAA(AM).

TVSS

▶ Continued from page 10

about their policy on TVSS devices. Some insurance companies, recognizing the reduction of loss claims, will pay for all or part of the cost of these devices.

At the least, when these are installed, your premium should be reduced — just as when adding a theft deterrent to your car will reduce car insurance premiums. Obtaining a free TVSS device, protecting the station equipment investment or lowering premium rates are steps that should get you noticed by your management.

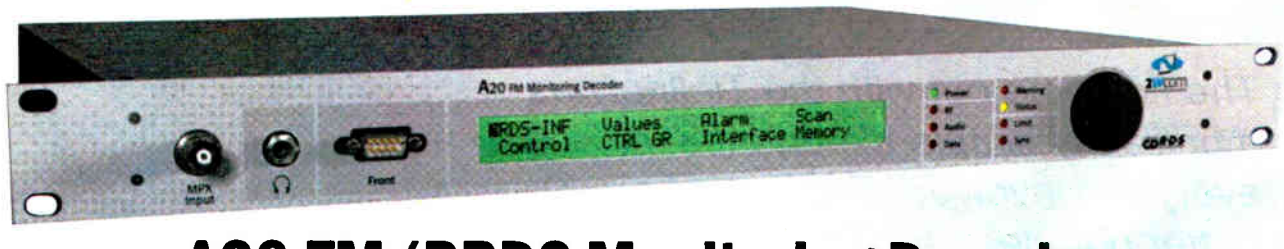
★ ★ ★

Fig. 2: Use winter months to schedule tree or landscape help. Keep your towers clear.

Winter months are a good time to line up landscape or tree removal assistance. Spring is right around the corner. Don't get caught like the station pictured in Fig. 2.

Keep tower field growth under control.

John Bisset has worked as a chief engineer and contract engineer for 37 years. He is the northeast regional sales manager for Broadcast Electronics. Reach him at (571) 217-9386 or jbisset@bdcast.com. *Faxed submissions can be sent to (603) 472-4944. Submissions for this column are encouraged, and qualify for SBE recertification credit.*



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World Radio History

Religious Broadcasters Head to Orlando

Communicators Debate Political Role, Emulation of Secular Stations' Strategies

by Ken R.

The roots of Christianity go back two millennia. Religious broadcasters will make their annual pilgrimage this month to discuss ways to keep their message fresh and relevant for today's audience.

More than 6,000 people attended last year's National Religious Broadcasters convention, an 18 percent growth over 2005. This year almost 6,500 are expected to meet at Orlando's Orange County Convention Center, according to David Keith, NRB vice president of conventions. More than 300 exhibitors will be there.

"Our theme is 'Christian communicators impacting the world," he said.

Arbitron Format Trends data show a slow but steady growth for combined religious formats. In fall, 1998 they had a 2.1 average quarter-hour share (AQH). By summer, 2006 it had grown to 3.0. Of the 50 radio formats Arbitron lists, five are devoted to religion. On satellite, Sirius and XM have several religious channels.

At least one NRB leader wants to break out of those traditional categories.

"Christian radio may want to investigate creative new ways to present a wider variety of content," said Craig L. Parshall, NRB senior vice president and general counsel.

New directions

"Some stations are primarily music; others are weighted with news, commentary and talk. Still others are primarily teaching. But with the rapidly evolving expectations from information and entertainment consumers for greater variation and integration of information in shorter bites, we may have to look at a new design for packaging our programming."

Parshall's wife Janet is a nationally syndicated talk host who discusses Christian topics as well as cultural, political and lifestyle issues.

Public policy and program diversity are frequent topics among religious broadcasters.

"Religious radio is doing extremely well in America," said Barry Lynn, executive director of Americans United for Separation of Church and State. NRB describes Lynn as a leader of the American religious left.

"My great concern is that it is not as diverse as it ought to be. Most religious programming comes overwhelmingly from the very conservative end of the spectrum. The extraordinary political influence of men like Dr. James Dobson [of 'Focus on the Family'] is an example."

Lynn believes that America is a diverse nation and programming should reflect that quality. "We need voices from the center and the left to balance out the current rather one-sided nature of the industry," he said. "These issues are too important to be handled by one narrow part of the religious community. The American public deserves better. Let a thousand flowers bloom."

Dr. Michael Youssef will speak at Saturday's opening session. He is founding pastor of The Church of the Apostles in Atlanta and host of radio/TV program "Leading the Way," which is broadcast in North America, the United Kingdom and other countries. He is pleased that religious broadcasters, in his view, have maintained some of their mission to teach, in addition to just playing Christian music. Asked if the recent congressional election will affect religious broadcasters, he answered, "It should not affect them at all. Christian broadcasting is focused on Christ and not political affiliation."

Youssef is interested in the Internet for expanding his message and predicts that in 10 years the Web will surpass the influence of radio and TV. He is also exploring HD Radio because of its ability to broadcast multiple languages on multiple channels.

Talk with a consultant

Daniel Anstandig, vice president/consultant for McVay Media, works with several religious broadcasters.

"Passion for contemporary Christian music has steadily grown in recent years," he said. "In 2006 while album-length CD sales were down for most genres, Nielsen Soundscan reported that Christian/gospel increased its sales by 6.75 percent in albums alone. Digital sales continue to rise and the successful crossover of Christian artists to mainstream formats serves as a helpful on-ramp to the format for general market listeners."

While album sales are strong, Anstandig advises his clients to update their media and their message.

"Internet and new media have become increasingly important in any successful radio station's distribution model," he said. "It is essential for Christian media to develop online audio, video-on-demand and customizable online entertainment to remain competitive."

What is the greatest challenge religious broadcasters face?

"They have to balance programming between extremely loyal listeners and 'passerby listeners,'" he said. "Some stations in small and medium markets have sacrificed their very loyal audiences by playing the 'high-cume-churn' P3 and P4 game that has found success in larger markets. They must avoid that one-size-fits-all thinking."

Anstandig also warns his religious clients to avoid the clichés that secular stations use.

"There has been a recent movement to position Christian radio with 'more music' and 'better variety' positioning," he said. "These statements are even more campy and useless on Christian radio. That is not why people listen to Christian radio. People are drawn to the message in the music. The most successful contemporary Christian stations, both talk and music-oriented, are the ones that engage the audience in an authentic way. Those relationships will always win over impersonal slogans."

On with the show

A glance at the session schedule indicates that NRB members are concerned with some of the same issues as their secular counterparts: building a more effective Internet presence, HD Radio, the increasing influence of the Hispanic audience and improving programming.

But many of the topics to be covered pertain to the unique aspects of religious stations. These include "Is Sharathon Enough?," "Beyond the Ecclesiastical Box: Reshaping Your Media Ministry to Reach a Postmodern Culture" and "A New Generation of Worship Facilities." Attendees also will hear musical performances by Julissa, Keith & Kristyn Getty and Ernie Hass and Signature Sound. They'll see a pre-release screening of "Amazing Grace," a motion picture about the life of antislavery pioneer William Wilberforce. Christian comedians Nick Arnette, Joe Recca and Carlos Oscar will entertain.

A guide to sessions and exhibits is at *www.nrbconvention.org*.

Ken R. is a former broadcaster and current college student and freelance writer.

Daniel Anstandig

Barry Lynn

Michael Youssef

How to Go

What: NRB2007 Convention & Exposition

When: Feb. 16–20

Where: Rosen Centre Hotel and Orange County Convention Center, Orlando

Who: Christian communicators including program producers, authors, pastors, engineers, directors and vendors.

How: *www.nrbconvention.org*

How much: NRB Member $625; Nonmember $750. Discount rates apply for spouses, international and expo-only.

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World Radio History

In Search of the Truth About Fessenden

The Question of Whether the Inventor Really Made the First Broadcast Is Far From Settled

by Donna L. Halper

I commend James O'Neal for his thorough research. Thanks to him and other authors who have commemorated the 100th anniversary of Reginald Fessenden's now-famous (and *possibly* mythic) 1906 broadcast, a largely forgotten radio pioneer has received some much-deserved attention.

But the question of whether Fessenden really did make the first broadcast ever on Christmas Eve 1906 is far from settled. Yes, there are the true believers, who insist that whatever was said in Helen Fessenden's 1940 biography of her husband must not be questioned. And there are a few skeptics who wonder, as O'Neal does, why such a momentous event received so little coverage at the time it occurred — or even years later.

Competing for attention

Chris Sterling and I wondered that too.

While O'Neal was doing his research, Chris and I were undertaking a similar project, writing an article for the Antique Wireless Association Review. In quite a few cases, we found the same information (or lack of it) as O'Neal, but we also found a few things that may shed a bit more light on a situation that may never entirely be resolved.

O'Neal states that he "researched Boston and New York newspapers published during and after the last week of 1906. They yielded nothing." But when I examined numerous Boston newspapers, I found something more: several possible reasons why neither the experimental broadcast of Dec. 21, 1906, which we know did occur, nor the Christmas Eve broadcast received any play from Boston reporters.

In December 1906, Boston was in the midst of a "telephone war," a contentious battle in which the monopoly New England Telephone and Telegraph Company was being challenged by the upstart Metropolitan Home Telephone Company. Metropolitan's executives were demanding the right to do business in Massachusetts, and newspapers were filled with articles about it. Hearings took place throughout the last two weeks of December.

While I cannot read the minds of the reporters, it seems evident that covering the ongoing controversy in Boston was much easier and more exciting than making the long drive down to Brant Rock to cover what Fessenden was doing.

And to make matters worse for Fessenden, several days before Christmas, there was a heavy snowstorm, providing Boston reporters with another reason to avoid making a long trip.

Reporters knew how to find their way to Brant Rock and Marshfield; they tended to show up in the summer to cover wealthy people vacationing there. They also covered hot air balloon races that took place in summer. And it wasn't that the press had anything against inventors; periodically, articles described interesting experiments and the men (usually men) doing them. In fact, Fessenden received a favorable profile of his long-distance transmissions in the Boston Globe on June 26, 1910. But while many of his achievements were listed, nowhere did the article mention a Christmas Eve 1906 broadcast.

Timeline

We may never know why neither the newspapers nor the British and American engineering journals of that time included any story about a broadcast on Christmas Eve. Fessenden often wrote about his Dec. 21, 1906 broadcast as well as his transmissions in November, and he pointed out how many times he had sent voice by wireless prior to 1906.

On the other hand, when O'Neal asserts, "It appears the legendary date stems from a letter written by Fessenden [to S.M. Kintner] from his home in Bermuda in 1932, about five months before his death," he is only partially correct.

In that letter Fessenden does indeed tell former colleague Samuel M. Kintner that the Christmas Eve broadcast occurred and it *might* be considered a "first."

But a letter of Sept. 8, 1936 that Kintner, now a vice president at Westinghouse, wrote to George H. Clarke offers an interesting clue. Kintner refers to previous correspondence between himself and Clarke. He says that Fessenden's son has been pursuing the idea of compiling a written record of his father's achievements, and had asked Clarke and Kintner to help. Reginald K. Fessenden was gathering information for his mother Helen, who was preparing to write a book; he asked Kintner for recollections of Fessenden's work. Kintner states in this letter that he agrees that Fessenden's achievements are worthy of being remembered, but "at the time the work was done, I must confess I ... didn't attach any such importance to it."

Also noteworthy is that four years before the Fessenden-Kintner letters, at an April 1928 talk given at Harvard, Harry P. Davis of Westinghouse credited Fessenden with having been the first to broadcast, on Christmas Eve 1906. This is the earliest mention of the event that we were able to find.

What is interesting about the speech is that Davis tries to estab-

See TRUTH, page 18 ▶

More on Fess

Readers expressed strong interest in the story "Fessenden: World's First Broadcaster?" by James E. O'Neal, which appeared in the Oct. 25, 2006 issue of Radio World.

The two articles printed here are in response to that story.

Comment on these or any article by writing a letter to the editor at *radioworld@imaspub.com.*

Just because nobody in the media thought
it worthy of coverage doesn't necessarily
mean it didn't occur.

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Goldsmith and the Fessenden Legacy

by Ron Pesha

James E. O'Neal's masterful primary research and extensive account of Reginald Fessenden spotlights the uncertainties that always seem to creep into history. The article also makes us far more aware of this radio pioneer and his significant accomplishments under primitive conditions.

O'Neal quotes a 1924 newspaper clipping of a letter from David Hardenbrook of Jamaica, N.Y. "Hardenbrook says he found a book in the public library by a Dr. Goldsmith, 'Radio Telephony,' that states that 'broadcasting was performed as far as Jamaica ...'"

The 1918 volume, published by The Wireless Press, New York City, was written by Alfred N. Goldsmith, Ph.D., Fellow of the Institute of Radio Engineers, Member of the American Institute of Electrical Engineers and Professor at City College. I own a copy of the book.

The actual quote, on page 126 in the chapter on alternators, refers to "Mr. Fessenden's tests between Boston and New York (Jamaica), a distance of some 150 miles ..." The word "broadcasting" is not used. "This was, however, not a matter of regular communication, but rather of test work."

Goldsmith reports similar Fessenden transmissions on page 140: "In July, 1907, speech was transmitted between Brant Rock and Jamaica, Long Island, a distance of 180 miles (290 km.) over land, and by day." The discrepancy between reported distances remains unexplained. Now an upscale coastal community about 30 miles southeast of downtown Boston, Brant Rock is actually closer to Jamaica than the City of Boston.

Radio Telephony details much early apparatus.

'Trough' transmitter

For example, to amplitude-modulate the carrier, Fessenden developed several high-current microphones or "transmitters" for series insertion between alternator and antenna. He published a paper describing his "trough" transmitter in the June 29, 1908, edition of the Proceedings of the American Institute of Electrical Engineers. Goldsmith quotes from this paper on page 137 of Radio Telephony:

"It consists of a soapstone annulus to which are clamped two plates with platinum iridium electrodes. Through a hole in the center of one plate passes a rod, attached at one end to a diaphragm and at the other to a platinum iridium spade. The two outside electrodes are water jacketed.

"The transmitter requires no adjusting," the excerpt continues. "All that is necessary is to place a teaspoonful of carbon granules in the central space. It is able to carry as much at 15 amperes continuously without the articulation falling off appreciably. It has the advantage that it never packs. The reason for this appears to be that when the carbon on one side heats and expands, the electrode is pushed over against the carbon on the other side, thus diverting a greater portion of the total current to the cooler side, which has thus been made of smaller resistance. It will be noted that the two halves of the carbon, on the opposite sides of the spade diaphragm are in parallel. These transmitters have handled amounts of energy up to one-half horse power (375 watts) and under these circumstances give remarkably clear and perfect articulation and may be

See GOLDSMITH, page 18 ▶

World Radio History

"My Number One Codec Rental is Zephyr Xstream"

-Steve Kirsch. President Silver Lake Audio

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World Radio History

Goldsmith

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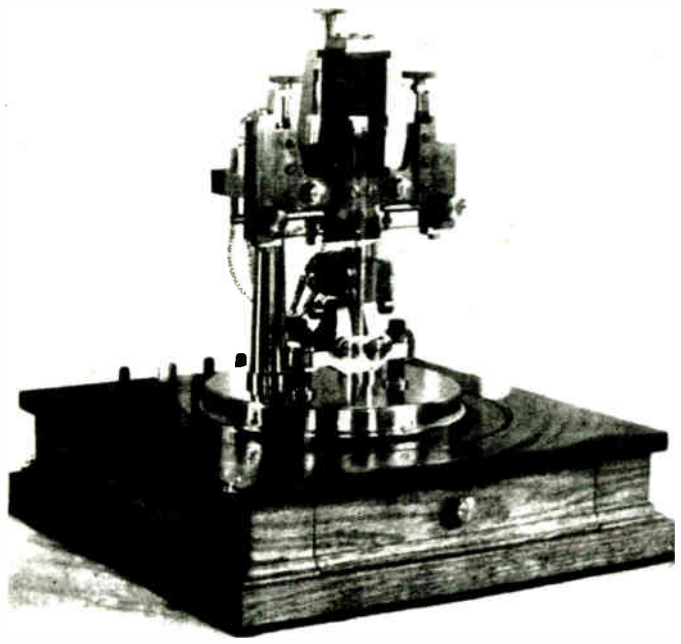
left in circuit for hours at a time."

The photo from the book shows the Fessenden heavy-current telephone relay, apparently a device analogous to a voice coil, mechanically coupled to Fessenden's carbon microphone. Again from the AIEE Proceedings paper, "It is a combination of the differential magnetic relay and the trough transmitter. An amplification of 15 times can be obtained without loss of distinctness ... the successful amplification depends on the use of strong forces and upon keeping the moment of inertia of the moving forces parts as small as possible."

This device under its glass dome cover is visible in the picture in Radio World, Oct. 25, 2006, page 20. It is beside the seated Dr. Fessenden, in the photo captioned "Another view of the Brant Rock radio room ..."

Goldsmith captions the photo at "National Electric Signaling Company-Fessenden 2 K. W. radiophone transmitter." He explains that by using this heavy current telephone relay, "speech was transmitted over an ordinary wire line to the radio station at Brant Rock, relayed automatically to the radiophone, transmitted by radio to Plymouth, and at Plymouth automatically relayed back to a wire line." Was this the first telephone patch?



A closeup of the heavy-current telephone relay, as depicted in 'Radio Telephony' by Alfred N. Goldsmith. Was it used in the first telephone patch?

Goldsmith continues, "In the right foreground are seen the radio frequency alternator and its driving motor and controlling rheostats. Directly back of these is a compressed air tuning condenser. On the table is shown a normal line telephone set connected to the high current relay which controls the outgoing energy. In addition, at the reader's left, on the table is placed a portion of the receiving set.

The 1918 volume was written by Alfred N. Goldsmith, Ph.D., Fellow of the Institute of Radio Engineers, Member of the American Institute of Electrical Engineers and Professor at City College.

On December 11, 1906, a demonstration of radio telephony was given from Brant Rock to Plymouth, Massachusetts, a distance of 10 miles (16 km). Both speech and music were transmitted."

Is this yet another date for tests of broadcasting? Or is the Dec. 11 a typo for Dec. 21?

Goldsmith, 1888–1974, acquired pristine and impressive credentials. In 1917 he became the director of research for the Marconi Wireless Telegraph Co. of America and, when it was absorbed by the newly-formed RCA in 1919, he continued in the same post. Goldsmith scaled the corporation ladder to vice-president and general manager until 1931. He remained a private consultant to RCA and others for the rest of his life. And in this book he makes no mention of a Christmas Eve broadcast.

Embellishment?

Another account of the Dec. 21, 1906 Brant Rock tests of speech and music appears in The American Telephone Journal, Jan. 26 and Feb. 2, 1907, available online at *http://earlyradiohistory.us/1907fes.htm.* This pair of contemporary articles also lacks mention of the purported Christmas Eve transmission.

O'Neal speculates about "unintentional" embellishment of events by an elderly Fessenden. This seems plausible, as do the religious music and Biblical readings by a man who was the son of a minister. How many of us remember events from a quarter century earlier with absolute accuracy?

The author is a frequent contributor to Radio World.

Truth

▶ Continued from page 16

lish a timeline, starting with Fessenden as the first broadcaster and leading up to KDKA as the first station (yet another myth, but a durable one). Henceforth, we will see the linkage of Fessenden's "first" and KDKA's "first" fairly often, thanks in large part to a wire service reporter name Robert Mack.

His account of the Christmas Eve broadcast, followed by the first broadcast of KDKA, began appearing in various newspapers in early November of 1930. But Mack was no ordinary wire reporter. He was in real life Martin Codel, co-founder of Broadcasting magazine in 1931. He seems to have gotten the Fessenden story from Davis, someone he covered frequently. But the fact that Codel continued to repeat the Christmas Eve story may also suggest that Fessenden himself was telling it to reporters, as were his son and wife, all trying to make sure the inventor's accomplishments were not overlooked.

Proving a negative

There are other fascinating bits of research that we found, such as information Chris derived from Fessenden's personal calendar books from 1906 and 1907, neither of which mentions a broadcast on Christmas Eve.

But rather than belabor the point, let us repeat that we mainly disagree with O'Neal's conclusion. For one thing, it's impossible to prove a negative, especially a century later. So we don't know if the broadcast happened. Just because nobody in the media thought it worthy of coverage doesn't necessarily mean it didn't occur.

It wasn't until the mid-1920s that Fessenden's loyal wife and son took on the task of being his publicists, a task made more difficult by the fact that even some who knew and respected him didn't recall everything he had done in the early 1900s.

Eventually, Reginald Jr. and Helen won over a popular writer of mass-appeal history books, Alvin F. Harlow, who wrote about the Christmas Eve broadcast in "Old Wires and New Waves" in 1936. With that, the story began appearing much more often, given further momentum when Helen's biography came along four years later.

We do agree with James O'Neal that Reginald Aubrey Fessenden was a great inventor who pioneered broadcasting. But we can't agree that the Christmas Eve broadcast did not occur. Our reading of the facts suggests that whether it did or not, it's a moot point, since he had already accomplished this feat long before Christmas Eve 1906.

Donna L. Halper is a radio consultant and media historian; she is on the journalism faculty at Emerson College, Boston. Christopher H. Sterling is an author and educator. He is on the media and public affairs faculty at George Washington University, Washington.

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Exactly the Same, Yet Completely Different

There Are Important Similarities and Contrasts Between the Early Days of FM and Those of IBOC

The Big Picture

Photo: Gary Hayes, BBC

by Skip Pizzi

Comedian Steven Wright has a routine in which he asks listeners to recall the feeling one gets when leaning back in a chair a little too far. He describes the sudden uncertainty that ensues over whether you can still recover or if you will fall backwards to the floor. Once his audience recognizes that moment of panic, he adds, "Well, that's the way I feel *all the time*."

This is the period in which HD Radio finds itself right now, waiting for pivotal influences to be applied while determination of its future hangs in the balance. Of course, the key to Wright's joke here is that we all know the condition he describes *cannot* last for long; gravity will soon have its way, and the chair will either quickly settle back upright or topple over.

For HD Radio, market forces will similarly exert their will with some haste, selecting one pole of a binary outcome for the emerging technology, and determining it during a brutally finite period of time.

So what can we learn from broadcast history that can help us better understand the dynamics at work here?

Quantity beats quality

A common refrain of this column has been that — despite many broadcast and audio engineers' wishes to the contrary — media audiences typically prefer quantitative change over purely qualitative change. This was certainly the case in the early days of FM. The format languished in its first two decades as simply a higher-quality alternative simulcast to AM channels.

Although existing AM broadcasters were each offered an FM license (in the 92–108 MHz band, while 88–92 MHz was allocated to new, non-commercial/educational channels), most were disappointed at the slow sales and low audience uptake for the new format, even well after its initial deployment, and thus they did little to help the format succeed. Several broadcasters even gave up their FM channels as charitable contributions to non-profit organizations, which is why there are a few non-commercial FM stations today on channels above 92 MHz. As late as the mid-1960s, the future looked quite bleak for FM.

Its success was stimulated initially by an FCC action that required broadcasters to separately program their FM channels from their AM services. This was a dramatic move, especially considering the cost to broadcasters that this ruling represented at the time. It is testimony to just how dire the FCC considered the fate of FM to be.

Broadcasters who wanted to keep their FM channels were therefore motivated to find cheap new sources of content. Some preferred automation, and many settled upon the format eventually known as easy listening, which soon became popular among some demographics. Others went for live assembly and hired young DJs who were relatively unconstrained by playlists. Thus the progressive rock format was born, and we all know the rest. These formats and a few others propelled FM to a meteoric rise, and over the next decade it challenged, and eventually overtook, the traditional AM format for audience share in most markets.

Whether it was serendipity or prescience that brought these formats forward, the key lesson is that it wasn't just because they were cheap. The content broadcast in these formats resonated strongly among both existing AM listeners and new audiences of the day, causing strong overall growth in radio listening, as well as massive shifts from AM to FM use. Meanwhile, listeners flocked to stores for new FM-capable radios.

It would seem that today, although specific tastes may have shifted, the preference for quantity over quality still generally applies. Thus HD Radio is well positioned, offering broadcasters the ability to provide both qualitative and quantitative improvements almost from its outset.

That was then ...

On the other hand, and as we know, a lot has changed along the audio media landscape since the 1970s.

First, the pace of technological progress itself has dramatically increased, thus any window of opportunity for a new format to catch on is necessarily shorter — perhaps almost ephemeral.

Next, consider that listeners already have many more audio-service options to choose from than existed in FM's early days. Some of these are themselves still fighting for a foothold, so the competitive environment is intense, and promotional budgets are necessarily ratcheting ever higher. Ironically, the age of digital audio

See TIME, page 20 ▶

World Radio History

YOUNG ENGINEERS

Timmons: A Veteran at Age 23

by Ken R.

One in a series of occasional articles about radio technical people who are defying stereotypes about the profession.

Self-described tomboy Kyria Timmons has been a broadcast engineer for more than 10 years. What makes that statement unusual is that she is now 23.

She began collecting paychecks for contract work at age 12 while tagging along with her father and mentor, Tom Ringer. He is now an engineer at Salem Communications' WAVA(AM/FM), a Christian-formatted combo in the nation's capital.

"I admire my dad's work ethic," she said. "Even after being on the job 14 hours, if he gets an emergency call he goes back into work without a complaint," said Timmons. "He enjoys his job and he's always been there for me."

Timmons creates and saves an operations log using Burk's Autopilot 2 software. She handles routine weekly maintenance at the WGYS transmitter site in Frederick.

In the blood

Timmons is a one-woman band, working as operations manager at the satellite studios of Bonneville International Corp. in Frederick, Md., about an hour outside of Washington. The small facility she oversees is primarily a transmitter site with a small air studio. Housed here are towers and transmitters for WTOP(AM). She also maintains the transmitters and tower site for WGYS(FM) on nearby Braddock Mountain. The latter provides a rebroadcast of WGMS from Washington, where WTOP programming also originates. The mini-studio can be used for live news or as a backup if a D.C. studio goes down.

Timmons recently joined Bonneville after a stint of two and a half years with Salem Radio Network, her first full-time radio job.

She may spend her day mostly in the company of snakes and other field critters around the transmitters, but Timmons says she is never unhappy.

"I stay pretty busy," she said. "I arrive in the morning and make sure the broadcast pattern is set correctly for WTOP, I verify the logs, check all the levels for the last 24 hours, test the computers, do weekly maintenance, reboot everything, and then do the same for WGYS."

Her responsibilities include working with the Burk Technology AutoPilot software for all eight of the Bonneville-DC transmitter sites. The product monitors forward power, reflected power, common point, tower lights and other functions.

"I like AutoPilot because I can operate it from a PC anywhere and if the transmitter goes off, I can switch to the auxiliary online or over the phone and get back on the air right away."

Timmons is not cooped up in Frederick all week. She drives to Washington to maintain operations logs and files. She travels to Wheaton, Md., to maintain the transmitter for WTWP(AM) and visits the WFED(AM) site in Silver Spring. Recently she found herself climbing around a mountaintop, reinstalling the IBOC transmitter for WGYS, which had been hit by lightning.

"I'll lift a 40-pound box on my shoulders if I have to," she said. "For what I need to do, I can do it as well as any guy."

While Timmons often works with software, she prefers a more traditional part of radio engineering: RF. "Honestly, I'd rather be putting my hands in the back of a transmitter than working on some computer," she said.

Ken Sleeman, transmitter site manager with Bonneville, supervises Timmons and recognized something special in her. "What I like about Kyria is that broadcasting is in her blood," he said. "I like her enthusiasm because it's always great to have someone who is passionate about the business and willing to pitch in even beyond the job description. She takes her on-call duties seriously too, leaving her cell on 24 hours a day."

Getting ready to check the fuel level in the tank for the WGYS generator, part of weekly maintenance. 'We have had some issues with wasps and hornets building nests in the cover on the propane tank so we are careful when lifting that lid,' Timmons said. 'The easiest way to do this and not get stung: use a big stick!'

It's not the music

Timmons is no frustrated DJ who got sidetracked into engineering.

"I'm not interested in music or formats," she said. "I just love exactly what I'm doing. I used to tear apart TVs when I was a kid. I played with circuit boards and learned to solder at age 12." (She says, "When there is hot solder on the tip, don't hold it straight up and down.")

Her life outside the station is anything but boring.

"I don't have time for a lot of hobbies because when I get through here at 5 p.m. I go to Hagerstown Community College to work towards my bachelor's of science degree," said Timmons. "Then I go home to my stay-at-home husband and three-year-old daughter. It's a long day."

Timmons has suggestions for those even younger than she who wish to enter the radio business.

"It's hard to find electrical engineering programs in school," she said. "Try to find some course that will give you the electronics, but also take computer classes, because if you can't work with a computer, you can't be a radio engineer anymore."

Ken R. is a former broadcaster who says his closest brush with engineering was trying to ungunk an old Gates console after spilling the entire contents of a bottle of Coke into it.

Time

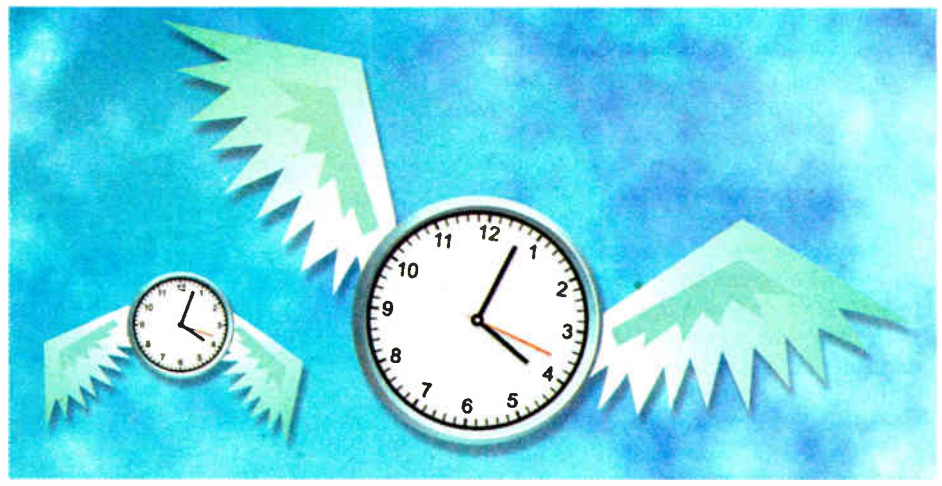
▶ Continued from page 19

clarity has engendered this different form of noise in the marketplace, one that is increasingly difficult to rise above in order to capture listeners' attention.

Speaking of noise, the commercial clutter on radio services also is greater than it was in the 1970s, although not as yet on HD Radio multicast services. Nevertheless, this long-term issue may already have established a reputation for radio that is difficult if not impossible to shake off, discouraging listeners from sampling any new offerings from the industry's incumbents.

Similarly, there is a sense among some listeners that radio is too set in its ways to change much, or too "old school" to produce anything compelling in the new-media era. This is a crisis of branding for the industry as a whole; deserved or not, it must be addressed. The emergence of HD Radio is an opportunity to do so, but it should be understood that it is still a tough sell to those who already consider the industry as rust-belt technology.

Finally, there is a complex matrix of expectations that radio and other more recent technologies have established among audiences, which can be summarized under the heading of "cheap, reliable and portable." While radio was once the only service that could truly offer all of these attributes, it is no longer alone in this respect, and the list of others who can make this claim continues to grow. Meanwhile, terrestrial radio's own new digital service offering has yet to score very highly on these critical parameters.



This is now

In summary, yes, FM indeed clawed its way back from the brink of its demise to be fantastically successful. And yes, HD Radio's similar slow start is to be expected. But can HD Radio survive low growth or a stall like FM experienced, for any similar amount of time? Unlikely. FM didn't begin to turn things around until over 20 years had passed following its introduction. No one believes HD Radio will have until the mid-2020s to do the same.

Analysts are mixed on just how long HD Radio does have to make its mark, however. The fact that its operational costs are so broadly dispersed among otherwise still-profitable enterprises (as discussed in this column in the Oct. 11, 2006 issue) may provide it with a relatively longer runway than most of its competitors. It also has some advantages out of the box that it took years for FM to gain. But whether these will be enough to make HD Radio the new mainstream, only time — and not much of it — will tell.

Skip Pizzi is contributing editor of Radio World.

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WIRED FOR SOUND

How to Gauge a Snake

by Steve Lampen

When selecting analog snake cable, you usually have three gauge sizes from which to choose.

It used to be that most snakes were 22 AWG. But over the years, 24 AWG snakes have gradually taken over. In fact, the only reason you might still consider 22 AWG is ruggedness. If it's out on the road or you're going to be pulling through a particular torturous conduit, 22 AWG will last longer than 24 AWG. But 22 AWG will also be bigger overall and more expensive (more copper). The maximum pull tension on each 22 AWG conductor is 7 pounds, multiplied by all the conductors in the cable (and don't forget the drain wires). For 24 AWG it's 4 pounds. You do the math.

Now, 22 AWG is 17.5 ohms per 1,000 feet; 24 AWG is 27.7 ohms per 1,000 feet. Because resistance affects all frequencies equally, the difference in gauge size only means a slight change in signal level. Capacitance of the pairs, and the source impedance of the driving device, are much more critical to the actual analog performance of the snake. The 24 AWG has an added advantage. Lots of punch-down blocks are based on 24 AWG wire. Sure, they take 22 AWG or 26 AWG, but they're *made* for 24 AWG.

You can also get 26 AWG snakes. They can be considerably smaller and a little cheaper. But you might not want to take them on the road. Installed, they would probably be fine, since they're protected.

Cap it

You can tell the quality of a snake cable by the capacitance.

Very inexpensive snakes, made entirely of PVC, can be 50 picofarads per foot. Those with polyolefin on the wires will be around 30 pF/ft. Spend a little more and put polyethylene (PE) on the pair and you're at 25 pF/ft. Spend a pile of money and get DuPont Teflon coating on the wires, and you're at 20 pF/ft. Or you can get foamed polyethylene and get down to 13 pF/ft.

Those last are the best-performing analog cables in the world. The only thing that might confuse you is that they will say "digital audio" on the outside. But don't worry. If that's a problem, I will personally send you a bottle of rubbing alcohol. You can use that to rub off the word digital. Then the cable will work great for analog!

There's one offshore manufacturer of snake cables that claims, in its catalog and on its Web page, that the pairs have a capacitance of 3.7 pF/ft. Since a capacitor is two metal plates (the wires) separated by a dielectric (in their case, polyethylene) you can easily calculate the distance between the wires necessary to get to that capacitance. In this case, *9.3 inches between the two wires.* Conclusion: this is a misprint in their catalog (and Web page) that, oddly, has never been corrected for many, many years. Wonder why?

Don't freak

One place you'll see a lot of 26 AWG snakes is digital audio. Having pairs that are 110-ohm impedance and 13 pF/ft. means they're going to be big. So digital snakes rarely get bigger than 24 AWG, and commonly get down to 26 AWG. Unlike analog, digital pairs have defined maximum distances. That's because the AES has a spec for distance: a 2 V source signal and a 200 mV received signal. With that, the gauge of the wires, and the sampling rate of the audio, you can calculate the distance before you even manufacture the cable.

Gauge Size	Bandwidth 6 MHz
26 AWG	813 ft.
24 AWG	1105 ft.
22 AWG	1538 ft.

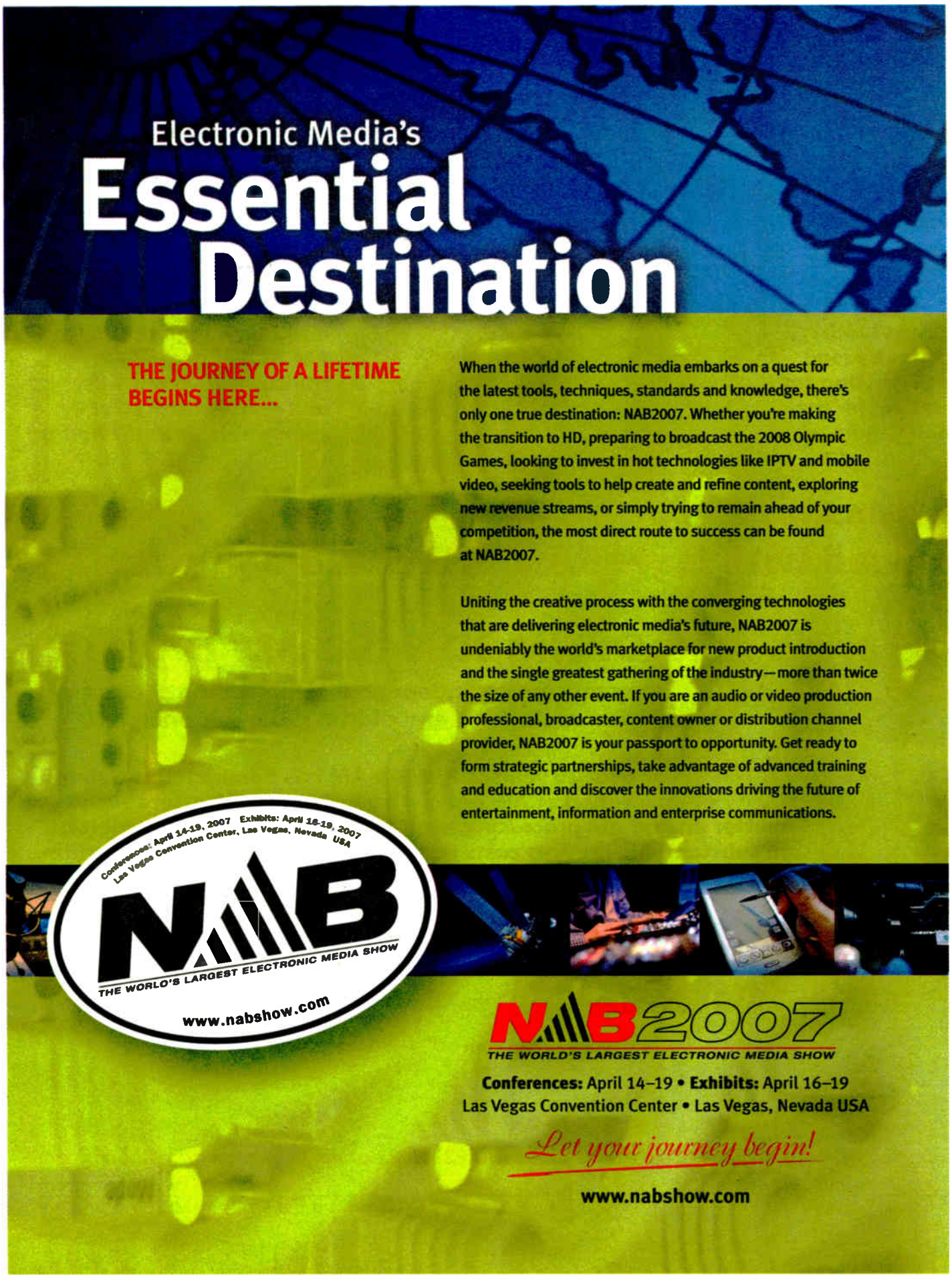
And speaking of 24 AWG wire, there are multipair cables out there that make great AES cables. They freak out a few grizzled broadcast engineers because I am talking about UTP, unshielded twisted pairs like Category 5e. And if you use Category 6 it only gets better. That stuff is 10–12 dB better in many crosstalk specs than 5e. And it's usually 23 AWG, halfway between 22 AWG and 24 AWG, so it can go farther than regular 24 AWG snake cables. Four pairs in Cat-5e or Cat-6 mean four or eight channels of digital audio.

For digital audio, with a 44.1 kHz sampling rate, the bandwidth is 5.6448 MHz. For a 48 kHz sampling rate, the bandwidth is 6.144 MHz, so we have distance on the chart shown at 6 MHz, which pretty much covers both sampling rates you are likely to use.

But 800 feet with the small stuff will pretty much cover any application you have except for a huge stadium, auditorium or the 18th fairway. And, don't worry, we have a solution for those extra-long applications. And that solution is coax snake ... next time.

Previous articles in the Wired for Sound series are archived at radioworld.com.

Steve Lampen's latest book "The Audio-Video Cable Installer's Pocket Guide" is published by McGraw-Hill. Reach him at shlampen@aol.com.



World Radio History

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Radio Automation

Simian - radio automation and digital playout system.

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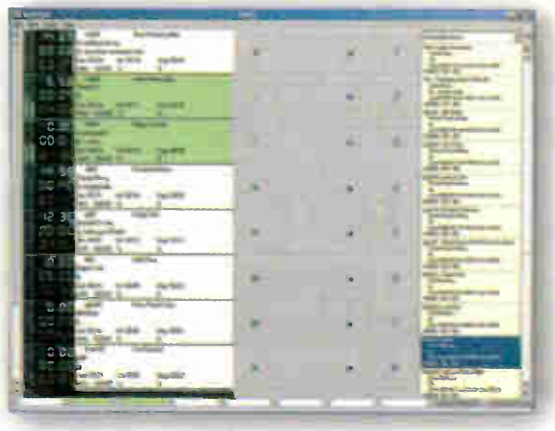
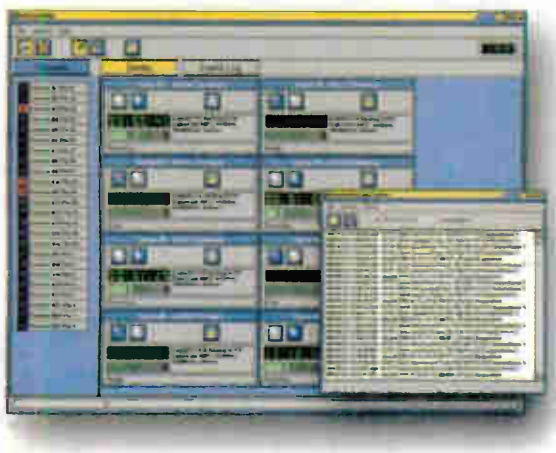


WaveCart - the original on-screen cart machine replacement.

Audio Logging



SkimmerPlus - skimming and audio logging with web playback.

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Systems - fully configured with hardware, software and music.

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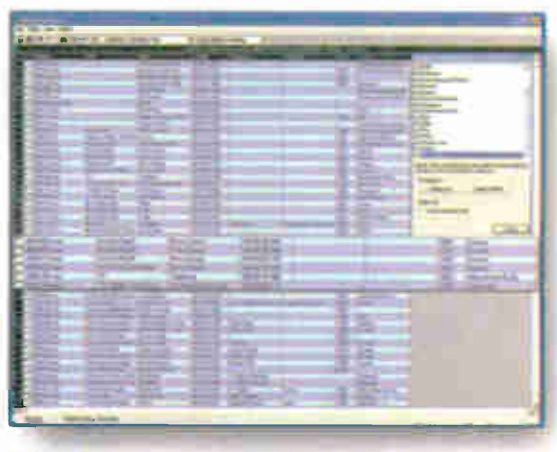

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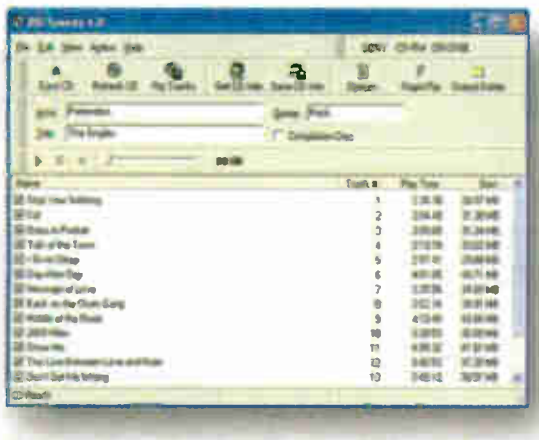

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BSI

World Radio History

HD Radio News

Radio World — Covering Radio's Digital Transition — February 14, 2007

Prepare Your STL Path

Page 26

PRODUCT EVALUATION

A First Peek at the Sangean HDT-1

Company Shows Its First-Generation AM/FM/HD Component Tuner

by Jim Somich

In case you haven't noticed, HD Radio is here in all its glory, warts and all. First-generation products are a challenge to review fairly, and here we have a first-generation "system," the Ibiquity hybrid analog-digital radio system for FM and AM, and a first-generation tuner from Sangean, the HDT-1.

I was fortunate enough to acquire one of the first HDT-1 tuners for evaluation. My first impression, before listening to it, was that it was an attractive matte-black unit that blended in well with my more expensive audio components.

Product Capsule:
Sangean HDT-1 Tuner

Thumbs Up

✓ Moderate cost
✓ Excellent audio quality
✓ Full-featured remote control
✓ Good to excellent sensitivity and selectivity
✓ Large blue LCD display

Thumbs Down

✓ Cannot be locked in analog mode
✓ Cannot output analog and digital simultaneously
✓ No FM stereo light
✓ Mutes occasionally

PRICE: $199

Information: *www.sangean.com*

It weighs 5.6 pounds and has a solid metal case; the only plastic parts visible are the front-panel switches. The HDT-1 looks more expensive than its $199 list. I would soon learn that it sounds as good as it looks.

The unit comes with accessories: remote control, FM dipole antenna, AM loop antenna, audio output cable and detachable power cord. The instruction manual was written for the layperson and is sparse but adequate.

Hooking it up

Setting up the Sangean HDT-1 is simple: connect the two antennas, connect the detachable power cord to an ac supply and use the supplied stereo audio cable to connect the tuner to your sound system. At first I was stumped on how to mount the supplied AM loop antenna, but I settled on a piece of gaffer's tape.

The HDT-1 has an attractive blue and white 1.5- by 2.75-inch LCD display. An internal clock can be displayed when the radio is on.

In the stand-by mode, the clock is displayed in a dimmed mode. I found that the clock in my unit tended to run a little slow: maybe by as much as two minutes every 24 hours. There is no alarm or timer.

If the AC supply is interrupted, the clock must be reset, but the HDT-1 remembers all your presets.

From left to right, the front panel consists of a "Standby/On" switch with LED indicator, a 12-button data entry pad, the LCD display, "Info" and band buttons, Tuning control, "Seek" and "HD Seek" rockers.

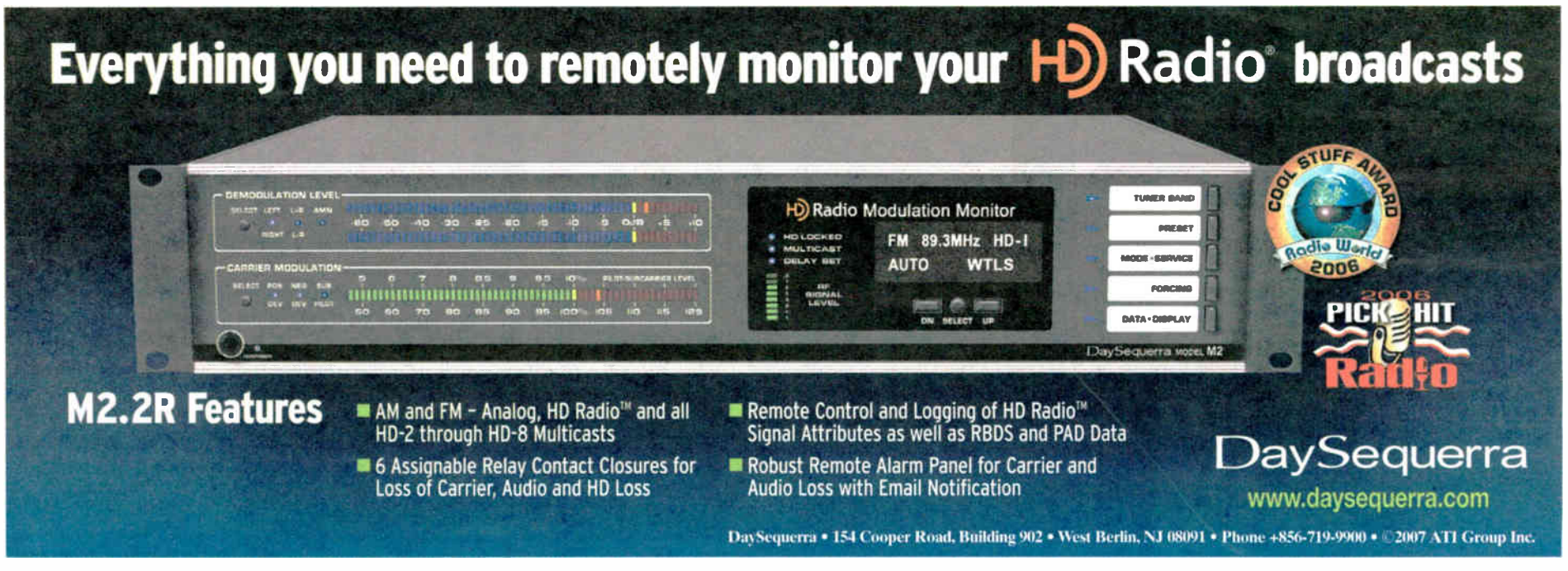
From left to right, the rear consists of an FM antenna socket, AM loop connector, line out RCA connectors and the AC power cord socket.

You will have the HDT-1 up and running in mere minutes without cracking the manual.

This radio sounds great. There is a tendency to forget that you are listening to low-bit rate digital data. It makes AM sound like FM and the improvement on

See SANGEAN, page 26 ▶

A brochure for the HDT-1. The author grades the tuner 'a solid B.'



World Radio History

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Radio World's HD Radio™ Scoreboard

The HD Radio Scoreboard is compiled by Radio World using information supplied by iBiquity Digital Corp. and other sources.
The data shown reflect best information as of mid-January. This page is sponsored by Broadcast Electronics. HD Radio is a trademark of iBiquity Digital Corp.

On the Air in San Francisco

Frequency	Station	Format	Licensee
910	KNEW-HD	Talk	Clear Channel
960	KGKE-HD	Talk	Clear Channel
1050	KTCT-HD	Sports	Cumulus
88.5	KQED-HD1	Nws/Tlk/Inf	KQED, Inc.
91.1	KCSM-HD1	Jazz	San Mateo Comm. College
91.7	KALW-HD1	Nws/Tlk/Inf	S.F. Unified School
92.3	KSJO-HD1	Span/Oldies	Clear Channel
92.3-2	KSJO-HD2	Hispanic Hits	Clear Channel
94.9	KYLD-HD1	CHR/Dance	Clear Channel
94.9-2	KYLD-HD2	Wild Hispanic	Clear Channel
95.7	KMAX-HD1	Clsc Hits	Bonneville
95.7-2	KMAX-HD2	Max Fever (Disco)	Bonneville
96.5	KOIT-HD1	Christmas	Bonneville
96.5-2	KOIT-HD2	Real Oldies	Bonneville
97.3	KLLC-HD1	AC	CBS
97.3-2	KLLC-HD2	Chill	CBS
98.1	KISQ-HD1	Rhythm/Blue	Clear Channel
98.1-2	KISQ-HD2	Romantica	Clear Channel
99.7	KFRC-HD1	Rhymc/AC	CBS
99.7-2	KFRC-HD2	Country	CBS
100.3	KBRG-HD1	Span/Oldies	Univision
101.3	KIOI-HD1	80s Hits	Clear Channel
101.3-2	KIOI-HD2	80s Hits	Clear Channel
102.1	KDFC-HD1	Classical	Bonneville
102.1-2	KDFC-HD2	Extended Play Classical	Bonneville
103.7	KKSF-HD1	Smooth Jazz	Clear Channel
103.7-2	KKSF-HD2	Traditional Jazz	Clear Channel
104.5	KFOG-HD1	AAA	Cumulus
104.5-2	KFOG-HD2	The New Music Matrix	Cumulus
105.3	KITS-HD1	Alternative	CBS
105.3-2	KITS-HD2	All New Music	CBS
106.1	KMEL-HD1	HpHop/RhyBl	Clear Channel
106.1-2	KMEL-HD2	Extreme Hip-Hop	Clear Channel
106.9	KIFR-HD1	Talk	CBS
106.9-2	KIFR-HD2	KCBS News	CBS
107.7	KSAN-HD1	Rock	Cumulus
107.7-2	KSAN-HD2	The Bone 2	Cumulus

The HD Radio Bottom Line

	Total Licensed	On the Air
	1,673	1,145
Last Month	1,629	1,123

Market Penetration United States

12,793 AM & FM Stations *(excludes LPFMs)*

Licensed by Ibiquity and on the air

Licensed by Ibiquity and not on the air

Number of FM Stations Multicasting:

532

Last Month: 527

World Radio History

HD CONVERSION DIGEST

Prepare Your STL Path for HD-R

by W.C. Alexander

The author is director of engineering for Crawford Broadcasting. This is one in a series of tips about HD Radio implementation. Articles are archived at radioworld.com.

Photo by Cris Alexander

An A/D converter may be needed for HD-R conversion.

For a lot of stations, STL and AES issues are major considerations in the HD Radio conversion process. This is particularly true for AM stations, many of which may be operating using analog monaural STL systems. For HD Radio, stations will need the best, most transparent STL conveyance possible.

Generally speaking, digital is better than analog for a number of reasons, but a good analog STL with a clear path, plenty of fade margin and an excellent signal-to-noise ratio can do the job for an HD Radio station. If a station has analog studios, for example, and the analog STL is otherwise transparent, there is no compelling reason to immediately convert to a digital STL system. The A/D conversion can be done at the transmitter site with equally good results as converting at the studio and using a digital STL.

A good analog STL with a clear path, plenty of fade margin and an excellent signal-to-noise ratio can do the job for an HD Radio station.

That being said and assuming a clear, interference-free path, a digital STL will get you a better, more noise-free signal to the transmitter site. The output will be in the digital domain, which is where you need to be eventually anyway. If your studios are already digital, the best course of action is to stay in the digital domain all the way to the transmitter site if possible.

Avoid repeated conversions

Repeated conversions between analog and digital and even sample rate conversions are to be avoided if possible. Each conversion degrades the audio quality by a small amount, and remember that the HDC coder is fairly aggressive, especially the low-rate AM coder. Each A/D-D/A or sample rate conversion pass results in an audible degradation after a pass through the HDC AM coder.

The FM coder fares better, but with enough passes the degradation will be audible even at the higher rate of the FM coder. A word to the wise: standardize on a 48 kHz sample rate and leave it there all the way through the chain.

Multiple MPEG passes are also to be avoided at all costs. If your station uses a compressed digital STL, you might want to look for alternatives.

Higher data rates are better than lower ones. One of the worst-case situations results when an AM station takes a 128 kilobit-per-second MPEG network satellite feed, feeds it through an MPEG STL and through the HDC coder. The resulting demodulated HD Radio audio will be loaded with artifacts and sound like a bad Internet stream.

We have found that if it is impossible to avoid the MPEG pass in the STL, at least get the data rate up to 256 kbps or better. That 256 kbps floor should apply as an absolute minimum for all source material, including spots, promos and other material, much of which arrives at the producer's inbox via e-mail these days.

We have found that apt-X seems to play fairly well with the HDC coder. G.722 and linear digital STLs also work well.

Once your station is up and running, it is important to pay attention to remote sources for compatibility. Some adjustments may be required.

Digital domain

You may well find that the POTS codec that your station has used for remote broadcasts for years sounds less than stellar after a trip through the HDC coder. An alternative may be needed.

Sooner or later, you're going to have to get your audio into the digital domain. If you have digital studios, you're set to go. The output of your mixer will be AES, hopefully 48 kHz AES.

If your studios are analog and you're using a digital STL, you can convert ahead of the STL or in some cases, let the STL do it for you. Some have analog audio inputs and perform the A/D conversion internally.

If you're analog all the way to the transmitter site, you have a couple of choices. The method preferred by most transmitter manufacturers is to provide an AES studio signal to the HD generator. You can generate such signal locally with any quality A/D converter.

We have found that some audio processors do a smoother job of A/D conversion than dedicated external converters. You may save yourself some money and produce better-sounding digital audio by letting your processor do the work. If you do this, you may have to depart from the transmitter/HD generator manufacturer's recommended audio routing scheme, but from our experience, there is no penalty for doing this.

So, will your existing STL work when you convert to HD Radio? The answer is, "probably," but you likely have some STL work to do to make the path optimal for HD Radio.

Radio World pays for your technical tips and stories. Inquire to radioworld@imaspub.com.

NEWS WATCH

Audio Flag Redux

WASHINGTON Audio flag legislation failed to pass Congress last year so proponents are hoping 2007 is their lucky year.

Days after the 110th Congress convened, Sens. Senator Dianne Feinstein, D-Calif., with co-sponsors Lindsey Graham, R-S.C., Joseph Biden, D-Del. and Lamar Alexander, R-Tenn., introduced the Perform Act (S. 256), with language identical to last year's bill.

Opponents include consumer advocate group Public Knowledge. They say the legislation could prevent digital audio recording devices from having the capability to record material automatically by specific artists, albums or recordings, and prevent consumers from having the capability to separate recorded material automatically into their own playlists.

Sen. John Sununu, R-N.H., planned legislation aimed at preventing the commission from imposing "technology mandates" on the communications industry. An audio flag may be included under that umbrella.

Supporters, including the RIAA, say the bill would give parity to digital music services and that satellite radio has become a digital distribution service, something the services refute.

HD Radio's ability to store and replay content, new features on the horizon, could also be affected if passed.

The bill is under the auspices of the Senate Judiciary Committee, chaired by Sen. Patrick Leahy, D-Vermont.

Sangean

▶ Continued from page 24

FM is substantial, especially under high multipath conditions.

Depending on station processing, the blend from analog FM to digital HD Radio can be a subtle improvement, with increased clarity and openness. Because the HD-R system does not use pre-emphasis, the high end sounds less busy.

Unfortunately, some stations are using identical processing for their analog and HD1 signals, including heavy high-frequency limiting. These stations are obvious when monitoring on the unit.

The HD2 streams sound excellent, but the perceived quality is largely dependent on the station processing. At first I felt the HD2s sounded noticeably worse than the HD1s, but this turned out to be a difference in audio processing and the quality of the source material.

Operation

Operation of the HDT-1 is simple. All functions are available on the front panel or the credit card-sized remote control. The radio is never totally off unless you pull the power cord (and lose the clock). When in standby, a red LED lights.

Then select your band: AM 1or 2 or FM 1 or 2. There are 20 presets available for FM and 20 for AM. Press the preset button and the number of the station you want to recall. Or you can press the "Direct Frequency Button" and enter the frequency directly.

The "Info" button cycles radio text, time, signal quality, frequency and spectrum. The tuning rocker moves forward or backward one channel at a time. The seek rocker finds the next or last usable signal, and the HD Seek rocker only stops on HD stations.

An indicator on the LCD screen indicates when the radio is locking on an HD Radio signal.

Under the hood, there are four boards: power supply/amplifier/I/O, front panel, display controller and the LG-Innotek DSP HD Radio module. Most of the inside is empty space.

Conclusions

Sangean, with 32 years of experience building radios, has produced an impressive first-generation tuner. Does it have a few small warts? Yes.

Band	FM 1	FM 2	AM 1	AM 2
Tuning range	87.5 – 108MHz	87.5 – 108MHz	520 – 1710kHz	520 – 1710kHz
Tuning step	100kHz	100kHz	10kHz	10kHz
Preset channels	10	10	10	10
Auto preset system	Yes	Yes	Yes	Yes
FM RBDS	PS, PTY, RT, CT			
Signal strength indication	Yes, with 6 segments indication			
LCD type	Graphic 128 x 64 dots			
LCD backlight	Yes, with white light LED			
Power supply	AC120V/60Hz mains power			
Dimensions	16.9" x 2.8" x 10" (W x H x D)			
Weight	Approx. 5.6 lbs			

My tuner would mute occasionally while I was pressing buttons. Recycling the power reset the audio. The clock is slow. There is no stereo light for analog FM. As a bonus, the HDT1 will decode C-Quam AM stereo, but there is no indication of this on the panel.

For professional use, there is no way to lock the radio in the analog mode and no way to call up analog and digital channels simultaneously for time syncing. But then this is not a professional product; I would classify it as high-end consumer, suitable for studio monitoring, quality control and home component use.

My grade: a solid "B." For more information: *www.sangean.com.*

Jim Somich is a former major-market radio chief with equipment design experience. He works as an engineering consultant and tech writer. Reach him at jimsomich@alltel.net.

World Radio History

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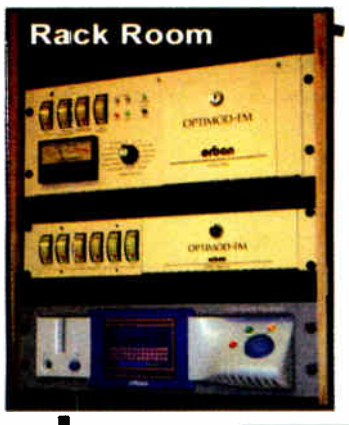

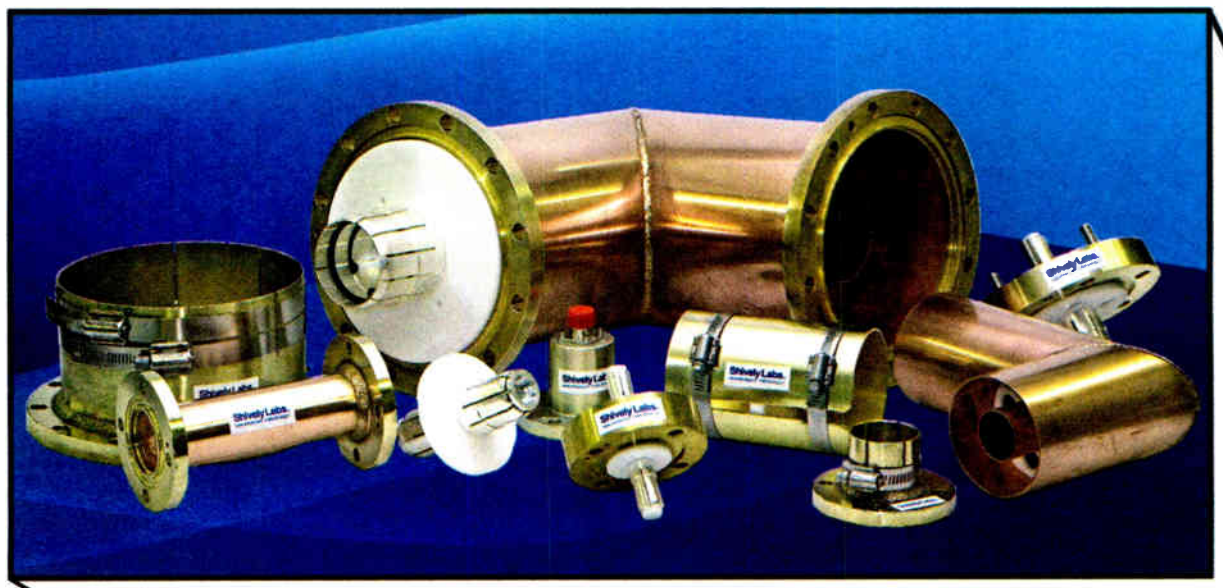

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World Radio History

DIGITAL NEWS

Polk to Debut $299 Radio Under 'Design' Label

BALTIMORE Polk Audio plans to release an HD Radio this year aimed at a different buyer than its upscale iSonic product.

The Executive Shelf System, Model HDX3, would be the first release under a new label, Polk Audio Designs.

Marketing Manager Paul DiComo said the new branding is meant to be "less geeky." The new HD Radio has a more conservative and traditional look than the curvy iSonic and includes a CD player and a detached speaker.

Ibiquity Digital displayed the two units side-by-side at CES on a shelf system, showing off several new HD Radios to be available later this year.

The new radio, to be sold at Radio Shack, will list for $299. That compares to $599 for the iSonic. The latter unit decodes HD Radio, XM as well as analog AM and FM. It also includes a DVD player.

The company did not official announce the product at CES, having 40 other new products to tout.

HD Radio was pitched to attendees of the North American International Auto Show in Detroit in January, via mobile billboards and an 'HD Radio Street Team.'

HD-R 'Street Team' Sweeps Detroit

DETROIT HD Radio was pitched to attendees of the North American International Auto Show in Detroit in January, via mobile billboards and an "HD Radio Street Team."

A group wearing orange uniforms handed out 21,000 HD Radio VIP lanyards at the PeopleMover stations close to the convention center. The lanyards invited people to register for a free HD Radio car converter.

The HD Digital Radio Alliance believes mobile messages like "Drive, Listen, Love" and "More free radio in your car" have started resonating with consumers and with the automotive industry. Diane Warren and Texas Creative created the promotion.

Sat Radio Merger Talk Is Tempered

WASHINGTON FCC Chairman Kevin Martin told Reuters it's possible a rule prohibiting a satellite radio merger could be changed — if such a request is made.

Martin said he was unaware of any such request. He was clarifying the rule and said he was not commenting specifically on how the FCC might react to a proposal.

Reporters inquired because the previous day, Martin had mentioned SDAR rules from 1997 stating there must be two satellite radio entities. He also said if a merger plan was submitted, the agency would review it.

Fellow Republican FCC Commissioner Robert McDowell told Reuters the concept was "intriguing" and his aides were looking for precedents for changing the agency's rules.

Some analysts would argue the rules could be changed, depending on how inclusive the agency is when defining the competitive environment for SDARS — whether it includes other media and devices such as MP3 players, the Internet and video. Analysts disagree whether a merger would help satcasters achieve profitability faster.

Satellite Consumer Group Forms

WASHINGTON A group of law school students at George Washington University in Washington formed a consumer advocacy group for subscribers to satellite radio.

They said the Consumer Coalition for Competition in Satellite Radio was created in response to rumors about the potential merger of XM and Sirius.

At the CES convention in January, XM again declined to comment on the rumors to Radio World. Several accounts quoted Sirius President/CEO Mel Karmazin speculating about the benefits of such a move.

"The competitive duopoly in satellite digital radio created by the FCC in 1997 is clearly at risk," according to Chris Reale, one of C3SR's founding members. "If the only two companies operating in the satellite radio industry are permitted to combine, consumers not only will lose their choice, but they will be totally at the mercy of a monopoly provider."

The group announced at the National Conference on Media Reform in January.

— Leslie Stimson

The cash-machine formerly known as RevenueSuite returns to the airwaves as Google AdSense for Audio.

RevenueSuite, a source of additional income for radio stations, promises to be even more so in this incarnation as AdSense™ for Audio, thanks to the power of Google technology. And when you combine that with the industry's most innovative station automation products – SS32™ and Maestro™ – you'll understand why hundreds of stations in markets of every size are starting to talk about the future of radio stations with renewed optimism.

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World Radio History

PRODUCT EVALUATION

E-Rack Comes Well Equipped

by James E. O'Neal

To the broadcast facility tourist or otherwise casual observer, an equipment rack is an equipment rack. To the uninformed, a row of racks may just as well be a row of bookcases — they all look alike and they all support equipment.

I know differently, for in my life as a broadcast engineer, I've purchased and installed a lot of racks. They are not all created equal.

I've praised some, sworn at others and been indifferent to a lot more. When I learned that a new model was available from APWMayville for review purposes, I gladly volunteered my services to find out just how I would categorize this rack. (Okay, I'll admit it — I like the "new car" smell that comes with a brand-new rack.)

Features

Not long after the freight delivery agent shows up at the loading dock with his 18-wheeler, one of things you notice is how well or how poorly something as big and heavy as an equipment rack survived the trip. Most of the racks that I'm used to came in heavy cardboard boxes that had to be cut or torn away to get at the unit inside.

I like the RU side label strips on the front rails, and the tapping and cleaning threads in the rail bolt holes.

APW Mayville's Stantron E-rack is a bit different here. First of all, the rack was strapped onto a wooden pallet somewhat wider and deeper than the rack it held. This caught my attention, as not too many manufacturers seem to bother with isolating their racks from other racks or whatever's in the tractor-trailer with them.

Once in a while something bad happens during the cross-country truck ride and you get delivered a rack that is slightly less than perfect. This is both annoying and time-consuming, as you have to contact the freight company, fill out forms, get someone to inspect the damage and then wait for a settlement and also for the manufacturer to send out another rack. (Sometimes when you're on a really tight timeline, there just isn't time for this and you have to take your lumps and use the less than perfect rack anyway. No one's happy.)

The E-Rack features a textured coating and 14ga steel construction.

The addition of the oversized pallet is a good idea. It's also handy for moving newly received racks around, as that's what pallet jacks were invented for. (They don't work worth a hoot with racks that are only packed in cardboard cartons.) Hats off to APWMayville for including the pallet.

There's another difference in the APWMayville's packaging concept. There is no packing box to have to tear or cut away. Ever scratch the paint on a brand new rack doing this?

On first glance, it appears that the rack is fully contained within a cardboard carton, but this is a bit of an illusion. Actually, there are four cardboard sheets wrapped around the rack and pulled tight with clear shrink-wrap. This gives the impression and protection of a four-sided shipping carton, but doesn't have to be cut away to get to the rack. Underneath the cardboard are 1-inch-thick honeycombed corner reinforcements for corner protection. The whole shrink-wrapped assembly is fastened tight to the pallet with strapping. The rack buried inside this cocoon is further protected by a clear vinyl shipping bag.

Our rack arrived without any dents or scratches. I should mention that APWMayville included a liquid-filled "tip alarm" on one of the cardboard sides. It turns red if the rack is not kept vertical during shipping.

Product Capsule:

APWMayville Stantron E-Rack

Thumbs Up

- ✓ Shipping materials well engineered
- ✓ Solid build
- ✓ Back door option
- ✓ RU side label strips on the front rails
- ✓ Nice job of tapping/cleaning threads in rail bolt holes
- ✓ Design of the rear rail system
- ✓ Instruction manual

Thumbs Down

- ✓ 'Peanut-sized' latch handle

PRICE: 45U 36 Deep: $626.27

CONTACT: *APWMayville in Milwaukee at (800) 558-7297.*

After the packing material was removed and put aside, which only took a minute or so after the bands were cut, I went off in search of a socket wrench to remove the lag bolts holding the wheeled rack down on the pallet. Surprise! There were no bolts. This gives me a little concern about the packaging system used by APWMayville. As the rack delivered for review was equipped with casters, I worry about what would happen inside a lightly loaded truck if the strapping had been compromised in any way. Our rack

See E-RACK, page 30 ▶

World Radio History

E-Rack

▶ Continued from page 29

did arrive safely and I'm sure that the company did its homework. Anyway, it's kind of nice not having to drag out the toolbox and hunt for the right-sized socket to get the thing off the pallet.

Aesthetics

Once the rack was out in the light of day, it was examined carefully for defects and overall quality of workmanship.

The model received at Radio World was supplied in a textured "basic black" coating. The finish was carefully and evenly applied, outside and in, with no sign of underspray or overspray or "shadowing" around the internal bracing. The frame is 14ga steel construction.

Speaking of bracing, the rack is constructed with multiple horizontal braces — a total of seven in the 70-inch model reviewed. This rack is going to hold its shape.

One of the more interesting features of the APWMayville rack is the presence of a black-and-white height reference applied to both front and rear rails. These strips are divided into rack units and can't help but make installation of equipment go faster and easier. How many of us have at least once mounted that 80-pound power supply half an RU off and then had to do it all over again?

In the world of equipment racks, there are two styles of rack rails used: those with oversize holes intended for installation of clip-in "Speed Nuts," and those with tapped bolt holes. Both have their weak and strong points. APWMayville uses the latter, so there's none of the aggravation from the clip being in the wrong position, or having one of them "spring" just as the last bolt is driven in.

In what has to be a first from rack vendors, APWMayville included a 15-page installation manual with the rack. It's full of detailed drawings, showing how everything is supposed to fit together and providing instructions for adding various accessory items to the rack, such as an "anti-tip" bracket. The anti-tip feature is a good idea for racks on wheels or that might be even the least little bit top-heavy.

Another "feature" is the PowerOptions AC plug strip. It is available in both standard-ground and isolated-ground varieties. The strip occupies a small footprint, which could be a real blessing in densely cabled racks.

In use

One of the "QC" checks I like to use in evaluating new racks is done with a carpenter's framing square. If the corners of the equipment opening are not square, the rack wasn't put together too well, or it took a hit in handling and shipping.

I put my trusty Stanley square to work in checking all four front corner openings, and the APWMayville passed with flying colors. While the corners weren't perfectly square, the error was so small that you'd never detect it without careful measurement.

Earlier, I mentioned the two rail styles used by rack makers, and that there are drawbacks associated with each. The APWMayville rack is equipped with drilled and tapped rails. While these are handy in the sense that you're not dealing with push-in clips, there can be a time-consuming problem associated with them. This stems from a poor job of cutting threads when the holes were tapped, or from subsequent painting operations that clogged the threads.

I decided to "test" the rack by installing some 19-inch gear received for review. Based on experience, I was not really looking forward to this, as I no longer have ready access to a tap and die set. In my former life, a tap wrench was a necessary part of dealing with new threaded-rail racks.

I was quite surprised to find out that one of the 10-32 bolts supplied with the rack went easily into the first hole I tried. Thinking this was a fluke or that the hole somehow had been previously cleared for installation of a shipping brace, I tried another. It went in just as easily. I tried five or six more of the tapped rail holes. Easy as pie. No stripped bolts. No excessive force needed. No slipped screwdrivers. No cursing. Good job, APWMayville.

Just for the fun of it, I tried mounting the unit in different locations within the rack — top, bottom and middle. There was plenty of side-to-side clearance in each position. Have you ever had to work with a rack that came with rails so "sprung" that you needed a house jack to push them apart sufficiently to fit in the gear you were racking? Again, nice job.

The unit sent for evaluation was equipped with rear rails, but none of the equipment available for racking here needed any rear support. However, just to see what I was up against, I decided to find out what was involved in relocating the rails.

Adjusting the rear rail position can be something of an ordeal. With other racks I have known, this can amount to unbolting and removing side panels, unbolting rails, relocating multiple sets of clip nuts, re-mounting the rails and then putting the sides back on. APWMayville has made rear rail relocation so easy, that it can be accomplished in less than five minutes.

The rails are secured to the horizontal frame members by four 3/8-inch head bolts. They screw into fairly large flat bolts that ride in special slots in the frame members. Changing position is as simple as loosening the four bolts, sliding the rail forward or backward and then retightening the bolts. Incredibly easy; you don't even need to break out the ruler or tape measure. The horizontal members are supplied with a series of reference marks (1/16-inch holes) spaced at 1-inch intervals to ensure that the rails are straight up and down and also lined up at the same distance from the front or rear.

The rack reviewed was 36 inches deep, with correspondingly wide and massive side panels. Someone at APWMayville must have had experience in removing and putting on side panels, perhaps without the benefit of steel-toed boots. Anyone who has had to jockey side panels off and on eventually learns what I'm describing the hard way. The panels are equipped with a couple of recessed grips. This is a godsend for lowering and raising the panels. No more smashed toes because you lost your grip. And if the rack is on casters, as this one was, the handholds make it easy to move around without bear-hugging.

A back door is a nice feature in a rack that's going in a location where more than the front side is visible. That is, if the door fits properly. The review rack was equipped with an optional lockable rear door that included a total of six keys. I'm guessing that you'd have to work hard to lose all of them.

The door fits the frame nicely with clearance on all sides — no binding. However, the key latching assembly could use help. It's very small for a door size it's used with. The latch is only about 5/8-inch at its smallest point and a little over an inch at the largest. The mechanism is surrounded by a smooth plastic "ring" that tapers away from the rack.

In short, it's not that easy to turn, as there's only room for a couple of fingers. I had to fumble with it a bit before I could get it to open. This may be a little trivial, but I'd be happier with a larger latch handle. I grew up with racks having car door-sized latches or big rings to turn.

The rack is constructed with multiple horizontal braces — a total of seven in the 70-inch model reviewed. This unit is going to hold its shape.

Summary

Other than the peanut-sized latch handle, I can find no fault with the rack. The shipping materials were well engineered. The rack is built solidly and finished to perfection. The fabrication was done in an exacting manner, with nothing left to guesswork.

I really like the RU side label strips on the front rails and I'm also impressed with the nice job of tapping and cleaning threads in the rail boltholes. The design of the rear rail system is second to none. Being able to relocate rear rails without having to remove and reinstall hardware is a real timesaver. I'm also impressed that someone took the time to do drawings and put together the first real rack instruction book that I've encountered. All in all, I was well pleased and would recommend the product to anyone needing a quality rack.

James E. O'Neal is technology editor for TV Technology; he has more than 36 years experience in broadcast engineering. Contact him at joneal@imaspub.com.

World Radio History

PRODUCT EVALUATION

NoiseFree Plug-In Quiets Broadband Noise

Algorithmix NoiseFree, ScratchFree Plug-Ins Eliminate Pops, Clicks and Other Impulsive Noise

by Read G. Burgan

Occasionally during the early 1970s, AT&T would forget to switch our NPR line to the Texaco Metropolitan Opera line on Saturday afternoons. At the last minute I would call AT&T long lines and end up patching the Metropolitan Opera directly from a phone to our audio console. Quality? A tin can and waxed string couldn't have sounded much worse.

By the end of the '70s, the Met Opera and almost everything else were coming by satellite in stereo. Improvement? Like going from the Stone Age to the Nuclear Age in 60 seconds or less.

In the decades that have followed, ever-improving quality has become the watchword for both AM and FM broadcasters. Digital audio restoration software and hardware have been some of the means of achieving higher-quality sound.

Product Capsule:

Algorithmix ScratchFree/NoiseFree Digital Audio Restoration Plug-Ins

Thumbs Up

- ✓ Plug-ins share an easy GUI
- ✓ ScratchFree has several modes
- ✓ NoiseFree obtains a noise print from a noise sample
- ✓ NoiseFree's Ambience and Decorrelation controls
- ✓ NoiseFree Chase mode
- ✓ Plug-ins handle variety of sample/bit rates up to 384 kHz
- ✓ Low CPU load enables real-time previewing, processing

Thumbs Down

- ✓ DirectX version requires use of clunky proprietary 'shell'
- ✓ ScratchFree VST version has minor problems (won't retain settings)

PRICE: $1,999 each

CONTACT: *Algorithmix distributor Synthax in Ohio at (330) 259.0308 or visit* www.synthax.com *or* www.algorithmix.com.

Over the past 11 years, I have reviewed many digital audio restoration software packages. During that time, they have improved considerably. Despite incremental improvements, I rarely find a new package that causes me to replace the software tools I have been using. Until recently.

Algorithmix offers two digital audio restoration plug-ins for Windows-compatible audio editors. Algorithmix is a German-based company that licenses its algorithms to other companies. For example, Waves Ltd. licensed some of Algorithmix's algorithms for its original noise reduction package.

ScratchFree and NoiseFree are available as DirectX or VST plug-ins. There are differences in the DirectX and VST versions. More about that later. ScratchFree is designed to eliminate pops, clicks and other impulsive noise; NoiseFree is designed to eliminate broadband noise.

The difference

The quality of the algorithms sets these plug-ins apart from others. In head-to-head comparisons with other digital audio restoration software I regularly use, the Agorithmix plug-ins produced consistently superior sounding restorations.

For example, one of the problems that plagues almost all impulsive noise filters is a tendency to modulate certain kinds of sound. The particular conditions that evoke that problem can vary from plug-in to plug-in, but it tends to rear its ugly head if you do enough restoration work.

After many months of using ScratchFree, I have yet to find that problem. Instead, even when restoring recordings with very high levels of pop and crackle, the resulting sound is clean and without the modulation effect that can characterize so many other impulsive noise filters.

The graphical user interface (GUI) for both ScratchFree and NoiseFree contains a window that displays a portion of the sound and the effect the particular plug-in is having on it. In ScratchFree, the window is called the "signal scope" and displays approximately 20 seconds of the signal in a spectrum analyzer mode. In NoiseFree the window is called the Analyzer, and the signal is represented in a typical time/amplitude mode with the input signal displayed in red, the output signal displayed in green and the noise profile displayed in white.

In each case, these windows are essential accessories that allow you to see graphically and tangibly how the various adjustments are affecting the program material. I find the graphical displays essential as I can see precisely how the various parameters are affecting the sound.

Slider controls

Both GUIs have a similar appearance with similar controls that help to expedite the learning process. NoiseFree has three primary slider controls on the left-hand side of the GUI: Threshold, Ratio and Ambience.

Based on my experience with other broadband noise reduction software, I expected that the Threshold control

See ALGORITHMIX, page 32 ▶

WorldNet Oslo makes your STL the strongest link in your digital audio air chain

MAKE YOUR
THE STRONGEST LINK

For all your studio to transmitter and studio networking needs, look to the WorldNet Oslo from APT.

A powerful and reliable solution designed for multiple channel audio transport, the WorldNet Oslo delivers up to 28 mono or 14 stereo channels over a single T1, E1 or IP link.

The unit's extensive feature set includes redundant power supplies, back-up transport cards, auxiliary data capability and a wide selection of audio modules offering analog, digital, duplex, simplex and 5.1 phase-lock options.

As well as uncompressed linear audio and J.57 companding, WorldNet Oslo also supports 16 or 24-bit Enhanced apt-X® offering cascade-resilient, near-lossless audio quality with under 2ms delay.

All settings can be managed remotely using the Codec Management System; a powerful graphical user interface providing extensive configuration, control and fault monitoring capability across multiple WorldNet Oslo systems.

Highly intuitive user-friendly interface with VU meters and programmable fault monitoring, all via IP or T1 / E1.

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Algorithmix

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would determine at what amplitude the noise reduction would kick in, and that the Ratio control would determine how much noise would be removed. Under that scenario, you should be able to move the Threshold control all the way up, and as long as the Ratio control is all the way down, there should be no noise reduction.

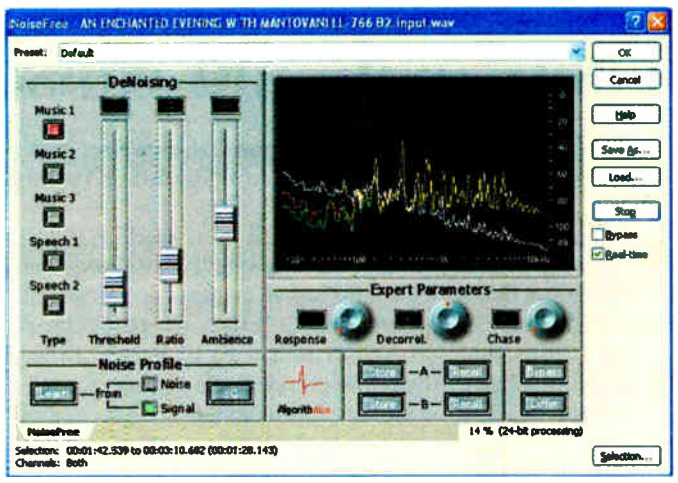
That is not the way it works. This is part of what makes this software different. While the Threshold and Ratio controls do interact, they don't interact in the usual way. Alogorithmix says its Ratio control is similar to an "expander ratio."

In practice, raising only the Threshold control will remove noise. Moving the Ratio control upwards will increase the noise reduction, but the higher you raise it, the more it has the potential to adversely affect the sound until you reach a point where the artifacts may become objectionable.

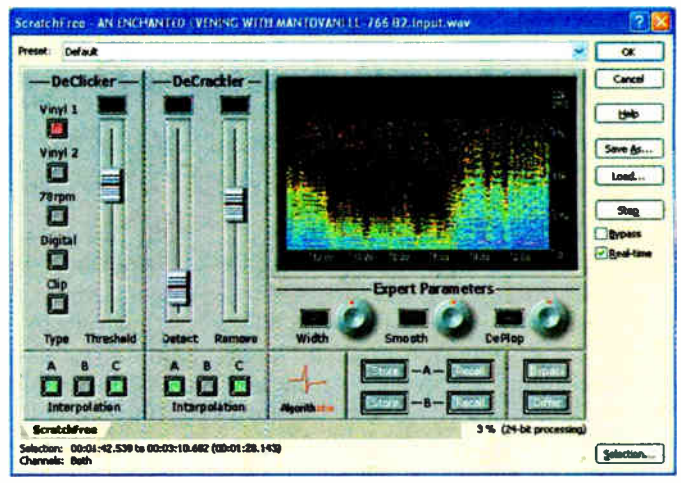
The third slider is called Ambience. As its name implies, it is designed to preserve the ambience of the original sound. The higher you raise this slider, the more ambiance is restored. Depending on the degree of noise and the type of material, you also may add noise back into the output signal.

Removing broadband noise using NoiseFree requires a balancing act between the Threshold, Ratio and Ambience controls. This may sound complicated, but it isn't. In fact, after a very short period of time, I found that adjusting these controls was intuitive.

More to the point, the quality of the sound I was hearing was superior to anything I could achieve using the other broadband noise reduction software I regularly used. The sound I was hearing was more open with much more detail than anything I had been able to achieve in the past. To prove this, I ran several weeks of tests between the older software and NoiseFree and consistently achieved a higher quality sound from NoiseFree than I could from the other broadband noise reduction software I had been using.



NoiseFree



ScratchFree

NoiseFree provides three ways to create the traditional noise print that determines what noise will be removed. You can create a "learned" noise print by selecting a small portion from the sound file that contains just noise, as with most traditional noise reduction software. For example, the silent portion between cuts on a phonograph record.

Creating the noise print

You also can create a noise print from the sound itself. By clicking that option, playing the sound file and clicking "learn," the software will extract a noise print from the sound itself. The longer you allow for the learn process, the more effective the derived noise print.

How well does this option work? That depends. I found that when I used a sound file that contained just a person speaking, it was able to create a noise print fairly close to what I could obtain via the traditional method of using a small portion of the sound file containing only noise. In some cases the noise print was superior, as it was able to find additional noise that might not be found by selecting an isolated sample of noise.

With music, the derived noise print tended to be more complex than it would have been if extracted from a small sample of noise. Because of this, at a given setting of the noise reduction controls, the resulting noise reduction could be a bit more aggressive than it would have been with a traditional noise print.

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This can actually be an advantage on recordings where the broadband noise is not constant, as it enables the software to do a better job of noise reduction. Even when the slightly more aggressive noise reduction wasn't desired, it could be tempered by simply backing off the noise controls a bit to compensate for the more aggressive noise print. I found that in situations involving only a moderate amount of broadband noise, the option of creating the noise print from the sound itself was a real time-saver.

In addition, there is a third way to create a noise profile. NoiseFree has a button marked EQ. Alogrithmix calls this the Noise Profile EQ. When you click on the EQ button, it opens an entirely new screen that represents the noise profile in a five-band equalizer format.

This can be used to manually adjust the parameters of an existing noise print that you have already created. Or by clicking on the "white" button, you can create a straight-line representation of white noise. Starting with this straight line and using the five-band equalizer controls, you can readily create a custom noise print of your own.

If you want to save a noise print, the Noise Profile EQ window is where you will save it and/or recall other noise profiles you have created. It took me a while to get used to this; I would have expected to do this in the main window.

NoiseFree also contains a row of five buttons that adapt the software according to the type of material you are working with. There are three buttons for music and two for speech.

Fine-tuning the process

These adjust the resolution and some other internal parameters. While Algorithmix doesn't spell out exactly how these parameters vary, judging by the change in the appearance of the noise print and the sound, I would expect that it is changing the FFT settings and possibly the degree of window overlap.

For most purposes, I found that the Music 1 setting worked well. I did experiment with the other settings but usually came back to that setting. That probably reflects the similarity in the kinds of material I work with.

NoiseFree also has what Alogrithmix calls "Expert Parameters." The Decorrelaton control can be used to help recover the transients that can be lost when the noise reduction is run aggressively. Its affect on the material is similar and complementary to the Ambience control.

The Response control affects the dynamic behavior of the de-noising process. It appears to adjust the attack and release times of the algorithm. The setting of this control, too, can help protect transients. At the same time, it also can allow some noise to slip in and out between words.

Even when restoring recordings with high levels of pop and crackle, ScratchFree's resulting sound is without the modulation effect of other impulsive noise filters.

The Chase control is an interesting parameter. When it is turned on, it essentially monitors the ongoing signal and adjusts the noise print as it perceives changes in the noise.

The higher you turn the control, the more rapidly it adjusts to the perceived changes in the noise print. I say "perceived" noise changes, because I am not altogether convinced that the algorithm is reading only changes in the noise.

With music material, I found that the resulting noise print was generally too aggressive and that it seemed to be based more on the music than on any actual changes in the noise.

With speech, the Chase feature worked better. I believe that for forensic applications where one is primarily concerned with intelligibility and some artifacts are acceptable, the Chase feature could be helpful.

Removing pops and clicks

ScratchFree removes pops, clicks and scratches through a two-fold process. The DeClicker algorithm removes larger pops and clicks. It has a single Threshold slider control. The higher you raise the Threshold control, the more pops and clicks are removed.

Selecting one of five buttons determines the kinds of pops and clicks that are removed. The first two are designed to deal with the kinds of impulsive noise found on vinyl records, while the third button is optimized for removing noise from 78 rpm records.

The fourth button is designed to remove noise created by digital sources, and button five is devoted to analog material that has experienced clipping due to excessive levels.

In addition, ScratchFree has three Interpolation buttons that select algo-

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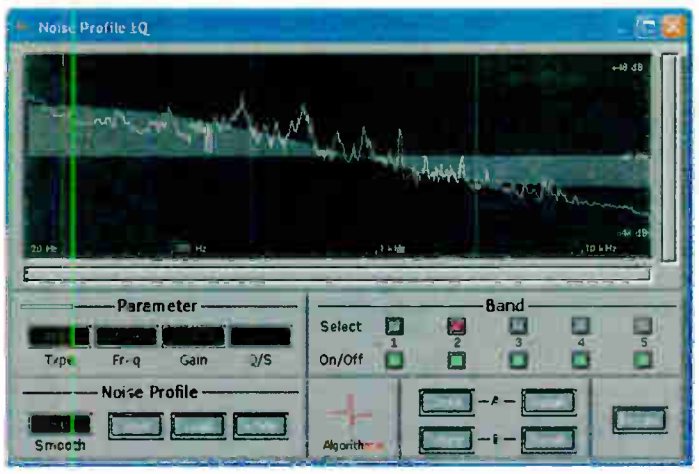


Noise Profile EQ

rithms devoted to specific kinds of impulsive noise: A is for vinyl, B is for digital and C is for 78 rpm material. Any or all of the Interpolation settings can be selected and at any given time at least one will be in effect.

For experts only

Additionally ScratchFree has three "Expert Parameters" that fine-tune the DeClicker part of the processing. "Width" affects how wide a click will be affected. I found that the higher the Width control is set, the more likely the DeClicker might produce artifacts at a given setting.

Essentially there is a trade-off. If you need to remove very wide clicks, then you may have to reduce the Threshold setting of the DeClicker to prevent artifacts. Reducing the threshold setting may allow some smaller clicks to sneak through the DeClicker. One way around this is to first remove the wide clicks, and then rerun ScratchFree with the width parameter set lower and the Threshold set higher to catch the remaining clicks that slipped through the first time.

The second Expert Parameter is "Smooth." In some applications, removing impulsive noise also can adversely impact the brilliance of a recording. The Smooth control is designed to adjust for this. It can help to restore lost brilliance.

DePlop is the final Expert Parameter. It is designed to deal with subsonic artifacts that can be created by the click removal process. Essentially the control determines detection range of the DePlop algorithm.

What about crackle?

To remove any remaining small clicks and crackles, ScratchFree has a second process called DeCrackler. DeCrackler has two sliders: Detect and Remove. Detect adjusts the width of the frequency range that will be affected by DeCrackler, and Remove determines the amount of crackles that will be removed.

The higher you move each of the two sliders, the more crackle will be reduced. Moving them too high can adversely affect the brilliance and/or clarity of the material. Both NoiseFree and ScratchFree have a "Differ" button that allows you to hear what each plug-in is removing.

I found that ScratchFree was able to remove as much noise as other similar software that I regularly use, but it did so without creating the artifacts that plague most impulsive noise reduction software. In my experience, ScratchFree successfully removed large amounts of impulsive noise while leaving the resulting sound clean and crisp.

Together, NoiseFree and ScratchFree provide a very high quality of digital restoration. The software is easy to learn and apply and the user manuals provide good explanation and documentation.

A couple of caveats

First, the software comes in two forms: DirectX and VST. The DirectX uses a proprietary interface into which you can load up to five different Algorithmix Pro-PlugIns. I found the PlugIn Center cumbersome to use.

The PlugIn Center allows only one use of any particular plug-in, so you cannot chain together two or more copies of ScratchFree, for example. With some audio editors, I found that I could not successfully chain together two or more copies of the PlugIn Center itself, which would have allowed me to effectively chain together multiple copies of the same plug-in.

The VST version works in the conventional manner. That is, each plug-in can be separately loaded and used independently.

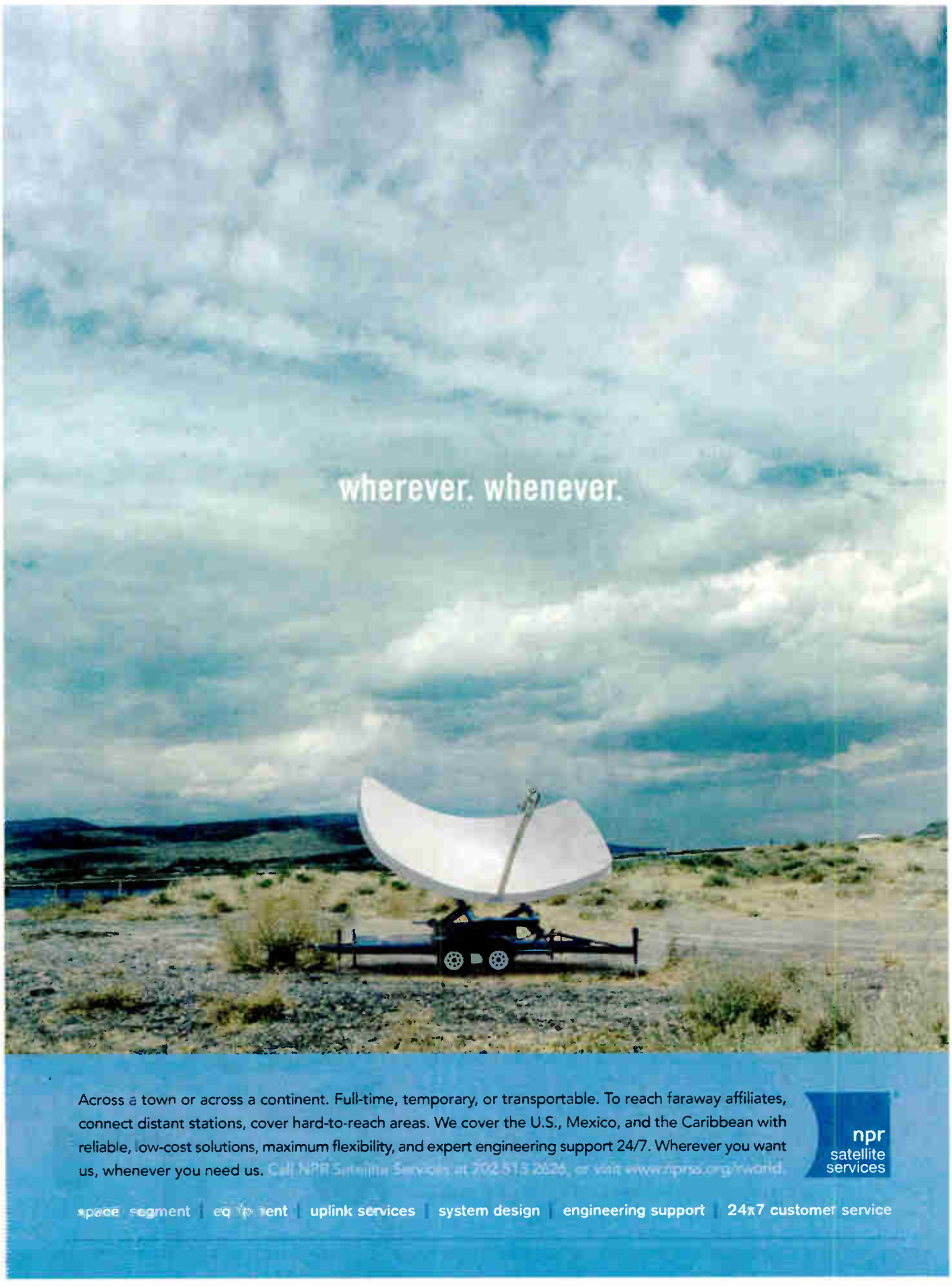
However, I found that when I used a third-party VST wrapper to convert the VST versions to DirectX to use with audio editors that don't support VST, I had some problems with ScratchFree.

With one audio editor, ScratchFree wouldn't retain its settings when the program was closed and reopened. In another, ScratchFree would crash the program if I tried to chain two or more copies together.

These are relatively minor problems. Because of the high-quality sound produced by the plug-ins, I am more than willing to put up with a slight inconvenience.

In summary, I have adopted Algorithmix's NoiseFree and ScratchFree for almost all of my digital audio restoration work. In most cases the quality of restoration is superior to other software I have used to date.

Read Burgan is a freelance writer and former public radio station manager specializing in digital audio restoration. Reach him at (906) 296-0652 or via e-mail at rgb@chartermi.net.



World Radio History

USER REPORT

AEQ Eases Load for Roving Reporters

PAW-120 Offers Journalists Easy-Start Recording, XLR Mic Cable, Various Outputs, Color Display

by Herbert Sedation
Radio Freelance Reporter

MOTCOMBE, England My first impression of the AEQ PAW-120 was that it looked and felt very much like a cellphone, but less plastic-like and made of aluminum. This is a handheld device that fits neatly in one's pocket or bag, which means that it can be carried all the time — not just when you specifically go out reporting.

Two AA batteries power the recorder. I have made these last around eight hours; you can use rechargeables but the PAW-120 will not charge them internally. At first, the 512 MB internal recording memory the unit comes with doesn't seem like much, but this equates to 100 minutes mono linear recording.

This device is more suitable for field reporting than location recording, so using the various MP2 or MP3 options means this maximum recording time can be increased significantly, especially when using some of the speech recording options. I found that the optimal 128 kbps MP3 setting gives a more than adequate nine hours recording time — certainly longer than on a MiniDisc. Linear recordings, although excellent in audio quality, take longer to download to the PC using the USB connection.

Unlike many similar recorders, the unit has mic-in, line-in, line-out and headphone outputs, all on 3.5 mm mini-jack sockets. Supplied with the unit is an XLR mic cable, which terminates on a special latching connector with two jacks, meaning users don't need to worry about a loose connection or the plug being pulled out during recording.

First on the scene

There also is an internal microphone. Initially I thought I would never use this, but when I needed to start a recording quickly without having my mic handy, I was surprised with the quality. Although you do get handling noise, it is not as bad as you would expect and the quality using the built-in AGC was more than sufficient for broadcast. The voice-activated recording also was easy to use and ideal for when you have to leave the PAW-120 recording on the table before a press conference starts.

It is fairly easy to set up templates for recording, depending upon where the audio is destined. You can easily set the filenames — including extension, which is useful when transferring into that quirky DAW at the studio — and various sample rates, including 32, 44.1 and 48 kHz; and the audio format including

PCM linear, MP2 and MP3 in both raw and BWF formats. You also choose either mono or stereo.

There also are a number of templates, depending upon which input you are using. You can set the default gain, boost and even 5 V phantom power, but I only used a dynamic external microphone, which worked very well.

The unit appears as a USB device on either Mac or PC using the supplied cable, although I would have preferred to see it as a faster USB-2 device. However downloading is no slower than other comparable units in the market. Indeed, you don't need to plug in the supplied external PSU in order to connect to your computer.

No card

Some may say that only having internal memory with no removable media card is a drawback. However having tried other units that do, they all seem to be more reliable in transferring audio via USB rather than a card reader. This therefore does not impact on the AEQ PAW-120's lack of removable memory card.

The dual color display is excellent and easy to see, even in bright sunlight. Although the buttons and their functions don't appear at first to be logical, I soon got used to them. The display shows clear VU meters and an indication status of key parameters like duration, battery status, input and gain. The speaker does not produce much volume, but it is ideal for checking and reviewing recordings by holding the unit to your ear like a cell phone if you don't have your earphones (also supplied) handy.

The PAW-120 also has a basic waveform editor. This only works on linear files but enables simple clipping and edit lists. Good for playing in-clips "down-the-line," it's a bit fiddly at first. You soon get used to the functionality.

I used the PAW-120 on a number of reporting assignments. One of the best features was being able to simply slide up the recording button to start recording; no complicated menus to navigate to get that vital audio clip. It also was handy to have a physical slider button to enable or disable the AGC; this was particularly useful in noisy environments such as a busy exhibition or trade show. The record levels can be manually adjusted easily (but not with the internal mic). And it was useful to lay down markers during the recording.

The PAW-120 does what it says it does. It's a handheld recorder full of features and is suitable for reporting and longer interviews. I have found it to be reliable, but more important, I haven't lost an important recording, as I always seem to do on other recorders.

For more information, contact AEQ in Florida at (800) 728-0536 or visit www.aeqbroadcast.com.

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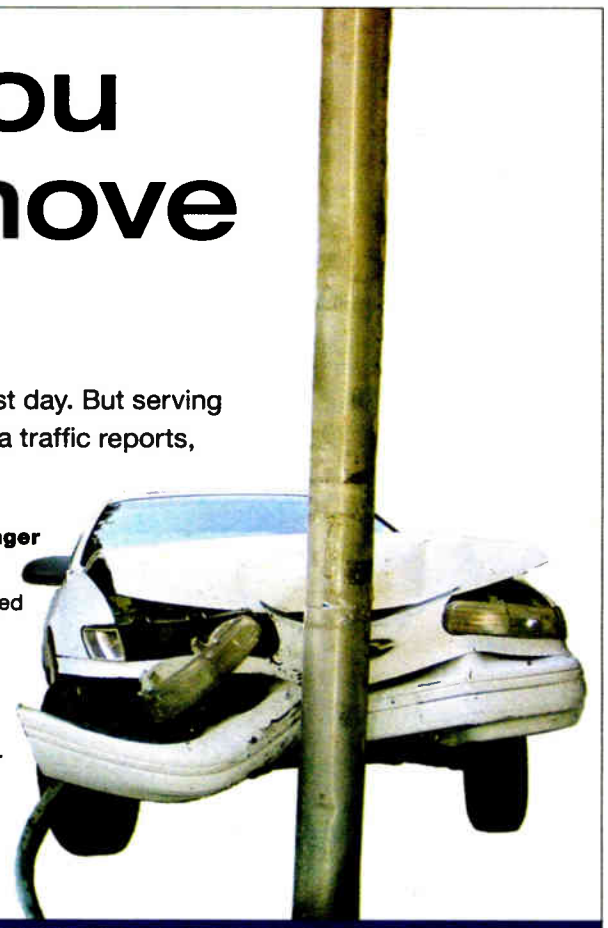

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TECH UPDATES

Olympus Debuts DS-Series

Olympus offers three digital audio devices that can be used to capture audio or listen to podcasts. Software included with the DS-30, DS-40 and DS-50 eases the downloading of audio content, such as podcasts, from a Web site. Memory from 256MB (DS-30) to 512 MB (DS-40) to 1 GB (DS-50) enables recording times ranging up to 275 hours.

MP3 and WMA files can be downloaded and played back on the devices. PC Link allows the recorders to connect

Olympus DS-50

to a PC via the included USB cable for downloading of audio files to and from a computer.

The company says the XSHQ Remarkable Stereo Sound Quality mode enables the devices to record and play audio content up to 44.1 kHz, which it says is equal to the sound quality of most CDs. The devices also offer microphones that can detach from their bodies, allowing interviewers to clip the DS-Series' microphone onto a shirt or tie and record in high fidelity at the flip of a switch.

Olympus says users of the DS-Series digital recorders will appreciate the control provided by the variable speed playback settings. After capture, the slow playback option allows recordings to be listened to with playback that is up to 50 percent slower that real time, and fast playback that is up to 50 percent faster than real time. Slow playback helps to eliminate the need for users to listen to the same recording multiple times to hear what was said, and with fast playback they can skip ahead to important sections when transcribing dictation.

When the voice confirmation is turned on, users can easily navigate the folders and various setup options, which enables visually challenged users to move through the device's menus, folders and setup options.

The DS-Series of recorders are currently available.

For more information, contact Olympus America at (800) 622-6372 or visit www.olympusamerica.com.

Sound Devices 702 Records, Plays to CF

The two-channel 702 from **Sound Devices** is a file-based digital audio recorder that records to, and plays back audio from, removable Compact Flash cards. It writes and reads uncompressed PCM audio at 16 or 24 bits with sampling rates between 32 kHz and 192 kHz. Compressed (MP3) audio playback also is supported.

The 702's audio path includes Sound Devices microphone preamps with phantom power, limiters and high-pass filters. The company says the preamps are designed for high-bandwidth digital recording at high bit rates. Other key features include sunlight-viewable LED level metering.

The removable rechargeable battery is a Sony-compatible Li-ion camcorder cell. The Compact Flash card appears as a removable storage device when connected via the FireWire port to Windows or Mac OS computers. Additional highlights include AES3 (XLR) or AES3id (unbalanced AES on BNC) digital inputs and AES3id outputs.

For more information, contact Sound Devices in Wisconsin at (608) 524-0625 or visit www.sounddevices.com.

Meet The New Innkeepers
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We've refined our innkeeper 1(x) line, gussied it up, gave it some great new features, expanded its family AND lowered the cost!

Why take a successful line like the innkeeper 1 and change it? Because we knew we could make it better AND lower your cost!

For starters, we've combined the features of the innkeeper 1 and the innkeeper 1x into a single hybrid that's more than the sum of its parts. As with the original, the new **innkeeper 1x** is a full-featured phone line interface which uses a proprietary dual-convergence echo canceller algorithm. It's designed to achieve excellent separation without any setup, and without sending a noise burst down the line. Plus, we've added an RS-232 connector for remote control applications and made them globally-compliant.

For remote control, we've now got t

The **Guest Module 1** gives you remote access to the on-hook/ off-hook and dial features of the innkeeper 1x series digital hybrids, using an 8 pin RJ45 modular cable.

The **RIU-IP** interface contains a web server which allows you to send and receive control data through your web browser. It can be connected to your computer NIC card for direct control, to a switch or hub for network control, or to an ethernet port with internet access for control from anywhere in the world.

Innkeeper 1x is more than a facelift. More than an upgraded feature set. It's a comprehensive, streamlined hybrid environment that gives you the tools you need to control it from anywhere. Visit us on the web or give us a call to learn more about innkeeper 1x.

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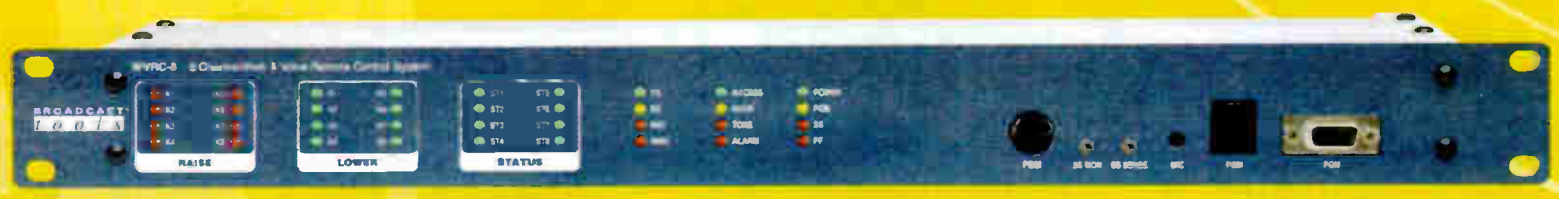
Remote Control



WVRC-8 8 Channel Web & Voice Remote Control System

The WVRC-8 provides a cost-effective, one rack-unit solution for web based and/or recordable voice response dial-up transmitter site control. The WVRC-8 was designed from a users point of view, so all of the basic functionality you need is included to control your site equipment, while including the accessories other manufacturers consider optional. Each analog, status, silence sensor and power failure input can be configured to email up to four individual email addresses, allowing different input alarms to be routed to different email recipients. The WVRC-8 is equipped with a browser based 100-event program scheduler for relay control and alarm muting, along with an 8192 event alarm logger. The user can also elect a sound effect to play when an out of tolerance alarm is generated. We have also provided SNMP capabilities to allow multiple units to be monitored with any SNMP manager software package. The WVRC-8 is equipped with eight high-resolution analog (telemetry) channels, while each of the eight optically isolated status channels may be configured for 5 to 24vdc wet or dry (contact closures) status monitoring. The eight control channels are equipped with independent SPST one-amp relays for each raise/on and lower/off function. These relays may be latched, unlatched or momentarily closed. The WVRC-8 is supplied with spoken words and phases in English, while the user is free to record words and phases in their language. In addition, the WVRC-8 may be programmed for dial-up operation via HyperTerminal, while the Java applet programming can be performed using your favorite web browser. System expansion may be accomplished by cascading multiple WVRC-8's on the same telephone line and/or Ethernet switch. Future external add-on products may be attached via the BT-Link expansion port.

WRC-4 Web Based Remote Control

The tiny TOOLS WRC-4 is a fresh approach to remote site monitoring and control or providing an inexpensive solution to Internet enabling your present remote control system. The WRC-4, combined with web access and your favorite web browser, brings you the following features, all available in this small, but powerful tiny TOOL: A powerful built-in web-server with non-volatile memory; 10/100baseT Ethernet port; four channels each of high resolution telemetry inputs with a large monitoring range; optically-isolated status (contact closures or external voltages) inputs; normally open dry one amp relays; open collector outputs; front panel status indicators, a single front panel temperature sensor and 4-email notification addresses. The WRC-4 is also SNMP enabled. The WRC-4 has been carefully RFI proofed, while including the accessories other manufacturers consider optional. The WRC-4 is supplied with plug-in euroblock screw terminals and loaded with a generic web page that may be edited by the end user. The WRC-4 works with either dynamic or static IP addresses (when used with a dynamic IP, an inexpensive cable or DSL router may be required). Multiple WRC-4s may be used with a user provided Ethernet hub. The WRC-4 may be set on a desktop, mounted on a wall or up to four units mounted on the RA-1, Rack-Able mounting shelf.

VAD-2 Voice/Pager Auto Dialer with Silence Sensor

The tiny TOOLS VAD-2 is a user programmable two-input with integrated stereo silence sensor, multi-number voice/pager auto dialer, designed for dial out voice message notification. The VAD-2 has two dry contact inputs and stereo silence sensor, which, when tripped, will sequentially dial up to four different phone numbers and play back a user recorded message corresponding to the tripped input. The VAD-2 is also equipped with two SPST one amp relays for the control of external equipment. The VAD-2 can store up to four 32 digit phone numbers and one 32 digit pager phone number which may be associated with any of the two inputs and/or stereo silence sensor. The VAD-2 is capable of remote or local configuration and message recording with a total recording time of 16 seconds. The two SPST relays may be programmed for momentary, latching or tone duration operation. The VAD-2 may be set on a desktop, mounted on a wall or up to four units mountec on the RA-1, Rack-Able mounting shelf.

AVR-8 Voice Remote Control

The AVR-8 is a voice remote control system that automatically reports changes detected on any of its eight digital inputs to a remote telephone and/or pager. After speaking a greeting message that may identify the source of the call, the AVR-8 then speaks a unique message for each input change. Each message comes factory programmed, but may easily be re-recorded with your own customized messages. After reporting, the AVR-8 allows you to give it commands through your telephone keypad. Functions include telling the AVR-8 to report on the input state of any of the eight digital inputs, commanding the AVR-8 to pulse any one of its four relays for 750 ms and/or turning any one of the relays on or off. When a relay command is given, the AVR-8 speaks the relay 'name' followed by the 'on' or 'off' message. For instance, commanding relay 4 ON causes the AVR-8 to turn the relay on and then report "Relay 4 ... is on." As with the greeting and input messages, the relay 'name', 'on' and 'off' messages may be re-recorded if desired.

In addition to initiating a call out when inputs change, the AVR-8 monitors its telephone line to receive a call-in from a remote location. When a call is received, the AVR-8 speaks a greeting message, and is then ready to receive and execute commands to report on its inputs, change to its relay outputs or turn on an audio input to the telephone line.

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TECH UPDATES

MZ-M200 Records, Plays in Hi-MD, MD Formats

Sony says its MZ-M200 Hi-MD recorder represents the next generation of MiniDisc technology.

The unit is a suitable recording/playback tool for journalists, offering the ability to record and play in both the Hi-MD and MD formats. It also has larger buttons for basic record and playback operations, and a true overload indicator and manual recording level control.

"Especially important is the audio quality provided by the included ECM-DS70P stereo microphone," said Paul Foschino, senior manager for professional audio in Sony's Broadcast and Production Systems Division.

The MZ-M200 accepts removable 1 GB MiniDiscs for up to 94 minutes of linear PCM uncompressed recording time and up to 34 hours in ATRAC3 Plus format. Hi-MD media enables users to archive original recordings and facilitates data transfer. A USB port for Macintosh and Windows/PC operating system provides connectivity for various pro-recording applications including music, interviews and field recordings. The MZ-M22 also can transfer conventional MD self-recordings to Windows PC via USB.

The Hi-MD MZ-M200 is available at a suggested retail price of $439.95.

To find the nearest Sony dealer or service location, call (800) 686-SONY (7669) or visit www.sony.com/professional.

Edirol R-09 Is Recorder, Microphone

BSW says with the **Edirol** R-09 WAV/MP3 recorder, the world is yours — or at least the world of audio.

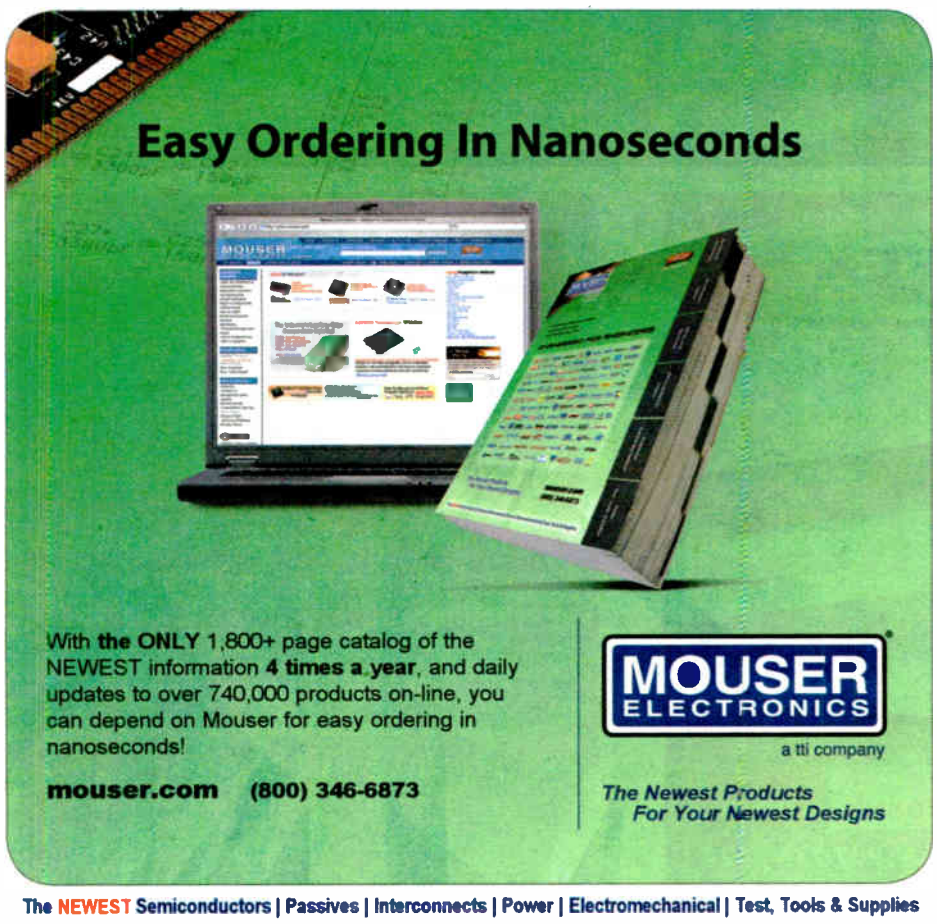
The R-09 offers 24-bit uncompressed recording and a stereo mic, and captures sound at either 44.1 kHz or 48 kHz sample rates. Users can record and playback in MP3 format as well (up to 320 kbps). Recorded files can be monitored through the R-09's headphone jack and/or exported to a computer via USB. The R-09 records to Secure Digital Flash memory cards, which are similar to but a different size than Compact Flash memory cards.

The stereo microphone offers dedicated input control, mono/stereo selector, low-cut filter and gain boost. The R-09 has a 1/8-inch minijack mic input for use with an external microphone. It also comes with a reverb processor for added richness to the playback.

Version 1.10 adds support for the SDHC standard for SD memory cards, allowing for card storage sizes beyond 2 GB.

The Edirol R-09 lists for $450.

For more information, contact Broadcast Supply Worldwide in Washington state at (800) 426-8434 or visit www.bswusa.com.



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Combining a broadcast-quality Flash recorder with a Sennheiser mic capsule, HHB's new FlashMic is perfect for interviewing, journalism and any type of voice recording.

One button press is all it takes to start recording in either linear or MPEG 2 formats. 1GB of built-in memory stores a massive 18 hours/999 tracks of recordings and it's easy and quick to transfer files for editing or onward transmission via FlashMic's built-in USB interface.

Power comes from standard AA batteries and the included FlashMic Manager software makes it easy for individual users or news organizations to configure single or multiple FlashMics for particular applications and file naming protocols.

Available with cardioid or omni capsules, FlashMic is all you need for broadcast-quality recording.

So just pick up a FlashMic and go.

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World Radio History

TECH UPDATES

Zoom H4 Adds Function To Prevent Distortion

The **Zoom** H4 digital recorder from Samson is suitable for recording live performances, interviews and podcasts. It records 24 bit/96 kHz digital audio as well as in MP3 format with bit rates up to 320 kbps.

The latest system version, 1.10, fixed a problem with the encoder software that could cause excessive modulation noise when recording MP3s using 256 kbps or VBR; and added a function for selecting the type of host computer when using the H4 as an audio interface. The company says this helps to prevent waveform distortion when a sound source with little harmonics content, such as a sine wave signal, is input.

The H4 features two electret condenser microphones configured in an X/Y pattern for true stereo recording. It also includes two combination XLR 1/4-inch input jacks with phantom power for use with external microphones. Additionally, the H4 has onboard studio effects such as compression, limiting and mic modeling. A 1/8-inch headphone jack also is provided for monitoring.

The H4 records on to Secure Digital media, and a 128 MB SD card is included with the unit. With a 2 GB SD memory card, the H4 provides up to 380 minutes of recording in 16-bit mode, and 34 hours in MP3 stereo mode. The H4 includes a USB mass-storage interface for moving recordings to a Mac or PC.

The H4 offers four hours of continuous recording operation for two AA batteries. A backlit, 128 x 64 pixel LCD provides the visual interface. An AC adapter, USB cable, windshield cover and tripod adapter are included.

Additional highlights include a four-track recording mode for mobile multitrack recording. The H4 also serves as a USB audio interface for direct recording of instruments and vocals to your computer. The Zoom H-4 retails for $499.

For more information, contact Samson Technologies Corp. in New York at (631) 784-2200 or visit www.samsontech.com.

Fostex Releases Smaller Version of FR2

Fostex debuted its FR-2LE two-channel digital field recorder, the smaller version of its FR2.

The FR-2LE records BWF (stereo or mono) or MP3 files to Type II Compact Flash or microdrive cards, at up to 24 bit/96 kHz resolution. Features include phantom powering, editing functionality and USB 2.0, which allows high-speed transfer to Mac or PC. The company says a pre-record buffer ensures that no vital takes are missed.

The company says in order to eliminate overwriting, one take equals one file system. Additional highlights include backlit display, auto file closing to save recording data and a wired remote controller supplied as standard. Approximate eight-hour operation possible with Tamiya RC3600HV, Ni-MH battery.

Visit *www.fostexdvd.net* for FR-2 software updates.

For more information, including pricing, contact Fostex America in California at (310) 329-2960 or visit www.fostex.com.

M-Audio Updates Firmware For MicroTrack 24/96

M-Audio has downloadable new firmware for its MicroTrack 24/96 two-channel digital recorder, which records WAV and MP3 files to Compact Flash or microdrives. The company says MicroTrack's ability to record directly to MP3 files and transfer them to the computer means users can e-mail or post recordings to the Web instantly.

Users can record via balanced line inputs or high-fidelity microphone preamps with phantom power for studio-quality mics. Connect MicroTrack to a PC or Mac via USB, and drag and drop recordings to a computer for editing or Web posting. Power derives from a Lithium-ion battery, and the unit can recharge via the computer's USB connection or USB power adapter.

Balanced 1/4-inch TRS line ins ease the taking of a feed directly from a studio or club mixer. S/PDIF input means users can record the output of digital mixers and do transfers from other digital recording/storage devices. Regardless of the recording method, users can monitor via the 1/8-inch stereo headphone jack or RCA line outs.

MicroTrack 24/96 ships with free Mac and PC versions of Audacity editing software. Additionally, the Mac version can be downloaded from the company's Web site.

For more information, including pricing, contact M-Audio in California at (626) 633-9050 or visit www.m-audio.com.

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TECH UPDATES

HHB Has Cardioid Model FlashMic

HHB has expanded the FlashMic range with the debut of the FlashMic DRM85-C, a cardioid version to accompany the original omni-directional DRM85 portable recording microphone.

Both models share the same feature set, which includes 1 GB flash memory for up to 18+ hours recording, USB audio data transfer, a preamplifier with full manual or automatic gain control and an illuminated LCD display. Nine user templates also are included, which can be configured externally using the supplied FlashMic Manager software.

"Some of our broadcast users have been requesting a more directional FlashMic specifically for use in environments in which there are high ambient sound levels, such as press scrums and conflict zones," said Ian Jones, HHB managing director.

HHB also updated the firmware for the original DRM85. Version 4.0 includes a new flash file system, which retains recordings even if the batteries are removed while in Record mode; and the facility to introduce cue points during playback, enabling the user to begin compiling the finished piece once the interview is over.

The company says this process is enhanced by the ability to skip between tracks and markers in playback. Meter decay characteristics are improved and the facility to meter level in both Idle and Play modes is useful when preparing for an interview.

Additional highlights include the ability to transfer MPEG encoded files with either WAV or MP2 extensions. Existing users can upgrade free of charge via the HHB Web site.

For more information, contact HHB's distributor Sennheiser USA in Connecticut at (860) 434-9190 or visit www.sennheiserusa.com.

CDR310 Has Pre-, Background Record Modes

Marantz says its CDR310 portable field recorder frees the user from the constraints of system-based solutions. It features a hard drive; it records 16-bit audio in CD-DA, WAV, AIFF or MP3 file formats and then burns a CD. Highlights include an LCD status screen, one-touch recording and Background Record and Adjustable Pre-Record modes.

The Pre-Record mode is engaged by powering up. The company says this creates a rolling buffer of recorder audio, up to 10 seconds long (user-selectable). Once the event has begun, the Rec-Pause function activates Background Record mode. If there's a break in action, the user hits Pause; if anything important happens it's captured on the CDR310's hard drive.

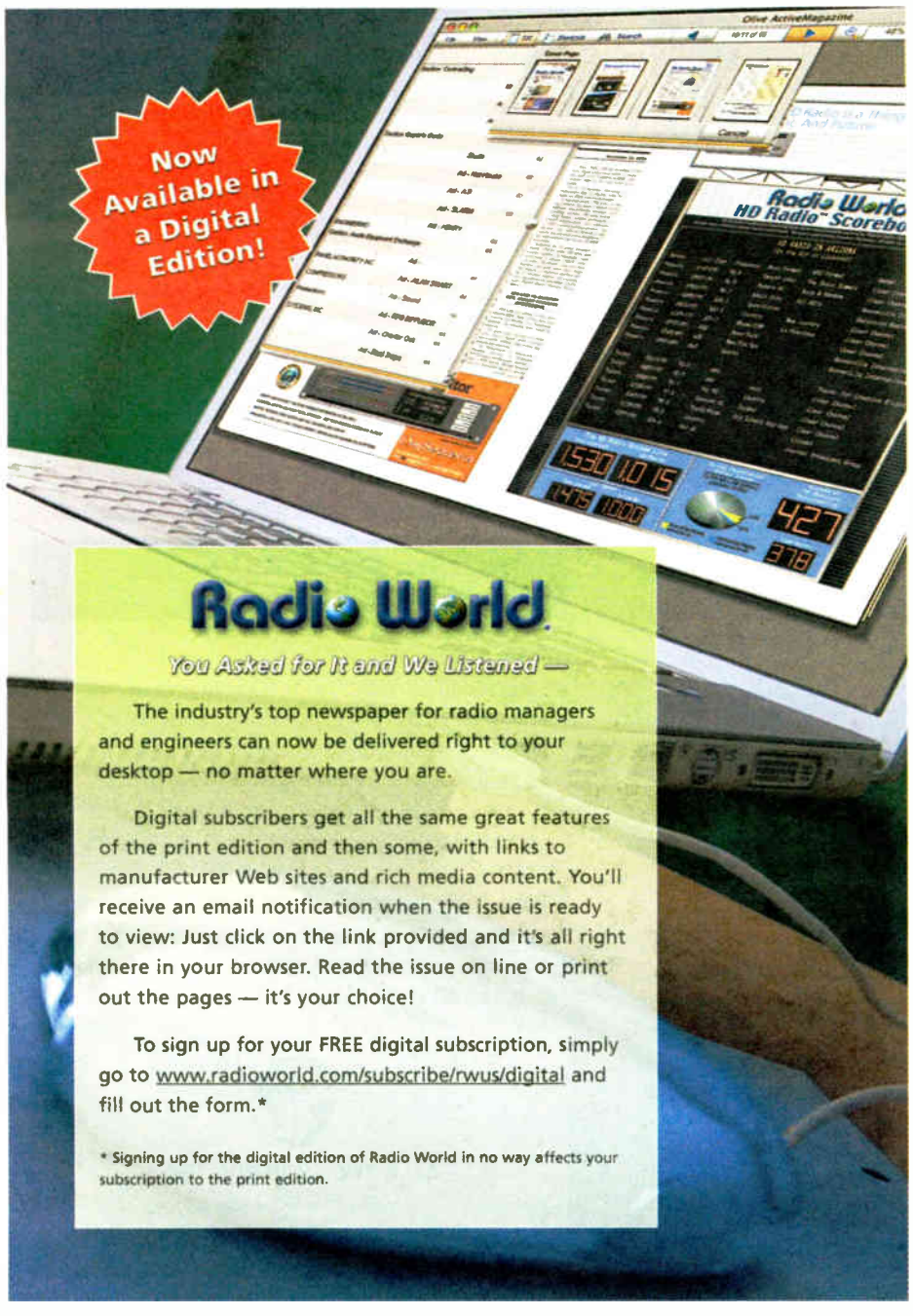
When the event resumes, and the Pause control released, the CDR310 gives the option of deciding whether to keep the audio captured during Background Record. Other modes include Silent Skip and Adjustable Audio Track.

The system records at 44.1 kHz sample rate, and the hard drive holds up to 110 hours of material (MP3 mono). Users select the file type before recording.

At the conclusion of an event recording, the audio file can be burned to the CD immediately. Users press the Make CD button and follow the on-screen prompts. For events more than 80 minutes long in CD-DA format, the CDR310 offers CD Split burning, automatically dividing the contents over multiple discs.

The CDR310 accepts AA alkaline batteries, or optional Ni-Cad and Ni-MH rechargeables. Using the optional RB1651 battery, the CDR310 delivers up to four hours of continuous operation. It retails for $1,049.99.

For more information, contact D&M Professional in Illinois at (630) 741-0330 or visit www.d-mpro.com.



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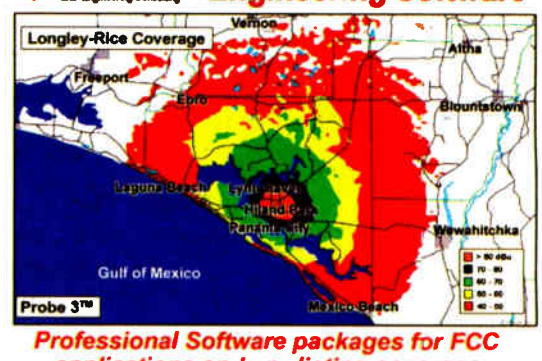

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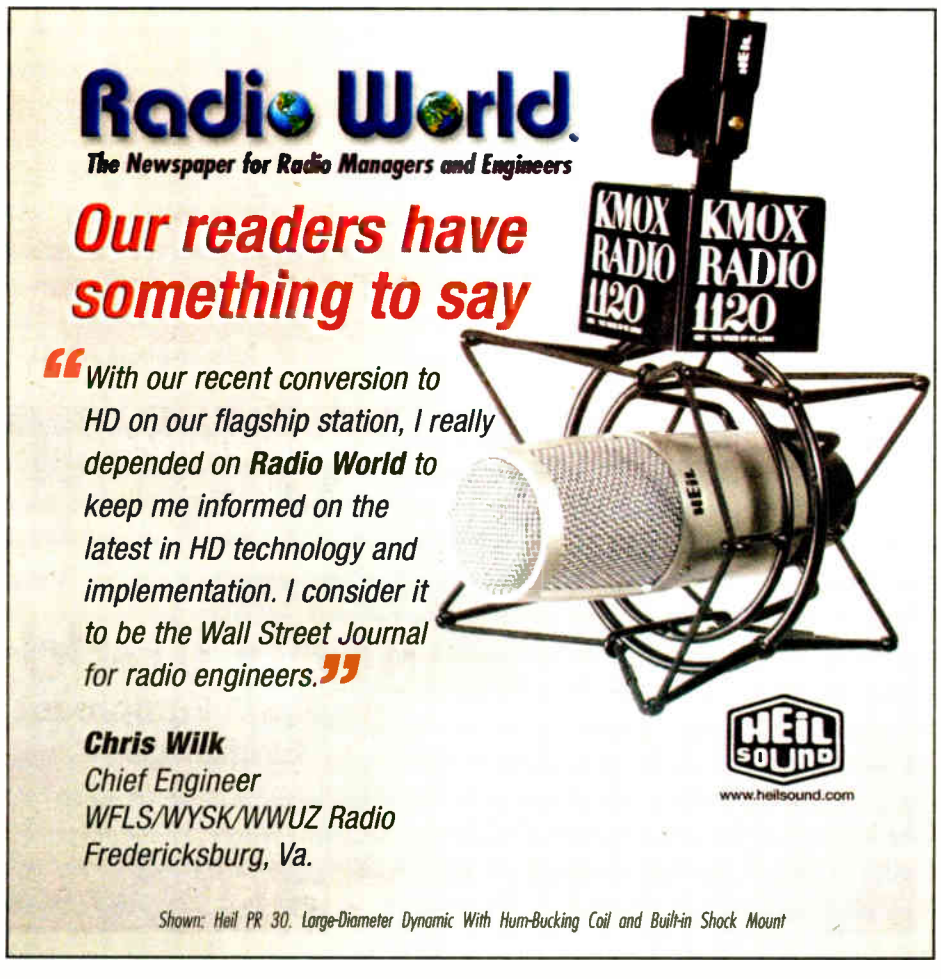

◆READER'S FORUM◆

HD Radio and AM Stereo

I thought it might be worth mentioning that HD Radio receivers based upon the LG Innotek chipset include support for Motorola C-Quam AM stereo. So far the Accurian Tabletop HD Radio and the Sangean HDT-1 HD Radio Component Tuner have been verified to receive C-Quam signals in full stereo.

As Bill Norman of WNMB wrote on The AM Stereo Forum (*http://AMStereo.s5.com*):

"I got an Accurian HD Radio this morning. Took it to the radio station and sat it in the production room. Ran the headphone output to the console and there it was — AM stereo coming out of the speakers. Bear in mind, my transmitter and towers are about a dozen miles from the studios and my production room is full of computers. That said, it was not a bad sound. I am not an HD Radio fan, but I am excited to find any receiver that will decode and play my AM stereo [station]."

C-Quam AM stereo seems to be an undocumented feature of these radios.

— Kevin M. Tekel

C-Quam AM stereo seems to be an undocumented feature of these radios. The manufacturers' literature does not mention it, and the tuner display does not include a stereo indicator for either AM or FM.

Nonetheless, this is good news for the hundreds of stations still transmitting AM stereo, because for the first time in years, their listeners can now walk into any Radio Shack and purchase a radio that will let them hear the station in stereo.

Kevin M. Tekel
Founder
The AM Stereo Web Site
Warren, N.J.

AM Migration: Possible, But Not Likely

Regarding "Rethinking AM's Future" (RW Opinion, Dec. 20), it was sometime in 1993, I think, I filed a PRM with the FCC asking to move the AM operators to new spectrum. Little-used frequencies in the 200 and 300 MHz were suggested. Each station would have been 10 kW — one size fits all. No action was ever taken.

A meeting with NAB executives went nowhere. They weren't interested in improving the AMers' lot at the expense of adding competition to their group owners' AMs and FMs. I coined the phrase "FM-2" (later picked up by another unrelated group) as it would have been frequency modulation — digital had not yet arrived.

Are times changing? Your editorial suggests migration of the AM operators to unused TV channels. It was always possible — possible but not probable. Not only would it improve the AM operator's service to the community, it would also bring in lots of new station applications/auctions and operators to compete for the new available channels not assigned to the existing licensees. It would also create more competition to the new, and inferior FM IBOCs (clearly a desperate, sub-standard reaction to satellite).

Do you really think the NAB and large group operators would entertain allowing this? I know it won't happen. Been there, done that! Remember, Congress is the final word.

In an "amazing" reversal of philosophy, the NAB now wants AMs to use FM translators to enhance night coverage. Or is it really to keep LPFMs from competing with the radio industry? Those translator ideas were suggested long ago in an attempt to "Rethink AM's Future" and were shot down. The AM's translator would be competitive with FM's. What has changed? LPFM, that's what. By the way, was there ever a logical reason why one aural service (FM) can use translators and another (AM) cannot?

When one observes that the FCC can find entire new spectrum for the TV operators and move them, is there any question it could have been done for AM (and FM), and even the hybrid/less-than-perfect FM IBOC? Of course it can and should be done, but the economics of large group owners and new competitors for newly open channels kills that idea. AM's future or any station's future is community service. It works.

The public interest, necessity and convenience are no longer the controlling criteria. One other "small" problem: vacant TV channels will be auctioned and the money spent by Congress. You can't really think the government is going to pass up that kind of money in the interest of its citizenry, can you?

Larry Tighe
Hackettstown, N.J.

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World Radio History

GUEST COMMENTARY

They (Thankfully) Don't Make 'Em Like They Used To

Waxing Nostalgic About Audio Gear of Yore Is Fun, But Today's Is Undeniably More Reliable

by Randy Howard

Fred Krock's article "Turntables and Radio in the 1950s" in the Dec. 20 issue took me back to my entry into radio in 1960. I worked for a station in Waterbury, Vt., WDEV(AM). There we had an assortment gear, ranging from fairly modern (Gates Twinsistor remote mixer and a Gates ST-101) to very *old*, even then.

We had *both* of the RCA turntables mentioned in the article. I think the 70 was the one with the shifter on top of the platter, the 70-A on the edge. These things had quite large motors, mounted in the bottom of the stand-alone cabinets.

The output shafts ran at 78 rpm, and the lever either engaged the whole top end to the shaft, or engaged the center part under the platter to the shaft, and with a set of five ball bearings, caused the platter to turn at 33.33 rpm. When the 45s came along RCA had a lot of engineering to do, as no stations wanted to replace their turntables just to play the newfangled records.

They ended up cutting the main shaft about halfway up and inserting a planetary drive. There was a knob on the top of the cabinet, labeled "33/78" or "45." This operated something similar to a brake band, which gripped the outside of the planetary drive, resulting in 45 RPM at the platter. You had to put the lever control in the 78 position, then turn the knob to 45. If you forgot to move the lever to 78, you got a really strange sound, when your 45 played at some speed slower than 33.

By the time I got there, most music was on LPs; 33-to-45 switches were common within any daypart.

Gates way

Gates handled it differently. Its CB-11 was an inside rim drive table. Individual rubber idlers engaged a large (78) or small (33) step on the motor shaft. Their solution to the 45 was to (1) bore two holes on the top of the platter, about 2 inches in diameter; (2) cut a slot in the top of the motor shaft — not too deep; (3) install 45 adaptor — a brass sleeve with a drive wire across the top. Engage the drive wire in the slot, and presto. The 33 position was now 45. It was good to have several of the adaptors, as they frequently got dropped into the bottoms of the cabinets.

Nobody liked playing 45s on a 16-inch turntable. You can't "slip-cue" comfortably. No place to rest your thumb while your middle finger holds the record. The Capitol Records folks came up with a "fix." It looked a lot like a 12-inch record, but had no groove. It did have an area at its center, just the diameter of the hole in a 45. It also had a ribbed area at the outer edge. Problem solved. I think they called it a cue-disc. It had a label and a part number on the reverse side.

The turntable shown at the start of the article, the Gates CB-500 was in reality a fine unit. It really wasn't necessary to slip-cue with this one. It came up to speed in about a half-turn at 78, a quarter-turn at 33 or 45. Unfortunately, DJs brought up with slip-cueing for tight operation insisted upon doing it with these units as well, and that did nasty things to the drive system. The silliest part was the incandescent lamp under the power switch. The CB-77 was the 12-inch version. You could play 16-inch discs on it, as long as you had an arm to clear the edge.

Regarding vertical vs. lateral recordings: To my knowledge, only Edison (a quarter-inch thick) Diamond Disc Recreations and Pathe Sapphire Recordings (red rooster on the black label, gold lettering) were vertical. They ran at 80 rpm. There may have been others, but not many. Most commercial records throughout the history of the disc record were lateral from the start.

Transcription libraries were something else. World, Lang Worth, Muzak and perhaps others, were vertical, and some were inside start. The first track was nearest the label, and played outward toward the edge. Two good (at the time) reasons: (1) not many people had record players that would handle 16-inch discs, so let's make sure they can't play them with available equipment; and (2) we can market our own pickup and equalizer at our own price. The latter didn't last, but until the advent of stereo records and pickups, the first did.

A new age

Records and the means to play them have been an important part of my entire life, and I just can't resist putting in my 15 cents' worth when the opportunity arises. I'm still in broadcasting. I sort of miss the old days of tubes and big, gunky transformers, but then I realize that reliability is so much better now.

Until recently I dealt with a 20-year-old transmitter that was so reliable that when I had a problem, maybe once a year, I had to go back and hit the books to track it down. I now deal with one I haven't even looked inside of in more than a year.

When I started, at the tail end of a Green Mountain Power Co. three-phase feed, something needed fixing at least once a week — not counting changing styli broken by the DJs! Go back? Not on your life.

Randy Howard is station engineer for KJLL(AM) in Tucson, Ariz.


FEATURES

Turntables and Radio in the 1950s

by Fred Krock

A Gates 16-inch turntable loaded with a 1957 Stars For Defe show featuring Joyce P. Morgan and complete with Civil Defense

Until recently I dealt with a 20-year-old transmitter so reliable that when I had a problem, I had to go back and hit the books to track it down. I now deal with one I haven't even looked inside of in more than a year.

— Randy Howard

READER'S FORUM

Gates Turntable

I liked the photo of the Gates turntable you used to illustrate my article ("Turntables and Radio in the 1950s," Dec. 20). It had a Gray viscous-damped tone arm.

Unfortunately in the editing process two errors crept into the article.

1) I worked top 40 radio before cart machines. Invariably one of four turntables was used for playing the hits. It had a microgroove stylus and ran at 45 rpm. The other three were used for playing 33-1/3 rpm commercials, themes, liners and other production effects. Often the two rear turntables were old ones that would not play 45s. You had to play so many very short effects that you didn't have time to cue them up unless three turntables were available.

If you had to segue two 45s in "twin tune time," you had to change one of the other tables to play a 45. The station often would schedule twin tunes to cover the competition's newsbreak so listeners would be assured of getting music when they hit the station change button. Then you would convert the first twin tune turntable to play 33-1/3 rpm transcriptions so you could have three tables cued when the second twin tune ended.

I visited two other top 40 stations during this time and saw that they operated the same way with one turntable used to play the music and the other three used for effects, etc.

2) I don't believe GE made professional phono cartridges with the turn-around stylus so it could play both microgroove and standard records. I believe that feature was available only on consumer cartridges that could not be used with the Gray Labs passive equalizers. If a station used a separate phono preamp rather than the Gray Labs device, it could use the consumer cartridges. I never saw a GE turn-around stylus cartridge used in a control room. Announcers too often would use the wrong stylus that degraded the sound on the air.

Later transcriptions were cut using a microgroover cutting stylus so they could be played with either playback stylus. But that was for the future.

Also the optimum tracking force was very different for microgroove and standard groove recordings. A more common technique was to use plug-in cartridge shells that were weighted to provide the proper tracking force for the stylus used. Invariably the microgroove cartridges were painted with red fingernail polish.

I know. I'm an old pedant.

I hope your readers enjoyed the article.

Fred Krock
Walnut Creek, Calif.

The Gates turntable pictured in Fred Krock's article brought back an amusing memory.

In 1964, when the holder of a first ticket was much in demand, I was working as a combo announcer/engineer at WOKO in Albany, N.Y. One of my shifts involved opening the station Sunday mornings at 7 a.m. and acting as board op for a live show hosted by the minister of the local Salvation Army group.

Our one and only studio featured two of those Gates tables with the rocker switch and neat little gearshift speed selector. One morning I walked in to discover one of the turntables running and immediately thought the previous night's DJ had left it on.

But then a double take as I spotted the culprit. A little gray field mouse was sitting on the spindle spinning merrily around and around. Every once in a while he would jump off the spindle and use the platter as a treadmill until he had enough exercise and returned to the center. Fortunately for Mickey, the turntable was only set for 33 and not 78 rpm. Best I can figure, he had stepped on the rocker switch just before he jumped on the turntable and started his wild ride.

Needing a witness to this remarkable sight, I waited 'til the minister arrived before shutting down the turntable and escorting a rather wobbly rodent back to the field outside.

And you thought mice only came with computers.

Bill Draper
Chief Engineer
Clear Channel of the Hudson Valley
Poughkeepsie, N.Y.

World Radio History

◆READER'S FORUM◆

The Push to Digital (I Still Don't Get It)

At risk of being lumped in the grumble group of Luddites when it comes to digital radio, it looks as logical as investing in oil shale in the 1950s.

Someone please explain why I'm wrong on the following points that I contend say things are okay as they are:

1) A properly set up FM station sounds good. The IBOC is marginally better and maybe that isn't even so.

2) So expensive and complicated, IBOC sounds just about like good FM. Why is it smart to switch?

3) Don't tell me it's about the extra channels (HD2). The big guys that give us homogenized focus-group-driven plastic are certainly not going to risk the gobs of capital that HD requires to experiment, think or risk. We haven't seen "out of the box" thinking to date, and at even higher costs do you realistically think that will happen? Of course not.

4) Then there's the consumer. I can buy a really nice AM/FM radio that sounds good for well under $100; lots out there for under $40. What consumer is going to spend $179 for the Radio Shack model, or $299 for the Boston Acoustics, to hear what I can hear for under $40?

5) If the consumer won't buy the receiver — remember it sounds pretty much the same, costs a bunch of cash; a no brainer — why should the broadcaster spend the considerable sum to put out a signal no one will receive?

6) Facts are sketchy on this point, and just like in "The Fugitive" with Harrison Ford, until we get to the showdown at the end of the film, methinks the truth about interference will be pooh-poohed until it's too late to back out; too many people have a vested interest. They say, "If anyone knows any reason why this woman shouldn't be married to this man speak now or forever hold your peace." Call this marriage off now. The divorce will be ugly.

What's the real truth about interference? Some IBOC AMs have turned it off. Artifacts on FM? I'd like some truth here from the industry leaders.

7) Remember 1996 where consolidation was allowed; and justified because radio was "moribund." Allowing Clean Channel, et al., to swallow it all up was to make life better. A pack of lies it was. Excluding LPFM, there are 13,748 AM and FM stations ("HD Radio Scoreboard," Dec. 20) and moaning in trades says there isn't enough ad revenue to go around. HD-2 means more inventory but the same amount of money. We're still moribund.

8) Expensive and complicated means only big players and larger markets can be in the game.

Complicated and expensive. No receivers in hands of listeners. Not enough ad dollars to pay for new "stations." Bland and plastic programming. Only the "big guys" will have enough money to play.

What part of this says, "Digital radio is the way to go. Let's bet the farm and quit our day job"?

Jim Jenkins
Owner/General Manager
WAGS Radio
Bishopville, S.C.

Call this marriage off now. The divorce will be ugly.

— Jim Jenkins

Don't Forget the Wow Factor

If terrestrial radio is to survive in the long term, it must differentiate itself in a positive way from the satcasters, podcasters and Internet broadcasters.

The typical station now faces a lot more competition than just the similarly formatted outlet across town; and that competition is growing. If we intend to maintain market share to remain relevant and viable, we have to be different and better. That means the terrestrial radio *listener experience* must be better in some way than the listener experience for competing media.

As we often note, much of a listener's experience comes from the content. But a good bit of it is technical in nature — the overall aural, sensory and visual experience. Engineers and other tech-savvy managers do have a role to play in the success of this digital transition.

Individual stations and group owners as well as the industry at large should consider several factors.

Atop our list is the FM HD Radio experience. At the insistence of Ibiquity Digital, many station engineers have worked hard to make the analog/digital transition "seamless." Mission accomplished — but if you can't tell the difference between the analog and digital, why bother with the digital at all?

Recent newspaper reviews of HD Radio have concluded just that. The reviewers couldn't tell the difference and thus couldn't see the benefit. It's hard to argue with that. AM HD Radio has a definite "wow factor." FM HD Radio lacks it. Somehow we've got to create such a "wow factor" for FM.

We suggest the use of lighter, peak-limit-only processing on FM digital audio to preserve the dynamic range of the source material. Another possibility is to use the feature in the Ibiquity software to push the demodulated level of the digital audio by a dB or so, creating the perception of greater loudness. This will, of course, be a tradeoff in the fringe, but judiciously used it could be a component of what is needed to make the digital audio "pop" and stand out from the analog.

PAD and RDS are areas where we can generate "wow factor" for the listener. We need something different and better here, something other than what we see on many stations now: song title/artist followed by "unknown" in the empty album/genre fields. Why not populate those fields with useful and interesting data? During commercials, display the business name and phone number. Be creative and use RDS and PAD scrolls for contests and promotions.

Undoubtedly there is more that we can do to improve our product; it's up to us to find it. The HD Radio rollout needs a greater sense of urgency. Compelling content is critical, yes. But radio engineers also must put ourselves in the listener's footwear, frankly critiquing our signals, sounds and scrolls — *the listener experience* — to determine what *we* can do to make terrestrial radio different and better.

— RW

CBR Technicality

This time of year things slow down and I get a chance to actually read some of the technical mail I get. Radio World, as usual, is a bit of a fun read. Just a few points:

Briefly, a Buyer's Guide article ("DCBR Maintains Coverage, Transmits HD," Dec. 20) mentions the Cavity Backed Radiator (CBR) type antenna, specifically a Dielectric-manufactured antenna. The article says the antenna is "a circularly polarized antenna comprising a crossed dipole radiator mounted within a circular cavity." Well, not exactly. There is a slight technical error here, but an important one.

The CBR antenna has a radiating element that *is the cavity*. The "dipole" arms excite the cavity with a rotating electric and magnetic field that radiates into space along an axis normal to the face of the cavity. The "dipole" arms also incorporate a secondary set of arms or rings mounted in front of them. These are capacitive impedance matching elements and serve no radiating function.

It is the *cavity* that radiates and the element beam shape, both horizontal and vertical plane, is determined by the cavity diameter. With different diameters (smaller = wider beam) you can get elements that add well in a three-around or four-around configuration, or build almost any pattern you want.

By the way, the horizontal and vertical patterns for the CBR element are almost identical and they have good isolation behind them (producing very low RF exposure within the antenna system; another story).

The CBR also has almost no pattern influence from the mounting structure; only the CBR size, its mounting geometry and electrical feed system affect the pattern. Its only downsides are weight and windload. In one case we made CBRs with *solid* cavities and full radome covers, knowing that were they to be used the basket-style CBRs would eventually be fully covered in rime ice.

Yes, this is a small and obscure technical point, but good engineering should worry about the small stuff.

Bob Culver
Laurel, Md.

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