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New Orleans Comeback
For Entercom's cluster, the road to normal operations has taken some strange detours.

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Small and Flashy
Portable recorders and newsgathering devices shrink and shrink.

In Buyer's Guide

Radio World
$2.50 The Newspaper for Radio Managers and Engineers February 15, 2006

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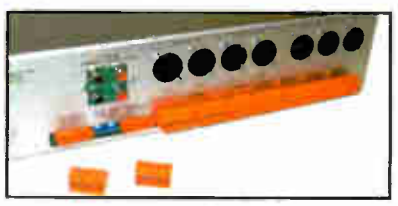

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NEWS ANALYSIS

What Google Wants With dMarc Broadcasting

'The Darling of Internet Go-Go Groups' Invests Nine Figures in Radio Software Firm

by Randy J. Stine

NEWPORT BEACH, Calif. Google's search for a broadcast technology partner to diversify its online advertising model has led it to purchase an upstart software company founded in 2002 by two brothers interested in developing broadcast technology.

Analysts see Google's acquisition of dMarc Broadcasting Inc. as the Internet

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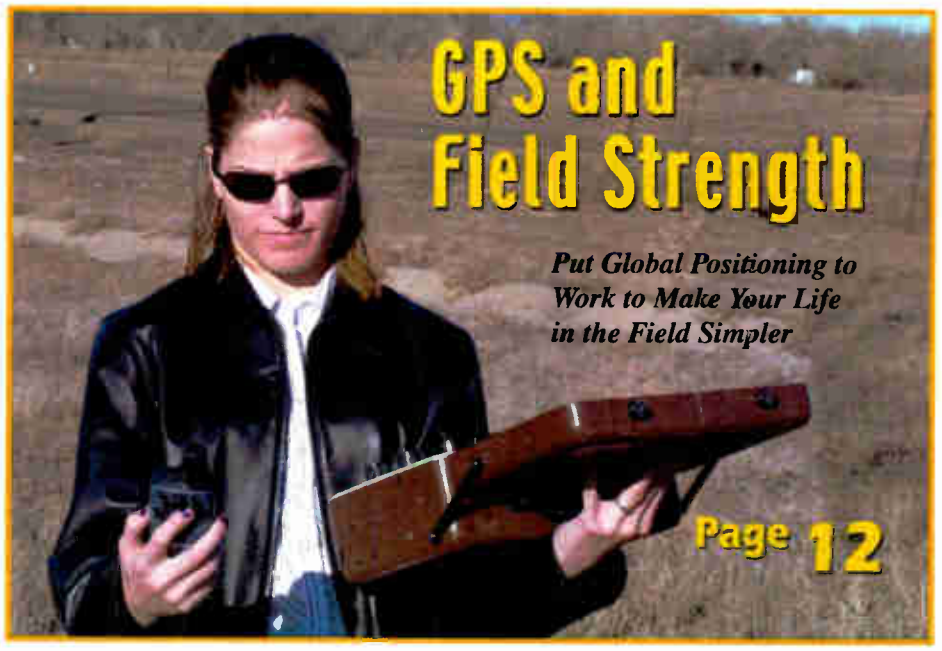


'iRadio' to Crowd Radio In the Dash

Clear Channel Plans to Participate as a Program Vendor to New Motorola Service

by Leslie Stimson

Move over, iPod; Motorola plans to ship its second "iRadio" device to stores by the end of the quarter.

Radio World reported on the first such product under development in 2000. At that time the company was to combine an in-dash head unit with an Internet connection including text displays. But actually maintaining such a connection in a moving vehicle at that point in time "was a stretch," admits David Ulmer, senior director of marketing for Digital Media Services at Motorola; and that product never actually shipped to stores.

Now Motorola believes its new iRadio will grab consumer's attention better than both satellite or HD Radio — and iPods — alone. The device combines music with cell phones in a mobile environment. It features hundreds of commer-

See iRADIO, page 6 ▶

◆ NEWSWATCH ◆

2006 Station Sales Predicted to Be Flat

CHANTILLY, Va. The value of radio stations sales essentially was flat in 2005, and BIA Financial Network predicts more of the same for 2006.

One area of interest for buyers is unrated markets, a trend expected to continue as the go-go days following passage of the revision of the Telecom Act have long given way to operators focusing on running current clusters. That, coupled with the assault on radio by other technologies, makes for apprehension among would-be investors, believes BIA.

There were $2.8 billion of announced radio transactions in 2005, only slightly higher than in the previous two years, according to BIAfn. The estimated $1.2 billion sale of Susquehanna's radio properties drove the slight uptick; without that sale, the value of radio transactions for 2005 would have been less than any of the previous four years, the financial group says.

"The steep drop in the value of the stations that were sold is troublesome and there does not appear to be any specific reason to believe it will change in the next few years," said Mark Fratrik, vice president of BIAfn. "Confronted with new competition such as satellite radio and iPods in the audio marketplace, radio is being challenged from all sides to demonstrate a healthy and strong future. As such, there is great apprehension on acquiring stations and investing in this industry."

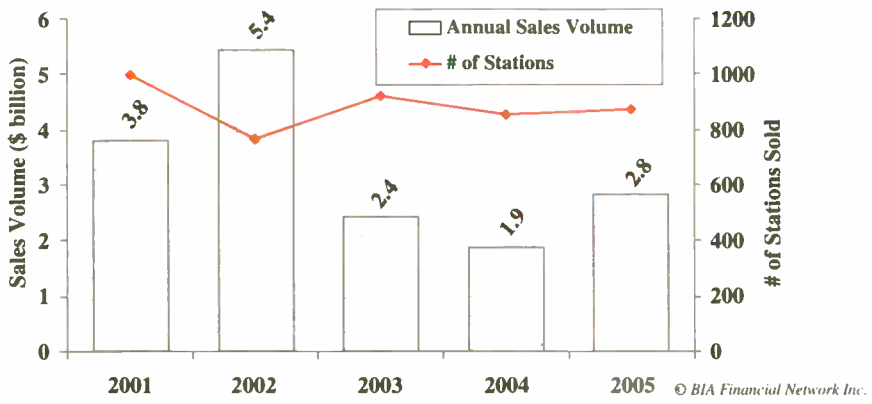
From 2001-05 the annual number of stations sold has been between 859 and 1,000, with the total value of each sale between $1.9 and $5.4 billion. Also, the total value of station sales for 2001–2005 combined was only 66 percent of the total reached in 2000 alone, BIA finds.

In 2000, there were 2.5 times more stations sold in rated markets than in un-rated market. By 2005, there were only 33 percent more sold in rated markets.

"This trend indicates that potential buyers are looking for strategic acquisitions in smaller markets since there are few, if any, radio stations available in the larger markets where most of the strong stations are already part of local clusters," said Mark Fratrik, vice president of BIAfn. "Also, by developing a cluster of radio stations in an un-rated market, groups can work with Arbitron to establish it as a rated market."

In 1996, there were 261 Arbitron markets; now there are 296. Establishing a rated market provides the opportunity to increase revenues at a faster pace than otherwise, according to Fratrik.

Radio Station Transaction Volume: 2001 – 2005



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Satellite Radios Get Smaller, More Portable

Satellite/MP3 Players Coming

by Leslie Stimson

Satellite digital radios coming this year are smaller and more portable. The services are also finding a place more devices such as cell phones and other digital products.

Digital satellite radio is becoming a mature product category — so much so that at the Consumer Electronics Show in January, both Sirius and XM departed from holding the long, glitzy press conferences of shows past, where executives discussed everything from programming to earnings, and let the products become front and center.

Here's a roundup of news about satellite products this winter.

PORTABLE XM/MP3 PLAYERS COMING IN SPRING

In late March or early April, consumers will see the first satellite radio portables that also store and play MP3 files.

XM, Samsung and Pioneer introduced a line of portables that combine the functions of XM and an MP3 player. XM believes the devices create a new product category. A spokesman told Radio World that the company believes the new portables will broaden its appeal, especially for those who may not want to get a second or third digital device that doesn't play MP3s.

The Samsung Helix XM2go offers

Photo by Leslie Stimson

Sirius displayed products in 20 partner booths, including this kiosk of Plug & Play radios in the Directed Electronics exhibit.

XM reception and can store MP3s, WMA files and XM content. The model allows a user to "bookmark" songs heard on XM for online purchase from the XM + Napster service. It'll retail for around $400.

Samsung and XM will also offer a portable line of XMP3 digital audio players that receive XM when connected to a docking station. The Samsung Nexus players can store XM content, MP3s and WMAs. The Nexus 25 player lists for about $200 and stores up to 25 hours of XM programming; the Nexus 50 lists for $250 and stores 50 hours. Both will be available in the first quarter and offer the "bookmark" capability.

The Pioneer Inno is a wearable XM2go satellite radio that combines an MP3 player and satellite radio. The device also has the "bookmark" capability and has Flash memory storage for MP3/WAM files and XM content. The Inno can store up to 50 hours of programming.

Like Samsung, Pioneer expects to ship product to retailers this quarter and list for just under $400.

SIRIUS PROMOTES S50 WEARABLE

Sirius touts its S50 as a "wearable," rather than a portable, product that stores and plays both Sirius and MP3 files. A spokesman said the company plans to debut a portable satellite radio/MP3 player sometime this year.

The S50, which the company says was a big seller in Q4 of 2005, can store up to 50 hours of Sirius content, or a mix of Sirius programming and MP3/WMA files. The device records content when docked into a home docking station.

Both XM and Sirius say the content stays on these wearable/portable MP3 devices and cannot be uploaded onto the Internet, to satisfy digital piracy concerns of the record industry.

The S50 lists for just under $400 and includes a 6-hour rechargeable battery, ear buds, belt clip, armband, USB cable and AC adapter as well as a car dock, which includes an adhesive mount, custom cigarette lighter power adapter, a remote control, ultra-low profile antenna, DC input and line output.

XM DEBUTS PASSPORT 'MINI' TUNER, SPORTSCASTER

XM and Audiovox have unveiled the XM Passport, a tiny portable tuner that delivers the satellite service to products using Connect and Play technology.

The satellite service described the Passport as 40 times smaller than the original trunk-mount radio tuners introduced four years ago. The device measures 1.3 by 1.65 by 0.44 inches. It contains a tuner to deliver XM to devices like home stereo and home theater system and boomboxes. It is inserted into a docking station connected to the product or a port offered by the manufacturer.

XM believes manufacturers will build products that have a built-in port for the Passport, eliminating the need for an extra home docking station, a spokesman said. At CES, Samsung said it will introduce a TV that would be compatible with the XM Passport and LG announced it would offer a DVD player compatible with the device.

The satcaster expects home stereo receivers from Yamaha, Harman Kardon, Denon, Sony, Pioneer and others to produce compatible products.

"The XM Passport is universal. You can carry it from one product to another and pay only one XM subscription," said the spokesman.

The first two XM MP3 players will be available from Pioneer and Samsung.

The company said the device will be available in spring. It retails for around $30; home and car docking stations for about the same. The Passport will come with new Samsung Nexus XM/MP3 digital audio players and connect to the supplied home docking station and optional car dock.

Separately, XM said it introduced a plug-and-play satellite radio aimed at sports listeners, in partnership with Advanced Global Technology. The model is called the Sportscaster and will list for about $60.

It has 30 channel presets, including presets for sports channels such as the baseball talk channel MLB Home Plate and hockey talk channel Home Ice, as well as a channel that provides text about where to find live sports on the service. XM said it will air 5,000 live sports events this year.

The radio comes with accessories that transmit XM Satellite Radio to a car's FM radio. The receiver fits into an optional wearable kit with headphones. A boombox and home docking station are sold as accessories.

See CES, page 5 ▶

They Ignore Radio at Their Own Risk

Traditional radio is going to be someone's darling again soon, at least for a time.

Media types and Wall Street analysts love a comeback story; they also love a simple story. Radio will present them both in coming months.

We saw some of this in January. After years of PR bombardment from XM and Sirius, reporters and analysts who cover radio and have often hinted at its demise, or at least its growing irrelevance, were shaken up by two big headlines.

One was the announcement of Google's purchase of dMarc. A smart, respected new media company apparently had seen what most radio-bashers have ignored for years — radio's vast reach, its $20 billion a year sales record, its place in the fabric of American life — and found a way to invest in it.

I found the price paid for dMarc astonishing given the size of the radio supply marketplace; I wondered briefly if this meant the dot-com days were coming back. But I do not pretend to be expert at valuations of software vendors, broadcast or otherwise.

Google's rationale in explaining the purchase makes sense to me (see page 1); and this isn't a sale of a strictly hardware manufacturer, where we can guess at how many consoles or transmitters might be sold in a given year. This is a deal that goes to how radio sells its inventory, the transaction at the center of our industry. A lot of money changes hands in radio every day. Don't be surprised if other big "outside" names take a fresh look at ol' radio, exploring how they might claim part the action as well as how radio might fit into their proliferating empires, merging old and new media in unexpected ways.

Of greater impact over the long term will be the news that the first coordinated rollout of multicast stations has begun; this too shows that radio has game left. We've been reading that multicast could be the "killer app" for HD Radio, and I suspect that's correct; certainly the promise of new content moved the business news needle in a way that the promise of digital sound never did. That's also because the concept is easy for consumers and analysts to understand. "You can get new program channels in addition to your old ones, and all you need is to buy a new radio." Nothing particularly complicated about that.

Watch for more stories in the general media about how traditional radio is kicking back at satellite; how XM and Sirius, by golly, also must cope with proliferating new media competition as well as very heavy Wall Street expectations; and how in radio, "what was old is new again" thanks to digital.

But the good feelings require effort to nurture. More than that, they require content. The new channels must be interesting. Radio owners and programmers must avoid any temptation to do them on the ultra-cheap. Content is king. Content is king. Content. Is. King.

★ ★ ★

Please join me in welcoming Timothy Kimble to the editorial staff.

Tim comes on board as assistant editor for the Buyer's Guide section and is handling special projects as well.

Kelly Brooks relinquishes the Buyer's Guide portion of her duties to make room for her new role as production editor for RW Engineering Extra; she continues as associate editor for Studio Sessions and Reader's Forum. Thanks to Kelly for her great work in her time at Buyer's Guide.

Tim has read Radio World for 17 years, since he was 19, when he built a carrier current station to serve his small college. He has experience as a radio program director, operations director, producer and journalist, working in North Carolina and Kansas.

In his most recent position, he worked at Public Radio East in New Bern, N.C., supervising a 10-person news and music staff, writing studio rebuild specifications for hardware and software, managing automation systems and launching a news/talk network. He is a self-described gear rat who has won awards for reporting and has filed reports for NPR and the BBC.

★ ★ ★

Football Hall of Fame center Frank Gatski died recently at the age of 83. We note it because his son John is familiar to many readers as a former Radio World staffer; he remains a member of the IMAS family as group publisher of Pro Audio Review.

John's dad played in 10 straight championship games for the Cleveland Browns, according to the Associated Press, and was inducted into the Pro Football Hall of Fame in 1985 in the same class as Joe Namath, Pete Rozelle, O.J. Simpson and Roger Staubach.

Our sympathies are with the Gatski family.

★ ★ ★

I sent this e-mail to Christopher Glenn in January:

Christopher,

I have your email address from Peter King, who contributes to our publication. I'm the editor of Radio World newspaper.

Driving into work this week here in northern Virginia, I happened upon your voice on the air for the first time in awhile. Upon hearing your instantly familiar voice, I thought to myself, "You know, I really ought to write to Christopher Glenn and tell him how much I enjoyed hearing him on the TV when I was young, how 'In the News' was perhaps my first regular news program, how hearing his voice still brings back such great memories and makes me feel I'm with an old friend."

Then Peter shared with me the word that you're retiring from CBS after a distinguished career in both radio and TV. So I must have had that thought for a reason.

You were among those whose example influenced me as I grew up, as I became first a radio anchor/journalist and later a trade publication editor in broadcasting. Had I done as I once thought I might and sought work in radio at CBS, perhaps we would even have worked together. To this day when I hear you, I rarely fail to pause in my business and think, "That's how a true broadcast professional should sound."

So just a word of thanks and congratulations. We often tell readers that radio is an intimate medium, one of relationships. That certainly has been true in your case, for me. I never listen with quite as much attention as I do when I hear you on the other end of the mic.

From the Editor

Paul J. McLane

CES

▶ Continued from page 3

SIRIUSCONNECT HOME TUNER DEBUTS

Sirius introduced a satellite radio receiver designed to work with multiple radios, audio systems and home theater systems. The company said its SiriusConnect Home tuner makes it possible for users to add the service to Sirius-ready home systems made by companies such as Eton and Thomson, under the RCA and GE brands, as well as other brands to be announced.

The unit measures 4 by 3 inches; it can sit flat or be wall-mounted. It has RCA analog and optical digital outputs. Sirius is also offering an optional wireless display controller that permits Sirius connectivity with a non-Sirius-ready receiver.

The tuner kit, which includes antenna, lists for around $50. Directed Electronics will distribute the products.

TI CHIP SUPPORTS XM CONNECT & PLAY

Texas Instruments said its chip, the TMS320DA295 reference design, is the first hard disk drive (HDD)-based architecture to support XM's Connect and Play technology for portable audio applications, including MP3 players and portable audio jukeboxes.

The DA295 reference design includes the system code and hardware to support hard disk drive, color LCD and NTSC interfaces, FM tuner, photo and video decode, rechargeable battery-based subsystem and implementations of audio codecs such as AAC, AAC Plus, which is XM's compression decoder, MP3, WMA and others, line-in encoding and Digital Rights Management technologies.

Beta versions of the XM Connect and Play-enabled DA295 reference design are available. Pricing for the DA295 reference design starts at $20,000 and is available from certain TI third-party providers.

KARMAZIN: WHY WE GAVE HOWARD STOCK

Speaking to a Citigroup conference of investors, Sirius CEO Mel Karmazin explained the reasoning behind Howard Stern's stock deal.

Stern began performing his morning show at the satcaster Jan. 9 and produces two additional channels for Sirius. Karmazin said the company is adding salespeople who can sell ads on Stern across all dayparts.

Stern and his agent, Don Buchwald, received 34.4 million shares of Sirius stock, valued at about $220 million in early January. The stock was part of an original 5-year, $500 million cash-and-stock agreement. The value of the stock doubled, Karmazin said.

Why the early timing? Because the company hit agreed-upon subscriber targets, bringing in 1.14 million new subscribers in the fourth quarter of 2005, with over 3.3 million as of this week, the CEO noted.

"We think that what Howard has done for Sirius has been dramatic. Our awareness is significantly higher than our competitor. Revenues being estimated by the street for 2006 for Sirius are $200 million higher than they were before Howard."

15 MILLION LISTENERS PROJECTED FOR SATELLITE BY END OF YEAR

XM had more than 6 million subscribers in early January. President/CEO Hugh Panero projected the satcaster would end 2006 with 9 million paying customers.

Meanwhile, Sirius Satellite said its subscriber base is now at 3.3 million and projects it will end 2006 with more than 6 million.

XM says it extended its lead over its competitor in 2005 by adding 2.7 million net new subscribers, and expects more than 3 million net new subscribers in 2006.

More than 85 percent of XM's nearly 900,000 net new subscribers during the fourth quarter came from retail sales. XM ended 2005 with 5,933,000 subscribers, not including radios purchased as Christmas gifts that were not activated before Dec. 31 and will be activated during the first quarter of 2006.

"This is our sixth CES. We've come a long way," Panero told the reporters who packed the XM booth.

Sirius said 826,000 new subscribers purchased its radio service during the fourth quarter. Bridge Ratings cites Stern as the reason many new subscribers purchased the service.

In interviews with customers at CE retailers, Stern was responsible for 22 percent of the sign-ups during the first week of the quarter in October, according to the research company. This number increased steadily throughout the period, to 58 percent by mid-December.

MARTHA PLUGS AND PLAYS FOR SIRIUS

Host Martha Stewart installed a Sirius Starmate Replay in a BMW MiniCooper on her show, according to Sirius spokesman Jim Collins. After Sirius employees showed her how to accomplish the task, she proceeded, including placing the magnetic mount antenna on the roof. The plug-and-play unit features wireless transmission between the in-dash radio and the Starmate that sits in a cradle that is plugged into the cigarette lighter.

Sirius has begun construction of a retail store on the first floor of its New York Headquarters in the McGraw-Hill building in Manhattan.

WORLDSPACE REBRANDS, PLANS SATELLITE LAUNCH

Most of the news about satellite at CES was from the services that broadcast in the United States. Meanwhile, WorldSpace, headquartered here but airing abroad, unveiled a new brand identity and corporate logo.

The company says the tagline, "Turn on Your World," better reflects its commitment to offer unique, personal global satellite radio. Chairman/CEO Noah Samara told Radio World WorldSpace would focus on bringing its service to India in 2006.

The FCC has given permission to WorldSpace subsidiary AfriStar to launch and operate a replacement satellite, called AfriStar-2, and co-locate it with AfriStar-1 until the first satellite is taken out of service. AfriStar's satellite is controlled from the United States.

The footprint of the new satellite would cover more of Europe than the old satellite. Competitor Ondas of Spain filed an objection. Ondas seeks to implement a BSS sound system in Europe using satellites and said AfriStar-2 would interfere with that. The FCC disagreed.

Photo by Leslie Stimson

XM President/CEO Hugh Panero holds up Snoop Dogg's necklace (shown backwards), a reference to the holiday TV ad in which the artist goes from XM studio to studio, looking for the chain.

Martha Stewart installed a Sirius Starmate radio in a BMW MiniCooper on her show.

iRadio

▶ Continued from page 1

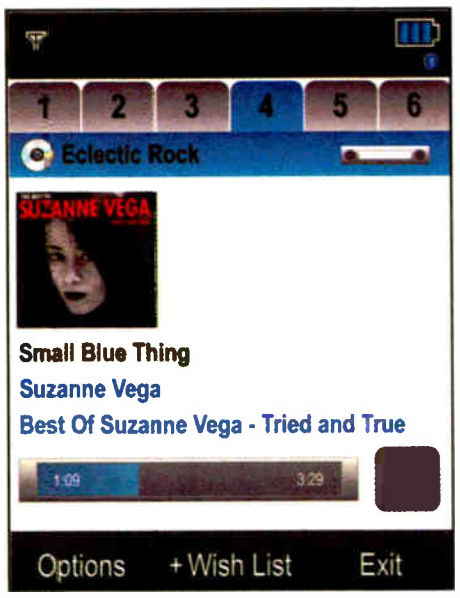
cial-free Internet radio stations that can be downloaded onto listeners' cell phones, along with their own personal content — songs or spoken word content from MP3 files.

After downloading the content to their home computer, the listener loads their cell phone with music so they can listen to it using their cell phone or a car stereo via Bluetooth. When listeners charge their phone at night, preset Internet streams are updated automatically.

Motorola faces competition in the audio download space.

Verizon Wireless introduced mobile music download services recently to compete with the iPod. Sprint Nextel launched music download and streaming services last fall and Sprint and Sirius Satellite Radio customers who sign up can get 20 Sirius channels over their Sprint Nextel phones.

Motorola already has a relationship with Apple Computer, running Apple's iTunes music distribution service on the first generation of its Rokr cell phone.



How the iRadio screen would look on a Motorola cell phone.

Clear Channel, too

Warner Music Group, Music Choice and Universal Music Group signed on to provide content for the iRadio service, which launches with 435 commercial-free channels; so did Clear Channel Radio. Clear Channel and Motorola announced the plans at CES and said they expected to sign a deal shortly, according to Jeff Littlejohn, executive vice president for distribution development at Clear Channel Radio.

The broadcaster plans to provide talk content and create custom music channels, so listeners can hear their Clear Channel Radio content "whether they're underground in a subway tunnel or traveling outside their local radio market," said Littlejohn.

Motorola learned from its early development efforts, Ulmer said, about using the Internet as an entertainment medium. "Internet radio is coming back," he said; it's growing and is a commercially viable alternative to terrestrial radio.

"We can't maintain an Internet connection on the car while it's moving, but we've devised a method to use the Internet on the cell phone using Bluetooth technology."

Motorola has adapted Bluetooth wireless connectivity to make it work with digital audio and a car stereo, he said, rather than FM modulation or over-the-air streaming. Bluetooth technology doesn't drain the phone battery and its range of 30 feet or so is well within the distance between the driver and the car radio, he said.

A transmission rate of 128 kilobits per second is in trials, he said.

The idea of iRadio is to make the cell phone a portable music player. A minimum of 10 hours of material can be buffered on the phone, or the user may buy an additional storage card.

The iRadio service is a software application individuals may purchase from their cell phone carrier; the application is "activated" on the user's PC and cell phone, he said. Initially, the service will be available on Motorola cell phones; Motorola is introducing iRadio in its second edition of the Rokr cell phone, called Rokr E2. Eventually, the company believes other wireless carriers will make their phones compatible with iRadio.

Wish List

The carrier will charge a fee, which will range from $7 to $10 a month, he said.

The car version of iRadio is a Bluetooth adapter for existing car stereos. "It allows your phone to take over the stereo selection," said Ulmer. The adapter plugs in to the CD changer or the satellite radio port in the back of the in-dash head unit; it detects the phone if the phone is on in the car.

"If you listen to your cell phone as you turn on your car, you will hear iRadio content through your car speakers. Song title and artist information will now appear on the car radio display."

If the user holds down the pre-set button, that particular content is tagged on the phone and PC. The Wish List feature, which Motorola says goes beyond satellite radio's offerings, provides a way for listeners to buy the content later over the Internet or at a bricks-and-mortar retailer.

The device gives buyers more content choice than HD Radio or satellite, Motorola believes. "Radio has been spiraling downhill, with stations playing the same 12 songs," said Ulmer, and the advent of multicast channels won't change that, he feels. While new channels will remain commercial-free for a while, eventually advertisers will determine those program choices to some extent.

"Advertisers on radio are not supporting big genres like classic rock. Imagine what it's like for unknown artists," he said, referring to the number of new artists on the iRadio service.

HD Radio will be a hard sell "if it's message to the public is, 'Buy this $500 radio because it's digital,'" he said. "The Achilles heel for traditional radio is they didn't look over their shoulder and pay attention to the growth of Internet radio. You can't just ignore technology because it hasn't hit you yet."

Also, satellite radio has a long climb to drive adoption rates, Motorola believes, saying the company sold more than 10 million cell phones in a recent month, with a total of about 800 million sales in one year, compared to about 9 million subscribers for both satellite radio companies combined.

One of the services that distinguishes traditional radio is local traffic; satellite radio offers new traffic services as well. Motorola is working on it, with plans to offer it on-demand for several cities.

Clear Channel has expanded the number of navigation system manufacturers and markets involved with its Total Traffic Network, for example. Littlejohn says the broadcaster supports the iRadio concept because it's "an important addition" to the choices available to consumers.

One analyst believes Motorola is backing off its iTunes relationship in favor of this new offering. Nitin Gupta of the Yankee Group told Yahoo News it will be interesting to see how the phone company markets iRadio "given that it competes with existing music services offered by Sprint, Verizon and other carriers."

Gupta inferred that iRadio might be more cost-effective because bandwidth is less expensive on the PC than it is on the wireless carriers' networks.

NEWS WATCH

iPod Offered in 2006 Chryslers

DETROIT iPod integration in the car is moving fast.

The Chrysler Group plans to be the first American automaker to provide iPod integration as an option in most of its 2006 models, including more than 3 million 2006 Chryslers, Jeeps and Dodges. The news comes as Apple unveiled the iPod Radio Remote, which combines a wired remote control with FM radio for the iPod nano.

Drivers will be able to listen to their iPod through the car's audio system, select their music by artist, album or playlist with radio or steering wheel controls and see selections on the radio display.

Randy Ewers, director of Mopar Accessories, said using the iPod connections, owners can bring and listen to entire music collections in the vehicle.

Apple Vice President of iPod Product Marketing Greg Joswiak said more than 40 percent of cars sold in the United States in 2006 will offer iPod connectivity.

The optional iPod Integration Kit for Chrysler, Jeep and Dodge model lines will list for $175 plus dealer installation. The kit can retrofit many model year 2005 vehicles, the companies said.

Alpine, Clarion, Kenwood and Pioneer offer aftermarket solutions for autos that do not offer iPod integration.

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Put Comrex On The Line.

COMREX

Google

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giant's attempt to expand quickly its advertising distribution services, which include Google's AdWords ad placement platform and new online streaming video store.

The deal is reported to be worth $102 million in cash plus possible future considerations. dMarc's founders, brothers Ryan and Chad Steelberg, will remain with the company; Chad Steelberg becomes general manager of Google's radio division. If the conditions are right, the Steelbergs could wind up billionaires.

'Complimentary medium'

Google "has been continuously looking for ways to extend the measurable and accountable advertising model that we brought to online space. We think radio is a very complimentary medium to online," said Josh McFarland, business product manager at Google.

"dMarc is a very good business fit on both the technological level and the team level."

Google will integrate dMarc's Revenue Suite inventory buying technology into its AdWords program, McFarland said, and create new radio distribution channels for Google advertisers. dMarc's technology automatically connects advertisers directly to radio stations, allowing them to schedule and place advertising. dMarc says the technology enables advertisers to purchase and track their ad campaigns more efficiently.

Google's AdWords platform allows advertisers to buy keywords and deliver targeted ads based on specific searches. Google says clickthrough rates improve when advertising is placed with specific topics.

"In just a few minutes, advertisers can go to our self-serve interface and purchase online advertising. We can now broaden that to other forms of media, specifically radio," McFarland said.

Analysts say Google has made it clear it plans to extend the technology beyond the Internet. The company is testing a program that allows advertisers to place ads in print in newspapers and magazines, called Google Publication Ads.

"Bundling and getting pieces of ad budgets is what it is all about," said Bishop Cheen, analyst with Wachovia Capital Markets, covering the media and entertainment sector. "Advertisers like to hedge their bets with a multimedia approach for maximum reach and exposure.

"Google can now bundle up radio, print, Internet and they are working on television. I expect we'll see much more mixing and matching," Cheen said.

Media diversification is Google's strategy, said Peter Geyer, a media analyst at Bond & Pecaro.

"dMarc going to Google is indicative of a paradigm shift in advertising to providing advertisers with an increasing amount of hard data about the results of their investment. The ability to better provide this information will be a primary determinant as to how well radio serves its customers and thus how well radio can maintain rates and revenues," Geyer said.

"Google is taking their expertise in the pay-for-performance advertising model and endeavoring to transfer that expertise to radio."

Niche media

Mark Fratrik, vice president of BIA Financial Network Inc., noted the merging of Internet with legacy traditional media.

"Google believes it's in their best interest to mesh their advertising sales with traditional media advertising to reach an efficiency for their clients. The Internet is a very niche advertising vehicle, and so is local radio in that you target specific age demographics with content," Fratrik said.

Chad Steelberg

Analysts say one of the key components of the deal was the inclusion of dMarc's wholly owned subsidiaries Scott Studios and Computer Concepts. dMarc says the pair make it the industry's largest digital air studio systems vendor with more than 4,600 broadcast users, reaching more than 40 percent of the stations within the top 50 radio groups.

dMarc acquired Scott Studios in 2004 for an undisclosed price. The acquisition gave dMarc instant credibility in the broadcast industry, analysts say.

With that earlier deal, dMarc "immediately became a well-established vendor in the radio marketplace through its subsidiaries Scott Studios and Computer Concepts," said one source familiar with the acquisition. "It enabled them to get closer to radio stations at the broadcast point."

dMarc's Steelberg said his company's purchase of Scott Studios allowed it quickly to extend a more efficient and accountable radio advertising delivery technology.

"From that point we started the process of connecting those automation systems over the Internet back to our centralized information data center," Steelberg said. "It certainly was a key part of our ability to launch our ad insertion platform."

dMarc's Revenue Suite and its remnant inventory abilities, which typically fills radio stations' unsold inventory with national advertiser spots, will be enhanced with the integration into Google's AdWords, Steelberg said.

"We have an advantage in that we can tell what is about to play on a radio station, and then have the contractual and technical capability through our partnership to insert an advertisement specifically targeting the audience for that radio station — and then reporting back on that information because we know exactly when it aired on our automation systems," Steelberg said.

"We record that spot off the air in the market, then digitize it and send reports back with verification technology in real time over the Internet to the advertisers. They can then modify their ad campaigns in real time."

Steelberg said more than 500 radio stations in the United States are using Revenue Suite. The platform can interface with broadcast management automation systems besides Scott Studios and Computer Concepts, he said.

Fewer steps

Google sees the new opportunity as a chance to interface with constituents at every level of the advertising industry, including advertisers, agencies and rep firms, McFarland said.

"What we will have eventually is a complimentary platform between individual buyers, agencies and even third parties that represent buyers. We'll take some steps out of the process and make it all more efficient," McFarland said.

Analysts say the Google and dMarc marriage will prove beneficial for traditional radio and could prompt Google's competitors to look harder at diversification.

"I would expect Yahoo! and Microsoft to look at making investments to lever their technological expertise to better serve traditional media, whether it is publishing, cable or broadcasting. Despite all of its hype, the Internet still only accounts for approximately 5 percent of advertising spending," said Geyer. "That would allow the companies to tap into a much broader stream of mass media advertising spending."

Wachovia's Cheen said, "Wall Street's sentiment has been that if radio is not growing, then it must be dying. Now all of a sudden the darling of the Internet go-go groups comes along and puts its arms around dMarc. I think investors will look at this deal very closely and watch its development."

Several analysts have questioned whether the Google advertising model will negatively affect national radio rep firms, since advertisers will be able to approach stations directly.

"The nagging question that arises from the non-station side is its possible impact on national reps as a substitute rather than a complement," said James Boyle, Wall Street analyst and former managing director of Wachovia Capital Markets.

"On the whole, having the 800-pound gorilla of the Internet sit down at the radio table is a net positive at this time; but bear in mind that such creatures take up a lot of room and possess gargantuan appetites."

Steelberg said dMarc plans to continue to develop ideas and prototypes for RDS and datacasting capabilities, with new products rolling out in late 2006.

dMarc will retain offices in Dallas and Kansas City and combine operations with a pre-existing Google office in Newport

See GOOGLE, page 10 ▶

The world's best-sounding POTS codec.

At Telos, we're obsessed with quality audio. We were the first to marry DSP with broadcast phone hybrids to achieve clean, clear caller audio. We invented Zephyr, Earth's most popular way to send CD-quality audio over ISDN. And now our DSP experts have built the **best-sounding POTS codec ever — Zephyr Xport.**

Instead of proprietary algorithms, we chose **MPEG-standard *aacPlus*®**, the same coding used by XM Satellite Radio, Digital Radio Mondiale, Minnesota Public Radio, Apple Computer and many others to deliver **superior audio at low bit rates.** (An optional ISDN interface lets Xport connect to Zephyr Xstream with Low-Delay MPEG AAC, or with nearly all third-party ISDN codecs using G.722.)

There's no need for a studio-side POTS line. Your studio's Zephyr Xstream receives Xport's POTS calls via its existing ISDN line, **eliminating the cost of a second POTS codec** and delivering smooth, clear digital audio to your listeners.

And Xport **makes unexpected modem re-training extinct** thanks to custom DSP algorithms that extract stable performance from even marginal phone lines. Xport gives you **surprisingly clean 15 kHz remote audio at bit rates as low as 19 kbps.**

No wonder clients tell us Zephyr Xport is the world's best-sounding POTS codec. But don't take their word for it — hear it for yourself.

Zephyr Xport: **It's all about the audio.**

Two-input mixer with sweetening by Omnia, switchable Phantom power, and send / receive headphone mix make life on the road easy.

Ethernet port isn't just for remote control: feed PCM audio right into the codec from any Windows™ laptop. Great for newsies on the go.

Xport's *aacPlus* and Low-Delay MPEG AAC deliver superb fidelity. G.722 coding enables connections with 3rd-party codecs, too.

Xport lets you easily send and receive audio using a cell phone headset jack. Gives a whole new meaning to the phrase "phoning it in."

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NEWS WATCH

Bonneville Shifting News to FM...

SALT LAKE CITY In an effort to reach younger listeners, Bonneville has begun shifting news to FM stations, starting at its headquarters city of Salt Lake City and also in Washington.

The broadcaster moved its WTOP news format in Washington to FM, where it also plans to add Washington Post Radio in March and has begun classical music HD-R multicast channels in that market.

In Salt Lake City in September, Bonneville added a simulcast FM signal at 102.7 MHz to extend the broadcast reach of KSL Newsradio at 1160 kHz, its AM flagship station there.

The WTOP news format moves from its long-time slot at 1500 kHz to 103.5 MHz, formerly home of Bonneville's classical station WGMS. This move, the company said, gives the big news station better reach and penetration.

The news made further headlines because of the format deal struck with a major newspaper. Two frequencies formerly occupied by WTOP programming — 1500 kHz and 107.7 MHz — will be branded as "Washington Post Radio," though owned by Bonneville. The Post is a former radio owner in Washington.

Bonneville said the Post will provide content for the station. That programming will include news and commentary provided by Post staff. "Bonneville will also pursue play-by-play sports for evening and weekend broadcasts on Washington Post Radio," it stated.

The company also launched two multicast classical stations, one that will play traditional classical in more depth, the other an on-air version of its Web-based opera and choral music station, Viva La Voce.

...As Part of FM Initiative

On the heels of those recent shifts in signals and people for its Washington and Salt Lake City stations, Bonneville has begun an FM news initiative aimed at luring younger listeners to the news format.

Bruce Reese, president and CEO of Bonneville International, said the company is pleased with early results of its strategic moves to make news and information available to listeners on FM.

Bonneville is conducting a national search for on-air talent, reporters, producers, production personnel, and Web site developers for its initiative. Bonneville International also has radio, television, satellite, and advertising properties also in Chicago, San Francisco, St. Louis, eastern Idaho, and southern Utah.

Google

▶ Continued from page 8

Beach, Calif.; dMarc has nearly 100 employees, most of whom will still work for Google, Steelberg said.

Stanford Ph.D. students Larry Page and Sergey Brin founded Mountain View, California-based Google in 1998. The Silicon Valley company employs nearly 5,000 full-time workers and says it's considered to be the top Web property in most major global markets. The company reported revenues of $1.578 billion for the third quarter ending Sept. 30, 2005.

Google anticipates the acquisition will close in the first quarter of 2006. Executives did not provide additional details regarding the closing.

In addition to $102 million in cash for dMarc's assets, Google will be obligated to make additional contingent cash payments occasionally if certain product integration, net revenue and advertising inventory targets are met over the next three years. Potential contingent payments could total $1.136 billion over the next 36 months. Google officials declined to discuss specific performance targets.

Scott Studios Part of dMarc Success

Dave Scott has a special interest in the recent sale of dMarc to Google.

He founded Scott Studios in 1992 and became a pioneer in what he terms "hear it like it is" voice-tracking and studio automation. He left Scott Studios following its acquisition by dMarc in 2004.

"Google opens many new doors for ad money to come into local radio. That's great for radio and all of us," he said.

"Google has demonstrated ample brains, money and ability to excel at everything it has done so far. Other dot-coms came and went; but Google not only thrives, it skyrockets. Their involvement with radio will be dynamic."

Scott said most of his former employees are still with the company. "They all have an excellent record of resolving any issues that come up." Scott has been on the broadcast sidelines for the past year under a non-solicitation contract he signed with dMarc, Scott said, which recently expired. He spent that time developing several new radio supplier businesses, including another air studio digital system, he said.

— Randy J. Stine

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GPS and AM Field Strength

Put the Global Positioning Satellite System to Work And Make Your Life in the Field Simpler

by W.C. Alexander

AM field strength/proof-of-performance measurements have been a staple of broadcast engineering since our industry came into being. Such measurements are used by the FCC and engineers for allocation purposes, to determine the ground conductivity along a certain path, to show that a non-directional antenna is producing a certain inverse distance field (IDF) and to show that a directional antenna system is actually producing the authorized pattern.

Other than licensed monitor points, measurements are not made at "spot" locations; rather, many measurements are made on radial paths because a lot of factors can influence the instantaneous field intensity at a given location. Ground conductivity and dielectric constant, localized reradiation, attenuation from buildings, trees and other surface objects, and other unidentified factors can and do affect the field strength.

In a perfect world, the measured field strength along a radial path would follow the inverse distance line. In other words, the field strength would be inversely proportional to the distance from the antenna, and E x D would always produce the same number.

In the real world, however, the field strength *approximates* the inverse distance line, and E x D is *roughly* the same for each point with instantaneous departures that can, in some cases, be considerable.

It is because of these real-world effects that we (a) take a lot of measurements on each radial, and (b) *graphically* analyze the data. Having more data allows us to better see the trend (and we can toss out errant points), and graphical analysis allows us to *see* what inverse distance line or conductivity value that the data points best fit.

The key to making good measurements is in knowing one's location.

In the old days, we used 7-1/2-minute topographical maps. The antenna site location (ND radiator location or center of array) carefully was plotted on the central map and then radial lines were drawn outward from that point and onto adjoining maps to a distance of 32 km or more.

Small is a big deal

There is a lot of potential for error in laying out radials on topo maps. Over the years, I have laid out a lot of radials, usually on the transmitter room floor. Topo maps are necessarily large, and a typical map or drafting table simply isn't big enough. The environment in which the radials are plotted is thus often less than ideal.

Also, the accuracy of the protractor or plotter used to determine radial bearings usually leaves a lot to be desired. A typical protractor has a radius of three inches, which corresponds to a little less than 2 km on a 1:24,000 topo map.

Largely because of the distances involved, AM proof radials often do not fall on whole number degree values, so the engineer laying out the radials has to interpolate between degree marks on the protractor. Assuming that the protractor was oriented properly with respect to true north in the first place, an error of 0.5 degrees or more can easily occur. This corresponds to an error of about 1,000 feet at 32 km.

Errors at a considerable distance from the tower site are not as critical as those close in. Errors of even a few feet at short distances are significant, particularly on tight null radials. Close in, plotting errors are not so much a problem as navigation errors. Relying on automobile odometer indications from known (and mapped) landmarks has potential for great error, and yet this is the means by which engineers have for many years determined the location of measurement points.

CBC-Denver Staff Engineer Amanda Alexander uses the GPS and FIM for a field strength measurement.

Lock in

With the advent of the Global Positioning Satellite system, engineers now have at their disposal a means of much more precise navigation.

In the early years of GPS, engineers jumped on the technology for far-field measurements. The tower location or center of array could be programmed into a handheld GPS receiver, and as the engineer navigated, the distance and bearing from that point were displayed. It was thus much easier to know one's location relative to the transmitter site.

There were, however, some problems with this.

For one, dithering is applied to GPS signals to deliberately limit the accuracy to civil users to 100 meters. Also, early user equipment provided only whole-number bearing information and 0.1 km distance resolution. Together, this meant that a user could be almost 0.5 degrees off bearing and almost 150 meters off in distance. Obviously, such positioning information would have limited value for AM field strength measurements, particularly for close-in measurements.

The GPS system consists of 24 operating ground-controlled satellites positioned in six orbital planes. There are four operational satellites and one spare in each plane. The orbital period is one half of a sidereal day (11:58). The orbits are close to circular and equally spaced about the equator at a 60-degree separation with 55-degree inclination relative to the equator. The orbital radius is roughly 26,000 km.

With this constellation of satellites, any location on the planet should, barring local obstructions, have between four and six satellites in view. Each satellite broadcasts its precise position on an L-band carrier. User equipment (GPS receiver) then computes its own position based upon these signals.

Standard or Precise

The GPS system provides two levels of service. The Standard Positioning Service (SPS) is for civil use and provides accuracy of 100 meters in the horizontal plane and 156 meters in the vertical plane. The Precise Positioning Service (PPS) provides much greater accuracy for military use. Some civilian use of PPS is allowed by special permit (surveyors, etc.).

One way around the inherent accuracy limitations of SPS is to measure the three-dimensional error vector from a known point and apply that to all GPS positional calculations within a fixed distance from that known point. The FAA has developed the Wide-Area Augmentation System, or WAAS, for just this purpose, providing GPS-equipped aircraft with much more precise GPS positional information than would be obtainable with SPS. Another work-around is the Differential GPS system set up by the U.S. and Canadian governments. Both systems operate beacon stations that transmit correction signals. Some high-end GPS receivers can receive and utilize WAAS and DGPS signals to correct GPS positional information. Tests have shown positional accuracy with WAAS correction to be on the order of 2-3 meters, and that's good enough for even close-in AM field strength measurement work.

Modern GPS units also have the advantage of considerable processor power, color displays and mapping software. Depending on the amount of RAM in the unit, the user can load all the topo maps for the entire area into the unit. This makes navigation a snap.

Making GPS-referenced AM field intensity measurements is relatively straightforward.

First, make sure that the GPS unit employed is equipped with WAAS or DGPS (and if DGPS is employed, make sure it is available in your area; check at *www.navcen.uscg.gov/ADO/DgpsSelectStatus.asp*).

Start with the reference point. Again, this is either the non-directional tower or the center of the directional array. In the case of most directional arrays, there will be different reference points for the close-in and far-field measurements. The close-in measurements must be referenced to the non-directional radiator. If the center of the array were used, many of the measurements would have considerable error. Once beyond 3 km or so, the array is itself a "point source" and the center-of-array coordinates should be used as the reference point.

Once the reference point is set, next set a waypoint for the end of the radial. For close-in measurements, set that at 3

See GPS, page 14 ▶

"We were building brand-new studios. Why use the same old tech?"

"Our company bought a station in San Diego, and we had to move the studios. Since the station would be a part of our Southern California network, we needed equipment

that could quickly re-route multiple audio signals – from satellite, T-1, ISDN and remote vehicles – to different destinations.

"I knew how expensive routing equipment was. I also knew we'd regret buying a system with fewer capabilities just to save money.

"More than anything, we wanted to avoid limiting our operations with the use of conventional routers. Most of those systems force you to plan, during installation, for every signal routing configuration you might ever possibly need. If your needs change, you either have

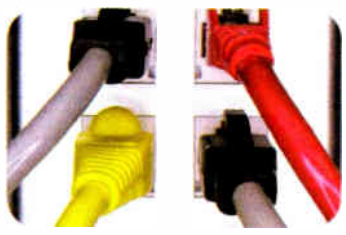
to re-wire or settle for operational compromises. Not very user-friendly! Making sure that the system was easy for non-technical air talent to understand and operate was critical, too.

"Axia addressed all these concerns.

"With Axia, setting up new routing configurations is easy; you just save new routes in software and recall them when you need them. SmartSurface makes controlling our many different audio sources and destinations very straightforward and uncomplicated; our air staff loves it!

Hi-Favor Broadcasting
KSDO - 1130 AM

"And expanding the network couldn't be simpler. Just plug in more audio nodes and boom! you've got more inputs.



"I've worked with lots of equipment in the past 30 years, and Axia is by far the easiest system to install and get up to speed with. There are just a few cables instead of hundreds; the entire installation – with testing – took just *one week.*

"Here's the kicker: Axia cost about half what we would have paid for a conventional router. We're very pleased, and plan to expand the network to our second control room. My advice? Get Axia. You won't be disappointed."

— Rudy Agus, Chief Engineer, Hi-Favor Broadcasting
Los Angeles, California

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GPS

▶ Continued from page 12

km on each radial. For far-field measurements, make the end-of-radial waypoint somewhere beyond 32 km. Next, set a route for each radial starting at the reference point (center of array or ND radiator) and ending at the end-of-radial waypoint. All this can be done within the unit, but it is often easier to do in external mapping software. The reference point, end points and routes can be set and uploaded to the GPS unit along with the full map set. Maps can also be printed at a convenient scale to aid in navigation.

It is important to set the proper units in the GPS unit. Because the FCC requires metric units, set the GPS unit accordingly. Reference datum can also be set, and it should be set to match the map datum in use.

In the field, the user simply navigates to a point on the proper radial bearing. The GPS route screen will show deviation from the route and distance to the reference point. Walk or drive more or less perpendicular to the radial until the deviation is as close to zero as possible and note the distance to the reference point. The area is then checked for obstructions (overhead wires, nearby large metallic objects, etc.) and the field intensity is read on the meter. The distance and field intensity are then noted along with the time.

Conveniently, many handheld GPS units can be programmed to display the time on the same screen with the route distance/bearing, so it is possible to keep very accurate time records.

A team of one

With GPS, close-in "walk-in" measurements can now be "walk-out" measurements. In pre-GPS days, a team of two people equipped with an FIM and a 50-meter rope (marked off in 5-meter increments) would start at a point determined by topo map to be exactly 3.00 km from the reference point on the radial of interest. The team would then work in toward the site, using the rope to measure distance and the FIM to "DF" the tower (which was often not visible because of trees and other obstructions).

When the tower was finally reached, the difference between where the team thought it was based on rope measurements and the actual tower location was noted and that correction factor was applied to the entire 3 km span. This makes perfect sense until you consider other measurement errors (rope stretch, obstacle circumnavigation, etc.). Still, it was the best we had and it worked.

A GPS-equipped "team" can now consist of a solo individual starting at the tower, navigating using the GPS and working out to 3 km. Rope errors are eliminated, and circumnavigation of obstacles is a snap. Such close-in measurements can become a combination of walk-out and drive-out, since it is not necessary to maintain a physical, linear measurement of distance on the ground.

The Garmin GPS unit on a proof radial showing distance from the center of the radial and distance from the tower in meters.

The key to good directional measurements is repeatability. The DA measurement must be made at the exact same location as the ND measurement. In the past, this was achieved by a careful and thorough description of the measurement location, e.g. "Three paces west of the mailbox marked 10548, 0.4 odo. miles north on Powhaton Rd. from the intersection with C.R. 11." It took a lot of time to write those descriptions, and multiplied by 20 or more points on each radial, this added a lot of time to each radial. Now, except in rare circumstances, distance only must be noted. That saves a lot of time and the DGPS/WAAS accuracy insures repeatability.

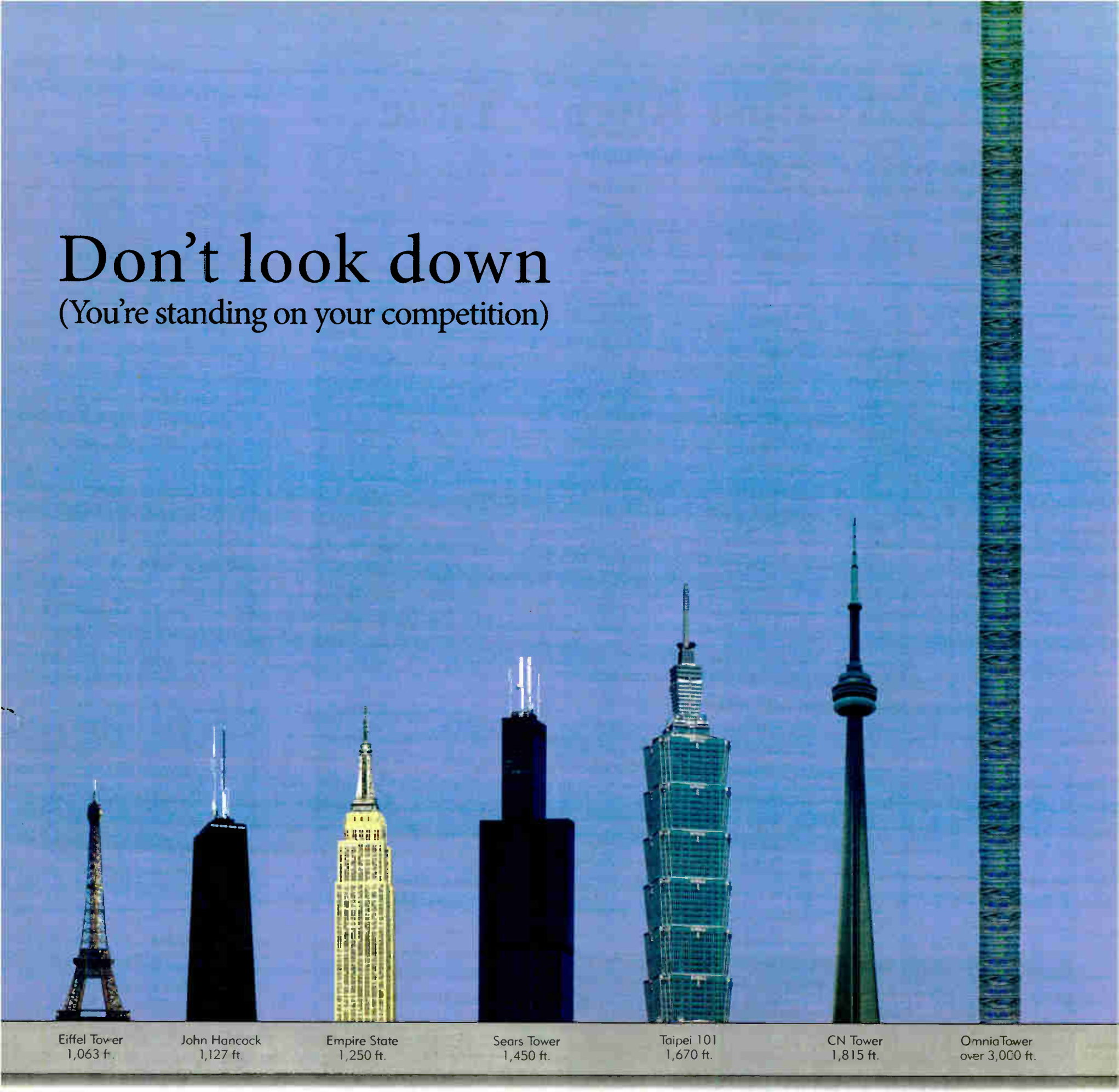
Repeatability is also the key to a good partial proof. The problem with partial proofs has always been in locating measurement points that were established years or even decades before. Things change, streets and roads are realigned, and it is often impossible to accurately locate certain points. GPS changes that, at least to some degree. If a location remains accessible (i.e. not fenced off or covered by a structure of some sort), with a good GPS-established location, you can get back there.

Monitor points have long been an issue in developing areas. It has been incumbent on licensees to periodically update the monitor point descriptions on file with the FCC. Often times, these MP descriptions are somewhat ambiguous anyway, but adding GPS coordinates to the description insures that the location can be found.

With the availability of high-accuracy GPS units, the process of making AM field strength measurements has been made much easier, faster and more accurate. What more could we ask for? Personally, I'm holding out for the self-tuning directional antenna.

The author is director of engineering of Crawford Broadcasting Co.

Don't look down
(You're standing on your competition)



More than 60% of the Top 100 highest-rated FM stations in the USA have already upgraded to Omnia-6EX—the six-band dual-path processor for standard FM and HD Radio signals. The reason these leaders choose Omnia? Once you've heard it, you'll know.

The Empire State building is pretty tall. Taipei 101? CN Tower? Even taller. But Omnia dwarfs them all. In fact, if you stacked up all the Omnia audio processors in use around the world, you'd have a tower well over 3,000 feet high.

In just a few short years, Omnia has emerged as the best-selling audio processor in the world. More importantly, it's the most successful stations in top markets like New York, Los Angeles, London, Paris, Rome, Beijing, Tokyo, Amsterdam and Berlin, that have put Omnia on top. And more broadcasters are upgrading every day, using Omnia as their secret weapon to stay miles above the competition.

Speaking of heights, did you know that Omnia processing now powers stations broadcasting from every one of the famous structures pictured above?

Big or small, isn't it high time you upgraded to Omnia?

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A Race Against Rhyme Time

IBOC Will Have To Play Catch-Up With Satellite Radio, But Will Other Similarly Named Competition Interfere?

by Skip Pizzi

Each year, the Consumer Electronics Show gives insight to the latest technologies' deployment pace and provides a good gauge of their relative impact to date. After last year's show, it seemed obvious that IBOC needed to make a good showing soon if it had hope of catching the public's attention — particularly in the growing shadow of satellite radio's high profile.

At CES 2006, both of the satellite radio services seemed to be at approximate parity with even stronger showings, evidenced by a wide range of fixed, mobile and portable receivers — including a new crop that integrates satellite radio with MP3 players (see the Oct. 26, 2005, column in *The Big Picture* online archives at *www.rwonline.com*). Sirius and XM have become established brands, and are now standard terms of art at CES.

Meanwhile, HD Radio was more in evidence at CES 2006 than ever, but it was still far from achieving the status of satellite radio. This is to be expected given HD Radio's later arrival on the scene, but the lag that exists today may be difficult to overcome.

It's generally understood that XM's continuing lead in subscriptions over rival Sirius is due primarily to the one-year advantage in time-to-market that XM achieved. Sirius was behind from the start, and although both services continue to experience robust growth, Sirius has found it hard to gain ground on XM's lead. This lesson may be applied to HD Radio's even later entrance.

Of course, HD Radio is not a direct competitor like the two satellite services are, so the comparison is not a completely apt one; but from the consumer electronics side, they all fall into a similar basket of new digital radio products. Many of the CE vendors showing satellite radios this year promised HD Radio receivers next year, but in the meantime satellite radio will add another year to its already long head start in their product lines. Trying to play catch-up from that far back will be challenging for HD Radio, and its marketing support will have to be extremely intense and effective if it is to help reduce the gap, and ultimately provide HD Radio the same "household name" status that both satellite radio services already enjoy.

These services either use the 'R' word, or sound a lot like it, making their intentions to compete head-to-head with radio explicitly clear.

Addition vs. replacement

Even more troubling for terrestrial broadcasters is the trend seen essentially for the first time at CES 2006, in which satellite radio products without terrestrial radio receivers made their debut. Previous Sirius or XM receivers at the show nearly always included AM/FM capabilities, and although most car receivers shown this year continued this trend, handhelds and other satellite radio products have dropped either AM or AM/FM tuners.

Could satellite radio truly replace terrestrial broadcasting for its subscribers, and become the only radio service they use?

For some, the question may rest on local content. Just what and how much local content is enough? Satellite radio subscribers in major markets who only care about local traffic and weather could already be satisfied by XM's or Sirius's services in this respect, and may not miss the AM/FM bands if they were omitted from a receiver. In this way, satellite radio may do to FM what FM did to AM, causing younger audiences to almost completely ignore the older band, and not protest if it were eliminated from some — or eventually all — receivers.

This could dramatically alter the balance of the industry and deployment plans for HD Radio. There has been some expectation that future satellite radios might include HD Radio capabilities, and that such "bundling" could be an important method of passive adoption by consumers who were really after satellite radio, but also got HD Radio in the bargain. Yet because HD Radio's multicast and possible surround-sound features could provide stronger competition to satellite radio, and given satellite radio services' common practice of subsidizing receiver production, it seems likely that manufacturers may be persuaded against including HD Radio — if they even include terrestrial radio capability at all — in future satellite radio designs.

Thus the terrestrial radio industry would be on its own in promoting consumer adoption of HD Radio, and it could be posed as an either/or proposition against satellite radio for consumers.

This dreary scenario becomes further muddled when one considers yet another trend seen at CES 2006.

It involves the new competitive services about to launch from terrestrial wireless providers, which may make HD Radio's quest toward critical mass even harder to achieve. These include Qualcomm's MediaFlo, Crown Castle's Modeo, Motorola's iRadio, Sprint's MSpot Radio and Verizon's VCAST, with probably more to come. Note that these services either use the "R" word, or sound a lot like it, making their intentions to compete head-to-head with terrestrial radio broadcasting explicitly clear.

Marketing and deployment campaigns for these services will be difficult for terrestrial radio to compete with, given the deep pockets of the wireless telco operators behind them, and the high likelihood of subsidies for consumer equipment. The fact that such devices will be converged products that also provide highly desirable and well-established communications services (voice, wireless e-mail, web surfing, etc.) makes them even more appealing.

So HD Radio is now in a race for the consumer's attention against two other opponents who've been spotted a long lead, with a lot more late entrants now loading into the starting gate. Trifecta, anyone?

Skip Pizzi is contributing editor of Radio World.

The Big Picture

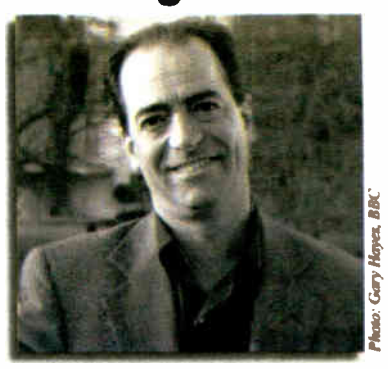

Photo: Gary Hoyer, BBC

by Skip Pizzi

The Eton booth at CES 2006 exemplified a trend at the show, presenting plenty of highly visible XM and Sirius radios. An HD Radio model? Maybe next year...

Conserves AU.

HD Multicast, HD Surround, conventional stereo — Element handles them all. Upgrade your studios with confidence; you're ready for anything.

element

Technology can save you money.

Consider: computers, VoIP phone systems and bandwidth cost less and deliver more every year. Wouldn't it be great if broadcast gear did, too? Thanks to Axia, it can.

Axia saves you money by using open Ethernet technology to replace expensive proprietary mainframe routers. Not only is Ethernet less expensive, it's simpler and more reliable — perfect for critical 24/7 operations. The Axia IP-Audio solution eliminates sound cards, DAs, punch blocks and cumbersome cables, so it reduces installation and maintenance costs.

And now, Axia has a cool new modular control surface: Element. Scalable from four to forty faders, you can build the ideal surface for every studio. Element's abundant outputs and flexible architecture can be switched between stereo and surround mixing. Its info-rich user display, built-in router control, and integrated phone and codec support simplify the most complex shows. You'll never outgrow it.

Like all Axia products, Element does more and costs about half what others try to charge for their *"Trust us, this is better than Ethernet, would we lie to you?"* stuff.

Element. Worth its weight in... well, you know.

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HD Radio News

Source Encryption Off the Table

Page 20

Radio World | Covering Radio's Digital Transition | February 15, 2006

Multicast Launch Begins in Earnest

The HD Digital Radio Alliance of big broadcast owners revealed the first 28 markets in which they are launching multicast programming. The top 12 U.S. radio markets are among them and all markets are in the top 100.

The announcement in January was the first time in recent memory, if not in history, that major radio group owners coordinated, rather than competed, in announcing nationwide programming initiatives; and the move was generally seen in the industry as an important one in traditional radio's attempt to regain marketing momentum in the fight against satellite radio and other new media formats.

The first of the formats on the list went on-air in mid-January. Alliance President/CEO Peter Ferrara said the rest are expected to take several weeks to roll out.

Most HD-R receivers on the market are capable of receiving multicast signals; perhaps "several thousand" have been purchased so far, said Clear Channel Radio John Hogan, who noted that there are an estimated 750 million to 800 million analog radios in use in this country.

Multicast stations have been sprouting for months but the rollouts marked the first wide-scale launch of HD2 multicast channels, with each market airing what the groups call unique content. Through the alliance's coordination process, each market gets its own mix of new programming.

Programming talent from within and outside the company was tapped, including veteran innovators as well as new hires not steeped in radio tradition, executives said. Club DJs, cable TV and Internet programmers had input into formats chosen for the multicast channels. Hogan stressed that local programmers "are doing what they think is best" in each local market.

"We have resources in-house available to us that we are deploying in different ways," Hogan told Radio World.

Among the clusters now multicasting is Clear Channel Radio San Francisco, which began broadcasting HD digital radio channels on five new HD2 channels in late January.

Hogan said the alliance format selection process, for the most part, went smoothly. There were some disputes, he said, but they were settled.

"We're much better known for not working together," said Hogan of the major radio groups. "In this case, we came together to the credit of every alliance member."

Meanwhile, CBS Radio Chairman/CEO Joel Hollander termed HD Radio one of the greatest technological achievements for radio. "We've been diligently converting a large percentage of our stations to a digital platform so listeners can take advantage of the superior sound quality, abundance of programming choices, and unique interactivity with their favorite brands."

Moves such as finalizing multicast formats are key "to the widespread adoption of the technology," he said.

Peter Smyth, president/CEO of Greater Media Inc., serves on the management committee of the HD Digital Radio Alliance. Of the new multicast stations for his company announced in January, he said, "Many of these program concepts are extensions of our current brands, creating variations that we know listeners want to hear. Others are completely new efforts to fill a need in the marketplace that's been missing for some time."

The formats introduced in the first wave include names like Coffee House, Female Talk, Future Country and Extreme Hip Hop. There are specialized opera formats, classical alternative, traditional jazz and blues, gay programming, in-depth news and various new rock formats.

Several rock formats are being developed, with names such as Deep Cuts Classic Rock, Live Rock, New Alternative, Fusion Hispanic-Anglo Rock, Chick Rock, Indie and New Rock.

Eventually, some 264 HD2 channels from alliance members will be on-air.

As of the end of 2005, approximately 70 multicast stations were on the air nationally, according to Ibiquity Digital. Its data provided to Radio World in January listed 66 stations; a company spokeswoman said the discrepancy is due to challenges in keeping the list current.

— Leslie Stimson

The Alliance's 28 markets and their market rankings are:

1	New York
2	Los Angeles
3	Chicago
4	San Francisco
5	Dallas-Fort Worth
6	Philadelphia
7	Houston
8	Washington
9	Boston
10	Detroit
11	Atlanta
12	Miami
14	Seattle
20	Baltimore
24	Portland, Ore.
27	Cincinnati
33	San Jose, Calif.
41	Indianapolis
48	Memphis, Tenn.
50	Hartford, Conn.
57	Birmingham, Ala.
58	Dayton, Ohio
60	McAllen, Texas
64	Tulsa, Okla.
70	Albuquerque, N.M.
76	El Paso, Texas
80	Springfield, Mass.
94	Wichita, Kan.

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 Jan. 19. This page is sponsored by Broadcast Electronics. HD Radio is a trademark of iBiquity Digital Corp.

HD2 Programming at CBS Radio

Multicast formats on the air or planned by CBS Radio as of Jan. 19. List is from CBS.

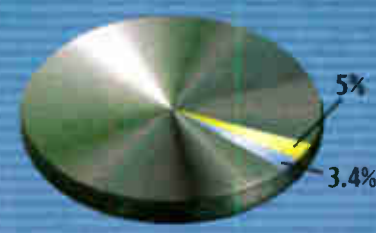
WVEE	Atlanta	Neo-Soul/Urban AC
WZGC	Atlanta	Deep Classic Hits
WHFS	Baltimore	The True Alternative
WLIF	Baltimore	Lite AC
WQSR	Baltimore	Sports
WWMX	Baltimore	CHR/Top 40
WBCN	Boston	Indie & Ultra New Rock
WBMX	Boston	All 80s
WODS	Boston	Super Oldies (Elvis to the Beatles)
WZLX	Boston	Lost Classics and Deep Tracks
WBBM	Chicago	Dance
WCKG	Chicago	News
WJMK	Chicago	60s/70s Oldies
WUSN	Chicago	Future Country
WXRT	Chicago	Channel X (new music)
WAQZ	Cincinnati	Extreme HD Rock and Hip Hop
WGRR	Cincinnati	All 80s
WKRQ	Cincinnati	My HD (interactive request channel)
WUBE	Cincinnati	Future Country
KJKK	Dallas	My HD (interactive request channel)
KLLI	Dallas	Hispanic Talk
KLUV	Dallas	Fab Channel (All Beatles)
KOAI	Dallas	Tracitional Jazz
KVIL	Dallas	Chick Rock (Rock for Women)
WKRK	Detroit	News
WOMC	Detroit	History of Rock & Roll
WVMV	Detroit	Tragitional Jazz
WYCD	Detroit	Future Country
WRCH	Hartford	Jazz
WTIC	Hartford	News/Talk/Sports
WZMX	Hartford	Hispanic Reggaeton
KHJZ	Houston	Traditional Jazz
KILT	Houston	Future Country
KCBS	Los Angeles	Variety CHR
KLSX	Los Angeles	Female Talk
KROQ	Los Angeles	Xtreme Active Rock
KRTH	Los Angeles	50s/60s Oldies
KTWV	Los Angeles	Classic Jazz
WMC	Memphis	Whatever 100
WMFS	Memphis	Xtreme Metal Rock
WCBS	New York	Oldies
WFNY	New York	Alternative
WNEW	New York	News
WOGL	Philadelphia	All 70s
WYSP	Philadelphia	Alternative
KINK	Portland, Ore.	Underground Link (Vintage Progressive)
KLTH	Portland, Ore.	Super Oldies
KUFO	Portland, Ore.	New Rock
KUPL	Portland, Ore.	Country Legends
KVMX	Portland, Ore.	80s Dance
KFRC	San Francisco	Country
KIFR	San Francisco	News
KITS	San Francisco	Nothing But New Music
KLLC	San Francisco	Chill (downtempo Electronic & Rock)
KBKS	Seattle	New CHR
KJAQ	Seattle	Progressive Talk
KMPS	Seattle	Future Country
KZOK	Seattle	Classic Rock Archive (deep cuts)
WARW	Washington	Adult Alternative
WJFK	Washington	Female Talk
WLZL	Washington	Hispanic Reggaeton
WPGC	Washington	Gospel

The HD Radio Bottom Line

	Total Licensed	On the Air
Last Month	1,072	617
	1,128	673

Market Penetration United States

13,599 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: 66

DIGITAL NEWS

Digital Radio Shipments To Top 22 Million Worldwide by 2009

SCOTTSDALE, Ariz. Worldwide, the combined market of digital satellite and terrestrial radio will grow from approximately 5 million unit shipments in 2004 to 22 million unit shipments in 2009, technology research firm In-Stat says. The digital audio broadcasting category includes HD Radio, Eureka-147, satellite radio in the United States and elsewhere, and Digital Multimedia Broadcast.

Driving growth will be new content, data services, price erosion for digital radio receivers and digital radio provider partnerships with new car manufacturers, the firm says.

In-Stat analyst Stephanie Guza said satellite radio is responsible for the growth in the digital radio market in this country, while terrestrial digital radio is driving it elsewhere.

"The launch of Digital Multimedia Broadcast services in Japan and Korea, along with increased promotional activity in Singapore, Australia and Taiwan over the next year, will drive digital radio shipments in Asia," she predicted.

Commercial-free radio ranks as the top reason for purchasing a satellite radio, with 54 percent of surveyed satellite radio owners citing it, according to the company.

The report is "Digital Radio: Turning Up the Volume on Satellite and Terrestrial Radio Adoption."

HD-R Products Coming This Year

For digital radio advocates, this winter is about the expanding number of HD Radio products on the market or coming soon.

Photo by Gary Kline, Cumulus

NAB President/CEO David Rehr, right, visited the CES show, getting up to speed on HD Radio. Here he visits the Kenwood booth to see the KOS-A200, a car audio product that the company says lets the consumer upgrade or add components to a vehicle entertainment system, including HD Radio, without replacing OEM components. Talking to Rehr is Kenwood Vice President of New Digital Technologies Mike Bergman, left, as NAB's Senior Vice President of Science and Technology Lynn Claudy, partly obscured, listens.

JVC's second-generation HD Radio CD Receiver the KD-HDR1 includes a built-in multicast-capable HD Radio tuner. It is compatible with satellite services and iPods. The company plans March availability for an estimated $300.

At CES this winter Yamaha introduced the RX-V4600, an A/V digital home theater receiver that includes HD Radio technology and 7.1 channels of surround sound. The RX-V4600 is available now and lists for just under $1,900.

Source Encryption Off the Rights Table

by Leslie Stimson

WASHINGTON Members of an NAB task force on the broadcast flag issue pledged in January to meet with counterparts at the Recording Industry Association of America to work out content protection for HD Radio. The agreement was reached in advance of a congressional hearing on the broadcast flag, planned for late January.

Preventing digital piracy over HD Radio services is necessary to preserve the future of music for the health of both of our industries, says Mitch Bainwol, chief executive officer of the Recording Industry Association of America.

Both the NAB and RIAA have agreed not to pursue source encryption for radio.

In a reply letter to new NAB President/CEO David Rehr on the subject, Bainwol said he understands the concerns broadcasters have over the RIAA's proposal that digital signals at the source be encrypted, and pledged to work with NAB to find another solution to potential digital content piracy.

"The RIAA has always been agnostic as to the technological method of protecting content contained in digital broadcasts," stated Bainwol. "We look forward to working immediately with members of the NAB's Audio Broadcast Flag Task Force, along with other interested parties, to achieve a timely resolution."

The RIAA has always been agnostic as to the technological method of protecting content contained in digital broadcasts.

— Mitch Bainwol

NAB wants to work with the record labels to figure out a compromise over content protection issues associated with HD Radio, rather than relying on Congress to mandate a solution. It opposes mandatory encryption of the digital signal at the source, however, and told the RIAA that such a proposal could obsolete both IBOC receivers and transmission equipment now in use.

Rehr fired the first shot, saying in a letter to the RIAA's Bainwol, the broadcast rollout is "well" underway and broadcasters have a lot invested in making the transition successful.

"The goal for our industry is to find a resolution that balances protection of copyrighted works against the important objective of ensuring the continued and rapid expansion of digital audio broadcasts. Such a balanced approach could, in fact, aid the HD Radio rollout by removing regulatory and legislative uncertainty from the marketplace."

NAB questions the degree to which HD Radio threatens copyright or will facilitate unauthorized, digital distribution of sound recordings, Rehr stated.

"Those desiring to obtain and listen to pure, uninterrupted performances of sound recording in lieu of radio already have an abundant number of means to do so. Peer-to-peer file sharing and the hours of uninterrupted music that can be stored on CDs and discs are but a few such means.

"iPod uploads and digital music on the Internet would seem to present much larger and more immediate threats to copyright holders."

The piracy risk with HD Radio devices is likely more limited than RIAA believes, argued Rehr, adding that RIAA's previous suggestions, such as an FCC mandate of digital broadcast encryption at the signal source, are "antithetical to the concept of free, over-the-air broadcasting."

Encryption also would likely obsolete HD Radio units on the market and "millions" more in the manufacturing pipeline, Rehr said. Making radios installed in cars obsolete would hurt the chances of additional automakers including terrestrial digital radios, he said.

Mandatory encryption would risk making installed HD Radio transmission equipment obsolete.

NAB said that in its consideration of digital copyright issues, Congress specifically left out free radio and suggested the NAB's Audio Broadcast Flag Task force meet with counterparts at the RIAA and in the recording industry.

During a panel about digital radio at the recent CES convention, Bainwol said RIAA "has been adjusting to painful changes in the marketplace," where physicals sales of music have dropped.

"In five years, we've lost a third of our artists due to the drop in music sales."

The RIAA wants to make sure the framework for music licensing is fair and makes sense for realities of the marketplace, he said.

"Fair use is not replacing a sale or making copies for 40 friends," said Bainwol.

The CEA, meanwhile, has said in published accounts that NAB is right to pursue making any changes backward compatible with current hardware, as negotiated digital rights management agreements affect both manufacturers and consumers.

Bright Lights Spot Pending Failures

by John Bisset

Heading to the transmitter site? When was the last time you looked inside that big old rig? After powering down, throwing the circuit breakers and contacting all components with the grounding stick, grab your trouble light and look at your power supply capacitors.

Fig. 1 shows the dirt and grunge that can lead to a flashover. After you've contacted both terminals with the grounding stick, use a clean rag soaked in isopropyl alcohol to clean the insulators. Inspect the terminals and make sure the wire crimp is solid, that the nuts are tight and no fluid is leaking. A leaking capacitor will soon explode; replace it!

As you inspect your capacitors, look for discolored terminals, such as that seen in Fig. 2. These signs of overheating can lead to potential failure. Anyone who has cleaned up after a capacitor explosion will tell you it's a nasty job. Spend the money to replace the capacitor before it explodes.

★ ★ ★

Ben Hill is chief engineer of CBS Radio's WIP(AM) in Philadelphia. He adds his cautionary word to our discussion about subcontractors digging at transmitter sites.

The water department needed to restore service to the WIP transmitter building after having billed the station — for at least five years — for water service that wasn't provided.

They used a device called a "shooter," a steel rod inside a PVC tube. Air is forced into tube and the rod blows through the soil for about 25 to 30 feet per shot.

This is a great way to save the AM ground system, while avoiding backhoe fade. A great idea — until in this case it blew through the station's 200-pair buried phone cable.

Like any good contractor, the crew had made the necessary calls and received a markout prior to digging. They had been told the area was clear.

Luckily Ben's STL is an aerial fiber to a T-1. It took Verizon about eight hours to respond and splice the cable. Ben writes that it all made for a fun night. The markout guys came back and confirmed they had been wrong with the first markout.

Thanks for the caution, Ben. Write to Ben Hill at *ben.hill@cbsradio.com.*

★ ★ ★

Ben's experience teaches several lessons.

First, make sure you contact Miss Utility or her cousin before any excavation work begins. If the diggers mess up, it's not your fault. If you can't meet the markout folks, verify that the painted marks on the ground indicate they visited your site.

Bring your digital camera and snap pictures showing where the cables are buried. Print them out and file them at the transmitter site. The information could be invaluable in the future, especially if the markout people "miss" a cable.

Finally, with all the changing of owner-

See WORKBENCH, page 24 ▶

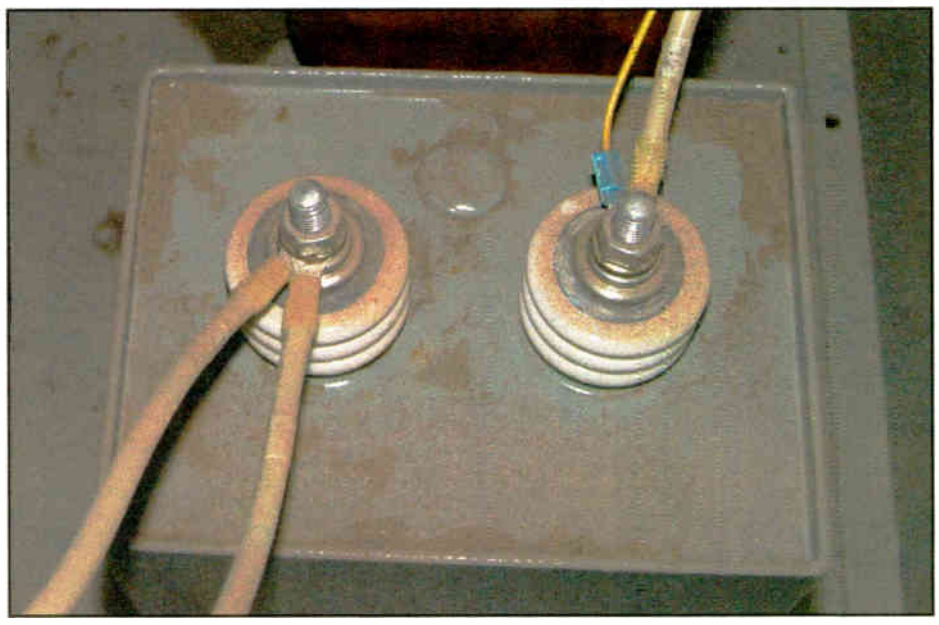


Fig. 1: Keep high-voltage capacitor insulators clean; discharge them first.

Fig. 2: A bright light can help you discover pending failures like this overheated terminal.

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Workbench

▶ Continued from page 22

ship that's occurred over the last few years, take some time to sit down with your business manager and see just what bills the station thinks it is paying for the transmitter site.

I've talked about the importance of phone audits, which ensure that you're not paying for a remote line that was disconnected years ago. The same is true for utilities. You may be paying for water service because the billing office never got a disconnect order.

Do you have empty nitrogen cylinders that you are "renting" each month, even though they've long been empty? Even unused septic systems that are still being pumped on a quarterly basis can be identified. The list goes on and on. Perhaps one of the funniest is a transaction in which two broadcasters swapped transmitter sites. Years later, an engineer later discovered that the new owner had continued to pay property tax on the site it sold.

Find such discrepancies and you'll look great. For once you're viewed as saving money, not simply spending it.

Discuss this work and its compensation with your GM before you start. This is "above and beyond" your routine job duties; because you will investigate the billing on your own time, at home, it is not unreasonable to ask for 10 percent of the savings as compensation.

Remind your GM that a professional audit company will receive 20 to 30 percent of the refund amount, so you're a bargain at 10 percent. Don't assume you'll be rewarded after the fact; you probably won't be, and that will just make you angry. A frank discussion before you embark on the project will lay the groundwork for what you will do and how you will be compensated. Remind your manager too that he pays nothing unless you discover an overcharge. Overbilling can amount to thousands of dollars, money that will be refunded to the station if discovered.

Follow up with a written memo or e-mail, summarizing the discussion, so there's no misunderstanding.

★ ★ ★

CAT-5 and CAT-6 cabling is becoming increasingly common, even with HD installations. Especially in studio applications, one of the challenges of utilizing this technology is accomplishing certification to guarantee that cables and systems are operational to specification. This proof of performance is best done during the installation process. A general rule of thumb: almost half of initial digital system problems are related to cabling.

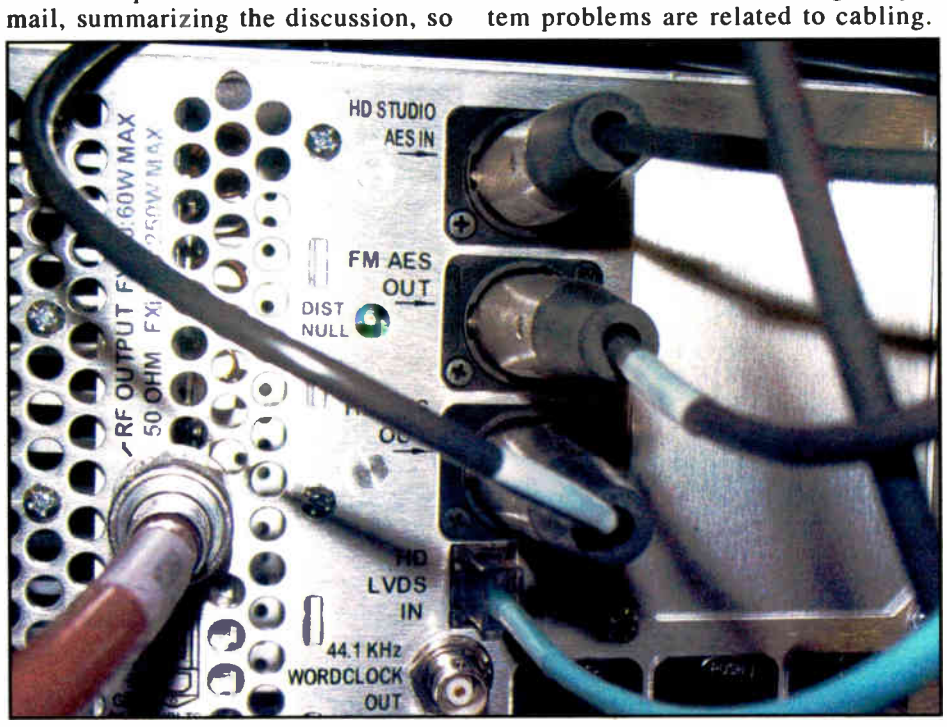

Fig. 3: CAT-5 wiring is becoming the norm.

However, if you've shopped for network certification equipment, you may have been put off by the price tag, which can be several thousand dollars.

Web retailer SystemsStore.com has a solution. You can add the Byte Brothers RWC1000K Real World Certifier to your project budget. It is a compact and versatile tool, providing testing and recording of both cable and system performance parameters.

SystemsStore is selling the test package for $525, a small price for ensuring integrity in the CAT5/6 world. The kit includes main and remote units, an instructional DVD, batteries, padded zippered case and "Passed" Certification Stickers for placement on tested cables.

The RWC operates in two modes. The first, Level 1, consists of a series of projected performance tests that include Cable Length, Opens, Shorts, Split Pairs, & Wire Map, plus Crosstalk and Propagation Delay, to name a few.

Ssetup and test parameters are displayed on a built-in LCD display with navigation controls to scroll through the numerous functions. The unit will hold in memory the results of 250 individual tests, which can later be exported to Excel and printed out with graphs documenting the performance of each and/or selected cables.

The Level 2 or confirmed performance testing allows the RWC to be inserted in the circuit under test. This allows total system testing, including not only the operability and attenuation of the cables, but the throughput (both advertised and negotiated port speeds) and data signal strength of hubs, switches, routers, PCs, etc., as well.

The RWC is similar to a high-speed time domain reflectometer that you may have seen used to verify RF transmission line performance. The RWC has 1 nanosecond resolution.

If you head to *www.systemsstore.com*, click on the Byte Brothers RWC1000K Real World Certifier. There you can get more information, as well as download the tech manual, a neat feature.

Submissions for Workbench are encouraged and qualify for SBE recertification credit. E-mail to jbisset@bdcast.com. *Faxed submissions can be sent to (603) 472-4944.*

MARKET PLACE

Wheatstone Expands Plant, Staff

Wheatstone said its facility in New Bern, N.C., is benefiting from a recent $1 million capital expansion. President Gary Snow said the company invested in machinery for the fabrication of studio furniture.

"We can now laminate a countertop in 45 seconds," Snow said. The company also added console assembly capacity and increased the number of manufacturing employees by 7 percent, to about 120.

Wheatstone's three furniture lines are the Preference, Eclipse and Techline series; its Audioarts Engineering division has a new furniture series called A-Line. The company also manufactures consoles, routers, processors and other studio equipment for broadcast.

Mike Ormond and Tim Sanders are shown working a new laminate machine.

For information contact the company in North Carolina at (252) 638-7000 or www.wheatstone.com.

AKG K240S

The K240S's semi-open-air design and around-the-ear pads are designed for hours of on-air comfort. It offers accurate reproduction at all listening levels with reduced fatigue even after prolonged use. And it now has a single-sided, detachable cable (no more stepping on the cable and yanking your headphones off!). Frequency response 15 Hz-25 kHz; screw-on 1/4" adapter for secure use; impedance 55 ohms.

K240S List $150.00

LowestPrice only $99!

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12-Channel R90 Audioarts Modular Console. Save $2,854!!

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Need a new console for the control room? Today is your lucky day. We are down to the last three AudioArts R90 12-Channel Consoles in our warehouse and the boss wants them sold. So, we here in the marketing department could razzle-dazzle you with advertising copy till the cows come home, but let's cut to the chase – we've got three of them, and we're willing to go the distance to move them. Only $5,995.00*. That's almost $3,000 off retail price and probably less than we paid for them. Read all about the console on our website and give us a call.

*While supplies last.

R901212 List $8,849.00 LowestPrice only $5,995!

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COMREX

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BSW has all your favorite interview mics. The Audio-Technica AT804 is an excellent omnidirectional interview mic with a metal body. The Shure VP64A omnidirectional interview mic's neodymium magnet provides increased output and improved clarity. The Electro-Voice's RE50B features a built-in shockmount and blast filter for reduced handling and wind noise. The Sennheiser MD46 cardioid mic is very insensitive to pop and wind noise and has extended frequency response.

Audio-Technica AT804	List $110.00	$75.00
Shure VP64A	List $125.17	$79.80
Electro-Voice RE50B	List $264.00	$150.00
Sennheiser MD46	List $199.95	$169.95

LowestPrice from $75!

FREE $99.95 7506 Headphone with purchase of MZM100!!
Or buy 'em separately:
7506 List $130.00 $99.95

SONY

FREE Headphone with Hi-MD Mini-Recorder

Perfect for any portable recording application or playback, the Sony MZM100 has a line-in jack and a mic input. You can use the line-in to archive audio or data, and the minijack input is there for making field recordings using your favorite microphone (this model also includes an ECM-DS70P high-quality, two-head, plug-in stereo mic). The MZM100 supports MP3/ATRAC3/ATRAC3plus and linear PCM audio formats, and supports WMA and WAV audio formats with conversion to ATRAC3. Each Hi-MD disc can hold up to 1 GB of audio or roughly 675 songs (one Hi-MD disk included as well as remote control stick, rechargeable battery, USB cable, AC power adaptor and carrying case). FREE headphone offer expires 3/31/06.

MZM100-PROMO Total List $569.99

LowestPrice only $399!

Marantz CDR632 CD Recorder

NEW!!

The new CDR632's full professional capabilities include sync (level-dependent) recording and programmable auto fade-in and auto fade-out recording with programmable time! Virtually any CD-R or CD-RW disc media may be used for recording, and the CDR632 can also play back un-finalized CD-R and CD-RW discs. You can even un-finalize CD-RW discs and add to them! MP3 playback is available from CDs, letting you play for hours from a single disk. Features include Marantz Minute Track w/adjustable time or level-dependent Auto Track Increment; adjustable pitch control on playback; On-the-fly Manual Track Increment from front panel or remote; Analog, Digital (S/PDIF) and Optical digital (TOS Link) inputs and outputs.

CDR632 List $699.99 LowestPrice only $549!

marantz

Haven't Gotten Yours?!! ...Marantz Handheld Flash Recorder

The PMD660 digital recorder lets you record hours of MP3 audio on a single Compact Flash card (or as uncompressed 16-bit .wav files) and easily transfer to your computer via USB. You can even edit in the unit itself – use simple cut-and-paste editing or take advantage of non-linear, non-destructive playlist editing. Virtual tracks let you compare edits, set up multiple sound bites or provide interview segments of varying durations. Onboard mics for stereo recording, or XLR inputs and mini-jack line I/O. A best-seller at BSW!!

PMD660 List $649.99 LowestPrice only $499!

marantz

NEW!!

Tascam Professional 192 kHz Portable Stereo Recorder

TASCAM

Tascam amazes again with the HD-P2, a portable CompactFlash high-definition stereo recorder that's perfect for 'on location' applications. It records up to 24-bit/192 kHz Broadcast WAVE and transfers to your computer via a fast FireWire interface. The HD-P2 boasts professional features like a SMPTE timecode input for synchronization to external devices while in record or playback. The user interface is designed for fast and intuitive use under stressful one-take-only situations, and its angled LCD is easy to view. XLR mic inputs with phantom power, analog peak limiting, SO MUCH MORE!! Affordable price! See it at www.bswusa.com.

HDP2 List $1,249.00 LowestPrice@bswusa.com OR CALL : 1-800-426-8434

Engineer's Helpful Hint #12:

Before sending the new intern out on the line to get an interview, make sure the batteries are charged and the mic cable is firmly attached.

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TECH TIPS

Arc Fault Circuit Interrupters

What Is the AFCI and Where Might You Use One At Your Radio Station?

by Charles S. Fitch

What is this new circuit breaker, the Arc Fault Circuit Interrupter? How is it better than the CBs we have?

Let me tell you a little story.

Recently I was working in a live branch panel, adding breakers. The curve of the incoming supply wires from the conduit entrance to the input lugs was a little in the way of snapping in one of the new CBs onto the panel rails. My big trusty screwdriver "persuader" should have been able to move those #4s just enough to allow me to do this.

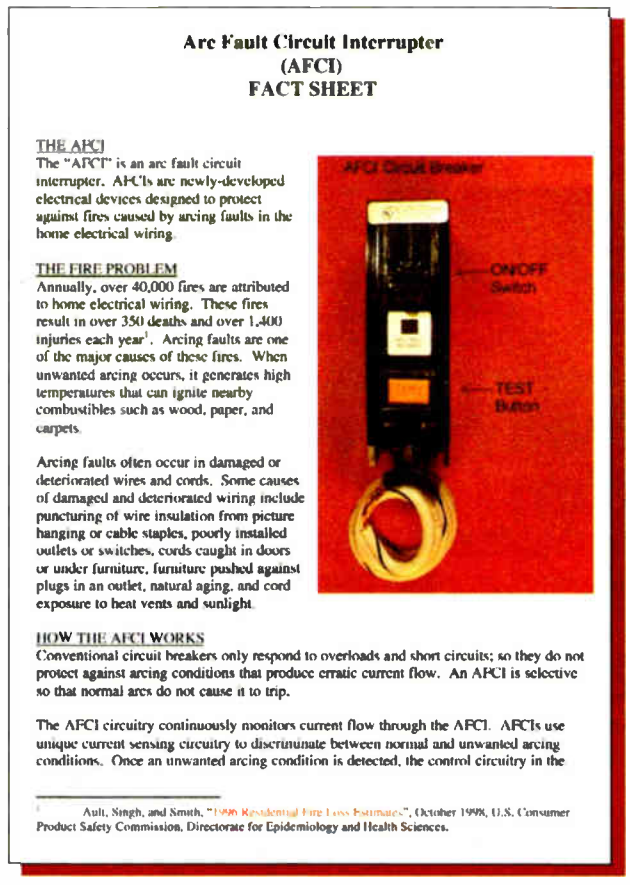
Crack! I drew an arc that startled me, and I'm not easy to startle, being a veteran of many massive "Arcs of the Covenant."

The electrician who wired the box apparently had changed his mind midstream. He had started to cut the supply wires to length but left another 4 inches on them instead.

I had caught the little, hidden, bare section of wire on the backside where he had started his cut. My screwdriver connected with this bare spot, shorting the wire to box ground.

This quick arc destroyed an otherwise excellent Craftsman screwdriver (not covered under the lifetime Craftsman warranty). But did it trip the 60-amp supply breaker? No, because the overload was neither long enough nor sufficient in intensity to get over the "trip curve" of the standard main supply breaker.

Had the breaker been a Ground Fault Interrupter (GFI) or one of the new AFCIs, would it have tripped? Yes, in a heartbeat plus a smidge.



Arc Fault Circuit Interrupter (AFCI) FACT SHEET

THE AFCI
The "AFCI" is an arc fault circuit interrupter. AFCIs are newly-developed electrical devices designed to protect against fires caused by arcing faults in the home electrical wiring.

THE FIRE PROBLEM
Annually, over 40,000 fires are attributed to home electrical wiring. These fires result in over 350 deaths and over 1,400 injuries each year[1]. Arcing faults are one of the major causes of these fires. When unwanted arcing occurs, it generates high temperatures that can ignite nearby combustibles such as wood, paper, and carpets.

Arcing faults often occur in damaged or deteriorated wires and cords. Some causes of damaged and deteriorated wiring include puncturing of wire insulation from picture hanging or cable staples, poorly installed outlets or switches, cords caught in doors or under furniture, furniture pushed against plugs in an outlet, natural aging, and cord exposure to heat vents and sunlight.

HOW THE AFCI WORKS
Conventional circuit breakers only respond to overloads and short circuits; so they do not protect against arcing conditions that produce erratic current flow. An AFCI is selective so that normal arcs do not cause it to trip.

The AFCI circuitry continuously monitors current flow through the AFCI. AFCIs use unique current sensing circuitry to discriminate between normal and unwanted arcing conditions. Once an unwanted arcing condition is detected, the control circuitry in the

[1] Ault, Singh, and Smith, "1998 Residential Fire Loss Estimates", October 1998, U.S. Consumer Product Safety Commission, Directorate for Epidemiology and Health Sciences.

The Consumer Product Safety Commission publishes a three-page fact sheet on the AFCI; go to *www.cpsc.gov/cpscpub/pubs/afcifac8.pdf*

Trip curve

A standard CB has what is known as a trip curve. When current passing through the circuit breaker exceeds a design value, it will open the supply feed. When and how fast this happens is graphed by the trip curve.

If the currents are equal (balanced), power is only being consumed in the load and going nowhere else. If the currents are unequal, a portion of the current is flowing someplace else — back to the generator via another path, normally through ground.

Modern GFIs use a variation of an op amp circuit in high amplification, CMR, differential mode. When the sensed current differential, impressed on the two inputs, exceeds a certain small window, this pseudo op amp goes into maximum gain, tripping open the GFI. That test button on the front actually places a tiny resistor between the high side line to ground (the neutral, normally), causing a microcurrent fault to ground. The resistor value is selected to be a current drain just above the design trip value, usually between 4 and 20 mas.

Out in the big wide world of electrical design and contracting, two types of GFI devices exist. One is the familiar GFI described, which simply opens the circuit when a ground fault appears. The other is a "GFI circuit breaker." This is a composite device that will open the circuit like a standard CB with overcurrent as well as when a ground fault appears. You will see these more complicated devices at disconnects for hot tubs, service entrances at 480 volt three phase above 1000 amps and similar situations.

An immediate location where I see immense value for the AFI is your radio station repair shop.

A standard CB normally does this in two ways.

The first is a thermal trip, in which a control element is heated. The rate of heat increase and final temperature are set by the current flowing through the CB.

For example, say you have a standard 20 amp CB in your panel supplying some racks. Around 20 amps, plus or minus about an amp, the thermal control portion of the circuit breaker starts noticing that you have reached the design value. Look at the bogus trip curve graph shown in the illustration. At 21 amps, this hypothetical CB will take 10 minutes to trip; at 25 amps, about a minute; at 30 amps, about 10 seconds.

The second action is magnetic. A heavy overload (design value of two to 10 times rated control current) instantaneously trips the CB. This typically is a solenoid design with a snap spring released to open the CB quickly and definitively. Note the small avalanche point on the graph.

In the incident I described, my arc didn't reach this instantaneous current point and was not long enough to trip the CB thermally.

My personal guess is that 90 percent of all CBs in the universe have these characteristics.

GFI

How is a GFI, like the one in your bathroom, different? Generally a GFI senses the current flowing down one supply wire and, reciprocally, the current flowing back on the other.

AFI

So we come to the AFCI. What's the diff? Now we must shift gears and think small.

The standard CB senses overcurrent and behaves like a fuse; the GFI senses fault current that is finding its own path back to the generator.

The AFI senses current, sometimes way below the trip point of the standard CB and not sensed by a GFI, that is being dissipated in an arc essentially between the supply wires. The generator (normally the power company) and a general protection CB would just see this as a part of the load. An AFCI device looks at the waveform of the current flow and opens the circuit when that waveform resembles an arcing fault. (UL 943 is the standard for ground-fault circuit-interrupters and UL 1699 is the standard for arc-fault circuit-interrupters.)

Is this arcing dangerous?

Because most of the new NEC requirements mandate the use of the AFI in homes, let's start there. The Consumer Product Safety Commission informs us that 145,000 residential fires occur each year. (Do you know where your home fire extinguishers are?)

Some of these fires, especially those of unknown origin, are caused by undetected, usually minor arcs.

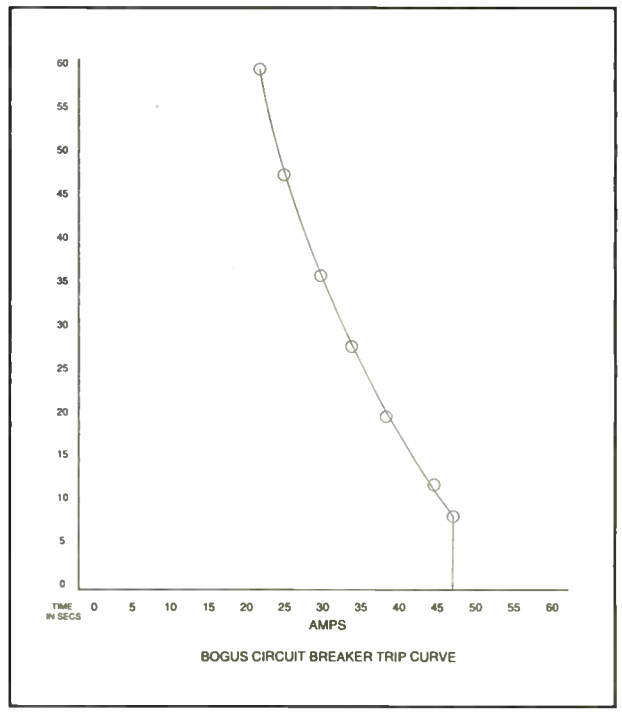
According to the CPSC, 13,000 preventable electrical fires claim more than 700 human lives, 6,700 injuries and $1.2 billion in personal property each year.

These arcs can occur in defective switchfields in appliances such as hair dryers or dishwashers; in defective cord sets of small electric appliances that are always plugged in like can openers; etc. Subtle arcs can occur in everyday tasks as pedestrian as driving a picture frame nail through Romex in an interior wall or placing a drywall screw placed during repair work even into armored cable such as Greenfield. Arcs exhibit different current flow/consumption patterns than most loads in a house or radio station. Most of the available AFI CBs have embedded microprocessor control to make this subtle differentiation and trip.

In the 2002 NEC, the primary mandate for AFI is in the bedroom area. But as prices drop and the finesse of AFIs improves over the years, we can expect to see them mandated in more areas of home and business.

The average price at the moment for a 15 or 20 amp single-pole AFI to retrofit into your CB panel is about $35. A QO type Square-D 15 amp AFCI sold at Home Depot in my area in December for $31.

An immediate location where I see immense value for the AFI is your repair shop. I suggest an AFI CB in the panel, followed by a downstream GFI to protect every outlet where you might come into contact with AC, such as the workbench circuit. If you plug in a device and either of the two, GFI or AFI, trips, you know there are serious AC side problems within that box. These trips mean the same thing at home if you plug in your favorite boombox from the '70s and the AFI trips.



Author Buc Fitch provided this caption for the above: 'Trip curve for a very special CB, the QZ Square-Buc. It exists only in the Twilight Zone.' Our caption: Hypothetical circuit breaker trip curve.

If you happen to plug in yourself, there's a good chance you might preserve your life if one of the two interrupters trips quickly enough.

Charles S. Fitch, W2IPI, is a registered professional consultant engineer, member of the AFCCE, senior member of the SBE, lifetime CPBE with AMD, licensed electrical contractor, former station owner and former director of engineering of WTIC(TV) in Hartford, Conn., and WHSH(TV) in Marlborough, Mass.

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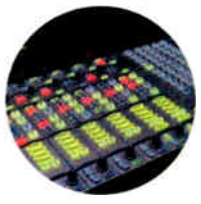

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HARRIS

NRB Members Gather in Dallas

by Lauren Rooney

Gimme that ol' time religion; just make it more relatable. That, one could say, is a focus of Christian broadcasters in the second half of this decade.

"I think we've been a little too stodgy and a little too staid for a number of years; and I think it's time that we started relating to our culture in a more effective way," said Dick Jenkins, president EMF Broadcasting, Rocklin, Calif.

There was a time when those seeking Christian programming had few choices and so they stuck with what stations wanted to give them. Now listeners can find various channels of Christian programming online and via satellite radio.

"The consumer today is much more sophisticated and aware of other choices; and that means their loyalty factor to us may be diminished from what it was in the past because we're not the only game in town," Jenkins said.

Jenkins said teaching programs have seen a 20 to 25 percent drop in audience in the last four years, with the bulk of that loss among younger listeners. If you don't bring young people into your format, the format is going to die off.

The solution, he said, is to get better at giving listeners what they want.

The annual National Religious Broadcasters convention and exposition Feb. 17–22 in Dallas/Fort Worth. Organizers hope to help Christian radio shake off some cobwebs and grow the listener base.

REACH out

New this year at NRB is REACH 2006.

"The focus of REACH 2006 is on developing innovative media for a new generation," said NRB President Frank Wright. The conference will present ideas and techniques to use various electronic media as a bridge to reach a younger demographic.

"The timeless message of the Gospel must remain the same, but creative new ways of reaching people with that message will be explored," Wright said.

The NRB, organizers say, is the nation's largest religious convention. It has seen attendance grow by about 4 percent each year; last year's total was just under 6,000 people.

Ron Harris, Greg Fast, Wayne Pederson, Roger Stubbe and Dick Jenkins discuss challenges facing Christian broadcasters at last year's event in Anaheim.

Judging from session offerings, religious broadcasters are concerned about how to attract new audiences, use technology and improve station imaging.

"One of the criticisms of Christian broadcasting is it sounds inferior to mainstream radio. So we're offering a hands-on boot camp to help people learn how to write better and do better production," said Tim McDermott, president/general manager KSBJ(FM), Humble, Texas, moderator of "Sing It or Say It: Shaping Your Station's Image."

"It's about spreading the word without breaking your budget," he said.

NRB boot camps are day-long training sessions. Camps also focus on better use of a station's Web site and management strategies.

Write said the Innovation Exchange continues to be among NRB offerings. He called it "a dynamic time of interaction and peer-to-peer resource exchange."

The peer-led session features small groups meeting to discuss issues facing communicators and ministry leaders.

The convention's opening session will be emceed by Wayne Shepherd, manager of programming for Moody Broadcasting Network in Chicago. Speakers at that event include Tony Evans, president of The Urban Alternative and Jack Graham of PowerPoint Ministries. Music is by Denver and the Mile High Orchestra.

NRB has invited President Bush to speak; he has appeared at the event in the past.

Digital and the Lord

New technology is expected to be on the minds of participants. The convention includes Tech Lab, an exposition hall featuring some 250 vendors. There will be sessions discussing how Wi-Fi will change radio and how stations are planning for HD Radio.

Jenkins, who is moderating a session on new technology, said HD will be a good thing for consumers because it will create more competition among Christian broadcasters, creating a better product.

"We've seen Susquehanna, Clear Channel and other chains in starting to dabble in Christian formats," said Jenkins. "I think in the long haul more channels of distribution, more available frequencies, more bandwidth means more opportunities for people to try things."

The general health of Christian radio seems to be pretty good; McDermott said it saw good audience growth last year. "But the growth was offset by a poor economy."

Natural disasters like the tsunami and hurricanes had listeners donating to those causes rather than to their radio stations; high gasoline prices and a sluggish economy meant less money for listeners to spend at station advertisers.

Many of the issues facing Christian broadcasters are the same as those facing mainstream radio: meeting the bottom line; dealing with competition from iPods and satellite radio; station pricing.

"There's a certain group of people now who think stations are at their peak and because of increased availability of channels of distribution the prices of radio stations are going to fall," said Jenkins.

Wright said the future of Christian broadcasting will be audience fragmentation. The challenge will be making the listener feel connected with your station or program.

"Above all, content will be king," Wright said. "Most people of faith don't want to remain static, they want to grow spiritually. They will be most loyal to programming that makes a tangible difference in their lives."

Info

What: NRB 2006

Where: Gaylord Texan Resort & Convention Center, Dallas/Ft. Worth

When: Feb. 17–22

Who: Professionals in Christian communications including broadcasters, media pastors and program producers

How: Register at *www.nrb.org*. NRB members pay $450; non-members $595, Expo only $100

We've seen Susquehanna, Clear Channel and other chains starting to dabble in Christian formats... More channels of distribution, more available frequencies, more bandwidth means more opportunities for people to try things.

— Dick Jenkins

SUPPLY SIDE

Danagger Audio Works

Supply Side is a series of occasional articles about suppliers in the U.S. radio broadcast industry. This Q&A is with Rob Robson of Danagger Audio Works.

You make the Plan B, which provides automatic switchover to an internal digital or analog audio source when a main program source fails.

It also does quite a bit more thanks to many great suggestions we've received from engineers.

The original Plan B, which we launched in 2002, is just as you described: a digital/analog silence sensor with a built-in backup audio source and a nice little voice remote control system.

Bundling those features solves a couple of growing problems radio stations face. Unattended operation can increase the likelihood of dead air, as well as the time it takes for personnel to notice and correct the problem. Also, consolidation

Rob Robson

and the growing need for engineers to look after several sites means that one-off solutions are no longer practical. The Plan B fills the dead air hole by itself, notifies the engineer and allows some simple diagnostics and corrections by remote control. There's also a listen line, automatic secondary STL switching and the ability to patch an incoming call directly to air for live emergency announcements. It's all in one rack-mount box with an internal power supply.

Then to fill the growing need for an IP-connected solution we developed the Plan B Deluxe, which has advanced audio storage and cut management capabilities, MP2 playback, failure logging, e-mail notification, Web remote control — the list goes on. It's the answer to requests we received for a backup system with no moving parts, or one with tons of audio storage, or one that could do day-part-specific backup programming, and it all still fits in a 2U chassis.

Who founded the company? How many employees do you have?

I started Danagger Audio Works after an 18-year career in radio/audio engineering and a lifetime of experimenting with electronic gadgets.

I felt the Plan B was an idea whose time was coming so I put everything I had into designing, developing and patenting it. The great feedback we've had encouraged us to keep expanding on the idea, and we think we're now at the point where we have a product that can benefit any station.

Danagger itself is a very small company. Our Christmas party would fit in a phone booth, although the band would have to set up outside. We work with a small group of excellent local companies who help us to build our products. It's pretty amazing what we've achieved so far, despite our size. There are Plan Bs in use all over the globe now.

What's new in 2006?

Our newest addition is the mid-price Plan B Classic, which we're excited about because it does local insertions for networks — something people have been asking about since NAB2005. It started out as a replacement for the original Plan B, which we unfortunately had to discontinue because its DVD drives were becoming too hard to get. The Classic uses many of the same components as the Deluxe and the entry-level Plan B Basic, so now users can upgrade between models as their needs change.

The Classic has all the features of the original Plan B, plus the option for Compact Flash audio storage and the ability to insert local programming during network breaks. This makes it possible to create really tidy network installations, because it gives you silence sensing, audio backup, a listen line, a voice remote control and local audio insertion all in one box.

On a broader scale Danagger is also looking into potential ways to help us get our products into more locations more quickly, possibly by working closely with a U.S.-based broadcast equipment manufacturer. The demand is growing for Plan B units, especially the new network-friendly Classic model, and we want to be sure that we can provide the best service possible to our customers as we grow to meet demand.

Info

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www.danagger.com

FACILITY PROFILE

Entercom New Orleans Slowly Recovers

by Scott Fybush

For Entercom's cluster of New Orleans stations, the road back to normal operations has taken some strange detours.

The big radio headline after Hurricane Katrina was the "United Radio Broadcasters" partnership between Entercom and Clear Channel, which used staffers from both companies to produce programming that was simulcast on both groups' stations in New Orleans from Clear Channel's studios in Baton Rouge.

As life, and radio, in the city began to settle down after the storm, United Radio Broadcasters came to an end in November, when the last of the Clear Channel stations that had been simulcasting the United programming returned to its regular format.

Southern hospitality

The cooperation between Clear Channel and Entercom continues, however, as Entercom's WWL(AM) remains in the Baton Rouge Clear Channel studios.

"They've gone way out of their way to accommodate us," said Marty Hadfield, Entercom's vice president of engineering. "It's really a nice situation for us to have a little breathing space on WWL," as the station waits to be able to move back home.

For the rest of Entercom's cluster, another AM facility and four FMs, the road back to New Orleans is running through the former Jefferson Parish Administration Building in suburban Gretna.

That facility, across the Mississippi River from the former Entercom studios in New Orleans' central business district, was scheduled for demolition even before Katrina hit.

Now, one floor of the building is being used as office space for the Entercom stations. The other floor has been converted into temporary studio space for the three FMs that returned to their normal programming in November: top 40 WEZB(FM), classic rock WKBU(FM) and adult contemporary WLMG(FM).

A fourth FM, WTKL(FM), suffered serious damage at its transmitter site and is being operated from a low-power auxiliary transmitter as a relay of WWL's news-talk programming; the second AM, WSMB(AM), runs automated Air America programming.

"It's really just a voice room per station," Hadfield said of the temporary facility known internally as "JAB."

Each station was initially linked by a Marti RPU (since replaced by ISDN lines) to the main Entercom studios across the river, where Dalet automation continues to play out music, liners and spots.

"We have limited access to our former studios," Hadfield said. "The building is only open during business hours," due to security concerns and lack of running water in the area. Entercom is the only tenant that has returned to the Poydras Street office tower since Katrina.

Each morning at 8 a.m., Entercom's production and traffic staff go to the former main studios to spend the day loading the Dalet system with spots and production material. On the other side of the river, each station's airstaff reports to "JAB" to go on the air from a small studio equipped with just a microphone and a small mixer.

Photos by Joe Pollet

WKBU's remote studio

VNC software provides remote access to Dalet HD system at the main studio.

Initially, Hadfield said, the talent at "JAB" used touchtones to control the Dalet system, with filtering at the studio end of the Marti used to keep the DTMF tones out of the broadcast audio. With the switch to ISDN, the talent now has full remote access to the Dalet, making the "JAB" facility function much like any other remote broadcast — one that runs live 24 hours a day, seven days a week.

The goal is to return to the Poydras Street studios. Hadfield says the fifth-floor facility rode out the storm fairly well, losing exterior glass and suffering water damage to the studios that lined an outside wall.

Entercom had its own generator and air-conditioning system, which continued to function even after the building's main chiller system was shut down. Hadfield said a test of the air quality in the fifth-floor studios found that the indoor air was better than the air at street level outside.

"Right now, we're trying to determine what our prospects are, facility-wise and time-wise, to move WWL back," Hadfield said.

For the moment, WWL is using a Louisiana Network satellite uplink to feed its programming from the Clear Channel Baton Rouge studios back to the New Orleans studios, where spots are played out of the Dalet system.

News reporters in New Orleans gather their material on laptops, then use Verizon Wireless' data network to send the files to Baton Rouge, where Clear Channel has loaned WWL a portion of its Prophet Systems automation system to store news audio.

Entercom also faces rebuilding work at its four transmitter sites around New Orleans. Hadfield said the WWL site, in a bayou south of the city, suffered no significant damage from the storm, except for the washout of the private road that leads to the facility.

Marti backup transmitters and Moseley LAN link are used to extend the Dalet network.

Entercom worked with FEMA to upgrade the site generators, installing two new generators and a new elevated fuel tank. An overcrank problem with the former generator at the site took WWL off the air for several hours at the height of Katrina.

When the project is finished, the main generator will feed WWL's 50 kW transmitter and its two-tower directional antenna, while the auxiliary generator will serve the 10 kW backup transmitter and a long-wire emergency antenna, providing a completely separate emergency facility at the site.

The American Tower-owned site where three of the Entercom FMs are located also survived the storm well. It will become home, at least temporarily, to the fourth Entercom FM (WTKL 105.3) as well, since the "BBT Tower" where that station was located suffered severe damage and will be unusable for some time to come.

The site was co-owned with a Clear Channel FM station that also is using the American site and with a public TV station, WLAE, which remains off the air.

For now, a low-power transmitter at the American Tower site is providing a minimal signal on 105.3. Entercom hopes to take one of the new Harris HD Radio transmitters it had ordered before the storm and use its analog-only capability to restore a full-power 105.3 signal from the American Tower facility, once equipment becomes available.

Entercom's fourth site, the WSMB (AM) facility, suffered some building damage, but the station remains on the air.

"I'm just proud of our people," Pollet said, "and thrilled that the Clear Channel people have risen to the occasion right alongside us."

Scott Fybush is a frequent contributor to Radio World.

Gates Sta-Level Offered Longevity

Before Replacement by Units With Advanced Circuitry, Sta-Level Touted Simplicity

by Tom Vernon

As a youngster whose interest in radio began in the mid-1960s, I went on nickel tours of every broadcasting facility I could find. One of the classic pieces of equipment at every station was the Gates Sta-Level.

This basic AGC amplifier usually was the last link in the air chain before phone lines to the transmitter site. It came into being when the transmitter watch engineer was eliminated, and it provided the electronic equivalent of a slow hand on the console's master gain control.

Part of the reason for the Sta-Level's ubiquity was its long production life. Manufacturing began in the late 1950s and continued through the early '70s, when it was replaced by the Gates Solid Statesman AGC. Apart from a few cosmetic changes to the front panel, the Sta-Level remained virtually unchanged throughout its long life.

It often operated in tandem with a Gates SA-39B peak limiter located at the transmitter site. Before the advent of loudness wars, this combo was all that was necessary to keep a station's modulation within the 85-100 percent limits mandated by the FCC.

Casualty of war

As with most classic gear, simplicity was part of its success. A GE type 6386 dual triode remote cut-off tube was used as a push-pull variable gain input stage. This was followed by 12AT7 driving a push-pull 6V6 output stage. The output stage provided the signal for the 6AL5 bias generator. Acting as a full-wave rectifier, it supplied the bias voltage to the grids of the 6386. A 0B2 regulated the 300-volt power supply.

The Sta-Level had a control range of about 25 dB and a compression ratio of 3.3 to 1. The threshold was +10 to +12 dBm. Although it was best operated at unity gain, it could provide up to 35 dB gain with the built-in resistive pads.

Unlike today's processors, the Gates Sta-Level had minimal adjustments. The input control determined the amount of compression. A front-panel switch selected moderate or fast attack and recovery times. An internal pot was used to set the meter to zero under no-signal conditions, and the output control could be set to drive phone lines to +8 VU. When it came time to do the annual Proof of Performance, the 6AL5 was removed to disable AGC action.

A drop-down front panel provided access to the Sta-Level's circuitry for voltage measurements and repairs. Replacement of ailing tubes and electrolytic capacitors, along with blowing out the dust, were usually all that was necessary to keep the Sta-Level in good operating condition.

While the Sta-Level was probably the most popular AGC amp to use the 6386 as a variable gain device, it was not the first. General Electric used this scheme in its Uni-Level AGC amplifier, and subsequently patented the circuitry. The Uni-Level was built for economy rather than elegance, and featured fixed resistive pads for input and output control, no voltage regulation and no indicating meter.

Comparing schematics of the Uni-level and Sta-Level, it appeared that the Sta-Level was a copy of the GE design, and the 12AT7 stage was added to avoid any patent infringement with the Uni-Level. All the gain of this stage was cancelled out by negative feedback. One of the popular underground mods for the Sta-Level was to remove the 12AT7, and bridge around it with .5 uf coupling capacitors. This resulted in a more pleasing sound, and reduced noise and distortion.

See GATES, page 32 ▶

This Gates Sta-Level was in the college station where I worked as an announcer and engineer. It rode gain for me and countless student announcers as we played the Beatles and Joni Mitchell. It was retired in the late 1970s.

PRODUCT EVALUATION

Sony Throws D1 Into Flash Recorder Ring

by Frank Beacham

In the sea of Flash memory-based audio recorders now on the market, all come with some flaws. But now, like a shooting star, Sony has entered the fray with a compelling new pro field recorder that defies conventional expectations and seems destined to be a classic.

Once you get past the "wow factor," the portable Sony PCM-D1 is an awesome bit of audio engineering that demonstrates once again that Japan's sleeping giant — in recent years — still has the ability to produce products that break the rules of commodity thinking.

While some of today's portable Flash recorders are cheaply made, come with buggy software, omit essential features or are too complex for the layperson to easily operate, the Sony PCM-D1 hits a home run by combining high-end quality and a well-designed, compact package. This may be the easiest pro audio recorder I have used.

WAV files in seven flavors

At a list price of $2,000, this recording machine might scare away some radio users. For those who want a flexible, rugged tool for no-compromise field audio recording, the D1 will be seen as an investment in quality.

Housed in a 1 mm thick titanium case, the D1 — weighing little more than one pound and operating on four rechargeable AA batteries — uses low-noise components. Its integrated stereo X-Y microphone configuration is nice, with Sony claiming the D1's condenser pair has a nearly 30 kHz frequency response and results in a sensitivity of nearly 6 dB superior to that of a standard outboard stereo microphone.

Unlike many Flash recorders that produce a garden variety of file formats, the D1 produces only uncompressed native WAV files in seven possible flavors. The most popular for radio will be 44.1 kHz/16-bit, while those wanting the highest quality will choose 96 kHz/24-bit.

The other main preset choices are for the built-in digital limiter, which is 20 dB lower than audio processed in the normal circuit and protects against clipping; and a 200 Hz high pass filter to knock out noise from sources such as air conditioning. Also included is Super Bit Mapping circuitry for enhanced 16-bit recording.

Once these initial choices are set, they remain in memory until you change them. There are no profiles or other combinations of options to remember. From this point on, just press Record/Pause, set your levels on twin analog VU meters with LED peak indicators and then hit Pause.

While recording, the meters and backlit LCD display offer status information. The fat, concentric control knobs allow easy adjustment of levels while recording. Live monitoring is available via a headphone jack.

Once a recording is made, it is stored in the 4 GB of internal Flash memory upon hitting Stop. To access the recording off the D1, plug its USB 2.0 port into a Macintosh or Windows personal computer. The D1 mounts as a hard drive, allowing drag and drop of the WAV files for editing or burning CDs. Special conversion software is not necessary.

Imagine 3-D sound

My evaluation unit arrived the day before fans from around the world gathered at Strawberry Fields in New York City's Central Park to remember the 25th anniversary of the death of John Lennon.

Beacham appreciates the PCM-D1's ability to discern between conversation and background noise when recording.

The marathon of live singing provided an ideal opportunity to test the D1's live recording capabilities.

I waded through a sea of humanity to get near the performers singing at the edge of the "Imagine" mosaic that commemorates Lennon's life. This was a moment where simplicity was key. Having engaged the limiter, as levels would be hard to monitor, I got a quick initial level, hit Record and held the D1 as close as I could get to the performers and the sing-along crowd.

Though I had no idea what I was getting while recording, the results were great. Because there are no moving parts, the recorder produces no self-noise. The stereo imaging offered almost a three-dimensional quality to the sound. The windscreen accessory worked well in the light breeze, though more substantial protection would clearly be needed on a windy day.

From Strawberry Fields I moved to a noisy diner to record an interview for possible use on a podcast. The D1 has a screw-mount at the bottom that allows attachment to a camera tripod. So I mounted it on a mini-pod to elevate it a few inches above the tabletop. Again, I set levels of the two of us and placed the D1 slightly off to the side. With all the background noise of plates and glasses, I had little expectation of success.

Again, when I returned home and dragged the files to the desktop of my Macintosh for listening, I was pleasantly surprised. The built-in mics had a way of picking up and highlighting the conversation and reducing the background clatter. Not only did I appreciate the sound quality I was getting, but I began to appreciate the lack of cables, battery holders, preamps and other clutter that such restaurant interviews had previously involved.

Over the next few days, I recorded a range of material, from open room conversations to live acoustic music, both piano and guitar. In each case, the results were nice. A couple of friends, prominent professional musicians, were taken with the D1 and saw it as a powerful tool for recording their own performances at home.

Suggestion box

There's a lot to like about the PCM-D1, but it's not perfect. The device's I/Os use consumer-type 3.5 mm stereo mini connectors. There are no XLR connectors for mic or line level in or out. Over time, I suspect some enterprising third party will offer a mod for this, but it was a big oversight by Sony not to include some kind of professional connectors with a recorder of this quality.

Sony also needs to create a more convenient rechargeable battery system for the D1. After the four included AA nickel metal hydride batteries are exhausted after about five hours of use, they must be removed from the unit's slide-in battery tray cell by cell and then inserted into an outboard AC charger. Once charged, they must again — cell by cell — be reinserted into the battery tray.

The good news is that Sony or a third party could build a one-piece battery cartridge that would pop in and out of the D1 in lieu of the AA battery tray. Hopefully, the machine will become popular enough to create a market for such a battery.

The thin foam windscreen that snaps over the built-in microphones is not protective enough for a stiff outdoor breeze, much less real wind. One of those furry professional wind protectors from a company like Rycote is much needed.

Finally, I wish Sony had created a way to separate the microphone module from the recorder. Then the mic array could be used on stage to record a live musical performance while allowing an off-stage operator to have control of the recorder functions.

In its current configuration, the D1 is a bit boxy-looking when mounted on a microphone stand, and some musicians will not want it positioned in audience view. Also, if used on stage, the operator is forced to set it and forget it until the show ends.

None of these criticisms are deal-killers. The D1 can be powered through its AC adapter when needed and can accept outboard microphones and preamps in live performance applications. These are just issues of convenience involving a recorder that I think is suitable for audio journalists like myself.

For radio sound recordists who want the ultimate portable field recorder, the new Sony PCM-D1 deserves consideration. It doesn't come cheap, but genuine quality rarely does.

Frank Beacham is a frequent contributor to Radio World.

Product Capsule: Sony PCM-D1 Portable Audio Recorder

Thumbs Up

- ✓ Extraordinary field recording quality
- ✓ User-friendly operating interface
- ✓ Excellent built-in stereo microphone
- ✓ Solid, intuitive software with no obvious bugs
- ✓ First-rate VU meters, LCD interface and user control knobs
- ✓ Built like a (titanium) tank

Thumbs Down

- ✓ Lack of pro audio connectors
- ✓ Clumsy rechargeable battery system
- ✓ Stereo microphone not detachable
- ✓ Needs more protective windscreen

PRICE: $1,999.95

CONTACT: *Sony at (800) 686-SONY (7669) or visit www.sony.com/professional.*

Gates

▶ Continued from page 31

The magic of the GE 6386 as a gain control device was undeniable. Original GE-produced devices featured gold-plated grids. The tubes had an almost unlimited life and never seemed to lose their near-perfect linearity. Many radio and TV stations copied the Uni-Level's circuitry in their scratch-built processors, adding variable input and output attenuators, full voltage regulation, threshold controls and compression metering.

By the early 1970s, the loudness wars on AM were heating up, and the Sta-level didn't offer any options to get a more robust signal. Many were replaced by the CBS 4440 Audimax, which featured more advanced solid-state circuitry and the added mystique of encapsulated "mystery modules."

A few major-market engineers replaced Sta-Levels with bleeding-edge technology, scratch-built multi-band AGC amplifiers. These provided their top-40 rockers with a real competitive edge and gave rise to the next generation of analog processors.

Tell us your memories of the Sta-Level and other gear of that vintage. Write to radioworld@imaspub.com.

Tom Vernon is a frequent contributor to Radio World.

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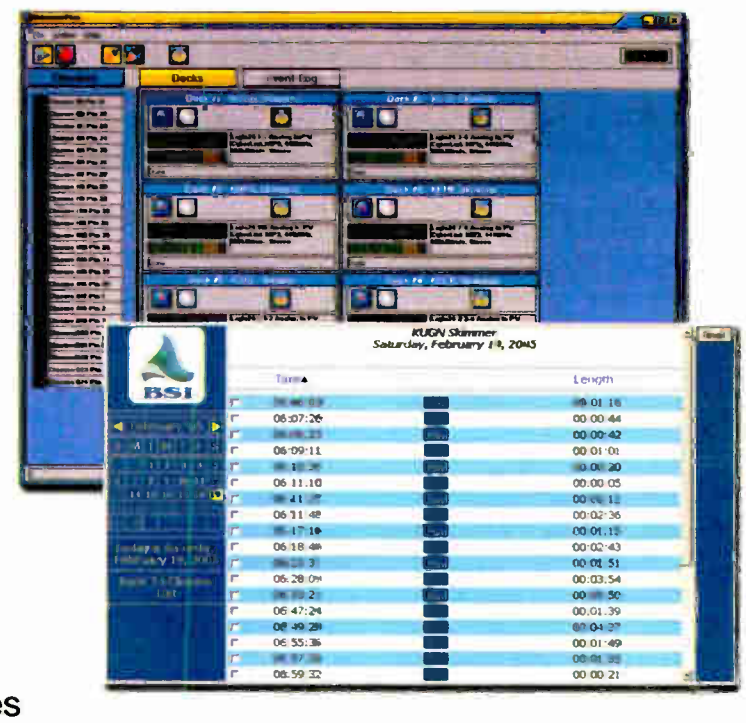

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PRODUCT EVALUATION

NM-250 MKII: A Newsroom Headliner

Dixon Systems' Upgraded 2 RU Newsroom Mixer Offers Phantom Power, Quieter Inputs, Mix-Minus Bus

by Carl Lindemann

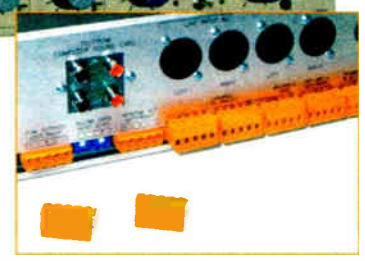
It used to be the demands put on a newsroom mixer and full broadcast console were far different. Today, news staffs are called on to mix and match material from many sources, requiring more sophisticated capabilities.

Over the past few years, Dixon System's NM-250 has gained a following by providing a mixer that meets this need, aiming to combine the simplicity and ease of operation typically associated with a newsroom mixer with a broadcast console's power and flexibility. The company says it has about 1,000 units installed. The NM-250 MKII refines and improves the company's concept.

For those familiar with the original NM-250, this upgrade includes numerous improvements suggested by feedback from the field. These include quieter inputs that can be set to line or mic levels with jumpers, and phantom power. Integrating a telehybrid is now simple with the new mix-minus bus alongside an input for the return from it.

The package meets most needs for a news operation in a convenient 2 RU unit.

NM-250 MKII



Detail of the rear connectors

Easy to figure

The beauty of the NM-250 MKII is in the simplicity of its controls. A bottom row of pots controls levels. Starting on the left, a pair is marked for microphones, then single pots are labeled for phone, computer and line one and two. There is a 1/8-inch front input jack with a dedicated pot for adding a field recorder. Each has a pushbutton cue switch. A second strip of on/off switches with LED light over them either engages or disengages these.

On the right, a two-channel LED for levels is over pots for the monitor and headphone. Two talkback switches include LEDs to identify who's calling. A switch under a headphone jack toggles between off-air and mixer. For the typical applications, even non-technical talent can grasp the self-explanatory layout.

The rear-panel connectors are fairly straightforward. The bottom wiring row is labeled for program outputs, monitor, mix/minus off-air in, talkback in and talkback send 1 and 2. An added feature is these connectors interface with a pop-out component. Wires are screwed down into the pop-out, then attached to the back.

This arrangement makes for more flexible installation and maintenance than if wires were attached directly. Instead of having to pull the whole unit from the rack to check connection, you pull the pop-out. Above this, a row of female XLR connectors are set up for the line ins, phone and mics. A pair of unbalanced RCA connectors serves as the I/O for a computer soundcard.

A cleaner sound

The major component upgrade for the MKII is the three new low-Z mic preamps. The first two are used for the mics; the last is intended for configuration as the line input return for a telehybrid.

The original components were sufficient for most radio applications, with S/N ratios of around 65 dB. Considering signal quality is only as good as the weakest link, this is a pretty decent spec especially for AM radio applications. But with the coming digital radio advances as well as additional applications for the NM-250 as a remote mixer, the new high-grade components bring the S/N ratio much lower. The published specs of under 80 dB are borne out with tests of the demo unit showing 85 dB.

Beyond the mic preamps, the unit is quiet from the use of 1 percent metal-film resistors all through the audio path and the power supply's toroidal transformer. While a lot of newsroom work is of the "quick 'n dirty" variety where time is of the essence in breaking stories, it's nice to know the MKII doesn't contribute to any of the rough edges that go with the territory.

Other adds for the MKII include start and stop pulses for the telephone and computer inputs. A 100 ms pulse to ground can be used to operate computer playback as well as telehybrid operation.

Overall, the NM-250 MKII is a well thought out piece of gear; an easy choice for a busy news operation. The front jack 1/8-inch input is especially welcome for field reporters wanting to get sound they've gathered out to the audience without any hassle. For larger operations, maintaining consistency from workstation to workstation makes it simple for staff to work at different locations with the same interface. Also, the rackmount design opens valuable desk space.

The only downsides are the unbalanced RCAs for the computer interface and the thin gauge metals used for the cover/case. Actually, the unbalanced RCAs are wired as differential inputs. Gain is configured for –10 dB and one side of the differential input is grounded.

The computer I/O is designed to save the need for a balanced/unbalanced adapter typically used to bring consumer-grade components — here, a generic computer's soundcard — into the professional broadcast mix.

Even though the quality of consumer soundcards has come up considerably, the real issue is that using any unbalanced audio connector near a PC is an invitation for trouble. PCs typically generate a variety of electrical noise from the computer's power supply and motherboard and the best way to sidestep it is by using a professional audiocard with a balanced I/O. But with the MKII, you'll need to use a balanced/unbalanced adapter to attach a professional soundcard.

When asked about the I/O, company officials indicated that users can simply field adjust the inputs to a professional +4 dB to facilitate a "pro" card. Also, computer noise from consumer soundcards apparently hasn't been an issue. Even so it would be far better to scrap the RCAs for balanced TRS jacks.

The question of the case for the unit is perhaps a bit picky. The NM-250 MKII is not designed to be a portable mixer and the components inside the box will be perfectly safe when properly installed in a rack. Still, the aluminum top of the case seems a bit thin and flexes in without too much weight or pressure applied. Tossing it on top of the pile at a workstation is not a good idea.

The NM-250 MKII is a workhorse for the contemporary radio newsroom and a significant improvement over adapting general-purpose mixers for this highly specific broadcast task.

Carl Lindemann is a frequent contributor to Radio World.

The major component upgrade for the MKII is in the use of three new low-Z mic preamps.

Product Capsule:
Dixon Systems
NM-250 MKII
Newsroom Mixer

Thumbs Up

- ✓ Simple to understand/operate
- ✓ Broadcast functionality in 2U space
- ✓ High quality, low-noise components

Thumbs Down

- ✓ Unbalanced (differential) RCA computer I/O
- ✓ Light gauge case

PRICE: $1,199

CONTACT: *Dixon Systems in Toronto at (416) 261-3773 or visit www.dixonsystems.com*

PRODUCT GUIDE

Omnitronix SL81 Has Serial Ports, EventSensors

The SNMP-Link SL81 remote site manager from Omnitronix offers dial-up or Ethernet access, up to six serial ports and up to 16 external EventSensors.

The SL81 typically is accessed via either its internal dialup modem or its internal 10Base-T Ethernet interface. Both of these items are optional and should be specified when ordering.

The unit provides two or four serial ports depending on the configuration ordered. The serial ports are used for Remote Console Port Access and or Serial Alarm Monitoring. If four serial ports are used, the SL81 can have only eight onboard I/O channels.

The SL81 has an optional internal temperature sensor plus up to 16 optional I/O channels, which can be a combination of contact closure inputs, analog inputs and/or relay inputs, allowing the user to monitor and control environmental and equipment alarms and conditions within the remote equipment room. It detects discrete contact alarms from devices such as backup power systems, air conditioners, door sensors and status outputs from non-networked devices.

An EventSensor Port on the unit's rear allows the user to connect up to 16 external EventSensor modules, which provide additional capabilities to sense temperature, humidity, contact closures and analog inputs, as well as the capability to switch relay outputs.

For more information, including pricing, contact Omnitronix in Seattle at (206) 624-4985 or visit www.omnitronix.com.

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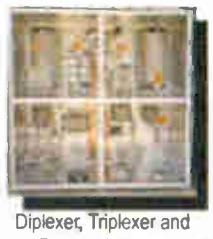

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PRODUCT GUIDE

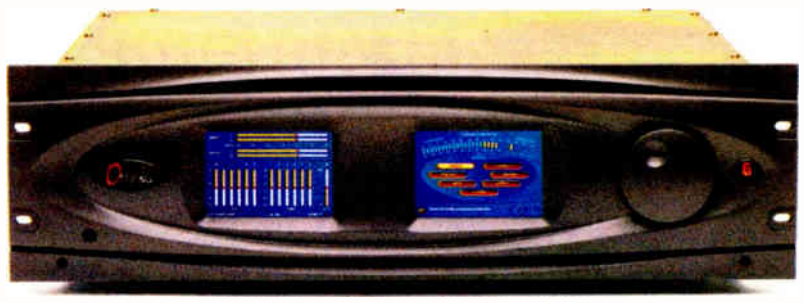
ENCO Offers CAP Option for DAD System

ENCO Systems debuted CAP, a content adaptive processing option for its DAD Digital Audio Delivery system designed to work with Omnia processors. CAP enables program directors to automatically adjust their audio processor settings to match program needs, without manual intervention.

The company says audio processing characteristics can be grouped in DAD's library so that when a particular class of music, voice track commercial or other classification appears in the on-air play list, preset settings are applied in real time to their Omnia processor.

CAP eliminates compromises to audio quality introduced by accepting a single audio processor setting across an entire broadcast of varied content.

For more information, contact ENCO in Michigan at (800) ENCOSYS (362-6797) or visit www.enco.com.



CAP allows a station to change the settings on their Omnia processor (shown).

50 kw Software Offers Coroner's Report, Click2Play Downloads

Coroner's Report from Fifty Thousand Watt Software immediately alerts the appropriate person if a station goes off the air. It watches streaming audio from an Internet radio station, or an audio input to the computer soundcard. When the sound card goes dead, Coroner's Report calls a cell phone or a pager. If the phone call is not answered, it can be programmed to leave a "voicemail" message of identifying tones or clicks.

The user can define what audio level and what length of dead time will trigger the alarm. The software uses the computer's modem card to call out, which the company says eliminates the need for special hardware. For internet radio, the software tunes into the radio station and starts the audio stream.

A 30-day demo is available for download at the company's web site. Coroner's Report runs under Windows XP.

The company also offers Click2Play, which identifies the sound files in a folder and automatically creates a screen of buttons for playing the sounds. The software enables the assembly of a catalog of sounds just before going live on the air.

Click2Play operates in one of three playback modes. In Single Play mode, a single sound can play at a time and an accidental button click cannot interrupt the sound. In Interrupt mode, a button click can stop the currently playing sound and start a new sound.

In Queue Multiple mode, multiple sound files can queued for playback. The program remembers the order in which the sound file buttons were clicked, and starts the playback of the next sound immediately following the previous sound.

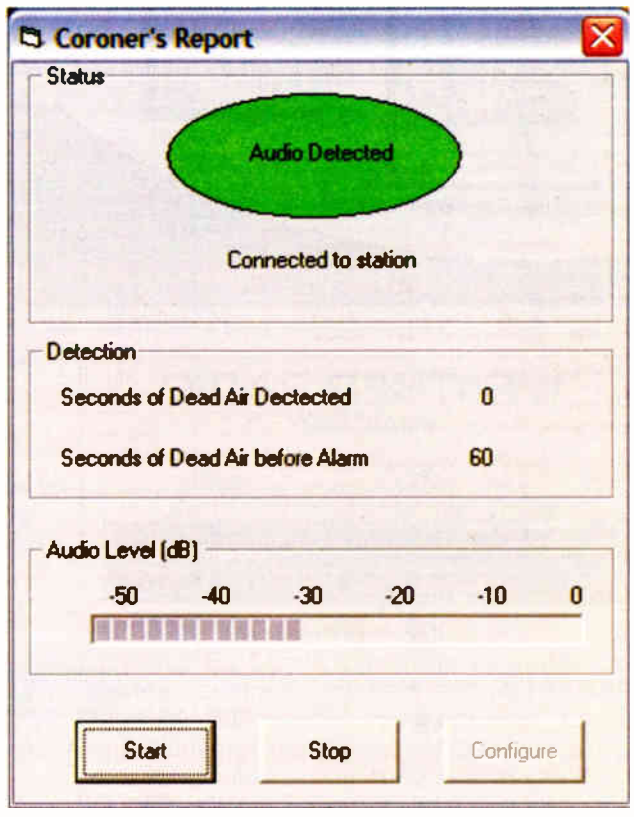
Sound file folders can be selected to present different screens of playback buttons. For instance, music, sound effects, jingles and commercials can each be placed in separate folders.

The company notes Click2Play's resizing capability. The screen can be resized from very small to full screen, and the buttons retain their relative shapes and labeling. Additionally, buttons retain their relative positions so preferred sounds are easy to find after resizing.

For Internet broadcasting, Click2Play extracts song titles and artists from the sound file names, and sends them to a SimpleCast encoder to appear on the screen of the listener's internet radio program.

A 30-day demo of both products is available for download at the company's Web site.

For more information, contact Fifty Thousand Watt Software at (763) 390-4046 or visit www.50kws.com.



EAS Support Added by D.A.V.I.D.

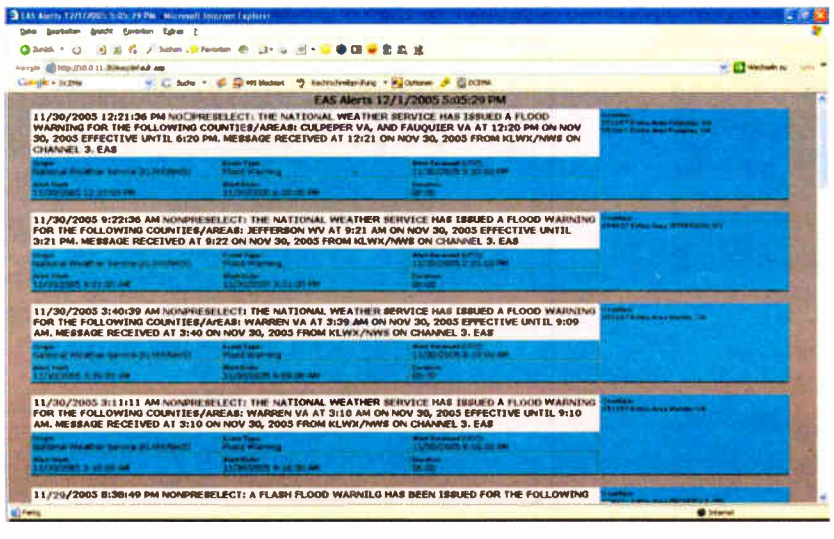
D.A.V.I.D. Systems added Emergency Alert System support to its program associated data functionality, allowing stations to display EAS alerts as text on RBDS and HD-enabled radios, as well as on their Web sites.

The EAS Listener connects to EAS receivers via RS-232 and monitors for incoming alerts. When an alert is issued, it formats the text and sends it to RBDS-enabled radios via Program Service Text or Radio Text. HD Radio-enabled receivers also will display the text message.

Additionally, notifications of the EAS alert appear on on-air workstations so hosts can read the announcement from a desktop computer. Program directors and news directors are made aware of the alert, which the company says gives them the earliest possible opportunity to determine if special coverage is warranted by the event.

Also part of the module is an HTML export to allow stations to display the alerts on the Web sites and LED signs. It automates the logging of EAS messages received, as well.

For more information, visit www.davidsystems.us *or* www.latitude-edition.com.



ATC Has SCM 110ASL Compact Reference Monitor

Acoustic Transducer Co. debuted its ATC SCM 110ASL active three-way reference monitor, comprising twin nine-inch ATC SL bass drivers, an ATC three-inch soft dome mid and a soft dome one-inch tweeter. It offers high-resolution sample rates and suitable bit depths for stereo and multichannel applications that feature a dedicated center channel and subwoofer system.

Additional highlights include a low profile for better sight lines through windows and below obstructions, and degree dispersion of +/-80 x 10 and amplitude linearity of 50 Hz–20 kHz (+/-2 dB).

The active design matches six MOSFET amplifier blocks with the drivers to deliver transient response and an SPL of 115 dB. Amplifier output is 50 watts for HF, 100 watts for MF and 200 watts for LF. An LF contour control provides 6 dB of bass boost.

The company notes that the SCM 110ASL is the first in a series of compact farfield monitors.

For more information, visit www.lasvegasproaudio.com, *ATC's U.S. distributor.*

USER REPORT

PMD660: Versatility at Half the Size

by Dan Rose
Studio Maintenance Engineer
WBUR Group

BOSTON A full-time NPR news format can offer different challenges to a station's engineering team compared to those of music broadcasters. While we have less reliance on cut-based automation, reporters' equipment needs take up most of our focus. These needs have changed through the years as we progressed from portable cassette recorders to MiniDiscs to solid-state recording.

WBUR has been using **Marantz** solid-state recorders for about four years, starting with the original PMD680 and 690. Training the less technical members of our staff to use them was surprisingly easy, and they had only two complaints: battery life and weight.

The earlier models used either eight AA batteries or a rechargeable pack (either NiMH or NiCad) that tended to give about three hours of life, and weighed three pounds without the battery.

However, the move to a solid-state medium was worth it, both in terms of maintenance and productivity. Reporters could transfer audio files to their desktops for editing through USB CompactFlash readers in minutes instead of hours of real-time transfer.

Bill Marx, arts and entertainment reporter for the WBUR group, holds the PMD660.

With no moving parts in the deck — even the card eject is a mechanical lever — they tended to last a lot longer than the MiniDisc recorders, even under the typical hard-use conditions our reporters put them through.

We used them successfully in numerous environments, from Iraq to the political conventions during the last national election; other than wearing out the rechargeable batteries, the only damage to one was a cracked button plate after being dropped. The part cost less than $100 and was an easy in-house repair.

Nice size

The new PMD660, listing at $649, addressed both complaints from our reporters, weighing only one pound and getting more than four hours of recording time from four AA batteries. At half the size of the previous models, it is barely larger than the microphone we supply them with.

Marantz has added LED meters to the front of the deck, which are easier to read than the LCD meters on the older models. There's a full-size USB-B connector, an improvement from the mini USB connector on the PMD670. However, the interface is still USB1, so there is a noticeable speedup in transfer times by moving the card to an external USB2.0 reader.

Unlike the PMD670 and 671, there is no S/PDIF output from the 660. We haven't found this to be a problem, as our reporters would transfer files through the USB connection and would rarely need to play audio in real time from the recorder.

The line-level inputs and outputs are on unbalanced 1/8-inch stereo jacks, a step down from the RCAs on the earlier models, which is understandable in the desire to make the unit smaller. Again, we don't typically use the outputs, but our reporters frequently need to use the line input for feeds at press conferences, requiring a couple of adapters.

At half the size of the previous models, it is barely larger than the microphone we supply reporters with.

Microphone inputs are on two XLRs, an improvement compared to several small form-factor recorders on the market that use 1/8-inch jacks.

See PMD660, page 40 ▶

TECH UPDATES

AEQ Launches Palm Workstation

AEQ is replacing its DR100 digital recorder with the PAW 120 Palm Audio Workstation.

The PAW 120 has 512 MB of Flash memory and uses USB connectivity to transfer files to a desktop environment. The recorder is compatible with both MAC and PC computers, and records linear PCM and compressed MPEG. Recording progress can be monitored visually on the unit's two-color display.

Users have the option of recording with the PAW 120 microphone, or connecting a stereo or mono external microphone. The unit provides phantom power for external mics.

The PAW 120 is powered by two AA dry-cell or rechargeable batteries.

For more information, including pricing, contact AEQ in Florida at (954) 581-7999 or visit www.aeqbroadcast.com.

HHB FlashMic Eliminates Cables

The **HHB** FlashMic DRM85 digital recording microphone records WAV or MPEG1 Layer 2 encoded audio files, which can then be transferred to digital workstations via USB cable. It uses a Sennheiser omnidirectional condenser capsule that sends the audio to a 1 GB flash drive.

The company says a useful feature for journalists is one-touch recording. Users can customize nine settings with the provided software. The microphone body features a backlit screen, which displays recording levels, time and battery power.

The FlashMic can run for six hours on two AA batteries, which are provided. In addition to automatic gain controls, the mic offers a variable pre-record buffer of up to 10 seconds.

HHB provides a stand clamp with the FlashMic, making it suitable for press conferences by eliminating cables and exterior recording devices. Users can monitor the audio on headphone from the mini-jack at the base of the mic. The frequency response is 20 Hz to20 kHz.

For more information, including pricing, contact Sennheiser in Connecticut at (860) 434-9190 or visit www.hhbusa.com.

R-1 Offers Effects, Portability

The R-1 from **Edirol** is an eight-ounce portable recorder that the company says offers audio effects usually found on larger studio processors. There are 11 pre-set "Easy EQ" effects, including noise reduction settings, speech and vocal performance, reverb, center channel eliminator and an editable 10-band equalizer.

Users have a choice between the internal microphone or external mini-jack stereo inputs. The R-1 can output analog and S/PDIF. Edirol includes a 64 MB Compact Flash memory card, capable of holding 137 minutes of MPEG mono audio and 68 minutes of stereo. Nine recording modes are available, ranging from 64 kbps compression to 24-bit linear WAV. Analog to digital conversion takes place at 24 bit, 44.1 kHz.

Sound files can be transferred to a Mac or PC via USB 2.0 cables. Recording time for the R-1 on two AA batteries is approximately 2.5 hours, and playback time availability is about six hours. An AC adaptor is supplied, as well as the memory card and carrying case.

For more information, call Edirol in Washington at (800) 380-2580, or visit www.edirol.com.

Field Mixer Brings Studio Outdoors

The **Sound Devices** 442 Field Mixer is designed to serve as a portable mixer for ENG, production and film sound, according to the company. The inputs of the 442 include four XLR switchable mic/line inputs with preamplifiers. The microphone inputs can be dynamic or phantom-powered.

Outputs on the mixer include four direct feeds that mirror the inputs, camera out, mix out and balanced out. Stereo returns also are available, as well as 1/8- and 1/4-inch headphone jacks. The front panel offers individual input level control, pre-fade listening, peak, limiting, level display, individual input trim, master level control and a stereo/mono channel selector. There also is a power control selector that allows the 442 to operate with an adaptor, or four AA batteries.

The body of the 442 is aluminum and is designed to operate from –4 to 140 degrees Fahrenheit and up to 95 percent relative humidity. It weighs four pounds.

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

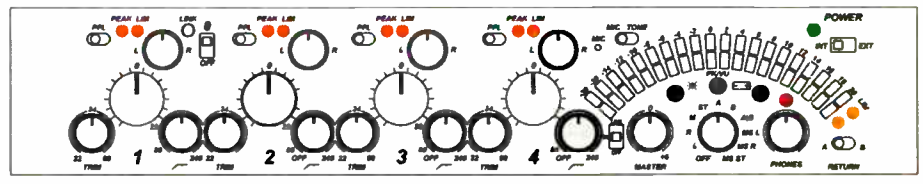


Diagram of 442 Front Panel

M-Audio Unveils Compact MicroTrack

With an eye towards computer-centric audio producers, **M-Audio** has developed the MicroTrack 24/96, capable of recording 24 bit/96 kHz stereo audio on a unit about the size of a deck of cards.

The Micro Track 24/96 records both WAV and MPEG, and has a USB port for Mac or PC connectivity. It records to CompactFlash media, and includes software for editing and format conversion. M-Audio provides a 64 MB CompactFlash card, stereo mic, USB cable, earbud headphones, and AC adaptor with the unit.

The supplied lithium-ion batteries are rechargeable and provide approximately eight hours of recording time, or three hours if phantom power is utilized. Inputs on the Micro Track 24/96 include balanced 1/4-inch, a mini-plug mic input and S/PDIF.

Audio can be output from the mini-plug headphone jack and RCA outputs. The unit has separate level controls for the left and right channels and dual microphone preamps. Recording levels status, and battery life are viewable on an LCD panel. M-Audio describes the Micro Track 24/96 as a recorder that can multi-task between musical production and recording breaking news.

For more information, call M-Audio in California at (626) 633-9060, or visit www.m-audio.com.

PocketREC Adds Software Feature, Mics

PocketREC has released an updated version of their PocketPC software, PocketREC2.0. The updated version allows direct recording and editing of compressed sound files, multi-track editing, faster upload from remote locations, and PocketREC Live, a pro-audio codec that allows PocketPC Phone users to provide live feeds in broadcast quality using high or low bandwidth.

Satellite news gathering is also offered in the update with PocketREC SNG, an interface cable that allows connectivity to a satellite phone. Audio and video can then be transferred, to a studio and placed into automation software with PocketREC's Rich Media Router. The software can also be used to integrate field reports into podcasts and blogs.

In addition to the software update, PocketREC has added a line of lightweight mic and cable sets. The sets weigh less than 1.5 ounces and are promoted by the company as being more portable than regular XLR cables and microphones. The mic sets can be purchased with an attached headphone jack and are available for iPaq and i-mate PocketPC devices certified to run PocketREC software.

For more information, call PocketREC in Connecticut at (203) 987 5525, or visit www.pocketrec.com.

Nagra Introduces Integrated Ares-M

The Ares-M from is a combined microphone and digital recorder. It records to 1 GB of memory in WAV and MPEG Layer 2 formats. Sampling rates range from 8 kHz to 48 kHz. In addition to the integrated mono mic, the Ares-M comes with an external stereo mic; it uses a mini-plug input. Other line inputs also can be connected via mini-plug jacks.

Capturing audio is accomplished with instant start up, one-button recording. Voice activated recording is also available. The LCD screen allows editing in the field. More extensive editing can be accomplished when the files are transferred to a Windows 2000 or XP PC, or a Mac using OS 9.11 or higher via the included USB cable. When connected, the Ares-M will appear on a desktop environment as an external drive. In addition to audio, producers can save data files, such as transcripts or edit notes to the Ares-M.

The frequency response of the output is 30 Hz to 20 kHz. The signal to noise ration is 85 dB. Bit rates range from 64 to 384 kbps.

Two AA batteries power the Ares-M for 10 hours. For longer events, a power supply is included. The Ares-M comes with a case and belt clip, and weighs just over half a pound. Nagra says the Ares-M is designed as a "ready to go" package with all cables, and a carrying case included.

For more information, contact Nagra in Tennessee at (615) 726-5191 or visit www.nagraaudio.com.

TECH UPDATES

Fostex Introduces Multi-Media Recorder

Fostex is offering the FR-2, which uses type II Compact Flash media and PCMCIA 1.8-inch hard disk drives, which can record 289 minutes of stereo 48 kHz audio. Connections offered on the FR-2 include analog XLR with phantom power, selectable digital between AES/EBU and S/PDIFand USB.

The recording format is WAV, with a sampling rate that ranges from 22.05 kHz to 192 kHz. An adjustable pre-record buffer can allow up to 10 seconds of recording prior to activation. Timecoding is available with an optional card.

Fostex says the construction and case of the FR-2 make it suitable for rugged conditions, with an LCD screen that provides recording information. The unit can operate on eight AA batteries or with the optional AC adaptor.

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

Sony Offers Linear on MZ, D1 Series

The **Sony** MZM100 series records linear WAV to MiniDisc and can upload files to PC using the provided Sonic Stage software and USB port. The unit can also download data and audio files to MiniDisc. Audio inputs include USB, mic in, and line in.

The MZM100 comes with a stereo microphone, mic extension cable, USB cable, rechargeable battery, AC adaptor, basic remote control, earbud headphones, carrying case, and a 1 GB HiMD disc.

Sony says the MZM100 is suitable for audio applications ranging from electronic newsgathering to concert production and recording. A six-line EL screen provides recording information in dark and bright environments.

The Sony MZM10 is a less expensive MiniDisc recorder, offering many of the same amenities, with a smaller LCD display, shorter battery operating time, and doesn't come with the remote control.

For more information, contact Sony in New York at (800) 686-7669, or visit www.sony.com/professional.

Flashman Goes Colorful

Mayah Communications is adding some color to the world of portable recording devices. The Flashman, introduced in 2002, will now be available in yellow, green, red, and blue.

The recorder has XLR, S/PDIF, and stereo inputs, as well as an RS232 PC interface. It can record MPEG and WAV, at sampling rates from 32 to 48 kHz. The Flashman uses CompactFlash cards and can record for three hours powered by alkaline batteries.

An LCD screen displays recording levels, time and record mode. A mini-plug jack is available for headphone monitoring.

For more information, contact Lamar Systems in Oklahoma at (918) 770-0941 or visit www.mayah.com.

PMD660

▶ Continued from page 37

Marantz removed MP2 recording capability from the PMD660 and restricts users to just 64 kbps per channel MP3 for a compressed format. With prices for 2 GB CompactFlash cards as low as they are, we made the decision early to disable that option and just use the uncompressed 16-bit PCM format in mono. We still get almost six and a half hours of recording time.

Available sample rates are 44.1 kHz and 48 kHz. Setup is straightforward, using three programmable preset modes that store input mode, recording format, manual or automatic gain control and several other parameters. Once set, users can select between them using the input menu.

We were concerned at first that sturdiness would be compromised by squeezing the same electronics into a smaller form factor. In our experience with MiniDisc recorders, the smaller units tended to die from a single impact, with tiny cracks appearing in the internal PCBs, while the larger units tended to be hardier.

Also, we've found that smaller handheld units such as recorders, cell phones and PDAs tend to get dropped frequently while larger recorders like the PMD670 and 680 and the older cassette recorders don't, probably because of the necessity of wearing the shoulder strap for comfort. In issuing the PMD660 to our reporters, we stressed the importance of wearing the included shoulder strap and have not had any damage to the recorders.

There has been some concern about the microphone preamps, and Marantz doesn't recommend using dynamic mics with the recorder. There is a noticeable hiss when the input gain is turned up to accommodate a low-output mic, but with the AudioTechnica 813a condenser mics we use, it is not really a problem. However, this could be a real issue if used with an Electro-Voice RE20 or RE50.

Though it has a few limitations compared the PMD670 — the different bit rates for compressed formats, the lack of a digital output and the 1/8-inch connector for line level I/O — the PMD660 still meets all of the requirements of our newsgatherers, in a package that is smaller and lighter.

For more information, contact Marantz in Illinois at (630) 741-0300 or visit www.marantz.com.

USER REPORT

FM Project Shakes Up Islands

by Chip Morgan
President
CMBE Inc.

This story was originally to appear in the Dec. 21, 2005 Buyer's Guide.

BURLINGTON, Vt. Our firm works with radio stations all over the world, on five out of seven continents, so we weren't surprised when we received a call from a company in the Cayman Islands that was going to build three new radio stations that needed to be on the air in 60 days.

Many of our projects are fast-tracked or emergency projects, and we have a long history with manufacturers of broadcast equipment. This project was for three complete stations, from microphone to antenna; the only thing existing was the tower.

We needed a broadband high-power antenna to handle the output of a three-station combiner with a total input of about 15 kW. The antenna should be omnidirectional and able to withstand the high winds from hurricanes that routinely sweep through the area. In fact, the tower we planned to use was one of the few towers that had survived Hurricane Ivan, which had devastated the Cayman Islands only a few months earlier.

We're often asked what brand of antenna we prefer, and the answer is always the same: It depends on the project.

Detail

In this case, we chose **Propagation Systems Inc.** of Ebensberg, Pa., to build the three-station antenna in the Cayman Islands.

PSI can provide most of the commonly used FM antenna elements including ring stub, skewed V and rototiller. The rototiller design can more easily be made broadband than the other common elements so we decided to use it in this case.

A call to Doug Ross at PSI confirmed that they could build it quickly and meet the specifications for the project. The antenna needed to be a four-bay 0.8 lambda with rigid interbay lines and able to handle 5 kW input at each frequency (104.1, 106.1, 107.1). We also ordered a broadband vertical dipole as the backup antenna for the system.

PSI isn't the only antenna company that could have done this project, but its quality of construction is excellent and price is competitive. Performance of the antennas and of the company is stellar.

Because we don't work with clients who want off-the-shelf systems, antenna manufacturers need to take more time and pay more attention to detail with our projects. PSI has been great about doing the little things that we consider to be a big part of antenna performance. It's clear that each project is important to PSI and we work closely with the people there to give them feedback about the needs of the project and the final results.

A bay of the antenna is lifted into place.

After shipping over land to Miami and then by boat from Miami to George Town, then through the maze of Camanian Customs, the antenna emerged with some damage on the inter-bay lines due to excessive pressure from the tips of pallet forks being applied directly through the shipping box. Because we had arranged shipping through PSI, and the package was ensured, it was no big deal to wait a few more days for replacement parts; and Doug handled the insurance matter personally.

We hung the antenna and line and swept it with a network analyzer. Even though each PSI antenna comes with a fine matcher, no tuning was required and we were able to go on the air right away with launch programming that featured the sounds of pirate ships coming ashore and AM-style tuning sound effects including lots of static, whistling, noise and mayhem. This was simulcast on all three frequencies for 48 hours.

We probably should have used different programming, because the performance of the system blew all the local stations out of the water. We were the loudest, cleanest, most powerful thing on the dial. People complained that all they could hear was interference from the station (the pirate launch static) and one of the government stations with studios very close to the antenna could no longer receive their station on their '70s vintage Realistic record player/radio with 4 inches of exposed coaxial center conductor looped through the hole of the window curtain rod.

We offered to supply a free outside antenna, but the well-built facility ended up shaking up the FM planning a bit there. The rest is history.

For more information about PSI, call the company in Pennsylvania at (814) 472-5540 or visit www.psibroadcast.com.

We needed a broadband high-power antenna to handle the output of a three-station combiner with a total input of about 15 kW.

We specialize in special antenna systems needing high performance in one way or another. Sometimes it's light weight and high power, sometimes it's maximum coverage in specific target directions, other times it's critical coverage on the back side of a side-mount directional array, difficult RFR control or special combining conditions. Our antenna projects are rarely standard.

Next in Buyer's Guide

Digital Audio Production
March 15

Microphones and Audio Monitors
April 12

Transmitters
May 10

Audio Processing
June 7

Consoles, Mixers and Routers
July 5

TECH UPDATE

Tascam HD-P2 Offers 'High-Def' Portable

The HD-P2 Portable High-Definition Stereo Audio Recorder from **Tascam** records at sample rates from 44.1 kHz to 192 kHz, at 16- or 24- bit audio to Compact Flash media. The sound files are written as WAV files and can be accessed by a PC through the HD-P2's FireWire jack.

The unit offers XLR inputs, unbalanced RCA ins and outs, and S/PDIF digital I/O. Recordings can be monitored via the headphone jack or the speaker. SMPTE timecode is standard on the HD-P2 through the locking XLR jack. It locks incoming SMPTE and also provides tri-level time sync support for HDTV applications.

Other HD-P2 features include ergonomic controls and an LCD panel that provides recording data and the name of the sound file. While the recording is in process, the HD-P2 continually re-saves the file header to protect against data loss. Users can name the file from the front panel or by a PS/2 keyboard via the keyboard input.

The HD-P2 has features useful to recording engineers and journalists for collecting audio, the company touts it for its logical layout and buttons that non-professionals can understand. The HD-P2 runs for five hours on eight AA batteries and also can run on DC power. The HD-P2 surface is about the size of a regular piece of letterhead paper, with a 2.5-inch profile. With the batteries installed, the HD-P2 weighs in at two pounds.

For more information, contact TASCAM in California at (323) 727-7617, or visit www.tascam.com.

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WANT TO SELL

AMPLIFIERS

WANT TO SELL

J-3250 Amplifier available – needs 10 watt drive. $2000 plus shipping. Call Curt Marker 906-249-1423

ANTENNAS/ TOWERS/CABLES

WANT TO SELL

Bird Thurline inline watt meter - 0-125 MHz, carries 50,000 watts forward - 5,000 watts reverse. $2,000 - weighs about 50lbs alleo21@yahoo.com or (770)-300-9287 8-6pm

WANT TO BUY

3 1/8" and 1 5/8" Coaxial Relays, Continental Communications - 314-664-4497, Contcomm@Sbcglobal.Net

AUDIO PRODUCTION

WANT TO SELL

Tascam 80-8 -8 Ch Digital Recorder, Reproducer Rack Mountable...very good condition $2000, Call W. L. Nelson 256-316-9845

Tascam OA-30 MKII, Digital R-Dat Recorder Reproducers Rack mountable ...little usage $650 Call W. L. Nelson 256-316-9845

AUTOMATION EQUIPMENT

WANT TO SELL

Now available, radio automation for the Linux operating system. Schedule music, voice track, create shells, auto or announcer assist mode, set intro and ending cues, hit the vocal every time with your voice tracks, execute exact time events, join networks, and more. Visit digitaldevelopment.net and click on RADIO AUTOMATION for screen shots. The software is free, there is a small duplication fee. For more info call 406.665.1832.

Digilink II and III, total of 4 units, for parts or rebuild, make an offer. Two of these were operational when removed. Call (785)628-3412 or e-mail lmintz@ruraltel.net

AXS complete system, On Air with Audio Switcher, Production, Spare Parts, working and still on line for your inspection. Call for price. Bob Romonosky 618-253-7282

Broadcast Electronics –Audiovault Express 8-40 Server with 2 cards – $3000 - Call Herman Johnson, Jr. 606-434-0404

CART MACHINES

WANT TO SELL

Two large boxes of audio carts, in fair to excellent condition. Some never used. Asking $500. Call for details. Lincoln Brown -KVEL/KLCY Radio 435-789-0920

CERTIFICATION

COMPLETE FACILITIES

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CONSOLES/MIXERS

WANT TO SELL

Gates – Stereo Executive – good working condition. **(free)** You pay S&H – Bob 518-881-1515

LFB Signature III.- good working condition **(free)** You pay S&H – Bob 518-881-1515

RCA 2 Channel BC-7B Good condition has the manuals and parts. **(free)** You pay S&H – Bob 518-881-1515

WANT TO BUY

Ampex AM-10 mixer in operating condition. Bill Cook, 719-687-6357.

LIMITERS/AUDIO PROCESSING

WANT TO BUY

Teletronix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST, 972-271-7625.

MICROPHONES

WANT TO BUY

RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 972-271-7625.

MISCELLANEOUS

WANT TO SELL

WANT TO BUY

The 1960's/70s vintage Robert Hall Productions news sounder used by WSB-FM/Atlanta during that period. It was a pulsing/beep sound. D. Bohanan 1-866-568-8780 or DanBBI@aol.com

REMOTE & MICROWAVE

WANT TO SELL

CDQ-Prima 120 + NT1 interface, v. good cond., ISDN quality for your studio or network. $2,000 or b/o. 425-304-1381 andrew.skotdal@krko.com

Marti RPT-40 Transmitter $1200 - 432-266-1663

WANT TO BUY

Marti RPU Equipment, Continental Communications 314-664-4497, Contcomm@Sbcglobal.Net

SATELLITE EQUIPMENT

WANT TO SELL

Zephrus #304, 4 card #304 Satellite main frame card holder. Excellent condition. Make an offer plus shipping. Call Curt Marker 906-249-1423

STATIONS

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Tascam Reel-to-Reel #32, Rack Mounted. $600 + Shipping (obo) Call Curt Marker 906-249-1423

WANT TO BUY

Large or small collections of 16" transcriptions or 12" transcriptions, not commercial LPs. Bill Cook, 719-687-6357.

TEST-METERING-MONITORING

WANT TO SELL

Potomac FIM-41, in good condition, with recent calibration. Rich Biby 540-882-4290 or rich@biby.net

TRANSMITTERS/ EXCITERS/ TRANSLATORS

WANT TO SELL

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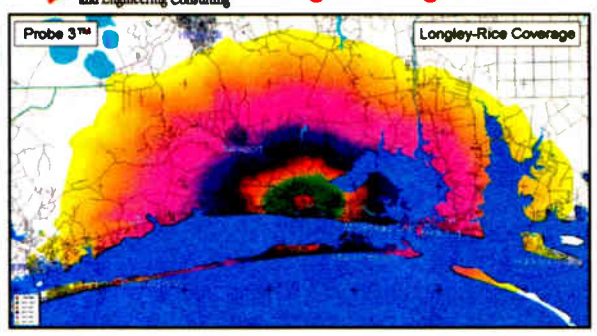

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◆READER'S FORUM◆

FCC Compliance

At the end of "FCC Compliance and the Station Engineer" (Sept. 28, 2005) Buc Fitch asked for feedback on whether readers would like more articles on compliance. I would like to see this.

Many radio stations — and TV for that matter — don't have a current copy of the rules (Pike & Fischer, Rules Service Co., etc.). And, even if they did, many engineers don't have the time to read or digest the rules.

While my company doesn't own any radio stations, Radio World is still my favorite trade publication because of the articles that Buc and John Bisset write, articles that allow the broadcast engineer in the trenches to put what they read into practice.

Keep up the good work.

Bob Richardson
Director of Engineering
Media General Broadcast Group
Richmond, Va.

EAS and Katrina

I respectfully disagree with my friend Clay Freinwald as to whether EAS should have been used during Hurricane Katrina ("No EAS for Katrina," Oct. 12).

Most of us would agree that you don't activate EAS for things like blizzards and hurricanes, as they are tracked for several days before they occur. However I think it would have been better to err on the side of caution in the case of Katrina for the following reasons:

First, while the hurricane itself was not a short-fused event, the breach of the levee system was. And as we now know, the majority of the flood damage was caused by that breach, not by the storm.

Second, Clay makes the statement, "It's all too common a mistake to think that EAS should be used for events that are already being covered by the electronic media." There are some serious legal ramifications there. The fact that an event is "already being covered" hardly means the news being presented to the public is accurate or official.

Also, no emergency management coordinator in his or her right mind would abrogate his legal responsibility to officially warn the public just because an emergency is "already being covered." If I were an emergency management coordinator, would I want to be sued for nonfeasance? I think not. In my opinion, sending out an EVI code would have been appropriate once the levee began to fail.

Third, one of the negative consequences of instantaneous, in-your-face coverage is that it *is* instantaneous and in your face. Taking Clay's opinion to its logical conclusion, do we even need EAS anymore? Why did the FCC create those new EAS activation codes, some of which are for specific civil emergencies, if we're not supposed to use them?

Is coverage on CNN an acceptable substitute for public warning? If so, please let me know so we can disband the NJ SECC and we can all go home.

The above commentary is my opinion and does not necessarily represent those of the NJ State OEM or the NJ SECC.

H. Robert Schroeder, N2HX
Communications and Warning Officer
NJOEM
West Trenton, N.J.

Most of us would agree that you don't activate EAS for things like blizzards and hurricanes, as they are tracked for several days before they occur. However I think it would have been better to err on the side of caution in the case of Katrina.

— H. Robert Schroeder

Thanks for the FCC compliance article. While much of the article applies to radio in general, there are some differences in FCC regulations as they apply to LPFM radio.

Perhaps at some point RW could address regulation as it applies to this class of station? Many LPFM stations read and monitor material on RW and might benefit from this information.

Marc Jones
Baltimore

A 'Must-Read' Pub

My note is long overdue to say how valuable I have found Radio World to be in keeping up with the fast-moving technology in our industry these days. I've been a reader since the early 1980s, and the past couple of years have been particularly informative.

I always feel one step ahead of those who miss out on the valuable insight found in Radio World. Kudos to you and the entire Radio World staff for a must-read publication.

Ken Moultrie
Senior Director of Programming
Jones Radio Networks-Seattle
Seattle

Letters

Send letters via e-mail to *radioworld@imaspub.com*, with "Letter to the Editor" in the subject field; fax to (703) 820-3245; or mail to Reader's Forum, Radio World, P.O. Box 1214, Falls Church, VA 22041.

◆READER'S FORUM◆

AM Memories 101

My favorite memory was my first job in radio at WBIB(AM) in Centreville, Ala. Houston Pearce, one of the best owners I ever worked for, had just built the station and, as many young people did in those days, I wanted to be a radio DJ.

I returned home to Centreville in 1965 from a few years traveling on the road with a quartet and found they had built the station in 1964. Needing a job, I applied and was hired on the spot. Training in a small town: "Here is the control board and I will be in the office if you have a problem." It was trial-and-error and it was terrible over-the-air but I learned quickly.

My memory is of a piece of equipment made by Gates, now Harris, called a 101 machine. It was a great concept when it functioned properly, but many times it failed. The machine had a recording tape as wide as the equipment rack, and a movable head with 101 positions. The maximum length that could be recorded was 70 seconds.

In those days small markets had many small advertisers and the 101 slots were mostly filled. It was impossible to run back-to-back spots because after each spot the machine usually rewound if it was functioning properly. It was fairly noisy but had to be close to the DJ to select the next spot to run. I never saw another one of these machines, but it was far ahead of the other method of playing spots on 3-inch reel-to-reel tapes on Apex 602 machines.

We did learn to cue the tapes quickly; as each reel contained only one spot. With the 101 and the reels, we were able to play commercials back-to-back. Today it is so much easier you just punch a button, or at most stations the spots are programmed to play automatically. Cueing records and tapes sure made for a tiring four or five hours on the air but we loved it — great memories of the 1960s and '70s.

Does anyone have a recollection of one of the 101 machines? I would love to know if any of them exist. They would be great collector's items.

Dan R. Hubbard
Senior Vice President
Paragon Advertising and Communications
Florence, Ky.

My "back when" story goes back to the mid-1960s when I worked as a fill-in board operator at a beautiful music FM in Los Angeles.

The background music system was in a closet, and consisted of three full-track tape decks with the large reels. A switcher randomly changed decks at the end of each song.

I got a call about 3 in the morning from a store security guard who pleaded with me to stop the torture. He said the music was pretty loud when there's no one in the store — and that every so often a song played backwards.

The regular announcer failed to tell me the reels were "tails out," so when I changed one it played backwards. I had no way to monitor the SCA to hear what was happening.

It had taken the guard quite a while to figure out where the music was coming from, and then which station provided the service.

Steve Hafen
General Manager
KVIP(AM/FM), KMWR(FM)
Very Inspiring Programs
Redding, Calif.

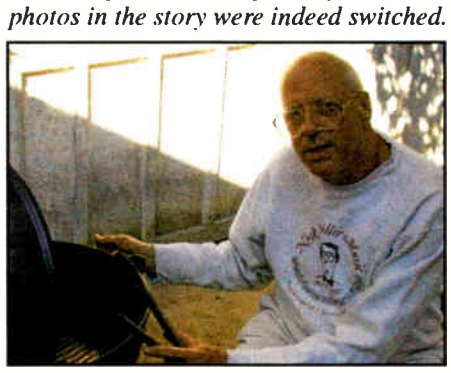
Comment on the above or any topic by e-mail to radioworld@imaspub.com.

Whups!

On page 33 of the Jan. 4 issue ("After 38 Years, WSBS Vet Retires"), the picture shows Nick Diller. The caption under the picture says, "Diller in 1967." Could this date possibly be in error? The picture looks much more recent than that, especially considering the logo on his shirt shows a phone number with an 888 area code. Don't think they had that in kind of area code in '67.

Bob Henry
Albuquerque, N.M.

RW replies: The captions for the two photos in the story were indeed switched.



Nick Diller enjoying retirement.

New Technologies, New Possibilities

If you define competition in our industry as neighboring radio stations and local newspapers, you disregard many other forms of entertainment and information to which listeners have access. Just as the three major television networks found cable TV to be a new competitor 30 years ago, terrestrial radio broadcasters face a panorama of new competitors for advertisers' dollars.

XM and Sirius offer a variety of formats. Internet radio stations likewise offer formats free of FCC censure and regulation, Motorola's iRadio, iPods/podcasting, P2P networks, automobile CD changers, cellphone-delivered entertainment and gaming, BlackBerry, cable and satellite TV music channels and other portable technologies offer terrestrial radio listeners and advertisers alternatives to traditional listening and additional avenues for advertiser dollar spending.

Radio also faces competition from television. Cable, TiVo, DVD, satellite TV and Internet video e-mail and subscription sites are some of the players.

IBOC is a new technology broadcasters can and should embrace. FM IBOC offers HD-2, an additional source of revenue through additional channels of programming. AM IBOC can improve audio quality and signal reliability. By its design, IBOC employs carriers within the FCC-defined spectral mask to deliver its product. Those who complain about the audible hash — derisively called IBUZ by some — fail to realize that where these artifacts are audible, mostly in fringe areas and outside protected contours, the impact on adjacent channel broadcasters is minimal. The amounts of revenue generated in these areas is *de minimus*, if any. Revenue generation is the bottom line in any business.

Broadcasters must examine their assets to maximize income from all available sources. FM stations can lease SCA channels to foreign-language programmers, data transmissions, power management services, time synchronizing, Microsoft and other clients. FM Extra is a new technology that offers several possibilities. Many broadcast stations own vertical real estate that offers a source of leasing income from tenants, provided their towers are structurally capable of supporting the additional loads. Some stations have modern production facilities that can produce commercial materials for clients or local advertising agencies. We have no doubt that creative types can think of other ways to generate more from radio's assets.

Multiplexing, or having two or more stations transmit from a common antenna system, is popular, especially in areas where new tower erection is difficult or impossible. In some cases, the value of the transmitter site real estate is so great multiplexing with another station is an attractive means of generating revenue.

A station's Web site can be a valuable revenue tool. Display and banner advertising is one avenue. Substitution spots are another. National or local spots might be replaced by Web-only spots or other content. Web-only contests, on-site music purchase, news, storm closings, traffic reports and local event coverage are ways to attract Web visitors.

We have witnessed many short-lived technologies in broadcasting. FMX, Dolby FM and AM stereo are examples. IBOC is supported by a significant, if not united, front of major broadcasting groups. It benefits both AM and FM broadcasters.

Or consider the argument from another perspective, that of a new media company. Google made headlines recently when it announced the planned purchase of dMarc Broadcasting, in part so that it could create a new radio ad distribution channel for its advertisers. That's fresh thinking on the part of Google; and the purchase defied what many outsiders probably would have told Google about the wisdom of investing in radio.

You don't need to be a big dot-com company to benefit from seeking new ways of looking at your business model. Let's move forward and embrace not only IBOC but other new technologies. Failure to recognize and compete with technological advances in other fields can have a devastating impact on the terrestrial broadcast industry.

— RW

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