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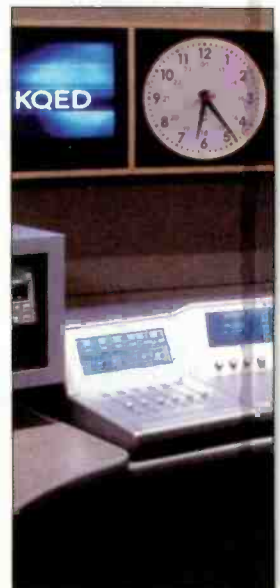
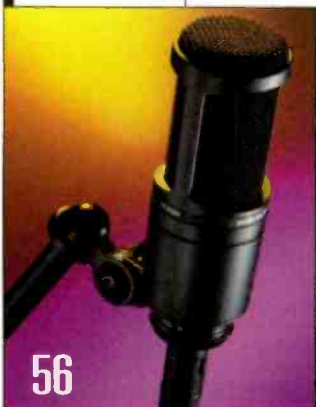
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ON THE COVER:

We cover both coasts with two NPR-affiliate Facility Showcases. Photo courtesy of Russ Berger Design Group. Cover design by Michael J. Knust.



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Currents Online

Highlights of news items from beradio.com from the past month

DRS Technologies Sells Continental Electronics

The new owner is Veritas. No changes are expected for Continental's service to broadcasters.

Ibiquity Adds to Broadcast Marketing and Promotions Department

Renee Jamerson and Roy Sampson will work with radio stations on promoting HD Radio.

SBE Creates New National Committee

The Regional Convention Strategies Committee will encourage growth, foster development and exchange ideas among the SBE regional conventions.

Ferree Named COO of CPB

Most recently chief of the FCC's Media Bureau, Ken Ferree has supported the broadcast transition to digital.

Digigram Adds to Distribution Network

RF Productions in New York and Joe Desmond Associates of Rohnert Park, CA, extend the Digigram network.



The Local Emergency Radio Service Preservation Act

Congressman Chip Pickering's (R-MS) legislation would require radio services to serve the public interest.

FCC Clarifies Position on IBOC Multicasts

To operate with multiple audio streams, IBOC broadcasters must first request and receive experimental authorization from the FCC.

Site Features

NAB2005 FASTtrack for your PDA

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NAB Insider Newsletter

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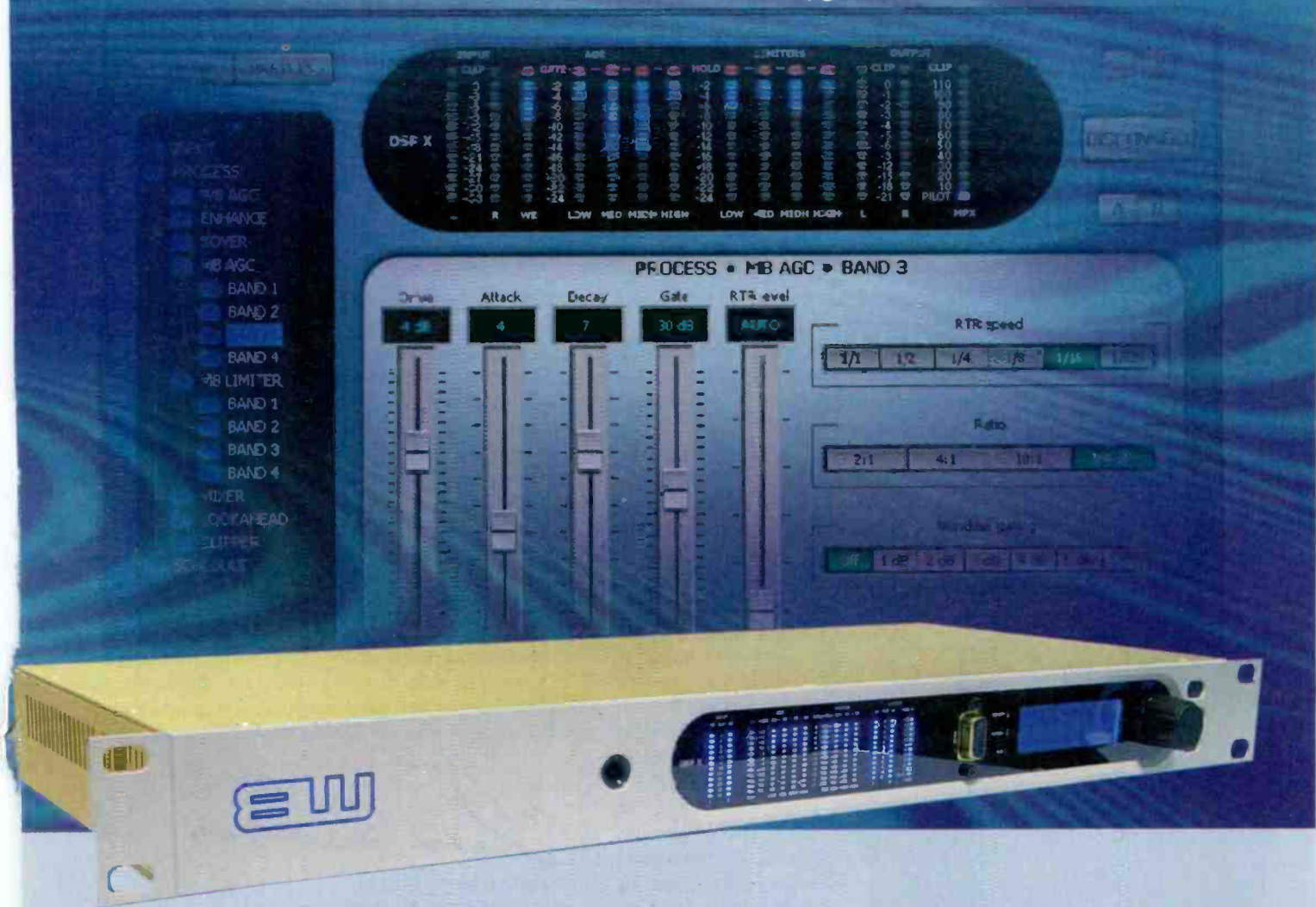
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Digitized and confused

A few weeks ago I passed the magazine rack at the grocery store and noticed a consumer magazine with a picture of a radio being shattered by a bullet. The graphic did its job; it made me stop to look at it. Once I picked it up I could read the full headline: The End of Radio (as We Know It).

Below this headline was a smaller line that read The Coming Digital Boom. Needless to say, I had to read more, so I purchased the magazine, which was the March issue of *Wired*.

I had to search for the article about the coming digital radio boom, which was in an article that started with an interview with Steve Jones, guitarist for the Sex Pistols and on-air personality at Indie 103 in Los Angeles. While the six-page article meanders through several top-of-the-surface elements, it actually touches on some practical consumer information about HD Radio. Unfortunately, it never calls the Ibiqity technology by the proper, trademarked name. So while this article, like many written for the listening public, provides some insight into IBOC, it fails to convey the message with a unique name.

Within the article and a 1/3-page sidebar that tries to explain how HD Radio works, the technology is called HD radio, high-definition radio, HD, digital radio and IBOC. With this kind of treatment it's no wonder that consumers don't know much—if anything—about the terrestrial digital radio technology that is expected to be installed at 2,500 radio stations over the coming months.

I wrote about the widespread misuse of the HD Radio trademark about a year ago. While the consumer media can be forgiven the lingo error and educated about it, broadcasters need to take the lead and use a

consistent name to publicize the technology.

Unfortunately, broadcasters are still part of the problem. A group of stations in Kansas City recently activated its IBOC transmission systems and began airing station identifiers that say "now broadcasting in high-definition." How is a listener supposed to ask for the proper equipment to hear these signals?


I'm not fond of the HD Radio brand name in itself because the technology transmits a low bit-rate signal with audio encoded with a perceptual audio encoder. However, HD Radio is more marketable than IBOC or the previous Ibiqity name for the technology, iDAB. It also ties into the consumer acceptance of the term HDTV, which also conveys the "digital is better" idea that consumers have been taught. But unlike the TV counterpart, the radio technology does not provide a signal with higher definition, hence my reservation.

Wired isn't the only one to blame. Similar misnomers have appeared in *Popular Mechanics*, *USA Today*, the *Motley Fool* and others.

Regardless of what the technology is called, unless broadcasters and manufacturers use the same name, the listeners will only be confused.

I conducted some field research and visited a few local electronics dealers in Kansas City. Doing my best to act like a barely informed consumer, I asked about digital radios. Of course satellite radio was the first option presented. (It seems that terrestrial radio has already lost fight.) I steered the sales people to terrestrial, digital receivers without using the terms IBOC, HD Radio or the dreaded high-definition radio. I was told the that the receivers did not exist, that stores had head units but not the receiver unit or that the store had no plans to carry these units.

There are at least six stations in Kansas City transmitting HD Radio signals, yet the stores can't help me. The radio industry has its work cut out for itself.

To make digital radio a consumer success, the marketing efforts need to come from the broadcasters, the consumer equipment manufacturers and the consumer electronics dealers. These efforts need a unified message, which starts with a single, consistent name. 



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--Tom Weeden, WNWC

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IBOC's real return

By Kevin McNamara, CNE

When I was asked about the return on investment of IBOC, my initial reaction was skeptical; after all, how can we quantify the return in terms of hard dollars? Even if we could, would I expect the answer to be something like "profit"? Not really.

IBOC is still in its infancy and any startup technology takes time to work its way through the masses. Radio has a unique advantage, however, in that virtually everyone over the age of five already knows about it and, more importantly, which stations they prefer. One would think that a simple transition to a digital format would be easy, assuming that there are radios to pick it up—right?

Unfortunately, in the past five years a multitude of competitive technologies—webcasting, satellite, Wi-fi, digital wireless telephones—have hit the market, most of which offer technical capabilities at least as good as IBOC.

IP-based society

You can't help but notice that when it comes to virtually any form of data broadcasting there is an IP address (or some derivative) involved. Most devices that have the ability to transfer data to another destination have some form of unique digital address.

This is how connections get established from one source to the intended destination in our new IP-based society. While not currently using formal IP addresses, IBOC could presumably permit radio to implement selective addressing in the future. In my mind, this is what IBOC really brings to the table; not improved audio, not expanded data services and certainly not multi-channel broadcast capabilities, but the possibility to become digitally compatible with the other emerging data services.

Competitive technologies

As subscriptions to satellite radio push the four million mark and well-established air personalities are considering (or already committed) to moving to the new medium, terrestrial radio operators are finally paying attention. Countless articles appear in the trades talking about creative methods to reposition terrestrial radio against the satellite operations and an on-air campaign has recently appeared with artists reminding us that they got their start on the radio. These are cute and might help preserve the erosion, and any attempt is definitely better than remaining silent, but the larger competitive issue doesn't lie exclusively with the satellite operators. Webcasting is all over the Internet; it seems like there is a broadcast for every taste.

Apple has done an excellent job of marketing the iPod. To make the device more appealing, particularly to us older users, the company made deals with some high-end auto manufacturers to provide a plug-in interface to the auto sound system; smart move. There are countless other additions to appeal to just about everyone. Why does the iPod present a challenge to radio? Enter the Podcast. Here is an idea that is so simple, but it needed a device like the iPod (or any other digital device that can record and play the MP3 format) to take off.

Podcasting is downloading prepackaged programming content; instead of hearing a show in real-time, you can download programs that can be enjoyed when convenient. Of course, these could also be played from your PC as well, but the portable digital player gives the flexibility of using it anywhere. Think of this, it would be pretty easy to use IBOC data streams to provide this type of content to listeners. An argument could be made to abandon the push to provide multiple channels of audio content over IBOC in favor of maintaining a traditional audio channel and keeping the additional data bandwidth as large as possible.

The next big competitor

While the Internet provides a rich source of diverse program content, it's not always available wirelessly over large areas, until the deployment of digital mobile phones. Wireless mobile phone carriers have quietly been upgrading their networks and handsets to provide a wide variety of digital services including e-mail, Web browsing and video services. As most of us are aware, any handsets purchased in the past three years has at least one of these capabilities and most current phones offer the full array of features. What you might not be aware of the next generation of network enhancements enable the phones to take advantage of high-speed data services.

The enhancement is called high-speed circuit-switched data (HSCSD). Wireless carriers are implementing this service currently and it is already in operation by some





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carriers in the top markets. So what's the big deal? In December, Sprint signed a deal with Music Choice to provide programming content to its subscribers.

For a monthly fee its customers will be able to access the audio (and possibly video) content of their choice. Other carriers will follow as their network capabilities are upgraded. Cingular expects to completely cover at least the top 20 markets by end of this year. Consider that wireless networks reach nearly 100 percent of the top 100 markets, and if current wireless telephone use is an indicator, this adds up to 40 or 50 million potential listeners.

Also consider that mobile phones provide full-duplex capabilities, which in the future might open some interesting interactive applications. As wireless network operators complete the move into third-generation services and begin to rollout the fourth generation of services, their capabilities will be on par with high-speed wired connections.

Put a data port on the radio

Finally, if indeed the ability to broadcast streams of data to listeners is important, radio needs to have the ability to interface with other devices. I think this will ultimately be the key to integrating terrestrial radio to the mainstream devices that we are beginning to rely on as a society. It will be necessary for standards to be developed that permit porting ancillary data streams through a USB port or, even better, use a wireless scheme such as Bluetooth that will allow similarly enabled devices, located in close proximity, to communicate.

Perhaps the answer to the return on investment for IBOC lies in its ability to keep pace with the emerging services. Viewing IBOC as a platform that is capable of accommodating a variety of technologies rather than simply a method to broadcast information and entertainment is the key to radio's longevity. Our mobile society is becoming conditioned to access all of their information and entertainment on fewer devices that can be carried with them. It's not hard to imagine the demise of traditional AM/FM radios, not unlike what happened to AM-only radios. To ultimately realize that investment, terrestrial radio operators need to stop viewing themselves as a provider of readily available free entertainment, but as a digital content provider.

McNamara is president of Applied Wireless, Elkins Park, PA.

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New rules for tower locations

By Harry Martin

Effective March 7 the FCC adopted new rules implementing the Nationwide Programmatic Agreement (NPA). The NPA is an accord hammered out by representatives of the FCC, the Advisory Council on Historic Preservation and the National Conference of State Historical Preservation Officers. These folks, along with representatives of Indian tribes and potentially affected tower managers and owners, formed a working group to try to streamline compliance with the National Historic Preservation Act.

The Historic Preservation Act requires federal agencies, including the FCC, to take into account the potential effect of any of their undertakings on registered historical properties or properties eligible for registration. The FCC and potential tower builders had been struggling with this requirement for years because the so-called SHPOs and THPOs (state and tribal historical preservation officers) had experienced delays in completing the necessary consultation that had to occur before the FCC could sign off on a tower construction with historic implications. The NPA is intended to ease that backlog by clarifying the obligations of the various parties to the process.

There are several useful elements in the NPA. It clarifies the circumstances under which a modification to an existing tower structure must undergo new historic preservation review. Because the criteria for a substantial modification of a tower are now clearly defined, a tower owner can be sure what sorts of changes will trigger regulatory delay. There are categorical exclusions from the purview of the NPA for qualifying enhancements to existing towers, replacement of towers, the use of temporary facilities, construction on industrial and commercial properties, or in utility or transportation corridors or SHPO/THPO-designated areas.

The NPA defines far more precisely the zones around the tower within which a tower builder must assess adverse historical effects. The NPA makes it clear that a

tower proponent does not have to determine whether structures in the protected zone are eligible for inclusion in the Historic Register even if they are not in the register already. Clarifying these and other points and standardizing the process with uniform forms and procedures will alleviate many proposed towers from historic consideration at all and will speed the disposition of applications for other towers that may or may not adversely affect historic properties.

Perhaps the most onerous requirement found in the NPA is the obligation to have a government-certified expert proclaim that the proposed construction does not require a field survey to ensure that no historical or archeological treasure will be disturbed by the construction. In other words, the default requirement would routinely call for such a site excavation—unless you can get an expert to absolve you and your site.

Finer points

There are exceptions to this requirement, but they are somewhat narrow. You do not need the expert's blessing as long as (1) geomorphological characteristics make it clear that there could be nothing under the ground (e.g., you're building on bedrock) or (2) the ground beneath the proposed structure has already been disturbed to a level two feet below the proposed construction. In any other situation you have to actually perform the field survey or get an expert to say that there is no reason to think that a field survey would be required. This is true even if you're planning to build in the middle of uninhabited woods or fields—because there could have been colonials or Indians on the site centuries ago and the site must not be irrevocably disturbed without the blessing of an expert.

These new requirements immediately affect the contents of FCC applications for construction permits. The environmental worksheets included in the instructions to Form 301 already require applicants to take historic preservation into account in certifying that the proposal complies with environmental standards.

Martin is president of the Federal Communications Bar Association and a member of Fletcher, Heald & Hildreth, Arlington, VA. E-mail: martin@fhhlaw.com.

Dateline:

June 1, 2005, is the deadline for stations in Arizona, Idaho, New Mexico, Nevada, Utah and Wyoming to file their 2005 renewal applications, biennial ownership reports and EEO program reports.

June 1 also is the date stations in California must begin broadcasting their renewal pre-filing announcements.

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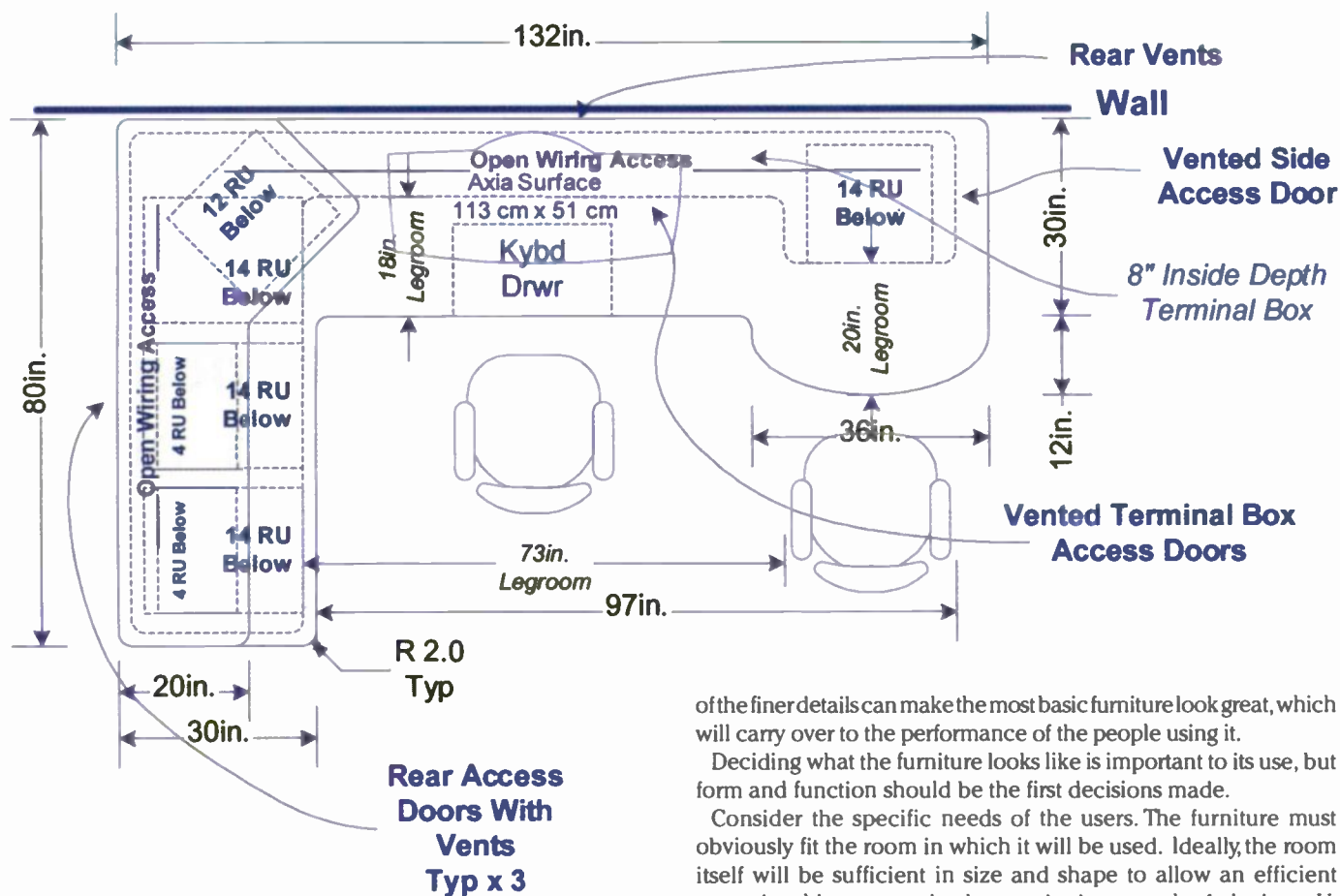
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The proper Support

By Chriss Scherer,
editor

It's the basis of any studio, but it's seldom given much more than a passing thought. The right studio furniture makes a facility a showcase.



of the finer details can make the most basic furniture look great, which will carry over to the performance of the people using it.

Deciding what the furniture looks like is important to its use, but form and function should be the first decisions made.

Consider the specific needs of the users. The furniture must obviously fit the room in which it will be used. Ideally, the room itself will be sufficient in size and shape to allow an efficient operation. It's easy to take the standard approach of placing a U- or L-shaped assembly in the space and load it with equipment. This can work, but you will see better results by understanding the needs of the users. In the case of a facility rebuild, observe the studio in use. Note any problems with the existing set up, which is usually easy, as well as any positive aspects, which may be harder to identify.

Consider sight lines between hosts and guests, equipment placement, ergonomic access to the equipment, and especially the adaptability of the layout to multiple users. Unless the studio is built for a single user, several people will use it at various stages during the day.

In many cases, custom furniture can provide exactly what is needed in a studio. Custom designs can also be fitted to unusual (or accidental) room dimensions. Custom designs typically come with

Image courtesy of Balsys Wood Arts

Name the one element of an air studio that makes everything work together. Some might say that it's the audio routing system. Others may believe that it is the audio storage and playback system. While these are critical elements to a studio's operation, it's the studio support system—the furniture itself—that makes it all work. The irony is that the most basic piece of equipment, and the foundation for everything in, on and around it, is often given the least forethought.

Aside from aesthetic treatments, a studio's overall look and feel starts with the furniture. This sets the tone of the room. If the furniture presents a lackluster presence, chances are the talent using the facility will provide the same performance. This is not to say that the furniture must be always be the top of the line, but attention to some

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a higher cost than pre-manufactured or modular systems. Pre-manufactured and modular systems can provide a practical and functional foundation at a reasonable cost. They will also likely have a quicker delivery time.

Making the grade

Any project will have a defined budget for the furniture. While a top-of-the-line, custom-made design may be desired, a more cost-effective approach may be necessary. Melamine, a low-pressure laminate, on particle board is commonly



Photo courtesy of Balisys Wood Arts

Custom furniture designs can incorporate unique design features. In this case, the wainscoat treatment on the walls has been repeated on the furniture legs at WPOZ-FM.

used in budget-minded designs. It provides reasonable wear.

A step up in cost and wear uses medium-density fiberboard (MDF) or plywood, with laminated tops. Edges are typically finished with plastic molding or wood stripping. This type of construction is durable and wears well. High pressure laminates also increase durability.

Solid-surface countertops have gained popularity more recently. Often called Corian, which is but one specific brand from Dupont, this resin material has stone-like look. Another common brand name is Avonite. Large areas can be covered by several pieces of the material, and then the seams can be joined to make it look like a single slab. This material lasts a long time, and small scratches can be buffed to preserve the impressive look.

The countertop will see the most wear, and scratches are to be expected. In the case of laminated surfaces, removing the scratches is not possible, but your choice in color can minimize their appearance.

The laminate is a plastic layer over colored paper. The lower layers, which are also paper, are usually brown. Because of this, lighter colors tend to hide scratches better than dark colors. If you prefer a dark color, consider one with a pattern that will hide the scratches, such as a veined marble or granite. Once a color is chosen, ask for a sample of the material and then conduct your own scratch test to be sure.

Design options

One of the strengths of modular designs is that it can usually be rearranged or supplemented to accommodate changing needs. A design may work well today, but down the road an additional equipment turret or rack is needed. A custom design might require extensive modification. A modular design may be able to seamlessly add an section or accessory.



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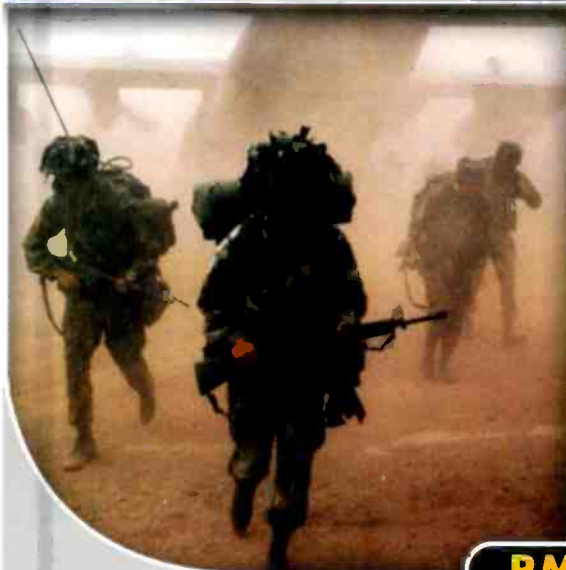
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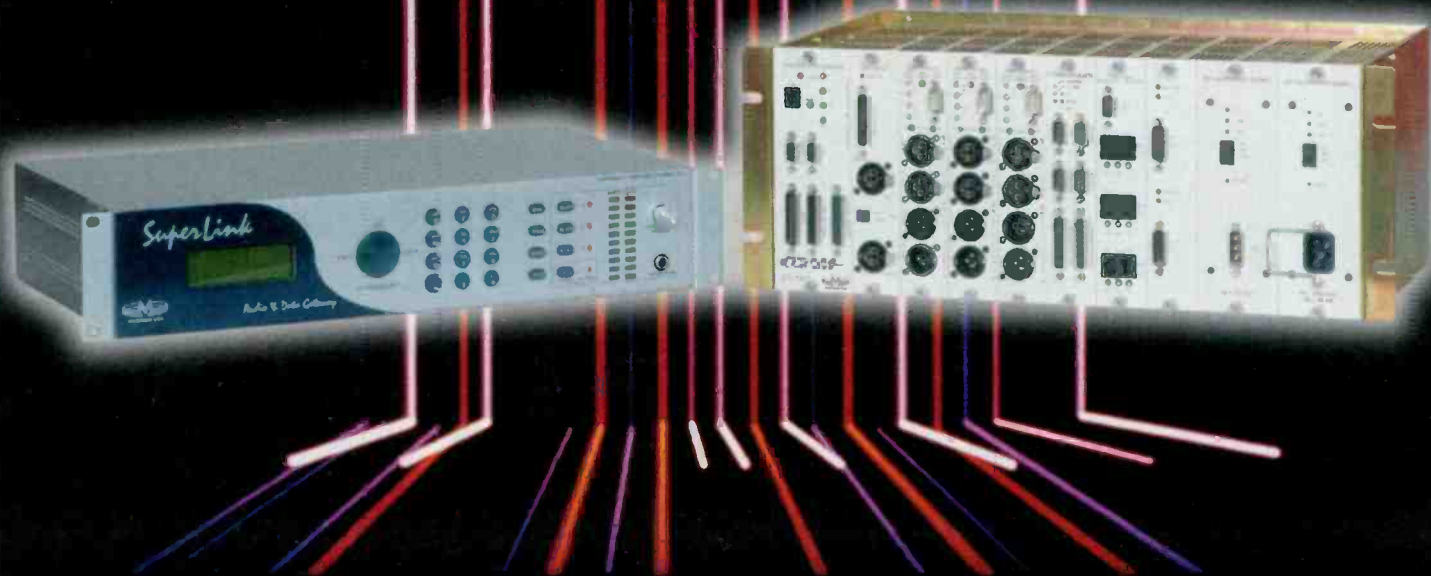
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WLRN

By Jack Yaghdjian

expands its on-air services



It's no secret that National Public Radio affiliates have been among the most aggressive in the transition to digital and HD Radio. Along with access to a depth of material for Tomorrow Radio multichannel services, NPR stations have ongoing support from its leadership and the Corporation for Public Broadcasting (CPB). The CPB, a private, non-profit corporation created by Congress, funds more than 1,000 public radio and TV stations throughout the United States.

WLRN, a high-power FM operation based in Miami, is the pre-eminent NPR member station for South Florida. WLRN is a complex organization that reaches out to the community in variety of ways. A partnership with *The Miami Herald*, the region's largest newspaper, provides additional material to the FM station for on-air news reports from new studios at the *Herald*, constructed by Harris. WLRN-TV is a complete TV facility with analog and digital channels, delivering PBS and other educational programming to local viewers and more than 350 area schools through 20 ITFS channels.

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WLRN expands

Where to begin

The radio leadership at the facility began mapping its digital radio plans several years ago. The launch of WLRN's digital TV channel two years ago

was a key motivating factor in the acceleration of the radio station's transition. Management developed plans for the construction of a new, larger transmitter facility to house analog FM transmitters, and digital transmitters for radio and TV. A new master control center for radio and TV, including a refurbished FM studio and expanded terminal equipment ear area, was planned for WLRN headquarters. With the initial stages successfully completed, WLRN-FM is on the air digitally and prepared to move forward with Tomorrow Radio services. Harris provided systems integration services for the new TV master control; the digital TV, new analog FM and HD Radio installations and system design; and the entire HD Radio equipment package.

The new transmitter building is a 2,500-square-foot facility housing three Harris transmitters: Z6HDS digital IBOC, Z10 analog FM and a Sigma DTV for TV. The IBOC model replaces FM tube transmitters with a combined 33kW power output that served the station well for more than 20 years. The FM transmission core, antiquated and no longer reliable,



The radio portion of WLRN's master control center features a Harris PR&E B-MX digital with analog and digital outputs, allowing the station to broadcast in HD Radio and analog FM.

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WLRN expands

was in dire need of replacement and yet another motivating factor to speed the digital transition.

A new 1,000 foot tower resides 150 feet from the old transmitter building. Complete with elevators

and 250 feet higher than the station's previous tower, the additional height and efficiency allowed for the best possible positioning of the new FM antenna. Although the station's theoretical coverage area remains the same, with the new antenna and transmitter, actual

coverage is significantly superior. The transmitter output is now 7.8kW compared to the previous output of 33kW—a massive reduction in wasted RF energy. The carefully planned directional antenna, which is central to that transmitter power output reduction, was designed so as not to waste energy over the Atlantic Ocean or the Everglades. Combined with new efficiencies in electrical power and greatly reduced maintenance costs for parts and labor, it all adds up to lower operational costs.

Other efficiencies have been discovered in the new digital operation. The extra space afforded by the transmitter facility design provides additional revenue-generating possibilities. Oversized air conditioners were added with the idea of leasing space to accommodate additional broadcasters. Everything on the tower has been oversized to accommodate additional transmission



All three production studios will transition to digital in the near future. This studio features a hybrid analog/digital Mackie audio mixer, although the output from the studio remains analog.

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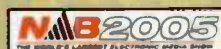
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The TT-1 Telco Tool



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The tiny TOOLS™ DTE-16 is a feature rich DTMF tone/sequence encoder that is user programmable to encode up to 15 tone sequences or a single tone via any one of 16 contact closure inputs and/or the RS-232 serial port. Each input may be programmed to generate a tone for the duration of the closure or tone burst immediately on command. A passive mixing network is provided to mix both the program and encoder audio if required.



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The STI-II
The STI II provides a hybrid interface between a single POTS line and a users PC COM port. The STI II is equipped with a programmable serial port, allowing control and monitoring via the users PC application software. This product makes those remote call-in recordings a snap while eliminating the DTMF tones. Various LED's, relays, pushbuttons, dipswitches and serial port comprises the user interface to the STI II.



The TS-6 Telephone 6 Six-Line Telephone Call Director
The TeleSwitch Six call director offers a low cost solution to interfacing up to six telephones lines to almost any hybrid. The TeleSwitch Six is supplied with one Switch Console and Controller. The units are interconnected via CAT 5 cable. A total of four Switch Consoles may be attached to the controller. The TeleSwitch Six is a dual-buss device, meaning that calls can be answered on the telephone set, while calls are active on the hybrid. With TeleSwitch Six, lines can be answered, placed on hold (MOH audio input), busied out and routed to a telephone set and/or hybrid.



The AVR-8 Voice Remote Control
The AVR-8 is a voice remote control system that automatically reports changes detected on any of its eight status inputs to a remote telephone and/or pager. After speaking a greeting message that may identify the source of the call, the AVR-8 then speaks a unique message for each status input. The user may customize each factory-recorded message. Additional features include; four SPDT control relays, balanced telco audio, access codes, eight phone numbers per input.



The STA III Smart Telephone Autocoupler III
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WLRN expands

traffic. For example, six-inch transmission line is now being used instead of the three-inch lines that were previously installed. This provides additional capacity in our transmission lines to combine outside TV and FM broadcasters.



NPR and Herald reporters transfer stories to WLRN over a partitioned T-1 line using a Harris Intraplex STL-HD system.

Among the more challenging decisions in the early design stages was the choice of HD Radio combining method. The station opted for high-level combining. This method made the most sense for WLRN from an operational standpoint. With a backup transmitter to come in the future, this method allows WLRN to easily incorporate its existing Dielectric switching system. The Dielectric unit is a specially designed, motorized RF system with three

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WLRN expands

switches that provides an automatic switch-over to a backup transmitter should it sense a lack of power output from the main transmitter.

The main consideration in choosing high-level

combining was to maximize the digital signal. High-level combining was selected because it uses the main FM antenna and has identical radiation characteristics between analog and digital signals.



In lieu of traditional routing systems, sources from the talk studio — which often originates live programming — are hard-wired to the master control console.

WLRN uses several test, measurement and monitoring tools to ensure the health and functionality of the transmission systems. The Harris IBOC transmitter is monitored by two Bird BPM-1 wattmeter systems that provide power output and combiner performance readings. A Belar monitoring system picks up RF readings from the analog antenna and feeds them to workstations at the studio and transmitter facility. The performance of a 67kHz subcarrier that transmits WLRN's Radio Reading Service programming for the visually impaired is also monitored over this system. And a Moseley remote control and monitoring system alerts staff to other potential problems at the transmitter facility by monitoring tower lights and other performance issues, such as utility power or standby generator.

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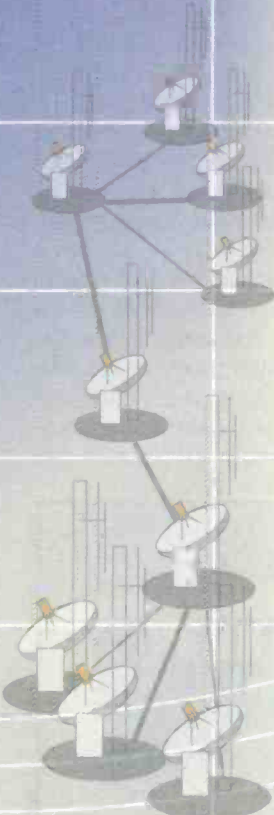
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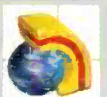
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WLRN expands

Back at the ranch

The master control center at WLRN headquarters is dedicated to TV and radio operations. The main radio console is a Harris PR&E BMX Digital with

analog and digital outputs. The hybrid digital and analog build features 32 inputs and outputs. The main analog and HD Radio channels can be monitored from the console, as can the station's Radio Reading Service and live Internet stream. Tomorrow Radio services will also be monitored through the BMX Digital. The fact that one staff member can monitor all of these outgoing sources is another example of a more efficient workflow environment.

The hybrid nature of the BMX Digital provides additional flexibility because any source can be added to any bus. With this installation, WLRN has moved away from traditional routing systems in favor of a hard-wired approach. Operational mistakes are virtually eliminated in this system for a cleaner on-air broadcast. Patch panels surround the console so engineers can rearrange hardwired sources using XLR connectors.

Currently, the station's BMX Digital sources include six channels of NPR programming that arrive via satellite and are sent directly to the console; three production studios; Electro-Voice microphones; a PC-based Dalet storage system; the Radio Reading Service; five



WLRN's Radio Reading Service programming for the visually impaired is transmitted over a 67kHz subcarrier, which is monitored by a Belar RF monitoring system.

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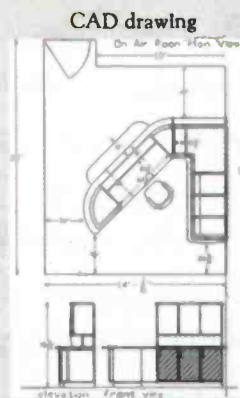
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The transmission equipment was also part of the facility upgrade. New transmitters were installed to transmit analog and HD Radio signals.

ISDN lines with Telos Xstreams and several playback devices, including Sony CD players and Minidiscs. Studio cabinetry for playback devices and additional furniture was provided by Arrakis. Foam and spatial tiles were installed for acoustical considerations, although these will soon be upgraded to address HVAC noise and general soundproofing.

Behind the curtain

The terminal equipment room, referred to as the Network Area, is located next to master control. Five equipment racks house radio and TV equipment vital to daily operations. The radioterminal gear area is basic in its setup. NPR-provided satellite IRDs receive and demodulate the NPR feeds before passing them through to the studio console for on-air playback. Sony and Tascam DAT machines and Minidiscs were added to record certain programs directly off the satellite receivers.

Perhaps most important to the Network Area is the Dalet 33X audio server and editor storage system that has its own dedicated rack with a built-in cooling

system. The Dalet server is the central hub for all WLRN radio programming. Various WLRN and *Miami Herald* studios can receive and record files directly into the server. These files are later recalled from the BMX Digital console for playback to air. WLRN is currently applying software upgrades to

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WLRN expands

automate the server. For now, the files are retrieved manually by on-air operators.

A redundant Moseley Starlink SL9003Q digital STL provides the STL link at 32QAM. Everything produced at WLRN is sent through this system to the transmitter for delivery over the air. An underground fiber system using Lightwave Systems Fibox products sends the uncompressed digital signal from the studio into the STL unit along with the remote control, Radio Reading Service and future program-associated data (PAD). A Black Box Ethernet extender uses the same fiber path and feeds a Moseley Lanlink to interconnect the studios and transmitter with a 512kb/s Ethernet link, which



The Network Area features recording and terminal equipment for WLRN's radio and TV operations. Satellite IRDs receive and demodulate NPR feeds for immediate on-air playback, while various Sony and Tascam devices record other programs to air at a later time.

Equipment List

Arrakis studio furniture
Audiometrics DA16000-B
Belar RF monitoring system
Bird BPM-1
Blonder Tongue RF amplifier
BroadcastTools ICM-16/MHI intercom system
Comrex DH20
Dalet 33X
Dielectric RF switching system
Electro-Voice RE27/ND
ESE ES-161UP
ESE ES-185A/HR
ESE LX5212
Harris Intraplex STL-HD
Harris Neustar
Harris PR&E BMX Digital
Harris PR&E Impulse
Harris rack cabinetry
Harris Z10 FM
Harris Z6HDS
Lightwave Systems Fibox DAT1-SL, IMS-TX
Middle Atlantic IOU
Moseley remote control and monitoring system
Moseley Starlink SL9003Q
Rolls RS 79B
Sony DAT and Minidisc
Sony SLV-N700
Symetrix 528
Symetrix 581
Tascam CD-RW2000
Tascam DA40
Tascam MD-801 RMKII
Telos Xstream
Ward-Beck POD-12
Wohler Audio VM-2A

we will use for Tomorrow Radio among other things. An analog signal is sent via a copper line in parallel with the digital signal for backup.

WLRN's collaboration with the *Miami Herald* has vastly improved the station's news output. Several small studios with Harris PR&E Impulse audio consoles for story editing are located at the newspaper's headquarters. NPR and other organizational reporters can transfer stories to WLRN over a partitioned T-1 line using a Harris Intraplex STL-HD system. The Intraplex system has linear, bi-directional audio feeds between WLRN and the *Miami Herald*, separate channels for intercom and data, and WLRN also sends a return news channel so reporters can monitor the feeds. An additional editing suite with a complete Harris console and furniture package, ISDN line and microphone will be built soon to further accommodate the news department.

The line's capacity is currently maximized, and the station is expanding the system with a backup T-1 line, adding additional Enhanced Apt-x audio and LAN paths. Adding the second T-1 line and new Intraplex equipment will make the data import and export much faster.

WLRN has been successful in working with a limited budget to obtain state-of-the-art equipment for our digital future. The station's listening audience has increased as a result of improved services. The next transitional phases will involve three production studios that are still analog, along with adding more redundancy to all facets of the station and the eventual launch of secondary audio services. The Network Area is also being expanded with the NPR Content Depot, although those plans are currently in the earliest formative stages. Still, WLRN has come a long way in a short period of time, and is looking forward to future growth.

Yaghjian is chief engineer of WLRN-FM/TV, Miami.

Facility Focus

the technology behind WLRN

Moseley Starlink SL90030



The Starlink used by WLRN is a 950MHz licensed STL with a 44.1kHz 16-bit uncompressed linear stereo pair and a compressed mono channel for reading services for the blind. The STL is using 32 QAM to convey an aggregate data rate of 1667kp/s in less than 500kHz of spectrum. WLRN engineers considered using twin 44.1kHz stereo pairs at approximately 3Mp/s at 128 QAM, but opted for the configuration described due to the fact that 32 QAM is considerably more robust in hostile RF environs than 128 QAM.

As the Starlink is a modular system future plans include adding the Moseley Starlink six-port mux with LAN option. This will allow the station to convey NPR's Tomorrow Radio programming on its existing 950MHz license.

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Electro-voice RE27N/D



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What is the Facility Focus?



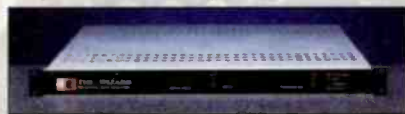
The Facility Focus provides an up-close look at the technology in use at the facilities featured in *Radio* magazine Facility Showcase articles. The highlighted manufacturers are leaders in the industry, and the Facility Focus allows them to showcase their products and services.

Turn to the Facility Focus for the insight on today's leading products and services in use in the top radio facilities.

Belar Digital Wizard System

WLRN uses several products to analyze modulation.

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ital baseband FM modulation monitor/analyzer that also acts as the host for the other Wizard family units enabling LAN/WAN remote monitoring and control with the Wizard for Windows software.

• The FMMA-1 is a DSP-based, microprocessor-controlled, FM stereo modulation monitor/analyzer.

• The RFA-4 frequency-agile FM RF amplifier is a microprocessor-controlled, tunable RF amplifier designed for use with Belar's complete line of FM monitors.

• The RDS-1 is a fully featured RDS/RBDS monitor and decoder that incorporates the U.S. and European standards.

• The FMRR-4 frequency-agile FM rebroadcast receiver is a microprocessor-controlled, tunable receiver designed for rebroadcasting and other applications that require accurate FM reception and composite output.

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Improving on excellence

By Richard Schrag

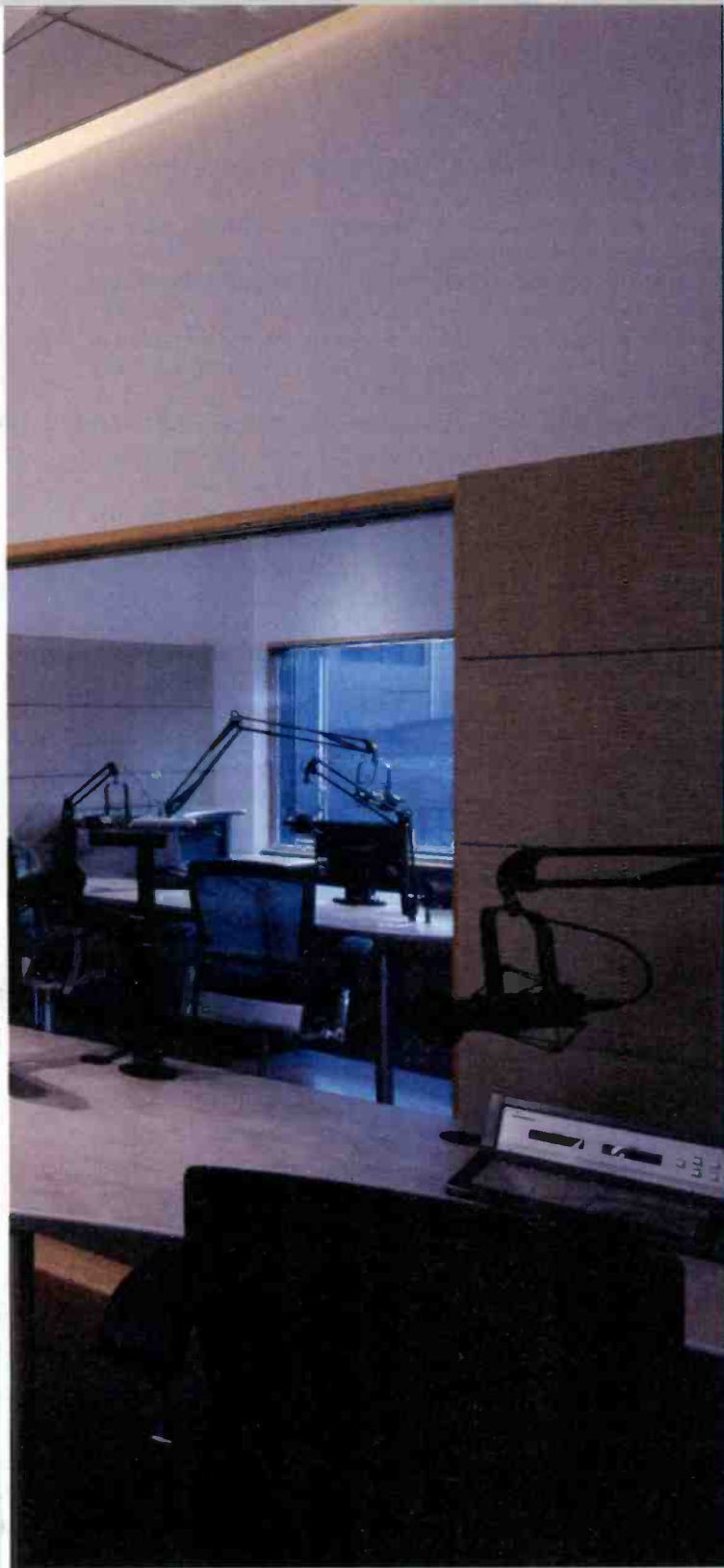
Revamping San Francisco's KQED Public Radio

When the most-listened-to public radio station in the country upgrades to all-digital production, you can be certain that it will not be a timid or hesitant move. On the contrary, when faced with a significant equipment overhaul KQED Public Radio in San Francisco decided to seize the opportunity to also make major acoustical and architectural improvements to their facility at the same time. The resulting project has transformed the station in several ways, increasing the quality and capacity of the station's operation.

KQED Public Radio, founded in 1969 and co-located with one

of the country's first public TV stations, has been an all-news and information service since 1987. Its award-winning production efforts include local news and public affairs commentary, a two-hour daily talk show, the *California Report*, *Pacific Time*, and its monthly radio documentary series *Hot Soup*. This amount of local content origination requires formidable production capabilities and day-to-day flexibility in how those resources are deployed.

The facility upgrade meant more than just installing new equipment. The station realized that it had a one-time opportunity to make improvements to several aspects of its operation, not just the

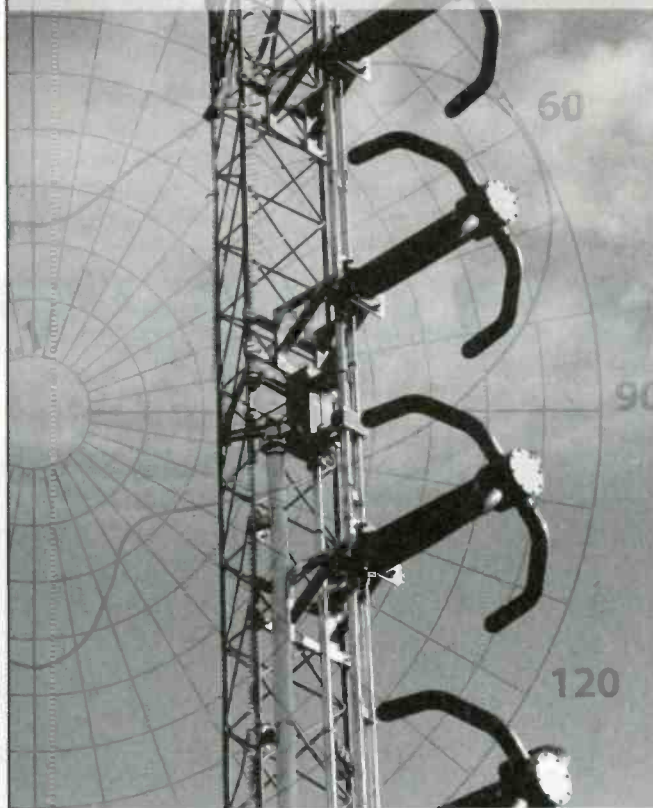


obvious audio and broadcast chains. Efforts were made to capitalize on all potential destinations for station programming, including the Web and other distribution media. In addition, the staff knew that unless the physical space was upgraded along with the equipment, they would soon wish they had more and better rooms.

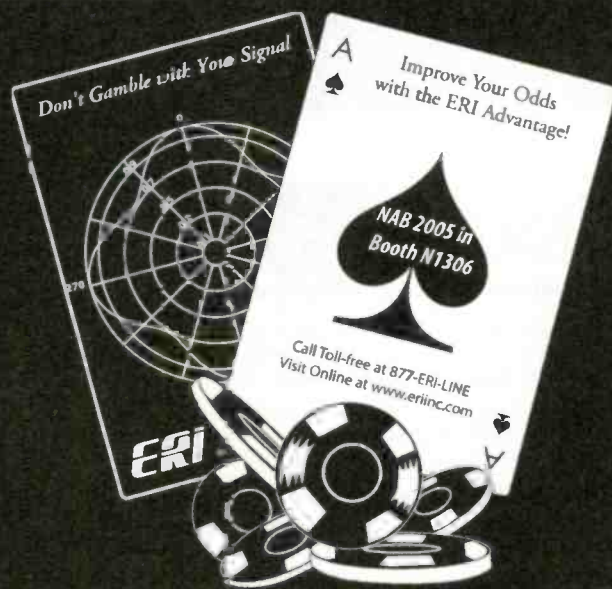
Knowing that under those circumstances careful planning and predictable results would be key to the success of the project, KQED hired Dallas-based Russ Berger Design Group (RBDG), a design and consulting firm with extensive experience in recording and broadcast facilities, especially public radio.

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KQED worked with RBDG to develop a design that would add a new master control and talk studio suite with two edit booths, and also allow improvements to the acoustics and interior architecture of all the existing technical spaces.

The power of three phases

All of this had to be accomplished as a renovation in place, within the confines of the existing building and within the space allocated to the radio station. To do so while keeping the

operation on the air without interruption, the construction was divided into three phases.

It's impossible to renovate in place without a lot of disruption, but one way to make it tolerable is to phase the construction so that one room isn't decommissioned until its replacement has been completed. In this case, KQED was able to vacate an area of office workstations large enough to create the new master control suite. Those rooms comprised the first phase of the construction. Once the new rooms were completed, it was possible to have all the master control functions originate from those spaces, which freed the existing rooms for their turn at the renovation. Construction in

the other spaces was also split into two phases so that the station was never without adequate production studios.

The renovation of the existing technical spaces was an opportunity to make acoustical and architectural improvements along with the equipment upgrade. It was decided to not change the things that would have been prohibitively expensive to modify, and RBDG agreed with KQED that the basic sound isolation construction and the mechanical and electrical systems already worked fine for the station.

Acoustic vs. seismic

For the new master control suite, room-to-room sound isolation was imperative. Because KQED is located on the upper floor of a multi-story building that also has underground parking, acoustical isolation from the building structure was essential, and necessitated the use of floating floors and other special room construction techniques. The new acoustically sensitive rooms were designed with completely isolated walls supported from the floating floors, and independently isolated acoustical barrier ceilings.

The goal of keeping the technical rooms floating, however, presented an engineering challenge to the design team because it had to be accomplished while also satisfying San Francisco's strict requirements for seismic control. Developing details that maintain the essential acoustical isolation while creating a structure that will be safe in an earthquake was a careful balancing act.

The seismic requirements for the new construction were at odds with what RBDG wanted to accomplish acoustically. RBDG wanted the rooms to completely float from the building, but the structural engineer wanted the rooms to be firmly tied down so they wouldn't hop around in case of an earthquake. The design team had to create a series of specialized details for limiting the movement of those individual construction components without negating the acoustic benefits. The design team found that it's possible to satisfy both interests simultaneously, but it's not easy.

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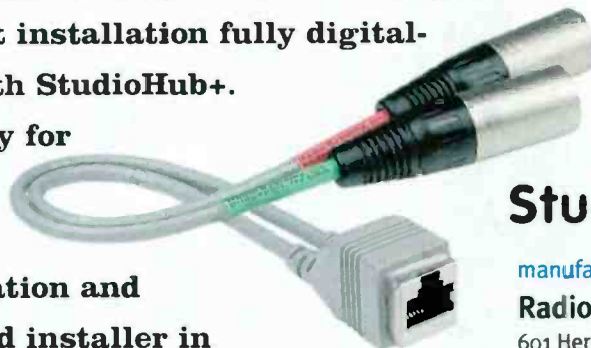
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Ultimately, steel components were anchored to the post-tensioned structural slab to constrain the floating floors without touching them. In addition, the walls were anchored to the floating floors with

additional bracing to make them structurally stable. Dan Mansergh, director of engineering of KQED Public Radio calls it a "complex puzzle." During the project, the contractors worked around the station's production schedules, but working on the slabs right next to rooms that were on the air proved to be a challenge for both sides.



Ramps and handrails at the floating floors became a design feature for the master control entrance.

Interior design

RBDG provided architectural, acoustical and interior design for the project. One goal was to take advantage of the building's exterior windows to bring daylight into the new technical spaces, and to upgrade the existing control rooms and studios to make them a more comfortable and pleasant work environment.

The existing control rooms and studios were situated off a long, claustrophobic interior corridor with no daylight. There was an open office area nearby that could be connected technically and architecturally to the older rooms, without requiring much demolition. Shuffling some offices around made the phased construction possible.

Because the new master control suite had floating floors built on top of the building's structural slab, a series of ramps and handrails were required for wheelchair accessibility from the surrounding office areas.



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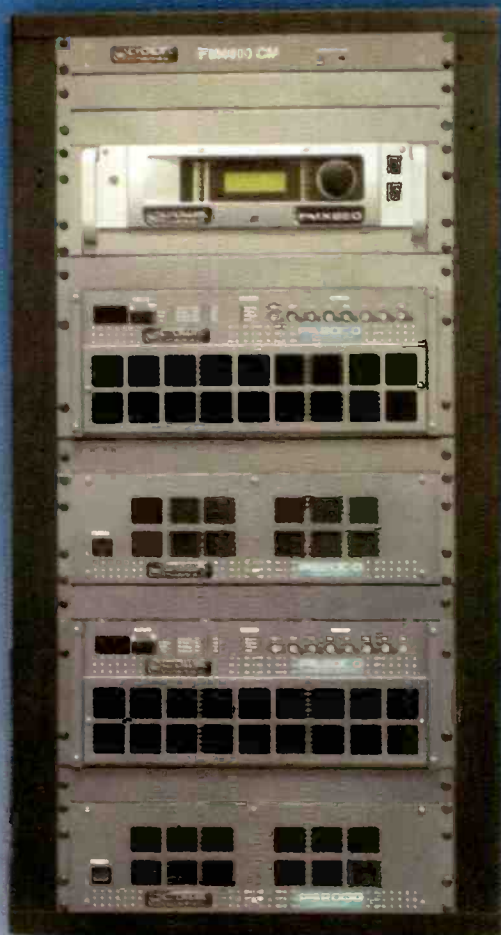
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RBDG selected stainless steel components that—along with accent lighting, special wall finishes, and coffered ceilings—make the entry a focal point, creating a place for visitors to view the technical rooms while they are in operation.

Within the master control room, a circular ceiling

element is juxtaposed with the angular geometry of the room, and allows indirect lighting to supplement the task lighting on the equipment surfaces. The adjacent talk studio inversely mirrors the round ceiling element. Cork flooring and custom acoustical wall treatments, along with new custom console furniture, are elements that also extend to the renovated rooms to ensure continuity of

design throughout the technical plant. These unique approaches to design helped create an identifiable aesthetic for the technical spaces that remains compatible with the rest of the facility.

Working the room

Mansergh knew that acoustical performance, particularly the sound of the rooms, is often a secondary consideration in a facility upgrade, but early on he made it a top priority for RBDG's design efforts. He wanted the studios to sound comfortable to the audience, and also to feel comfortable for the on-air talent and guests.

"Comfort and proper ergonomic design are essential in any facility, and they have as much to do with the function of the rooms as they do with aesthetics and creature comforts," said Russ Berger, president of RBDG. "The layout of the consoles and equipment is critical to the acoustics within the rooms, so that can dramatically change the on-air sound. But when the occupants are in a comfortable setting—which includes the acoustics, aesthetics, temperature, lighting, furniture, and finish materials—they'll do better work."

That same philosophy extends to the efficiency of the layout and the operational workflow. One design goal was to keep the new master control suite close to the existing central equipment room, just as the existing production rooms had been. That space houses nearly two dozen equipment racks to allow technical personnel immediate access to the broadcast equipment and to afford KQED expansion capabilities for their technical hub.

Even though the new master control room is designed as the primary on-air suite, each of the production rooms has the capability of becoming the nexus of a second program stream, or more



The master control room has a circular ceiling element to contrast the angular geometry of the room.

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likely allowing multiple rooms to hand off control throughout the course of the broadcast day.

Equipment upgrades

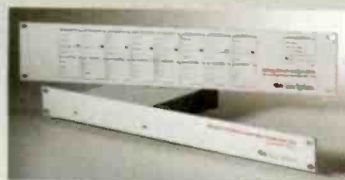
Changes to the rooms and their finishes were certainly not the only component of the facility upgrade. The project involved a significant degree of technical equipment improvements as well. New Studer On Air 2000M2 digital mixers were introduced as part of each phase.

The newest generation of on-air consoles can

store settings as presets or assign them to a particular show configuration. No matter what kind of production was in the room just before or who was working it, when the engineer sits down it only takes a few keystrokes to bring the console back to the way they expect it to be. That improves their comfort level along with their efficiency.

The new equipment complement includes a Dalet Digital Media Systems broadcast automation and news production database system, running on 10 IBM XSeries Eservers and a FastT200 SAN storage system and networked with nearly 70 workstations throughout the facility. A Sierra Automated Systems 32KD 256x256 digital audio network handles the audio routing. All the new and renovated production rooms have Genelec monitoring systems.

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Orban Optimod-FM 8400HD
Sacia 24-96 DAW
SAS 32000 intercom
SAS 32KD
Sony CDP-D12
Sony CDR-W66
Sony MDS-E12
Sony PCM-R500
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The new master control suite was built right next to the existing technical spaces, but an entrance area was created to give it a unique identity.

Teamwork

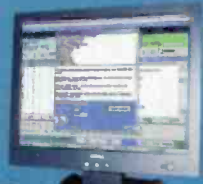
Efficient planning and exemplary cooperation between the design team and construction team kept the project on schedule. GCI, the project's construction management firm, was charged with executing the details of the technical spaces while working around the existing station operations. Harris Pacific provided the technical furniture, and National Teleconsultants was chosen to assist with the technical systems design.

The old rooms had to remain operational while the new ones were built, and people were moved into the new rooms gradually. For part of the time the station had duplicate systems running. Some production was done on tape in one room while the digital systems were already up and running in the room across the hall.

This move couldn't have been pulled off if KQED hadn't thought through each step and devoted the kind of planning and teamwork that was necessary to make it happen.

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Schrag is design principal for acoustics with Russ Berger Design Group in Addison, TX.

Photos courtesy Russ Berger Design Group.

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Audio-Technica AT2020

By Marshall Rice

The Bonneville International Cluster in St. Louis recently consolidated its four stations, heritage country WIL, modern A/C WVRV, smooth jazz WSSM and adult standards WRTH-AM. We built a new facility that incorporates a performance studio and also gave us access to a 144-seat auditorium within the surrounding office complex.

Our move into the new facility expanded the engineering departments' responsibilities. The engineering department is now called on to perform many different and challenging tasks by the various formats including live remote broadcasts, in-studio performances by guest artists, performances by competing bands in local contests, performances of guest artists at remotes and recording of performances.

While sound recording and PA mixing are not our primary mission, we are in a unique

position to provide this extra support for the radio stations and must maintain an abundance of quality microphones and ancillary equipment for use in all these situations. I am always on the lookout for a good quality microphone at reasonable cost to send to these events and I was eager to evaluate the newest addition to the Audio-Technica line-up, the AT2020.

At first I was concerned about the low cost of this microphone. My previous experience with low cost condenser microphones had not been positive, so my expectations were not high when I began the evaluation. I was pleasantly surprised by the performance of this microphone. The AT2020 is a large-diaphragm, side-address condenser microphone with a fixed cardioid polar pattern. It has an extended frequency response of 20Hz to 20kHz. The output impedance is 100Ω via a three-pin XLR male connector. It is well constructed, compact in size and lightweight. It requires 48Vdc phantom power, which is usually supplied by a mixing console or by a separate in-line power supply. Included accessories are the stand mount for 5/8"-27 threaded stands, a 5/8"-27 to 3/8"-16 threaded adapter and a soft pouch.

In the studio the mic demonstrates a smooth linear frequency response with a crispness and clarity in the upper frequency range common to other Audio-Technica microphones, yet the AT2020 displayed a more pronounced low end than other Audio Technica mics, the AT4033 in particular. The lightweight design allows the mic to be easily mounted on a studio boom with the included pivoting stand mount. A shock mount is also available. The compact size of the mic does not interfere with any sight lines. With the cooperation of a local voice-over talent, I compared the AT2020 with a Rode NT-1000 and a Neumann U-87 in a real studio environment.

The AT2020 had a much more pronounced and clearer high end than the NT-1000 and was less boomy on the low end. The mic was more forgiving on placement and worked well even when close miked. In comparison with the U-87, the AT2020 was not nearly as flat or transparent, and did not have the same natural and open feel as the U-87, but the AT2020 handled plosives and pops that overloaded the U-87 and the NT-1000. The voice-over talent could not overdrive the AT2020 even by speaking extremely loud.

Looking good

For me, two drawbacks of the mic are its lack of pattern switches and more importantly is the absence of a roll-off filter; that limits its usefulness in some circumstances. I preferred the sound of the AT2020 to that of the NT-1000 and was especially impressed with its dynamic range. The AT2020 is easy to work with and much more forgiving than the other two microphones. The AT2020 microphone would be a good choice for less experienced or non-professional announcers.

During the evaluation, I tested it in a live PA situation with a popular country singer. We were presenting this singer in our auditorium and recording the concert for later use on-air. I used the AT2020 to mic the performers' acoustic guitar. I generally try to separately mic acoustic guitars in

Performance at a glance

- Rugged construction
- High SPL handling (144dB)
- Wide dynamic range (124dB)
- Fixed cardioid polar pattern
- Extended frequency response (20Hz to 20kHz)
- Low cost

Leading POTS Codecs Compared.

	Comrex Matrix	Tieline Commander	Zephyr Xport
Audio Bandwidth @ 24 kbps @ 19 kbps	14 kHz 11.2 kHz	15 kHz 9 kHz	15 kHz 15 kHz
Direct Internet Software Updates	No	No	Yes, via Ethernet port
Digital PC Audio Input	No	No	Yes, via Ethernet port and supplied driver
Audio Metering (XMIT/RCV)	Transmit only	One-at-a-time	Simultaneous
Audio Processing	None	Simple AGC	Digital multi-band AGC with look-ahead limiter by Omnia
Remote Control	No	RS-232 and dedicated computer	Ethernet via Web browser
Auto Dial Storage	19 Numbers	50 Numbers	100 Numbers
Frequently-Used Settings Storage	none	none	30
Standards-based POTS Codec	No - Proprietary	No - Proprietary	Yes - aacPlus (MPEG HEAAC)
Transmit-Receive Quality Display	No	Yes	Yes
Contact Closures	2	2	3
Display Resolution	120x32 LCD	120x32 LCD	128x64 LCD
Analog Cell Phone Interface	Optional	Standard	Standard
Mixer Inputs	1 mic, 1 mic / line	2 mic / line	1 mic, 1 line
Phantom Power	No	No	Yes - 12 volt
Automatic Voice-Grade Backup	No	No	Yes
Power Supply	External	External	Internal auto-switching
Local Mix Audio Outputs Headphone Line Level	Yes Yes	Yes No	Yes Yes
Direct Receive Audio Output	No	Yes	Yes
Uses ISDN at the Studio Side for More Reliable Connections	No	No	Yes - your Zephyr Xstream becomes universal POTS and ISDN codec.
Available ISDN Option	\$850.00 (adds MPEG L3 & G.722)	\$850.00 (adds G.722)	\$495.00 (adds G.722 & state-of- the-art AAC-LD for high fidelity and low delay)
List Price:*	\$3,700.00	\$3,650.00	\$2,495.00

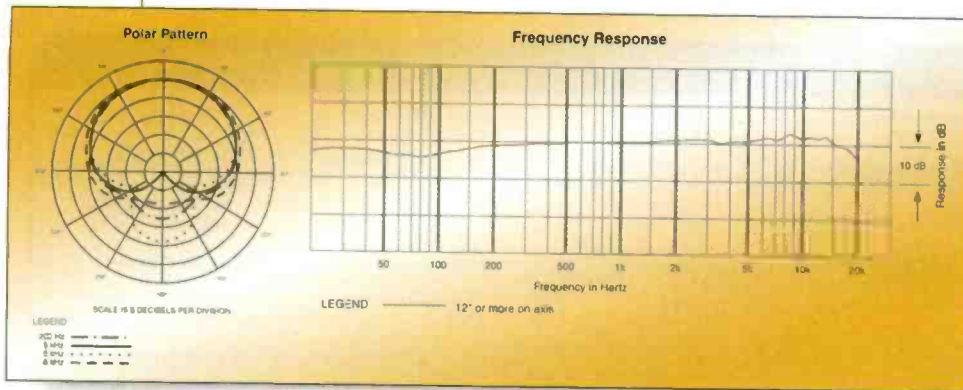


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addition to using the built-in pickup on the guitar itself. By miking the guitar separate from the pickup I can get a richer, fuller sound from the entire instrument, not just the sound of the strings. I placed the mic

the mic suited this application well, limiting the pickup of off axis sounds and preventing feedback. The high SPL handling and wide dynamic range allowed me to capture the percussive sounds of the pick on the strings without overloading. The extended frequency response captured



The frequency response and pick-up pattern of the AT2020.

the full tonal qualities of the strings and body with little EQ. I was surprised at how well it performed in this application. With its wide frequency response, high SPL handling and cardioid pattern, a pair of these mics would also work well as a stereo overhead mic set. Due to its low cost you won't mind taking it out of the studio for mobile work.

slightly up the neck and pointing toward the sound hole to capture the dynamics of the performance. The cardioid pattern of

Overall, the performance of this mic compares well to other much more expensive condenser microphones. It will not replace a high-end condenser microphone, but on a cost vs. performance basis it is tough to beat. This microphone would be ideal for a home studio or entry-level use and it is well suited to mobile recording environments. It is a good

choice for remote broadcasts where quality sound is required and you don't want to risk a more expensive microphone. A windscreen is available for this mic but it wasn't needed on any of my tests.

Rice is engineering director of the St. Louis Radio Group of Bonneville International, St. Louis.

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These reports are performed by the industry, for the industry. Manufacturer support is limited to providing loan equipment and to aiding the author if requested.

It is the responsibility of Radio magazine to publish the results of any device tested, positive or negative. No report should be considered an endorsement or disapproval by Radio magazine.

Introducing Optimod-FM 8500

Successor to Orban's industry-leading 8400, the new, all-digital 8500 offers major improvements: twice the sample rate, twice the DSP horsepower, and features HD Radio /digital radio/netcast processing with 20 kHz bandwidth.

The 8500's competitive sound takes 8400 version 3.0 sonics to the next level. The 8500 will import and run any 8400 preset, so anyone with carefully customized 8400 user presets can upgrade to the 8500 without missing a beat. For HD Radio broadcasters, a built-in, defeatable β -second analog-channel delay lets you use the 8500's built-in stereo generator and patented "Half-Cosine Interpolation" composite limiter to maintain full loudness on your analog channel.

All processing structures have about 4 milliseconds less delay, making headphone monitoring even easier for talent. For the most critical off-air monitoring requirements, you can even use one of the new "ultra-low latency" presets with only 3 milliseconds of delay.

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Ethernet is now built-in. Of course, you can also control the 8500 via modem, serial connection, GPI, external RS-232C interface automation, or internal clock-based automation with internet time sync—the 8500 is always easy to integrate into your facility, regardless of complexity. And we've retained the 8400's famous ease-of-use that makes it easy for you to tune your sound by creating your own custom presets—even if you're not an audio processing expert.

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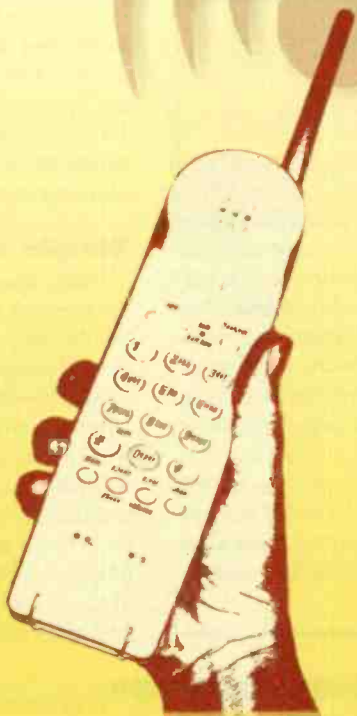
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Snap Appliance Snap Server 1100

Blake Thompson, CBNT

Do you need a fast, easy data backup system for your facility? At WZIP-FM our DADPro 32 server was getting filled with WAV files that we use for class projects and training in addition to the usual production work. WZIP-FM is the student run station at the University of Akron that's run as a professional broadcast training program, so we try to have industry-standard equipment and programs throughout the facility. The DAD server has 72GB of Raid 5 storage, which is enough for our on-air elements,

their low price and ease of use. The drive is mounted in a small 3"×5"×9" enclosure that only has power and Ethernet plugs on it. There are also four LEDs to show system OK, data link OK, network connection/activity and disk activity. Inside the case there is a small disk controller, the 250GB drive and a CPU running the custom Snap OS. The 1100 series is a single disk system only; other lines have Raid capabilities if needed. It will run on and emulate almost any network/server platform including all Windows flavors, Mac OS, Unix and Linux. It will also "talk" in TCP/IP, HTTP, UDP/IP, AppleTalk, IPX and Net BEUI. You can even set it up as an FTP server.



Quick assembly

The basic setup is simple and fast. Plug in the inline power supply, no wall wart, and connect to your network switch or hub. Then just load the configuration software on a nearby workstation. The quick setup option worked like a charm for me. I was able to set the IP address, work group and security settings from my DAD server in about five minutes.

You can also remotely configure it through a Web browser or use a DHCP server to assign the IP address. Security is Secure Sockets Layer (SSL) encryption that keeps data safe during transfers. During the next few days, I transferred more than 50GB of data to store all our production elements, a complete back-up of the on-air material and all the DAD programs to the unit. The Ethernet connection is 10/100 speed but through my new gigabit switch the transfer speeds were quite fast with most 32MB cuts transferring in about three seconds on a moderately busy network.

Performance at a glance

Storage sizes from 80GB to 250GB
Fast setup without IT expertise
Works with all networking flavors
Small, portable, easy to use

but now that we are migrating to uncompressed audio the production stuff is getting too big. I wanted to find an inexpensive option to store the production and classroom audio on the network without replacing all the server drives and then bogging it down transferring large WAV files.

I picked the Snap Appliance Server 1100 250GB network attached storage (NAS) unit from Adaptec. These types of storage units are becoming common for back-up use in many network operations due to

Simple setup

Workstation setup was even easier. The drive appears in the network neighborhood so you can put a shortcut on the desktop or you can use drive mapping through Windows if you prefer that method. I even connected the Macs we use for video editing. Once my system was backed up I tried to use the automated backup software that comes with it but, it wouldn't run on my Win 2k server. The software is designed to only back up from a local disk to somewhere else; all the files I want backed up are only local to the server. I tried it on a workstation but it would only see the workstation drives as a source for the back-ups so I was out of luck. The company does include a 30-day trial version for servers.

I did run into one problem with the unit. During a large file transfer session it stopped and put up a window with "cannot proceed, file path too deep" when I clicked OK it went away. The unit seemed to be running the disk but wouldn't allow any access. I restarted the system with no success; it still wouldn't show up in the network neighborhood. I looked through the PDF manual included on the setup disk but there was no indication of my problem listed. I went to the company website and found a FAQ search section. I entered my problem and the answer was I should call support. After a quick call to tech support I pinged the unit and found it was there but running a disk defrag/cleanup routine.

I had deleted some of the material off the main server before running that last group of files and some newer production could have been lost. After about 45 minutes of rebuilding, or whatever it did, it was back and all my data was still there. I later learned that its OS, like Windows, doesn't like the file path to be larger than 256 total characters, apparently I had a folder that was too deep.

There are many options out there now for NAS systems so figure out your needs then double or quadruple them. You can seemingly never have enough storage these days.

Thompson is chief engineer of WZIP-FM., Akron, OH.

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Syndicating a Website's

Responding to the tremendous buzz over RSS (Really Simple Syndication) a number of free sites on the Web have sprung up that completely automate the process of syndicating site content across the Web. In practice, this means that in a matter of minutes, you're now able to tweak your site so that hotlinks to your company press releases and similar promotional materials can be sent to RSS readers across the Web.

The popularity of RSS is growing exponentially. The technology is being seen by increasing numbers of Web users as an alternative to e-mail, because it can be used by Web surfers to track changes on websites without requiring a user to release an e-mail address.

In practice, RSS-generated news of website updates—including press releases, white papers, new product downloads and site changes—arrives as headline hotlinks, which RSS-users can click on to view the full press release or other site change.

While initially popularized by bloggers to alert their readers about blog updates, RSS is currently poised to go mainstream. Megaportal My Yahoo (my.yahoo.com/s/rss-faq.html), a site used by millions worldwide to track news and information, recently added RSS-tracking to its arsenal of Web data gathering tools, for example. Third-party products like RSS Explorer (rssexplorer.planethood.com) are enabling users to add a toolbar to Internet Explorer to makes the browser RSS-ready.

Also fueling mainstream acceptance are sites like Ice Rocket (rss.icerocket.com), which offer easy-to-use RSS builders that automatically generate the tiny strip of code needed to make a Web page RSS-readable. Ice Rocket offers the service free-of-

charge as a way to encourage use of its main product: its Web search engine.

NPR (www.npr.org/rss) offers a wide-range of RSS-syndicated programming, each on its own, individual RSS "channel." Minnesota Public Radio (minnesota.publicradio.org/about/site/rss) takes a similar approach, as does CBC/Radio Canada (www.cbc.ca/rss) and KSL News Radio 1160 AM, Salt Lake City (radio.ksl.com/index.php?sid=112927&nid=19).

Generally, an individual can find invitations for RSS tracking—little tags stamped with the acronyms RSS or XML—on the home page of websites encoded with RSS.

How it works

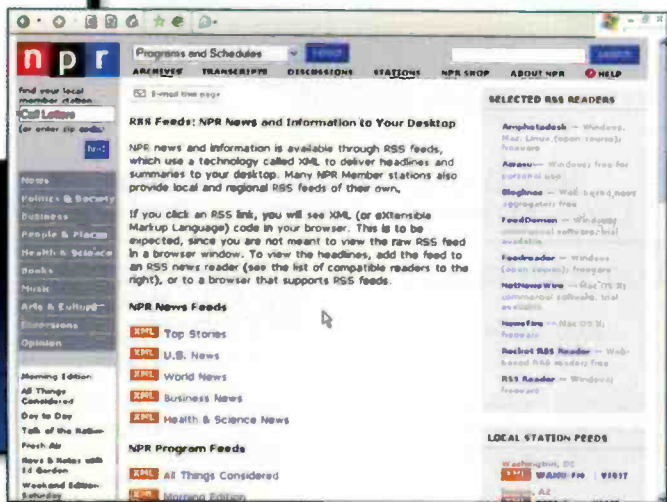
Probably the first thing users will notice when they get to Ice Rocket's RSS builder is the great pains the company has taken to simplify and goof-proof the process of RSS-link generation. Essentially, creating the link takes four steps: registration, channel creation, item creation and publishing. The process takes about five minutes.

The first step, registration, will take seconds. All Ice Rocket asks for is the user's e-mail address, a password and the user's first and last name.

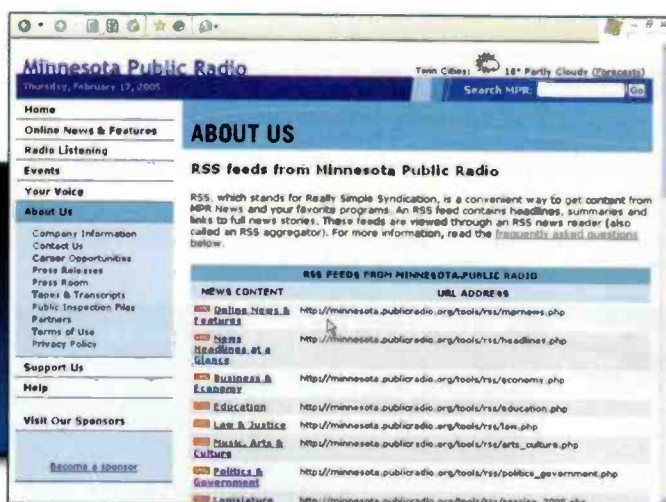
Next, the user will be asked to create a channel, which is used by RSS distribution sites to send his RSS link across the Web. To create a channel, users need some data inputs: the user's website name, URL, a brief description, a URL that will be used to source an image for the channel (usually the home page), the user's e-mail and any copyright info he would like to add.

Once a channel has been created, begin adding links to specific items—such as press releases, white papers and new Web brochures. Ice Rocket requires is a title for the item, a URL, a brief description of the item and the user's e-mail address. As an added service, Ice Rocket also verifies that the item as rendered on the user's Web page can be read by RSS news aggregators, and republished on other websites.

The last step is actually handled automatically by Ice Rocket. It



NPR offers a wide range of RSS-syndicated programming, each on its own RSS "channel."



Minnesota Public Radio takes a similar approach to NPR.

Content in Five Minutes

By Joe Dysart

automatically generates the code for a tiny RSS icon, which can be cut-and-pasted onto the user's website where his item appears. The icon serves as a heads-up for anyone using an RSS-reader—or anyone using an RSS-capable portal like MyYahoo—that changes to the site can be tracked via RSS.

With these four steps, anyone can create an "RSS feed," and his site has joined the ranks of tens of thousands of others, including *The New York Times*, CNN, BBC and About.com, that have decided to broaden their reach by making their sites readable to the RSS community.

(If Ice Rocket doesn't suit your fancy, you can find several other free RSS builders by entering key-phrase "RSS builder" into any search engine.)

Promoting and tracking

Even though Ice Rocket's RSS builder is virtually goof-proof, users may want to spend some extra time making sure the feed is picked up by all the major RSS news aggregators, and that all the major RSS readers are picking up on the feed as well.

The major RSS news aggregators include Syndic8 (www.syndic8.com), Complete RSS (www.completerss.com), Feedster Finder (feedfinder.feedster.com), News Is Free (www.newsisfree.com), and RSS Feeds (www.rssfeeds.com). Each of these sites will offer a link to click on to enter the URL of a site where RSS-coded content is available.

Also, double check the readability of your site's RSS feed in a few, well-established RSS readers. These include Feed Demon (www.feeddemon.com), Feed Reader (www.feedreader.com), Newz Crawler (www.newzcrawler.com), Ampheta Desk (disobey.com/amphetadesk), Net News Wire (www.rancher.com/netnewswire), Newsgator (www.newsgator.com), Bloglines (www.bloglines.com), My Wire Service (www.mywireservice.cm) and Feed-Me (www.feed-me.info).

Yet another group of sites, RSS search engines, specializes in searching out RSS content on the Web and summarizing those offerings. These sites differ from the others in that they go beyond

simply citing RSS feed names and descriptions, and bringing back summaries of the actual text being offered by the RSS feeds. These sites include Technorati (www.technorati.com), Daypop (www.daypop.com), Feedster (www.feedster.com), Pub Sub (www.pubsub.com) and Rocket News (www.rocketnews.com).

Dysart is an Internet business consultant based in Thousand Oaks, CA.

Additional RSS resources

For a deeper understanding of the technology, here are some great sites:

- RSS: What it is, Where to get it, How to make it, How to use it.

interleaves.org/~rteeter/rss.html#where

This site is easily one of the most comprehensive informational sites on RSS available.

Essentially: Stop one for anyone looking to get an overview of the technology.

- RSS: Your Gateway to News & Blog Content by Danny Sullivan
searchenginewatch.com/sereport/article.php/2175281

One of the pre-eminent gurus on Internet search, Sullivan offers hands-on users guide to RSS with this article. Besides an overall explanation and background, Sullivan offers detailed descriptions of numerous RSS news aggregators and RSS search engines.



CBC/Radio Canada has also joined the RSS fold.



KSL News Radio 1160 AM, Salt Lake City, serves up the RSS option to its listeners, too.

Dielectric HDR Plus

By Henry Downs

The dawn of in-band on-channel terrestrial radio has arrived. For the last 12 years or so, manufacturers have been working behind the scenes to develop components to make it a reality. The most daunting task by far has been how to combine the analog and digital signals in a cost-effective manner. The proof of concept work used a 10dB coupler as the combiner. This approach causes more than 16 percent of the generated RF signal power to

Much of the Dielectric Communications research has centered on combining the analog and digital signals in the antenna, one of the results being the introduction of the HDR Plus antenna. This device allows loss-less combination of the existing analog and IBOC digital sideband signals without the need for additional tower space. The array is made up of two completely separate interleaved antennas, which meet the FCC specified coverage requirements. An additional feature of this array is that the digital portion may be used as an auxiliary for the analog in an emergency situation.



be dumped into a load. Many different improvements have been suggested, all of which have slightly reduced the loss factor but no all-encompassing solution has been brought to fruition.

The most prominent challenge in developing this type of antenna has been how to obtain sufficient isolation between the transmitters. This is primarily due to the fact that the radiated analog signal power level is 100 times higher than the digital. With insufficient isolation the new digital transmitter could be damaged or could possibly generate unwanted spurious signals in band. Initial investigation into this type of interleaved array used two identical antennas such that they both exhibited right-hand circular polarization (RHCP). The resulting isolation was found to be grossly inadequate at about 13dB.

This led to the development of the Reverse Polarized Interleaved Antenna (patent pending) in which the digital antenna operated using left-hand circular polarization while the analog antenna continued to radiate RHCP. The use of the two directions of polarization increased the isolation to about 24dB. The addition of a ferrite isolator in the lower power digital input line allowed this device to be successfully implemented at WNNK in Harrisburg, PA.

Work in reverse

The HDR Plus research team built on the reverse polarization technique using different antenna bays with the result that the isolation between the transmitters has been increased to 42dB minimum.

This increase in isolation, which helps lessen implementation costs, also removes the need for an isolator, which has been considered a potential weak link in the system.

A significant amount of testing has been carried out with

respect to the obtainable patterns from this type of interleaved array and by appropriately offsetting the two arrays with respect to the tower the azimuth coverage from each antenna is, in effect, the same.

The main advantages of the HDR Plus antenna are threefold. It does not require any additional aperture on the tower. Because there are no losses incurred due to the method of analog and digital signal combination a low power digital transmitter may be implemented. This low digital power requirement means that a type N cable is sufficient to carry the signal from the transmitter to the antenna. Once a tower loading study demonstrates the feasibility of the additional antenna bays and the necessary permits are obtained, the system may be installed and brought to fruition. The HDR plus antenna meets or exceeds all of the pertinent FCC regulations with respect to coverage contours.

Downs is technical director, Dielectric Communications, Raymond, ME.

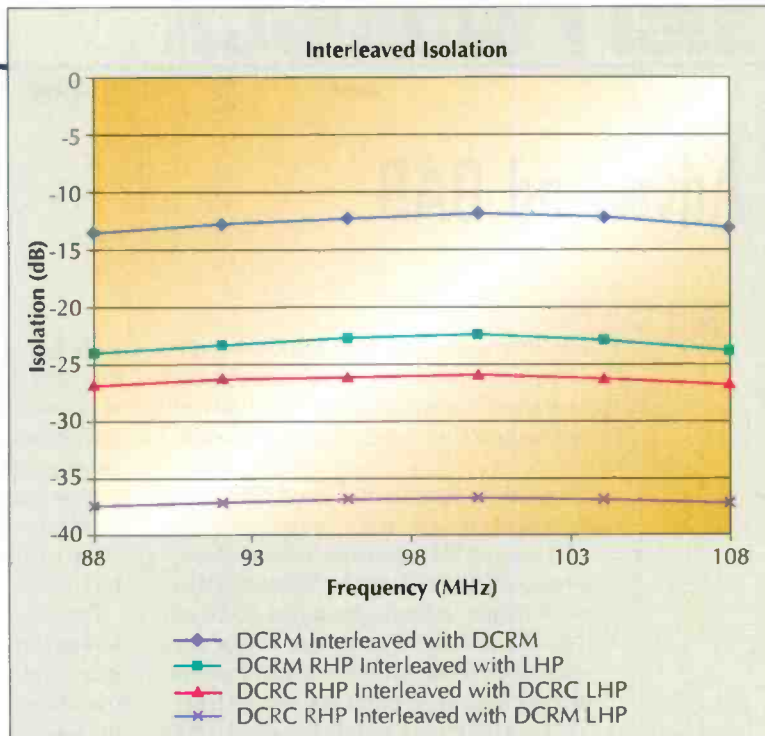


Figure 1. Comparison of isolation between antennas with different types of polarization between the two systems.

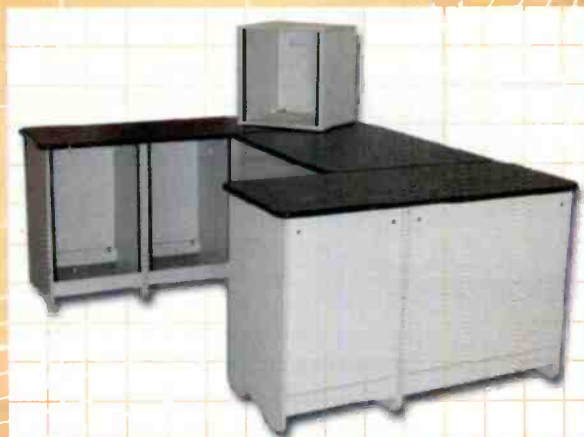
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Reader Feedback

www.beradio.com

Advanced DAB

T

his letter was received in response to the Viewpoint in the January 2005 issue of Radio magazine. That editorial discussed the various forms of DAB currently in development.

From the information to hand, DRE is the least likely system to go places:

1. Using an FM subcarrier instead of Ibiq-uity's COFDM will make the digital signal far more fragile, prone to break-up and total loss when received in the car. Digital systems take a considerable amount of time to recover from such break-up. Instant loser.

2. Cost of implementation, where DRE does offer some advantage, is not the biggest hurdle for DAB. The question for today is whether HD Radio offers enough benefits to get the consumer to buy digital receivers.

Does latecomer DRE have some unique selling point for the consumer? Apparently, quite the opposite. So next, does HD Radio actually offer enough benefits to get U.S. consumers to buy receivers? In the long run, I think the answer is yes. The salient points are:

1. Multipath problems with high-power analog FM
2. The sonic drawbacks of 75us FM de-emphasis
3. The great sound quality and robust signal of HD Radio
4. Possibilities of additional services on digital radio

Don't be misled by the apparent quiet prevailing in the market for digital radios right now. It will take a year or a few years to get going, and this won't happen until receivers are in the shops at well under \$200. Make that \$100 to really get the numbers going, but the industry will make it happen.

In the UK you can get a brand new Eureka-DAB receiver for less than \$100 already. The UK is probably five years ahead of the U.S. in digital radio (transmis-

sions have been on the air for 10 years), but our market is tiny, only 20 percent of the size. That's a huge factor in economies of scale at the start. And DSP technology has developed tremendously since the UK switched on ten years ago, giving second-generation DAB systems a considerable boost on cost, power consumption and deployment time. So the sub-\$100 HD Radio receiver within a year or two really is no problem at all. At that time, digital audio broadcasting will surely come to the fore.

The success of satellite radio in the U.S. will also be a telling factor. If they can recognize trouble when they see it coming, the regular broadcasters must feel the imperative to respond somehow. While a technological fix is not the whole answer, HD Radio would be a good start, and it is the only sensible game in town for the FM band right now. HD Radio receivers can have service-on-demand (for example, news or travel info on demand) built in - plus additional services, which will eventually offer a USP over analog radio.

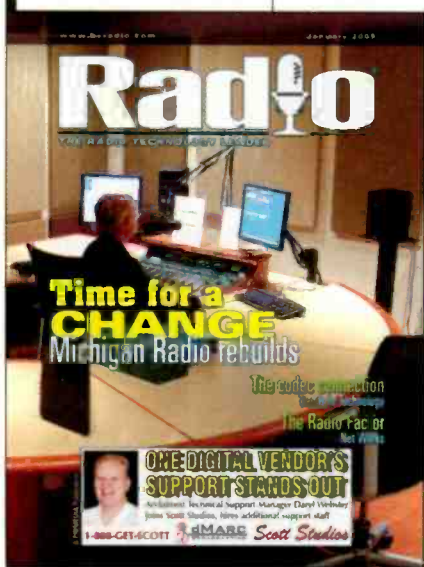
AM IBOC is a scary prospect when everyone is radiating skywaves at night, plus it's a U.S.-only standard. Note that IBOC uses a vast amount of AM bandwidth.

DRM is the way to go for digital radio in the AM bands. It has been designed to cope with the horrendous short-wave interference environment so it can fit in a tiny bandwidth, it is very robust and it works with skywave propagation. Receivers will be produced in vast numbers for a worldwide market and they could be so inexpensive as to compete with analog on cost before too long. Just look at some of the big names (like Sony) involved in the DRM consortium.

In closing, some comments regarding comparisons with the UK digital radio scene, which is the most advanced in the world. Take care when looking over here for pointers to future developments. In general, our FM radio system works much better than FM in the U.S.—sorry guys! Actually, joking aside, this is due to our kinder 50us de-emphasis, often shorter ranges and friendlier terrain. Multipath distortion is rarely a serious problem for long, the sound quality is crisp and clean already, and RBDS really is ubiquitous in cars—seamlessly switching mobile listeners to the numerous local FM repeaters in black spots.

When Eureka was initially sold on the benefit of sound quality over here, it failed. Our FM sounds good already and Eureka, with its 128kb/s data rate and outdated MP2 compression algorithm, was barely any better. Indeed, early adopters with quality sound systems found the quality limit of MP2 actually distressing. I'm glad to say that HD Radio's codec sounds great! A nearly identical codec is used for DRM as well, so the second-generation experience on sound quality will be very different.

Here in the UK, Eureka is now being sold on new



comments?

radio@primediabusiness.com

strengths of additional radio services that are not available on FM, and cheap portable and car receivers. It is growing in the UK but slowly, and its situation in most of the rest of Europe is absolutely dismal.

Keep an eye on DRM's proposals for use from 30 to 120MHz. If a DRM-Plus variant is developed that allows higher channel capacity at VHF, it may run away with the broadcast radio market. This would probably leave Eureka-DAB as a bitcasting system primarily for downloading music on-demand Web pages, and e-mail to the Ipods of the future. The upload channel could be the good old mobile phone (GSM), connected to the Ipod via Bluetooth. Voila. Everyone's happy.

For traditional radio broadcast, a DRM and HD Radio dual-standard receiver with AM and FM thrown in will be a worldwide winner. Don't discount analog broadcasting - especially in emergencies, it will continue to fit the bill for a long time to come yet. Unlike analog television, FM analog switch-off is just a dream for now.

Martin Spencer

*Omega development team, Inovonics
omegarev3@yahoo.co.uk*

Thanks for the notes. I'm glad you enjoy Sign Off. Finding information and equipments can sometimes be a challenge, but it is interesting. I am always looking for information, photos and descriptions of vintage and legacy equipment and facilities. Whether it's tried-and-true, well known equipment or something rare and unusual, if you have something in your files or your collection, please tell me about it.

— *Kari Taylor*
associate editor

ktaylor@primediabusiness.com

Thanks for the memories

Kari,

I just wanted to drop a note after reading *Sign Off* from the November issue of *Radio* magazine about The Gates Producer mixer. It may or may not surprise you that we were using one of those up until about a year ago in our production studio at KDLR.

Paul Clementich
morning announcer, KDLR/KDVL
Deville Lake, ND

I just wanted to drop you a note of thanks and appreciation for your *Sign Off* articles each month. Your articles on various pieces of equipment from radio's past sure bring back memories. When I opened the November issue and what did I find on page 82? Our old production board (the Gates Producer)! We still have it but it is no longer in service.

WVCY is a Christian station operated by VCY America out of Milwaukee. The station went on the air in 1969 under different owners, who used a host of Gates products, including the BC-250GY 250W AM transmitter. It's still in continuous use and operates in near-flawless fashion.

Thanks again, Kari, and keep up the great work!

Bob Gardinier
operations manager, WVCY-AM
Oshkosh, WI

Find the mic winner February issue

Congratulations to

Lyle Henry

of Los Angeles.

His name was drawn from the correct entries for the February issue. He won the Pauly Superscreen pop filter from Transaudio Group.



The mic icon was to the right of the *Radio* logo disguised as a track light.

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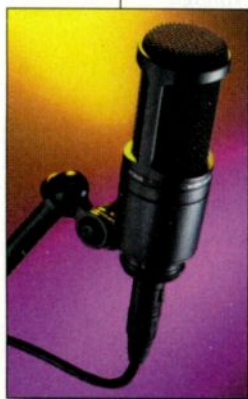
New Products @ NAB

By Kari Taylor, associate editor

www.beradio.com

The NAB convention is so big, we divided our new product preview into two issues. We have also provided the exhibitors' booth numbers to help you find them at the convention. For more NAB information, turn to the March issue, which includes the exclusive *Radio* magazine FASTtrack and a map of the Radio/Audio Hall.

Cardioid condenser mic Booth N3322 Audio-Technica



AT2020: This side-address condenser microphone features a custom-engineered low-mass diaphragm, providing extended frequency response plus the ability to handle high SPLs. The mic has a fixed, cardioid polar pattern to allow isolation of the desired sound source and features a flat, extended frequency response (20Hz to 20kHz), high SPL handling capability (144dB) and a dynamic range of 124dB. The microphone requires 48V phantom power and output from the mic is via a low-impedance, three-pin XLR connector.

requires 48V phantom power and output from the mic is via a low-impedance, three-pin XLR connector.

330-686-2600; fax 330-686-0719

www.audio-technica.com; pro@atus.com

Audio processors Booth N2802 Wheatstone

Audio processor series: The two-channel, stereo audio processor provides an array of analog and digital inputs and outputs, a four-band parametric EQ, three-band compressor, and tunable filters along with over-all AGC, limiting and expansion. All settings can be



stored and replayed as password-protected presets. The front-panel display includes input, output and gain-reduction meters. Remote monitoring and operational control is possible using Ethernet-enabled GUI software.

252-638-7000; fax 252-637-1285

www.wheatstone.com; sales@wheatstone.com

CD player/Minidisc recorder Booth SL1516 Tascam



MD-CD1: Combining CD playback and Minidisc recording in 1RU saves rack space and installation budgets. The unit features 1/2 percent pitch control, MP3 CD playback, RS-232 control and an optional balanced I/O board. The unit also offers RS-232 control, digital I/O and an optional I/O board for balanced interfacing. CDs can be played back at 12 percent higher or lower, and speed can be adjusted without affecting the pitch of the source. Discs can be duplicated from CD to Minidisc at up to 4x speed, and a wireless IR remote is included.

323-726-0303; fax 323-727-7635

www.tascam.com; tascamlit@tascam.com

Recordable discs Booth N2822A HHB

1x-12x CR-R: Unlike conventional media, these discs are optimized for low speed 1x to 12x writers. The discs deliver low block-error rates and low jitter in



audio recording applications, while improving economy by reducing the operating stress on the lower-powered lasers used by audio CD recorders. The CD-R discs replace the existing 1x to 24x discs in an HHB Professional Recording Media range that also includes CD-RW, DVD-R, DVD-RAM, Mini Disc, MO, DAT, ADAT and DTRS formats.

310-319-1111; fax 310-319-1311; www.hhbusa.com; sales@hhbusa.com

Expansion series Booth N3602 Burk Technology

G-Link G-Bus: By adding G-Link products to a new or existing GSC3000 system, broadcasters can monitor facility conditions with plug-and-play convenience. The AC-4 and AC-8 power strip controllers are for remote management of 120V inputs such as HVAC appliances, lighting and computers. G-Link emphasizes economies of scale by integrating all remote facility monitoring on a platform and using the same software and Web-based interfaces as the GSC3000.

800-255-8090; fax 978-486-0081; www.burk.com; sales@burk.com

DSP audio processor

Booth N4006

Symetrix

Air Tools Orion 8088:

Dubbed Orion 8x8 Ana-

log I/O DSP, this processor offers eight line-level analog inputs and outputs. The processor uses a pair of analog 66MHz SHARC processors to create virtual audio pathways and processing modules that replicate dedicated hardware devices in the physical world. The Studio Matrix Designer application creates these signal routes and processing chains on a Windows PC. Parameter settings can be assigned to any of the 1,000 onboard preset locations and recalled on demand via RS-232 commands from the stations automation package. Audio routing between units is handled via the Symlink bus. This proprietary interconnect supports the free exchange of 64 channels of audio and control through CAT5 cable.

425-787-3222; fax 425-787-3211; www.symetrixaudio.com; symetrix@symetrixaudio.com

Active monitors

Booth N1726, SL1143

Genelec

8000 MDE series:

This series of bi-amplified active monitors is comprised of three models: the 8030A, 8040A and 8050A. These speakers feature rounded edges and curved front and sides and use an aluminum MDE design. The 8030A, the smallest of the series, features a 5" bass driver along with a 3/4" tweeter. Its frequency response is 58Hz to 20kHz (± 2 dB). Peak SPL per pair is 108dB, driven by a pair of 40W amplifiers. The 8040A incorporates a 6" woofer and a 3/4" tweeter. Its frequency response is 48Hz to 20kHz (± 2 dB). Peak SPL per pair is 115dB, achieved using 90W amplifiers for each driver. The 8050A is the largest model. It uses an 8" bass driver and a 1" tweeter. This speaker produces peak SPLs of 120dB with a free-field frequency response of 38Hz to 20kHz (± 2 dB). Bass and treble amplification is 150W and 120W.

508-652-0900; fax 508-652-0909

www.genelec.com; genelec.usa@genelec.com

Audio codec

Booth N2118

Comrex

Access: BRIC technology enables broadcasters to use a variety of commonly available Internet access points to broadcast high quality, real-time audio. Access is capable of using wired circuits like DSL, cable, POTS and frame relay as well as wireless circuits such as Wi-fi, 1XRTT, Edge and 3G data networks. The codec will be available as rack mount and portable units. Capable of providing voice quality connections over IP connections, the codec also offers a stereo mode that offers optimized performance when used on managed data networks.

800-237-1776; fax 978-784-1717

www.comrex.com; info@comrex.com



Digital on-air console

Booth C1907, C3607A

Harris

VSDM-II: This console features a digital mixing architecture and supports analog and digital inputs and outputs to allow stations to transition to digital on their time frame. Smaller than the RMX Digital on-air console, the new console focuses on small market radio stations and smaller studio applications for larger markets.

800-622-0022; fax 513-459-3890

www.broadcast.harris.com; broadcast@harris.com

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savings in electricity and maintenance costs over an older transmitter...and as a bonus they get exceptional reliability and that major market sound for free.

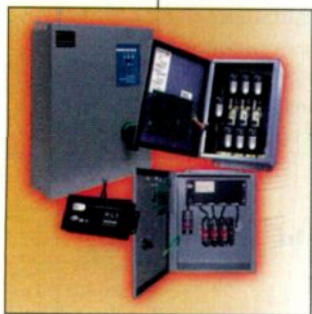
But, don't take our word for it. Talk to our customers already on-the-air with the X-1000E. Call or email for a users list and decide for yourself why owning this transmitter is a no-brainer.



Tel 315-673-1269 / sales@armstrongtx.com / www.armstrongtx.com

* HD Radio is a registered trade mark of iBiquity Digital Corporation.

Transient voltage surge suppression
Booth C10521
MGE UPS Systems

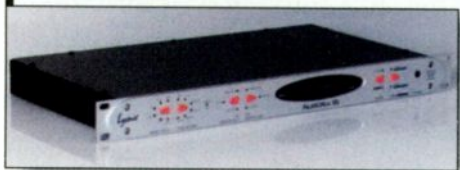


Eclipse-T: This commercial transient-voltage surge suppression (TVSS) equipment is a complement to the company's line of uninterruptible power supplies (UPS). The surge suppressor series includes six products with single- and three-phase models offering peak capacities ranging from 100kA to 500kA

in modular and non-modular panels. All models feature an audible alarm, LED indicators and dry contacts to notify users of system status, as well as individually fused metal-oxide varistors for optimized protection. Most models also include a surge counter (excluding the E-T100W) and a lightning temp fuse to prevent thermal runaway if MOVs are damaged.

800-523-0142; fax 714-557-9788
www.mgeups.com; info@mgeups.com

A/D-D/A converters
Booth SU8972
Lynx Studio Technology



Aurora 8 and Aurora 16: These digital audio converters offer eight and 16 channel models in 1RU. Both converters feature 192kHz A/D-D/A conversion with front panel control of all routing and sample rate options.

Extended functions are accessible via computer with the Lynx AES16 or by infrared using compatible laptops and hand-held Pocket PCs. The rear panel has MIDI in and out connectors and an L-slot bay, for the use of optional ADAT, Firewire and other audio interface cards. The most popular rates are selectable: 44.1, 48, 88.2, 96, 176.4 and 192kHz.

949-515-8265 x 205; fax 949-645-8470
www.lynxstudio.com; sales@lynxstudio.com

Data software
Booth N1802
Broadcast Electronics

Data 110, Data 120: New are the Data 110 software application for basic RBDS and Web text of "now playing" information and the comprehensive Data 120 application with several features for advanced data over FM, HD Radio and the Internet.

217-224-9600; fax 217-224-9607
www.bdcast.com; bdcast@bdcast.com

Phone plugs
Booth C5137
Neutrik



NP*X: Previously introduced as the C+ series, these 1/4" phone plugs offer a chuck-type strain relief that provides higher cable retention force. The phone plugs are all-metal and available in mono and stereo versions with nickel- or gold-plated contacts and nickel, black or velour chrome housings.

732-901-9488; fax 732-901-9608; www.neutrik.com; info@neutrikusa.com

Signal generator
Booth C2633
Rohde & Schwarz



SML: The fields of application of the SML are unlimited in development, servicing or production when it is used as a flexible signal source in automatic test systems and is available with stereo coder option. The unit offers 9kHz to 1.1GHz/2.2GHz/3.3GHz with SSB phase noise of less than -122dBc (1Hz).

410-910-7800; fax 410-910-7801
www.rohde-schwarz.com; info@rsa.rohde-schwarz.com

Audio network interface
Booth N806

Sierra Automated Systems

ANI750: The ANI-750 audio network interface for the 32KD digital audio router/mixer links multiple 32KD frames via fiber. Using a dual, counter-rotating ring for reliability, the interface provides static and dynamic sharing of 750 channels.

818-840-6749; fax 818-840-6751
www.sasaudio.com; sales@sasaudio.com

PCI time code interface

Booth C2639
ESE

PC-273PCI: A time code interface card for PC computers, this product receives a variety of IRIG and ASCII time codes. Using the supplied software the interface will automatically synchronize the PC's internal time-of-day clock. The time code input is provided via a rear-mounted BNC connector. Included is a Windows software application that allows time code selection, time zone offset and time frequency update.



310-322-2136; fax 310-322-8127; www.es-web.com; ESE@ese-web.com

Digital audio leveler
Booth N322
Translantech Sound



Ariane Sequel: Like its analog predecessor, this leveler features the company's sum-and-difference processing. The audio processing path is fully digital, not a hybrid analog/digital design. It provides independent two-channel and stereo-linked modes, protection limiting, input and output level metering, TCP/IP and RS-232 remote control, and software upgrade capability.

212-222-0330; www.translantech.com; david@translantech.com

Dynamic studio mic
Booth N2822
Neumann



BCM 705: This mic uses a redesigned version of the Profi Power Sennheiser MD431 hand-held stage microphone and capsule. Housed in the same body as the previously introduced BCM 104, this mic is identifiable as a Neumann dynamic microphone by its new green Neumann badge. To enhance low frequencies, the entire chamber surrounding the capsule has been enlarged and acoustically coupled to a rear

entrance port. The same wire mesh pop screen principles used in the BCM 104 microphones are used in this mic, thus removing the need for foam in front of the capsule. Individual, color-coded head grilles are available for each user. The microphone in its mount is elastically suspended and compatible via standard broadcast-segment microphone arms.

860-434-5220; fax 860-434-3148

www.neumannusa.com; neuulit@neumannusa.com

Digital FM antenna
Booth C7807
Dielectric

HD Plus: Easily integrated alongside existing analog FM antennas, this antenna allows the station to continue its analog broadcast while also adding a digital broadcast of the same signal at the same frequency. Special design considerations between the analog and digital antenna bays provide for isolation that exceeds 40dB; 10 percent more than the 36dB



required by the FCC. Because of this isolation from the antenna, the need for a supplemental isolator in the system is removed.

800-341-9678; fax 207-655-7120

www.dielectric.com; dcsales@dielectric.com

Broadcast power monitor
Booth N1116
Bird Electronic

BPM-E: This system offers users more options in how they measure, monitor and protect their RF transmission systems while providing dependable performance and accuracy. Its RF test port enables users to verify spectral compliance for many applications, including IBOC. Features of this system include alarm detection and notification, instant e-mail alerts, remote power/VSWR monitoring and administration, RF test port, access to historical data through data logging, and a small footprint for minimal rack space.

440-519-2062; fax 440-248-3790

www.bird-electronic.com; sales@bird-electronic.com

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INC.**

Analog on-air console Booth N2802 Audioarts Engineering



R-55E: Tailored for mid- to small-markets this console provides illuminated LED switches and a flip-up meter-bridge that provides direct access to I/O connectors. Logic

programming dip-switches complement the modular, low profile countertop design. The unit offers two stereo program busses, two mono busses, optional telephone caller input and opto-isolated logic control with a built-in machine interface. Additional options include a six-input stereo line preselector module, a dual failsafe power supply system and remote tape modules. The compact console is available in a nine-, 13- or 21-fader mainframe.

252-638-7000; fax 252-637-1285

www.wheatstone.com; sales@wheatstone.com

Side-mounted FM antenna

Booth C3031

RFS Broadcast

CPF: Featuring a stainless construction, the single-channel antenna is available with a power rating of 500W (CPF500) or 2.5kW (CPF2500) and is a lightweight solution for low- to medium-power applications in the 87.5MHz to 108MHz band.

The antenna is an incarnation of RFS's ECFM antenna, with extended power range. The radiation pattern and axial ratio of the side-mounted CPF-series has been enhanced to minimize tower effects and downward radiation.

877-737 9675; fax 203-821-3852

www.rfsworld.com; literature.americas@rfsworld.com



Cell phone codec

Booth N4524

ATA Audio

Scoop-EZTri-band GSM: The new module now includes the 900MHz to 1.9GHz bands. This allows the unit to be used in the Americas, Europe and Asia without the worry of which GSM module is needed. Users insert a GSM Sim card into the module and dial back to the studio. The module will automatically detect the band and service that is available.

973-288-8009; fax 973-659-9555; www.aetausa.com; info@aetausa.com

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Audio restoration software

Booth SL3345

Bias



Soundsoap 2: Soundsoap scrubs audio clean reducing tape hiss, clicks and crackles, buzzing and hum, rumble and most other types of unwanted noise. This software is useful when archiving a record collection to CD. The software will buff out any scratches.

Soundsoap uses advanced technology to clean audio. Click the "learn noise" button, and the software cleans the audio. Users can fine-tune the software for enhanced results.

800-775-2427; www.bias-inc.com

Voice processor

Booth N1815

Aphex Systems



230: Features of this voice processor include a reflected plate amplifier tube mic preamp, an easy rider compressor, a logic-assisted gate, split band de-esser and an aural exciter. The processor offers +4dBu and -10dBV outputs, as well as 24-bit/96kHz A/D AES, S/PDIF and optical outputs. Low-jitter word clock output, word clock input and a cough switch (soft mute) are also features of this unit.

818-767-2929; fax 818-767-2641; www.aphex.com; sales@aphex.com

**Portable recorder
Booth N313
Marantz**

PMD660: Featuring a built-in condenser microphone with automatic level control, one-touch digital recording to Compact Flash cards, on-board editing with segment marking, a virtual track mode for playback and instant audio access to the preset marked points, the recorder can record for four hours running on four standard AA batteries. The recorder is a solid-state media recorder with one-touch digital recording. Uncompressed WAV files can be recorded at 44.1kHz or 48kHz, and MP3 files can be recorded in mono at 64kb/s or in stereo at 128kb/s.

630-741-0330; fax 630-741-0652
www.d-mpro.com; info@d-mpro.com



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**Digital antenna system
Booth C9229
Propagation Systems**

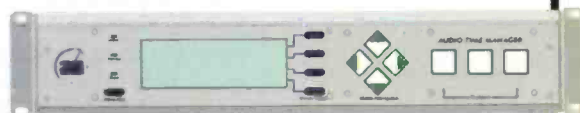
IBOC antenna: These FM antennas and FM antenna/combiner combinations are designed for FM broadcasters looking to initiate IBOC FM broadcasting. PSI can supply the entire RF package of transmission line, combiners and antennas. In the separate amplification approach, PSI can supply FM antennas using the Double V, Power-Tiller or multiple varieties of panel antennas for single or multiple station applications. The company also provides the combiner and reject load necessary for this approach. In the separate antenna approach, PSI has several antenna types available to suit the broadcaster's needs.

814-472-5540; fax 814-472-5676
www.psihroadcast.com; psiba@surlshop.net

**Time shifter
Booth N2432
25-Seven**

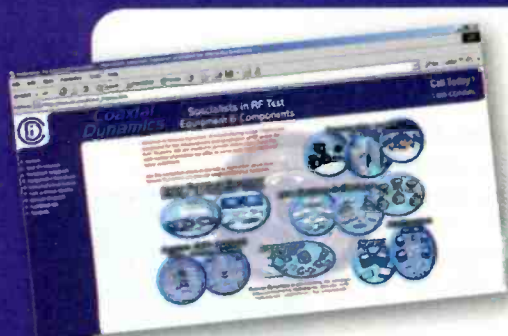
Audio Time Manager: ATM allows users to delay the start of live programs and shorten their duration, in real-time, to accommodate unexpected events or create additional availabilities on an on-going basis. Its time compression technology is clean enough to conservatively add about three minutes per hour to a schedule. Depending on the program source, users can more than double that and still maintain acceptable broadcast spoken language quality. The scheduler does not remove important content, change pitch, damage inflection or create artifacts. It integrates into digital and analog radio facilities providing smooth content insertions, network rejoins and broadcast delays.

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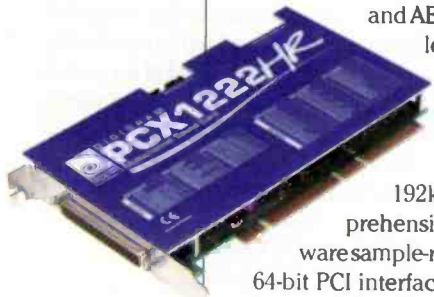
Booth N1426

Digigram

PCX1222HR: Featuring one stereo input and six stereo outputs in balanced analog and AES/EBU formats in a short-length PCI card, the sound card is targeted at mission-critical live-assist systems in radio. The card features 24-bit/192kHz converters, a comprehensive set of drivers, hardware sample-rate converters, a 66MHz/64-bit PCI interface, a more powerful on-board DSP and greater flexibility for custom developments. I/O connections are available on a breakout cable or a rack mountable external breakout box.

703-875-9100; fax 703-875-9161

www.digigram.com; input@digigram.com



Rackmount digital hybrid

Booth N3926

JK Audio

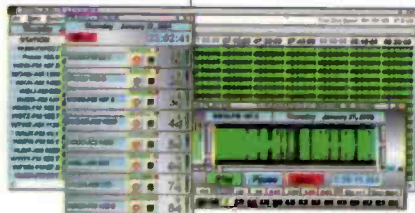
PBXport Digital Hybrid: This digital hybrid is capable of providing talk show-quality caller audio from a PBX phone system. The system allows the user to send mic- or line-level signals into a PBX telephone system while maintaining separation between the host's voice and the caller. The balanced XLR output jack contains only the caller's voice allowing full-duplex voice conferencing through the existing PBX phone system without echo and feedback. The unit provides connections for a microphone, headphones, mixer, telephone handset and a telephone set. The digital hybrid sends an audio signal into the PBX telephone system through the telephone handset cord. The digital signal processor continuously monitors the transmit and receive audio signals to deliver consistent separation.

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Booth N1111

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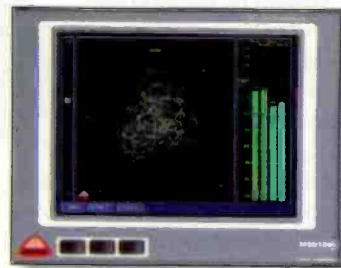
310-831-2234; fax 310-831-6287

www.pristinesys.com; sales@pristinesys.com

Stereo audio meter

Booth N2302

DK Technologies



MSD100C: By providing only three presets from which to choose, the daily operation of this meter is simplified for the user. It provides two PPMs analog input mode, two PPMs digital input mode and four PPMs both analog and digital mode. The meter features a color VGA screen and comes with two audio input pairs: one stereo analog and one AES-3 digital input channel. It accepts 96kHz on the digital input and has 24-bit A/D. The meter also incorporates a Goniometer (Audio Vector Oscilloscope) and a phasemeter. The meter supports multiple PPM standards. Other features include a level meter with user-definable scales and reference levels and a wall plug power supply.

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www.dk-technologies.com; info@dk-technologies.com

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Booth C1207

Staco Energy Products

Unistar SX: A solid-state UPS, the unit provides continuously regulated output voltage. For maximum flexibility, the system will operate over a wide input voltage range at 50Hz or 60Hz. Standard output voltages are user selectable. The system provides output voltage and frequency regulation, harmonic filtration, electrical noise attenuation and protection against voltage fluctuations, frequency fluctuations, brownouts and blackouts. Optional extended runtime battery cabinets can provide protection against extended power outages. The UPS uses a full-time rectifier and an inverter that generates clean power. Available in tower or rack-mount models, the batteries are hot-swappable.



937-253-1191; fax 937-253-1723

www.stacoenergy.com; sales@stacoenergy.com

SPL meter Booth N2523 ATI

SLM-100: Now shipping, this audio meter features a large analog meter for quick measurements in frequency ranges from 32Hz to 10kHz. It can be set to measure A- and C-weighted measurements with peak or averaging response. It includes a seven-range selector switch, calibration control and a test signal output via an RCA jack. A 9V battery supplies power. SPL ranges from 50dB to 126dB. A threaded insert allows the meter to be mounted on a camera tripod. The unit measures 6.25" x 2.5" x 1.75".

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www.atiaudio.com; sales@atiaudio.com



Plug-in for Pro Tools

Booth N811, N811A

Audio Processing Technology



Apt-x Pro: This compatibility tool allows Pro Tools to work freely with Enhanced Apt-x-encoded 16-to 24-bit audio files. It features an intuitive user interface and can convert audio files to and from Apt-

x faster than real-time. The plug-in allows Pro Tools to import Enhanced Apt-x and export PCM audio from a Pro Tools track to an Enhanced Apt-x-encoded audio track. The plug-in supports 44.1kHz and 48kHz sampling rates, mono or stereo files, and supports 24-bit resolution.

323-463-2963; fax 323-463-8878
www.aptx.com; aptmarketing@aptx.com

Switches

Booth SL2654

NKK Switches

KP01: Three cap sizes are available in the KP01 series: 12mm, 15mm and 17.4mm. The compact design is 23mm from the PC board to the top of the cap and features a long travel of 4.5mm. Engineers can request legend packets, which help facilitate the ordering of customer specific legends. The switches are constructed with a red and green, built-in LED. An amber color can be produced by simultaneous illumination of the red and green LEDs. The built-in LED frees engineers from having to source LEDs on their own and install them, or from having to assemble an LED into the base switch at all. A snap-in stand off provides secure PC board mounting and alignment. PCB layout is standard 0.100 x 0.100. Terminals are epoxy sealed to lock out flux, dust and other contaminants.

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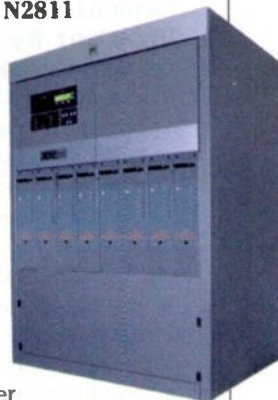
Digital transmitter

Booth N2811

Nautel

XR50: As the fourth generation of the Nautel 50kW AM transmitter, this modular HD Radio/DRM digital transmitter offers power modules that are hot-pluggable and can be removed and replaced without an interruption in transmission. For greater redundancy, the transmitter comes with a standby DDS exciter section including a modulation encoder with automatic changeover. It requires no manual tuning or adjustment, even with antenna mismatch corresponding to 1.5:1 VSWR at 50kW with 100 percent modulation.

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Newsroom production

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Prophet Systems

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RBDS, HD Radio PAD interface

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OMT Technologies

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Audio processors

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Orban



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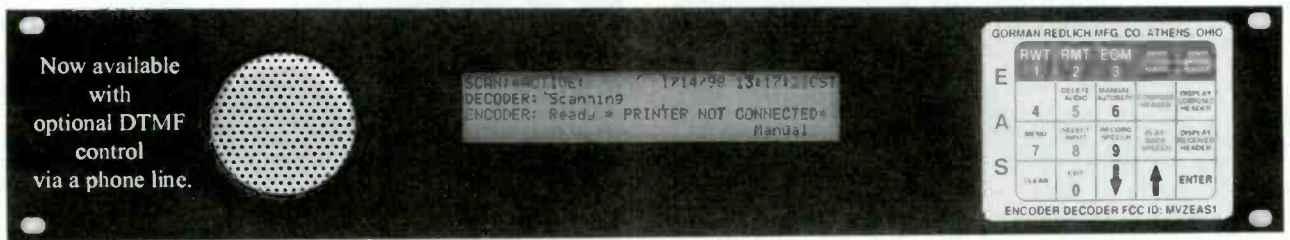
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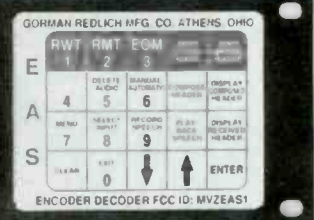
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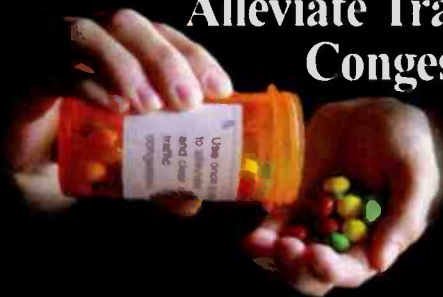
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10kW	1996	BE FM 10B
10kW	2000	BE FM 10T
10kW	2001	Henry 10,000D-95
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30 kW	1986	BE FM30A
50 kW	1982	Harris Combiner w/auto exciter-transmitter switcher

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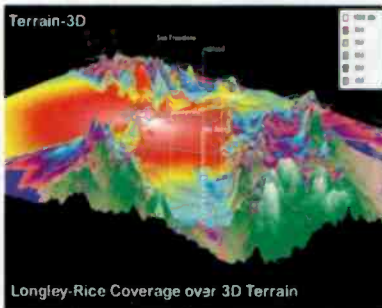
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Contributor Pro-file

Meet the professionals who write
for *Radio* magazine.
This month: Field Report, page 60.



Blake Thompson,
CBNT
Chief Engineer
WZIP-FM/Univ.
of Akron, OH

His grandfather, a ham, got him interested in radio engineering. He earned his First Class license just after high

school, and was hired by WAUP (WZIP) in 1980. He is active in SBE chapter 70 having served previously as chairman and now vice chairman and liaison to the Ohio Engineering Conference. He has also consulted/contracted for WAPS, WRQK, WINW and WKDD.



Written by radio professionals
Written for radio professionals

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Sign Off

By Kari Taylor, associate editor



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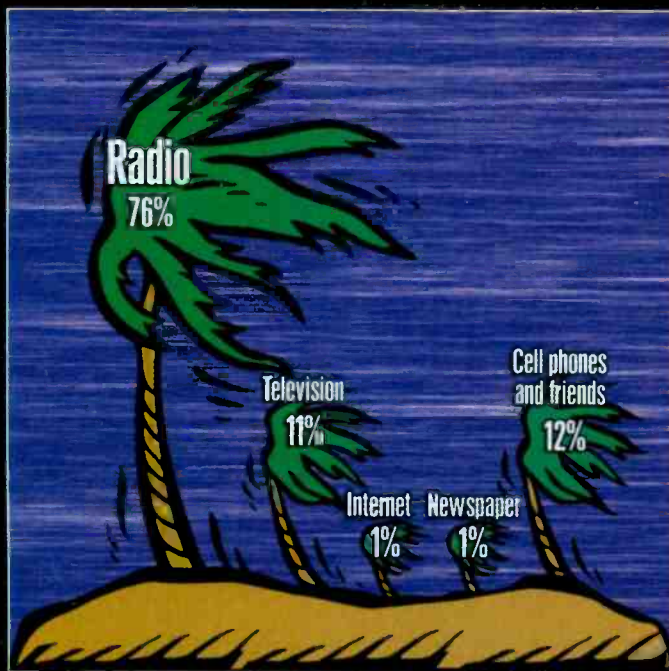
Do you remember?



The MR-1 professional cassette deck from Nakamichi offered front and rear balanced inputs, unbalanced outputs, balanced and unbalanced outputs, linear-scale peak-reading meters and independent tape and EQ selection. The unit featured an asymmetrical dual-capstan direct-drive transport with less than 0.027 percent flutter, as well as an exclusive pressure-pad lifter that eliminated scrape flutter and modulation noise. A motor-driven cam operating system ensured gentle tape handling and automatic slack take-up. This was a discrete three-head recording system for 20Hz to 20kHz ± 3 dB response advertised in 1985.

Sample and Hold

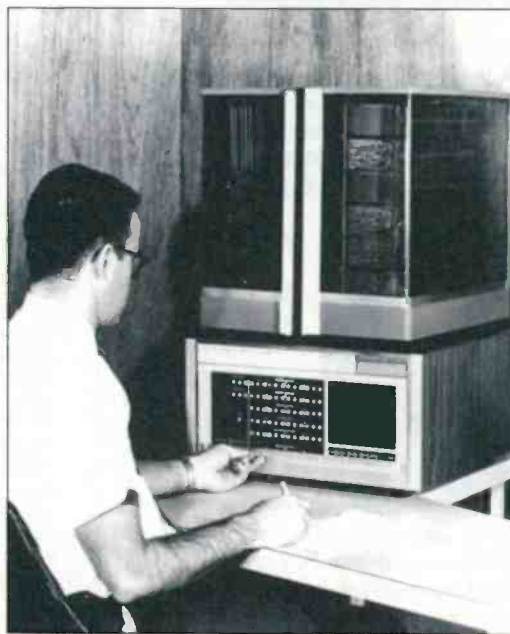
Most People Relied on Radio During the Hurricanes in 2004



Listeners repeatedly commented that radio was dependable, used fewer batteries and had better signals than television, and it was portable.

Source: Arbitron Listener Perceptual Study, Hurricane Markets, December 2004. Numbers may add up to more than 100 due to rounding.

That was then



Digital Equipment Corporation unveiled the PDP-8 in 1965. This 12-bit machine was the first commercially successful minicomputer. Small enough to sit on a desktop, it sold for \$18,000—one-fifth the cost of a low-end IBM/360 mainframe. The machine used a core memory system that operated at cycle time of 1.5 microseconds. Early PDP-8 models used a front-panel interface, a paper-tape reader and a teletype printer with an optional paper-tape punch. Over time I/O systems such as magnetic tape, RS-232 and current loop dumb terminals, punched card readers and fixed-head disks were added. With its combination of speed, size and cost the minicomputer was incorporated in thousands of manufacturing plants, offices and scientific laboratories.

Source: www.computerhistory.org



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