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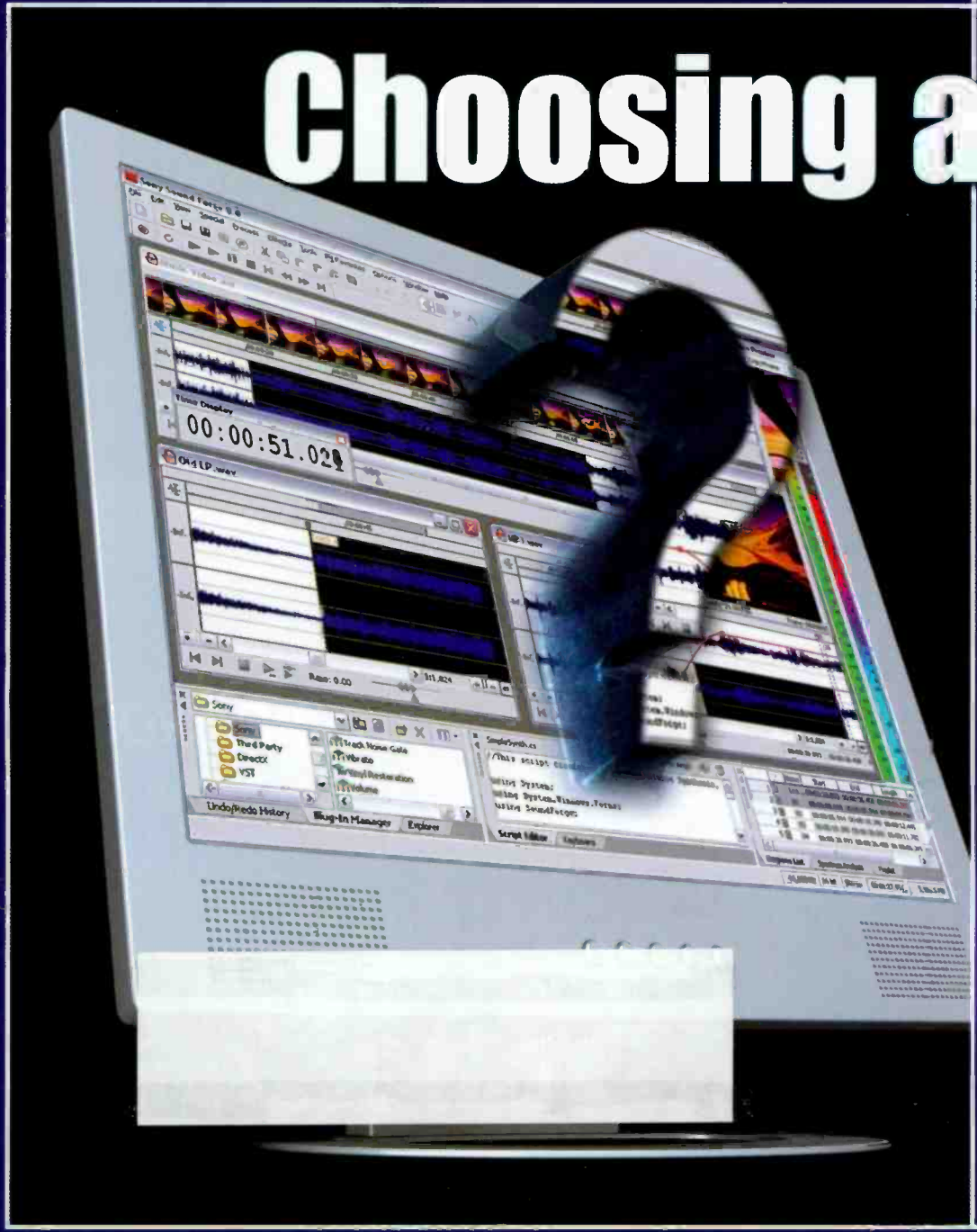

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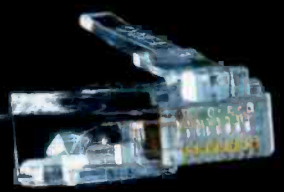

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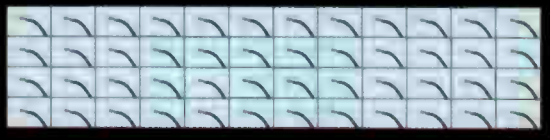

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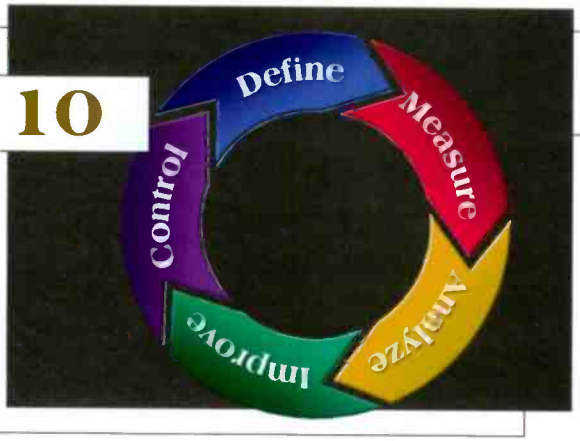

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Currents Online

Selected headlines from the past month.

FCC Launches Public Safety and Homeland Security Bureau

The new bureau is designed to provide an efficient, effective and responsive organizational structure to address matters related to public safety, homeland security, and emergency management and preparedness.

More than 3,000 Attend NAB Radio Show

The NAB Radio Show held in Dallas Sept. 20-22 was a success by NAB standards. Registered attendance at the show was 3,099, not including the R&R registration.

Radio One Chooses Harris Again

The seventh largest radio broadcasting company has purchased Harris transmitters for its third round of HD Radio conversions for 17 FM stations and one AM station.

FCC Slates FM Auction for March 2007

Designated Auction No. 70, this auction will offer 124 construction permits for new FM allotments.

Sangean to Debut HD Radio Products

Two Sangean HD Radio receivers will be available to consumers for the 2006 holiday season. The HDT-1 is a radio component tuner and the HDR-1 is a tabletop radio.

Mississippi Stations Find New Way to Send Emergency Alerts

30 Mississippi radio stations have installed Global Security Systems' First Alert System to deliver emergency alerts and enhanced RDS data to first responders and listeners. The First Alert System uses a station's FM subcarrier to provide a communications channel.

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Industry Events

The *Radio* magazine Industry Events section lists upcoming conventions and conferences. Look for it on every page of the *Radio* magazine website, and be sure to send your event information to us.

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Schools, museums, associations and more are listed in the Industry Links section.

Advertiser Links

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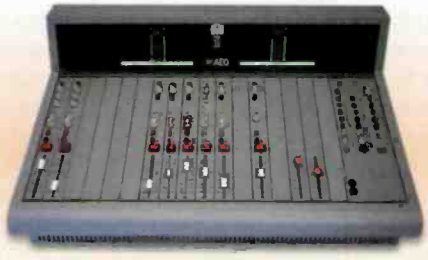

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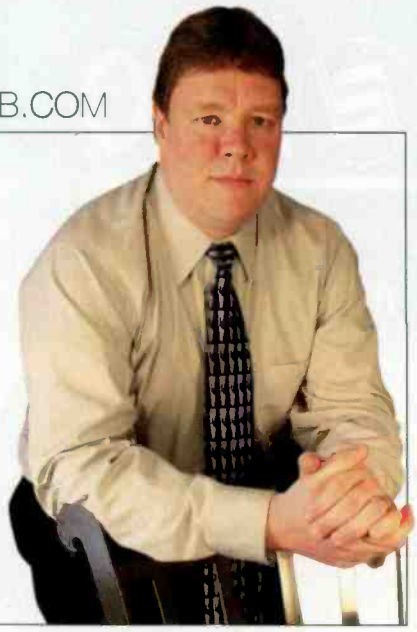

What do consumers know?

Last month I provided an update on HD Radio and how retail stores were prepared to answer questions and provide receivers. The results of my field study were disappointing. Since then, I received many letters and comments, most of them agreeing with my findings that the technology has not yet made large headway into the consumer circle.

One letter suggested that I ask consumers what they know about HD Radio. So I expanded my study during my recent trips to Dallas for the NAB Radio Show, Verona, NY, for the SBE National meeting and SBE22 Broadcast and Technology Expo, and Cincinnati for a couple of days with my family. I also spoke with a coworker at another audio technology magazine within the Prism Business Media family who is based in San Francisco.

My brother subscribes to Sirius, and he's happy with it. I doubt that he will ever make the effort to purchase an HD Radio receiver unless it just happens to be in the receiver that he is buying. My coworker in San Francisco had heard of HD Radio, but she knew nothing about it. I asked hotel clerks and restaurant workers. No HD Radio here.

I asked about the HD Radio promos running in some of the markets that urge listeners to discover it. Some had heard the spots, but had no clue what it was about. Nor did they have any concept about the stations between the stations.

I attended the HD Radio update session with Bob Struble and Peter Ferrara at the NAB Radio Show, and I heard a lot of positive information about the roll-out and the upcoming plans. It is encouraging to hear that more receivers are becoming available, although many of them will not be ready for the upcoming holiday season.

I also learned about the efforts to inform retailers about the technology. What's ironic is that the two main electronics retailers that have a presence all over the country are the two that are at the bottom of the retailer roll-out: Best Buy and Circuit City. Of course, these are the two chains that I visited last month and received the disappointing response.

Next time I'll stop at Radio Shack—a retailer that is promoting HD Radio in the "Discover It" spots—and see if the phrase is "you have questions, we have HD Radio."

Photo: NAB

Steve Cropper (left) brings it home during Sweet Home Chicago with Chriss Scherer, Richard Frisch and Jon Adelstein.

Not all work at the Radio Show

I had a rare opportunity to extend beyond the all-work element of the NAB Radio Show by participating in a group of broadcast peers who share my interest in music. Gathering to perform at the Marconi Awards dinner, the Formats, as the band is known, included some of radio's top-level managers, including Bonneville International President Bruce Reese, Emmis Communications CEO Jeff Smulyan, Sandusky Radio President Norman Rau, Regent Communications SVP Operations Fred Murr, Greater Media President Peter Smyth, Norm Phillips of Network Minded, South Central Communications President-Radio Craig Jacobus, Urban Radio Broadcasting President Kevin Wagner, KLIF-AM GSM Richard Frisch, RAB VP Mark Levy and others.

Besides enjoying the company of fellow broadcasters, I also had the opportunity to play with FCC Commissioner Jon Adelstein (who plays harmonica and flute) and the special guest, guitarist Steve Cropper.

I have to admit that the opportunity to play with a guitar legend and an FCC Commissioner on the same stage was one that I could not miss.

Chriss Scherer

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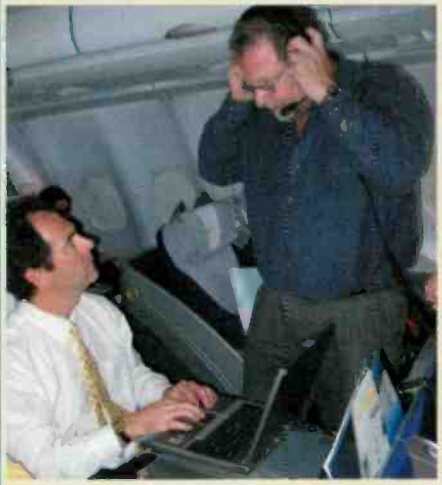

... successfully aired his three hour talk show from a commercial airplane [using ACCESS] at 37,000 feet on a regularly scheduled flight between Frankfurt, Germany and New York, US.

Peter Greenberg—Host of the syndicated radio program Travel Today

For the complete story visit http://remotebroadcasts.blogspot.com

Radio Free Asia—Live from the Himalayas

"The results [with ACCESS] were especially reliable considering that Dharamsala has one of most "problematic" Internet infrastructures that we have come across."

— David Baden, Chief Technology Officer Radio Free Asia

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Ski Mountain Remote

This picture, really demonstrates what ACCESS is about. This product truly has the ability to cut the wires.

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JAMN 94.5—Walk for Hunger

"ACCESS was used on the air exclusively for JAMN945 at this one. It was all over EVDO with a tremendous amount of active cell phones in the area. The ACCESS was connected to the Verizon wireless Broadband..

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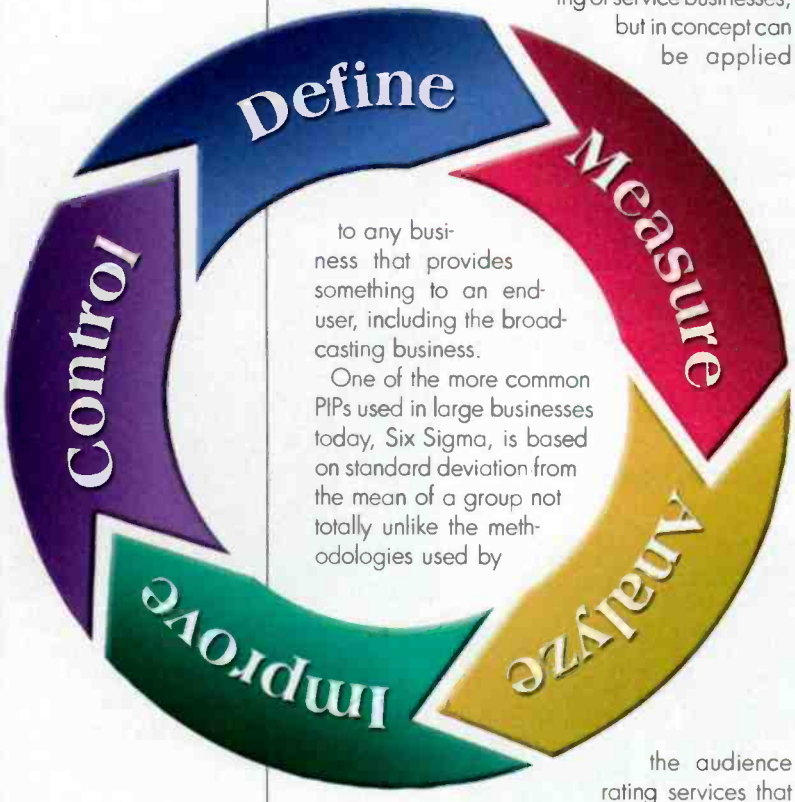
PIPs yield progress

By Kevin McNamara, CNE

The majority of large corporations throughout the world have been adopting some form of process improvement programs (PIP) in their day-to-day operations to increase production efficiencies, maintain customer loyalty and achieve significant cost savings. There are several PIPs available; these include: the Theory of Constraints (TOC), Just-in-Time (JIT), Lean Thinking, ISO 9000 quality standards and Six Sigma. Many of these have been around for years and you have no doubt heard or read about them in the past.

The goal of PIPs is to improve the way organizations perform specific tasks to achieve increased efficiency and lower costs. In the end they should also affect customer satisfaction with the product or service in a positive manner, i.e. more reliability or improved performance. Most PIPs are tailored for specific applications, such as those found in manufacturing or service businesses, but in concept can be applied to any business that provides something to an end-user, including the broadcasting business.



One of the more common PIPs used in large businesses today, Six Sigma, is based on standard deviation from the mean of a group not totally unlike the methodologies used by the audience rating services that measure the listening or viewing habits within a market.

The official definition of Six Sigma as applied to PIP is "a systematic and innovative activity that assesses the causes for defects and errors occurred in every sector of the management based on the statistical measures, analyses the causes and ultimately eliminates them."

The concept behind Six Sigma has been around for several decades, but in 1986 an engineer at Motorola named Bill Smith was recognized as the originator of the name as applied to the PIP most known for reducing manufacturing defects and improving the quality control of products. The term Six Sigma is, in fact, a registered service mark and trademark of Motorola.

Theory behind Six Sigma

The primary application for Six Sigma is traditionally in a manufacturing environment but has been successfully applied to other businesses such as engineering and construction. The basic concept of Six Sigma is to reduce the total amount of defects experienced by an end user to 3.4 defects per one million products.

The theory is deeply rooted in mathematics, hence the term Sigma, which represents a deviation from a mean value. In this case, the term Six Sigma would represent a window of six deviations on either side of the mean. Interestingly, the 3.4 defects per million actually translates to a value about 4.5 deviations from the mean, not 6. So what gives? Somewhere along the development of the PIP, there were 1.5 deviations added, which is known as the 1.5 sigma shift (or drift).

Six Sigma methods

There is more than one methodology for implementing a Six Sigma PIP. Which is used depends on the type of business or process application. The two most common are DMADV and DMAIC.

DMADV is an acronym for define, measure, analyze, design and verify. This method is used for the development of processes or product development.

DMAIC stands for define, measure, analyze, improve and control. This method replaces the "design and verify" used in DMADV with "improve" and control," which permits the PIP to be used with general business processes.

What is necessary to understand is that any implementation of Six Sigma requires a significant commitment throughout a company. To implement the program properly, those tasked with carrying out the program need to commit all or a portion of their time working on the program.

There is also a great deal of training required

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to continually develop the program and ensure its future success. Finally, Six Sigma PIPs do not deal with global company issues, rather it is intended for single processes used in the business. In most cases, separate PIPs will be developed for multiple processes within a single project.

To carry out the PIP, the problem must be defined. The definition of the problem typically is identified by the employee (or group of) that are closest to the task, called the Yellow Belts. The specific problem needing improvement is defined along with the supporting documentation and submitted to a Green Belt, who further gathers the appropriate information and provides a more detailed analysis of the problem and potential solutions.

This information is then sent to a Black Belt who is responsible for packaging the provided PIP and ultimately analyzes the cost/benefit of the PIP at the high levels of the company. He may also ask for further input from other departments as necessary.

Once the PIP is completed it is presented to upper management for approval. Once approved, the PIP is published throughout the organization to implement the change.

Certifications

Implementing a Six Sigma PIP within a company also requires that many, if not all, employees hold one of many certifications depending on their specific role. The name given to these certifications are synonymous with the ranking system found in martial arts and tend to reflect the responsibilities of the individual.

Yellow Belt - This level can also be called gold belt and represents an employee who is typically "front lines" in terms of the issue. They can identify the problem and possibly offer a suggestion on how it may be improved.

Green Belt - These employees spend more time implementing PIPs along with working on their normal workload.

Black Belt - These are the leaders of individual PIPs. They are typically employees dedicated to carrying out the PIPs, including presenting them to upper management and are expected to complete an average of six per year.

Master Black Belt - Are usually assigned to manage all PIPs within specific departments at the corporate level.

Champion - Has overall responsibility to carry out the program and ensure the employees have the required training and resources needed.

There is great deal of information on the Six Sigma and other PIPs on the Web. Even if your company has not adopted a formal program, use some of the methodologies on a smaller scale within your department to help with day-to-day activities, particularly if those include managing a new construction project.

McNamara is president of Applied Wireless, Cape Coral, FL.

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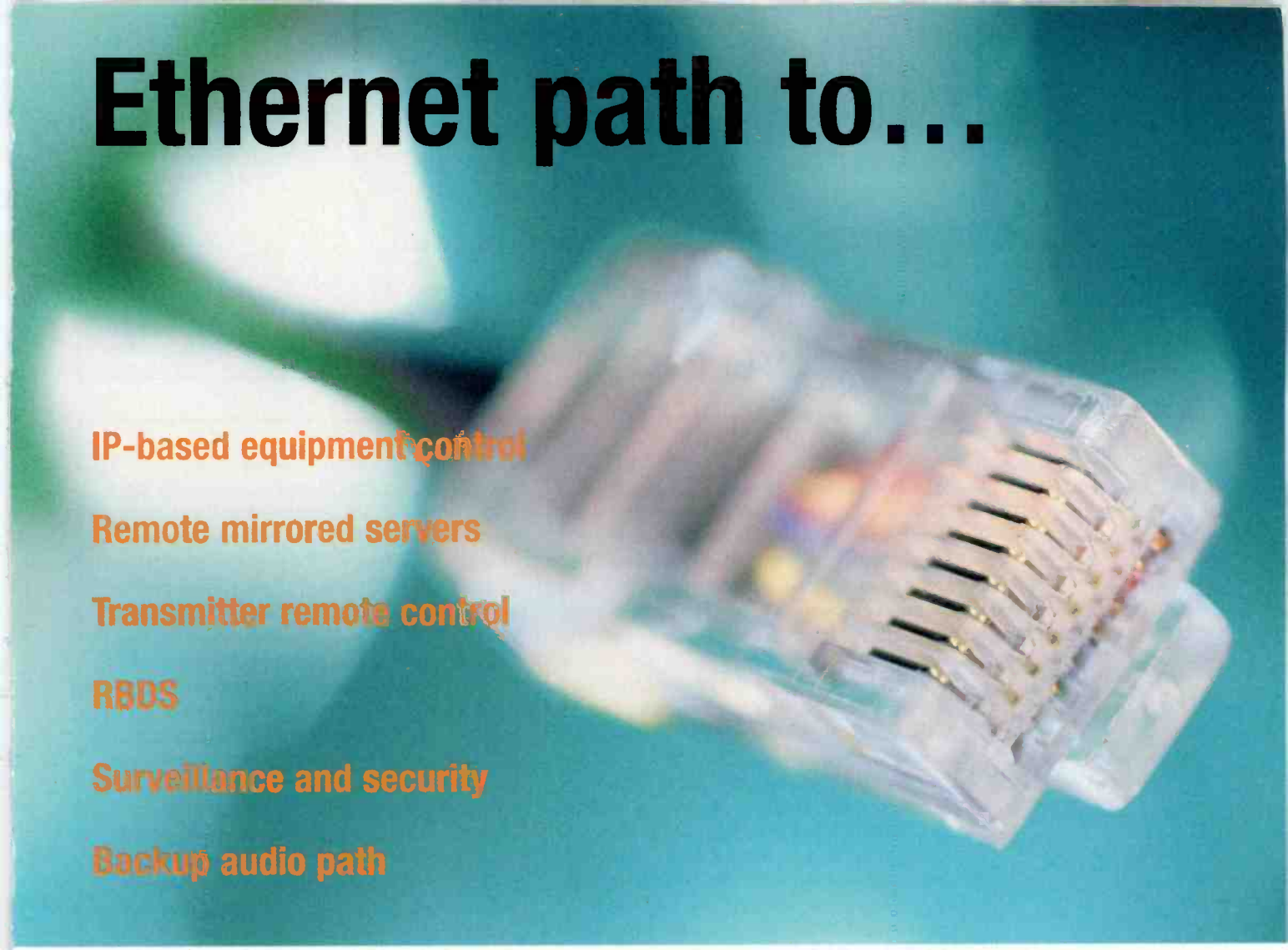

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NAB says
FM translators are the answer

By Harry Martin

FM translators have become the latest fad, offering a low-power solution to a wide range of woes. In July, the National Association of Broadcasters (NAB) asked the FCC to amend its rules to allow AM stations to use FM translators. As the NAB observed, nighttime interference forces thousands of AM stations to reduce power or cease operations between sunrise and sunset. That problem, together with the increasing number of external factors contributing to AM coverage gaps, imposes burdens that arguably warrant FCC intervention.

FM translators could provide a solution for AM coverage problems. The NAB is asking the Commission to allow use of FM translators to provide fill-in service for AM stations, with the translator signal limited to the lesser of the 2mV/m daytime contour of the AM station it rebroadcasts or a circle with a 25-mile radius surrounding the AM station. The petition submits that retransmission of AM stations by FM translators presents a technically feasible, pro-competitive and pro-public interest solution to signal-loss problems. Translators would not only allow daytime-only stations to operate at night, they also would improve daytime service, as FM translators would help overcome intervening terrain barriers and distance issues.

Dateline

Dec. 1 is the deadline for radio stations in Colorado, Minnesota, Montana, North Dakota and South Dakota to file their biennial ownership reports.

Dec. 1 is the date on which radio stations in Alabama, Colorado, Connecticut, Georgia, Massachusetts, Maine, Minnesota, Montana, New Hampshire, North Dakota, South Dakota, Vermont and Rhode Island must place their annual EEO reports in their public files and post them on their websites.

The NAB petition—and the FCC's reaction to it—is controversial. Recall that NAB opposed a similar proposal made by the American Community AM Broadcasters Association in 1997, a proposal that was similarly based on the use of FM translators to overcome AM nighttime signal disruption. The NAB now asserts that "continued pressures on AM radio" and the need for "another boost to enhance AM stations' ability to serve audiences and compete in the ever-changing media marketplace" have ripened the issue for re-examination. A footnote in the NAB petition expands on this general rationale, stating that "AM stations are encountering ever more interference problems as a result of an increase in ambient noise."

The NAB does not specify the source of that increase in ambient noise, but one possible source is in-band on-channel (IBOC) digital radio operation. Hybrid analog/digital AM operation requires a great deal more bandwidth than analog alone, which in turn increases the potential for adjacent channel interference. Hybrid AM operations are currently permitted only during the day due to concerns about adjacent-channel interference at night. But in June 2004, the NAB recommended that the FCC authorize hybrid AM operation at night, a recommendation that would invite an increase in potential AM interference problems.

The hybrid AM proposal got the FCC's attention in July 2006, when it was one of several proposals in an agenda item the Commission was scheduled to consider at an open meeting. But the Commission dropped the item from its agenda the day before the NAB filed the translator proposal. This sequence of events suggests that the proposal for FM translator use by AM stations may have been conceived by the NAB to complement the IBOC hybrid proposal for AM because translators in AM stations' hands would help ameliorate the additional interference that would emanate from hybrid AM operation at night.

If the FCC genuinely is concerned about the potential impact of FM translators on LPFM service, a policy issue being fiercely debated in another proceeding, why would the Commission be attracted to the NAB's plan to help lowly daytime AM stations and forego the opportunity to create more local LPFM stations? And this at a time when the FCC's processing line is choked with thousands of mutually exclusive translator applications that have been on file for more than three years.

The Commission may have a long-range plan for FM translators, a plan that somehow will accommodate increased translator use (for AM and FM stations) and protection of LPFM service. Alternatively, putting the NAB's translator proposal on a fast track may have no policy implications at all, and merely signify the agency's willingness to broaden the debate on the role of translators.

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

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Take the mystery out of choosing a digital audio workstation

By Jim Smith

After years of cutting analog tape with a razor blade, I assembled my first digital audio workstation during the stone age of computer editing in 1991. This was the Turtle Beach 56K system, running on a 386 PC with Windows 3.1. At a total cost of $6,500, it was less expensive than, but quite comparable to, Digidesign's Sound Tools (the primitive precursor to Pro Tools), which ran on a Mac. Both were 16-bit, hardware-based machines using largely destructive editing and clunky playlists to assemble audio clips. Both stored audio on SCSI drives costing more than $2,000 per gigabyte. Neither was immune to crashes. Neither always worked the way it was supposed to, yet both saw plenty of professional work in the early 1990s.

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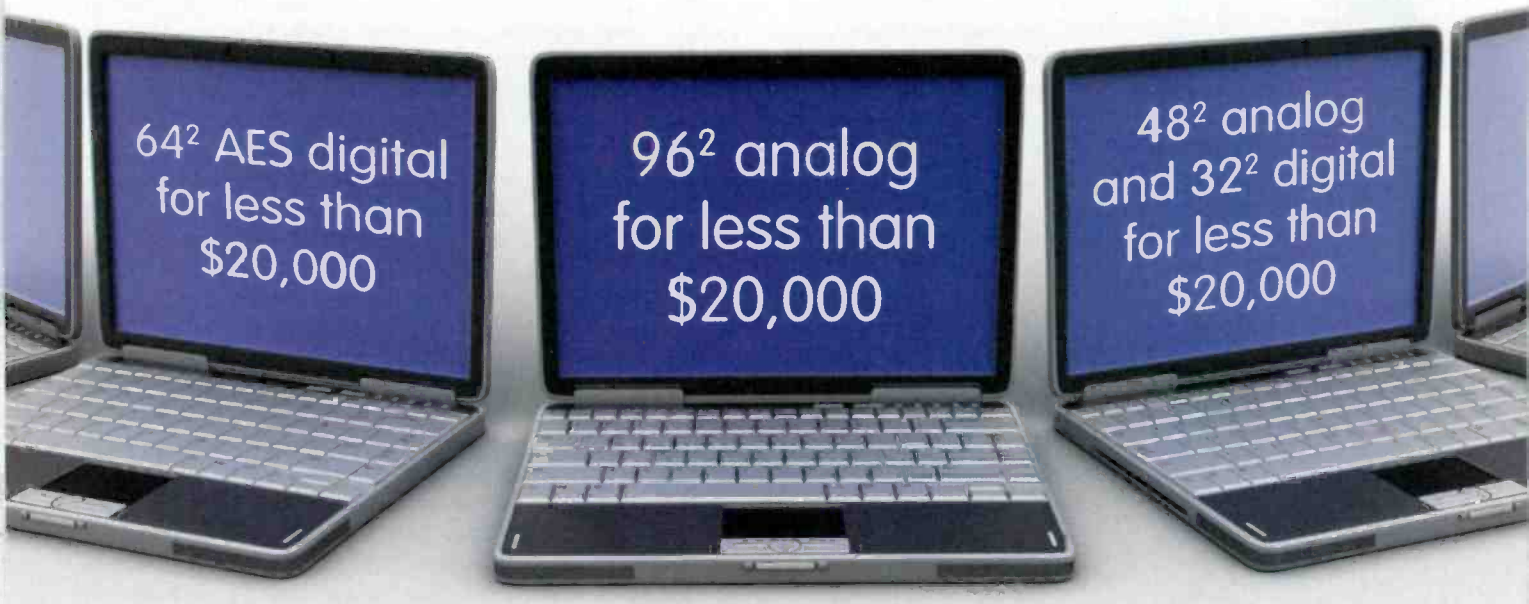

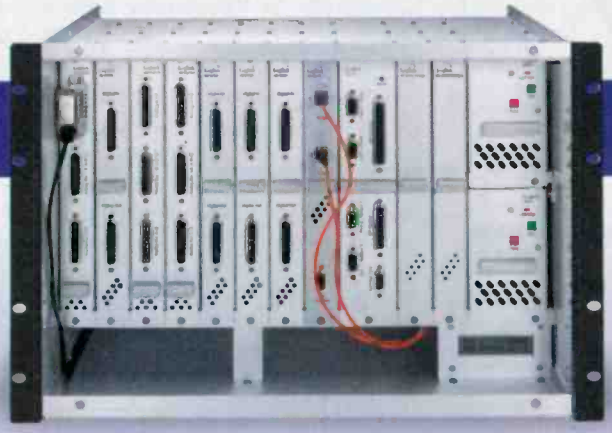

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By 1994, I had exhausted the capabilities of my first DAW, and Turtle Beach, in an increasingly familiar business cycle, was getting out of the workstation business. Casting around for a better system, I chanced upon the Microsound DAW from Micro Technologies Unlimited (MTU). Its 32-bit internal architecture, totally non-destructive operation and free-form editing paradigm all seemed unique in that era, and, to my ears, sonically superior. I made the difficult business decision to spend $12,500 for my first turnkey, hardware-based MTU box.

Fast forward to 2002. I had spent eight years creating radio shows, editing and mastering CDs and putting together soundtracks for long-form TV documentaries and commercials on the Microsound system. Never once had I lost a file or seen the system crash, and it still sounded great. Somewhere along the way, however, support and upgrades, which were initially fabulous, dried up. MTU did not have a large enough customer base or deep enough pockets to keep up with the changes in the pro audio market, and had to turn its attention elsewhere. The features I now needed to work efficiently—plug-ins, multiple file formats, surround support—would never be part of this otherwise flawless system, and it was becoming useless without them.

The challenge of finding a new editing and production environment was daunting, especially because I had not dealt with a serious software learning curve in eight years. Luckily, the world of computer digital audio had been busy while I was away, and, after several months of research, I settled on a pair of native software packages (Steinberg's Nuendo and Wavelab) that more than met my needs. What I learned during that process and during the following four years should be useful and heartening if you are interested in taking the plunge.

The state of the DAW

Support and longevity are key issues. The "faster, better, cheaper" pressure that has driven so many digital audio products into oblivion is still at work, but the marketplace has served to stabilize many of the more venerable players. Part of this process has been the absorption of successful software developers by large, well-established companies. Among others, Sony has taken in Sonic Foundry, Adobe bought Cool Edit Pro, Yamaha purchased Steinberg, Avid merged with Digidesign and Apple purchased Logic. Virtually every other company left standing now seems solid. The result is a strong field of software developers that are in direct competition with each other for price, power, features and support.

Better support, however, still requires cost efficiency in this competitive atmosphere, and does not necessarily imply personal contact. Good manuals, well organized FAQ, forums and e-mail interactions will be your primary resources, because talking to a human on the phone, with a few exceptions, will probably require a credit card. Like everything else now, support is driven almost entirely by the economy of using the Internet.

With this system in place, you may find yourself downloading software, drivers and upgrades frequently, and you will have to deal with any associated security issues. These concerns lead many pros to keep

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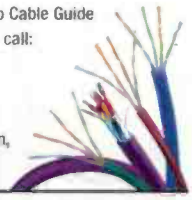

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their workstations offline permanently, and use separate business computers for downloads and Web communications. If you must use your DAW computer for your Internet connection, realize that your audio software may not run properly when the anti-virus software is activated.

Native software

There are only a few hardware-based DAWs still active in the marketplace, most recognizably Pro Tools TDM or HD, Sadie and Sonic Solutions. These machines are generally stable, well-supported and quite expensive by modern standards. They are expensive

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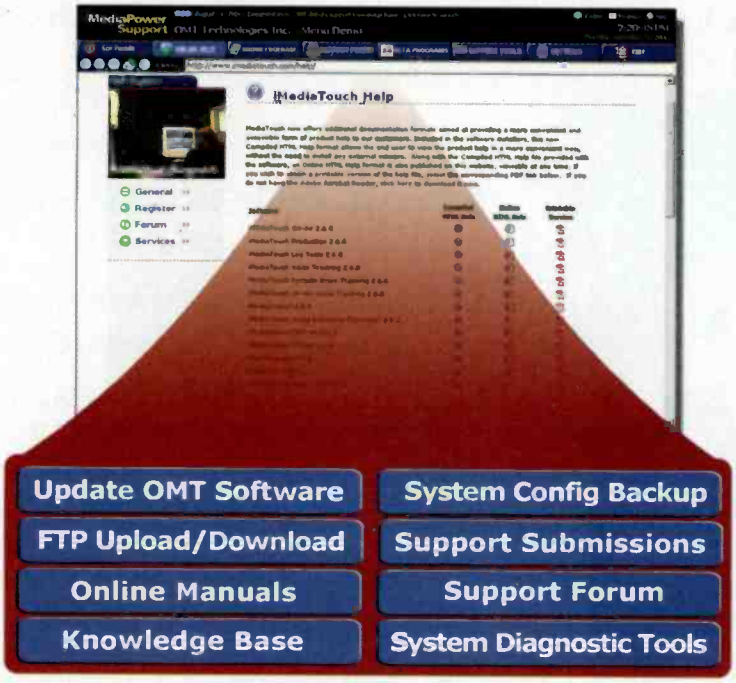

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enough that anyone considering buying one will have already done extensive research.

Hardware-based systems have historically had some natural advantages, especially with latency issues, but when I purchased my two software packages, I "went native" because I no longer felt that the (small) business model supported spending the big bucks on a hardware-based system. This outlook is widespread and has driven native development, even resulting in native versions of traditionally hardware-based systems (e.g.- Pro Tools LE and M-Powered). With the help of rapid increases in computing power, native software has matured to the point where a properly integrated system can rival all the power of a hardware-based system.

Properly, of course, is the key word. Turnkey native systems where the vendor has done all the homework for you are available for fairly reasonable integration fees, but those who choose to save money by installing native software in an existing computer need to be careful about system setup. The rules for proper setup of a native digital audio computer are usually available via the software company's website. Here are some of the basic requirements that are more or less standard for PCs and Macs:

- Lots of RAM, the more the better
- At least one extra audio-only hard drive running at 7,200rpm or faster
- Verified compatibility with the operating system and motherboard
- Installation of all the latest drivers and most current software
- Verified compatibility with the I/O hardware

And speaking of PCs and Macs, despite the raging opinion wars on Internet forums, there is no evidence that either is better for audio or is less likely to crash or suffer integration problems with native operation. Additionally, software is increasingly being written that runs equally well on both systems with nearly identical features, and the two platforms are pushing toward compatibility. Choosing one platform over the other is simply a matter of personal preference or the suitability of a particular software package.

Plug-ins

Programs that simulate outboard effects units and esoteric, vintage processors (EQ, reverb, mastering compression) have become a significant part of the creative process. Plug-ins are included in the DAW software and available as third party purchases. Some of these third party "plugs" are developed with the cooperation of the manufacturers of the expensive analog or digital equipment that they emulate (SSL, UA, Sony), and are regarded as being highly accurate.

One wrinkle accompanying the explosive growth in plug-ins is the continuation of several flavors of the software interface that allows the computer to stream audio (including plug-ins) in real time. These protocols are not necessarily directly compatible with one another, but can coexist within the same software or on the same computer.

- *Direct X.* This is the Windows-only internal interface that resides in the operating system. Although it has been considered sluggish by some in the past, this has not

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stopped some of the truly powerful plug-in packages from running well in this environment.

• *Audio Core/Audio Units.* This is the Mac-only internal OS interface. Programs for Macs will often include free plug-in bundles that run in Audio Core.

• *VST.* Virtual Studio Technology was developed by Steinberg as an open, cross-platform audio interface, and has become more or less universally accepted for non-Digidesign programs.

• *RTAS.* Real Time Audio Suite is the proprietary format for plug-ins running in Digidesign's Pro Tools. There are inexpensive third-party programs that allow plugs written for the other protocols to run in Pro Tools as if they were written for RTAS.

Heavy use of plug-ins of any flavor in real time can tax the host computer and slow things down dramatically. This has spawned the production of processing cards and outboard hardware, like the Mackie UAD-1, TC Powercore or Waves APA32, that carry the load of plug-in processing and provide relief to the computer's CPU. Most programs will also allow plug-ins to be frozen in place by pre-rendering the effect, thus eliminating the need for real-time CPU horsepower.

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Latency and I/O

Unlike the near-instantaneous travel of sound through analog circuits, digital audio is delayed while its bits are being crunched by computer processing. For practical purposes, the only time this latency tends to be a problem in a modern native DAW is during overdubbing, for example, when you try to record new material in sync with earlier material that you monitor while recording. The buffering and processing required for accurate playback, while not a problem during mixing and editing, can add enough delay to be disconcerting while adding new parts in real time. The latency can be reduced to low times by using fast computers and well-written software, but the major factor in latency control for multitrack monitoring has become I/O hardware.

Pro Tools, proprietary as always, will only work with specific Pro Tools-approved I/O, though some of its hardware can be used with other programs. Virtually every other piece of software out there can work with a variety of third-party boxes or cards. While the software may function adequately with onboard soundcards for basic editing and production, better fidelity and greatly enhanced multitrack performance will accompany the use of one of the large number of boxes or cards that are made specifically to handle audio for DAW software. These devices generally add monitoring and mixing software along with multiple digital or analog inputs and outputs. They can communicate with the computer and software via the internal protocols in the Mac or PC OS, or may, as long as the software is compliant, work with another Steinberg-developed open, cross-platform protocol called ASIO. ASIO can enhance the communication between your software and I/O hardware, and some hardware and software manufacturers are now advertising "near zero latency monitoring" using ASIO. In any case, your best latency settings are generally achieved by working with the protocol available to you and manipulating the software that comes with the I/O hardware.

What can this stuff actually do?

Although most of my production, and probably most of yours, is performed in stereo, there are only a handful of stereo-only native programs left; notably Sound Forge, Bias Peak and Wavelab (which now also offers surround). I found during my original search, however, that a multitrack program like Nuendo (or Samplitude, Logic, Adobe Audition, Pro Tools, Cubase, Vegas, Sonar or any of the others) could be equally fluid and powerful in a stereo-only project. The tracks can simply be used as handy organizational tools in a non-destructive mixing, editing and processing mode.

Virtually all of the multitrack programs allow you to create, delete and shuffle tracks in any quantity at will, while importing audio to them and moving that audio freely to mock up your production in an obvious and intuitive way. Processing and editing can be applied

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to tracks or clips and auditioned with little or no rendering time—and can be undone just as quickly. Files can usually be accessed directly (and destructively, if so desired) in a separate, traditional editing window, and the whole project can be mixed down to the file format of your choice when you have everything sounding the way you want. Many (but not all) of the programs offer direct mastering and burning of audio CDs from their multitrack windows.

That is the trend: the all-in-one program. The list of features found in a single program can include full video and SMPTE support, MIDI instrument playback, CD mastering, forensic analysis tools, full multitrack studio emulation, surround mastering, DVD-A mastering, high quality file conversion, looping of royalty-free music...and on and on. The depth and power available can be mind-boggling.

Which program is right for you?

I have not attempted to give you anything like a complete list or comprehensive review of the various audio programs. I can say, however, that everything in the marketplace offers high-resolution, high-quality audio performance capable of fully professional output. The differences between the DAW systems, which are rapidly dwindling, are not so much in quality, but in the specific features offered; the emphasis placed on various features and the organization of the editing and production interface. In my situation, I chose Nuendo because of its robust support for video and associated EDL and file formats. I chose Wavelab because of its CD mastering tools (Nuendo has no audio CD burning) and simpler, more familiar editing interface. Colleagues who work on similar projects decided on Logic, Samplitude, Pro Tools, Sequoia, Sonar, Cubase and Adobe Audition. An interesting fact about this group of programs is that it ranges in price from a few hundred dollars to more than $2,000, sans computer or I/O (except for Pro Tools). They are all different, yet there is not a real loser in the bunch.

It is a big field to choose from, but the research tools are there. Demo versions of DAW software, often fully functional for a limited amount of time, can be downloaded for a serious test drive. Manuals are often available on the same websites in PDF format, as well as user forums that can be browsed by non-owners. Reviews of almost every product can be found online. As you peruse this material, understand that powerful programs often contain many ways to organize or present the work, and that these alternate approaches are not necessarily obvious at first glance. With a little patience, you should be able to stumble across the menus and windows that provide access to the features and workflow that will best serve your situation, sensibilities and wallet.

Smith is the owner/operator of Muddy Hole Studios in Martinsburg, West Virginia.

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KPAM

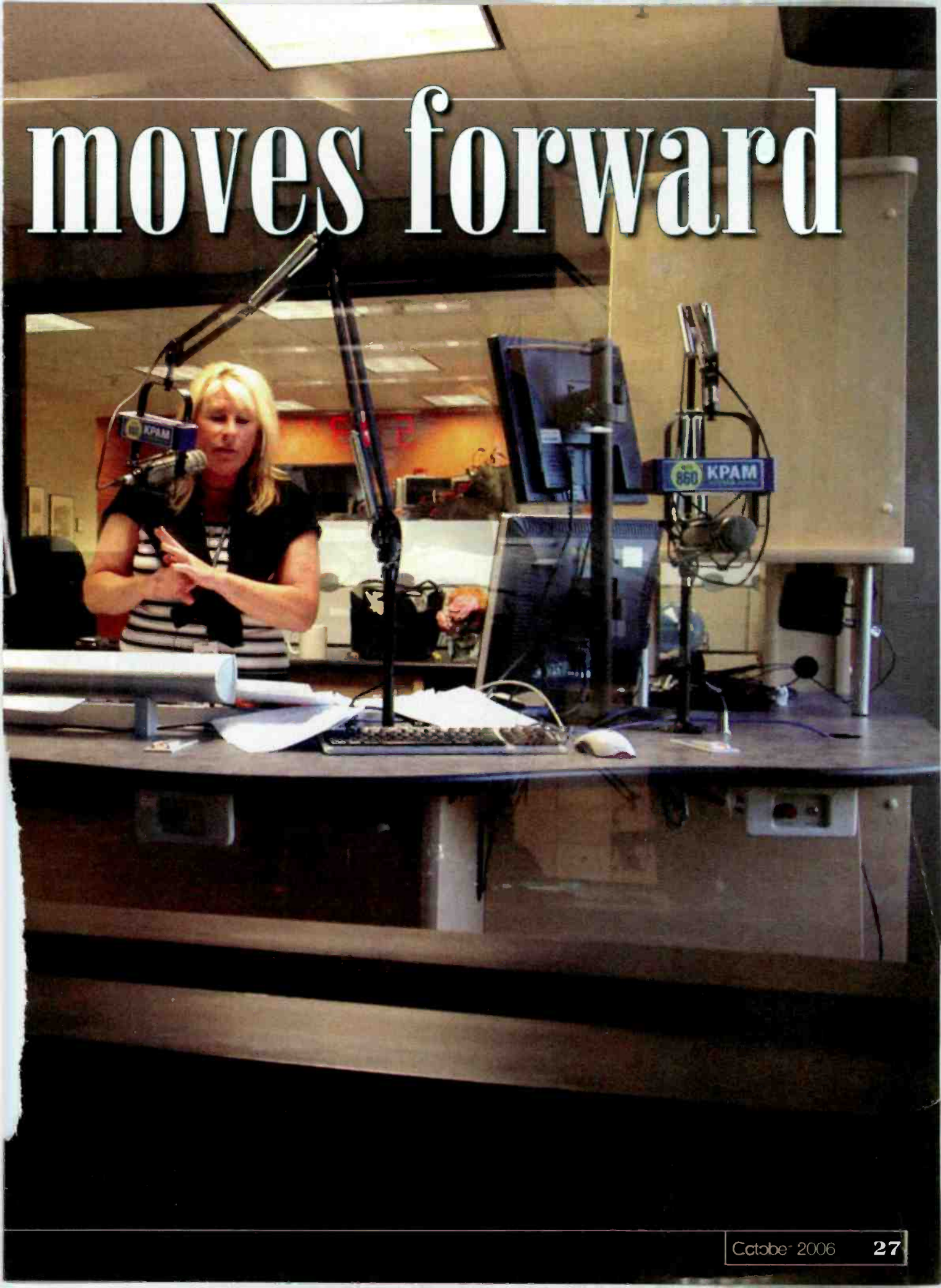
A new facility, new equipment, and a focus on a new future

By Matt Sheahan

Pamplin Media Group is a privately owned media powerhouse located in Portland. It has a number of media interests in the Portland area, including *The Portland Tribune* and other print publications. In addition, Pamplin owns and operates two radio stations in the Portland market. KPAM 860-AM providing a news/talk format, and its sister station KKAD-AM Sunny 1550 with a music of your life music format.

After seven years in one location (and studio equipment that was, in some cases, more than 20 years old) KKAD and KPAM were moving to the ground floor of a new shared building. The space was essentially the same size, about 9,000 square feet, but the broadcast infrastructure slate was blank. The ground floor of the building was empty.

moves forward



KPAM goes forward

A look into KPAM Production Studio #1.

Pamplin's new studios would be extensive: two on-air studios, one control room, one news anchor booth, one full newsroom, one traffic studio, three production studios, one master control and a server room.

Dave Bischoff, Pamplin Broadcasting chief engineer, had some serious planning to do and there were some challenges. From an engineering perspective, "radio stations on the seventh floor of a high rise...not fun."

Bischoff said that the overriding philosophy behind the planning of the new facility was for the technology to "step up," and not just for the immediate future but looking five, 10 or 15 years down the road. Bischoff noted that the technological needs of the AM format are vastly different today than even 10 years ago.

"AM morning shows used to be one person. Now, AM morning shows have three or four people working on the program and they all have technological access requirements."

Bischoff also had to make sure that the change over from the old facility to the new was seamless. He had to ensure that when the switch was thrown the signals from the new stations stayed on.

Making plans

Early in the process, Bischoff chose Creative Studio Solutions as the integration and design team. Bischoff began working closely with CSS Chief Engineer/Designer

A hub of activity, KPAM's traffic studio looks into the new studio.

Andrew Rosenberg. The most important consideration for Bischoff was the programming that an AM News/Talk station has to provide. "AM operations are remote intensive and field intensive. We had to have a system that gave us the capabilities to expand our AM operations, because that's what AM radio stations are required to do now."

After much discussion and research, Bischoff chose Sierra Automated Systems (SAS) technology for the new facility.

The primary SAS equipment used is the SAS Rubicon SL Console. The Rubicon SL provides router source selection, four mix buses, an unlimited number of automatic mix-minus buses, pan balance and IFB/talkback on each input module.

Bischoff knew that this technology was going to be a dramatic shift for the entire staff. "It's going to take a while for everyone to understand the new system and its capabilities, but with the SAS equipment we don't have to rush to learn the system's new technology, while successfully broadcasting an active AM station."

Mike Hagans, SAS' systems engineer also became involved early in the process because system reliability was also a huge factor. "This was going to be a pretty large facility and I think Dave chose SAS because of our track record." Also, Hagans said that there is an aesthetic quality to SAS's systems that helps.

Behind the Rubicon SL, Bischoff selected the SAS 32KD router. The hub of the Sierra Automated Systems connected digital network, the 32KD digital router/mixer provides switching, distribution, mixing, level control, signal processing, intercom, IFB and mix-minus in one modular, distributed, scalable routing system. The 32KD is expandable to thousands of inputs and outputs at one location or spread throughout a facility connected via fiber.

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KPAM goes forward

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Each 32KD mainframe supports as many as 512 input channels and 512 output channels. Multiple frames interconnect via the Sierra Automated Systems audio network interface high-capacity fiber link, which carries 1,000 channels.

Space, the final frontier

Another challenge faced by the Pamplin team was the new space itself. Located on the first floor of the building that houses Pamplin's newspaper operations, the space was not specifically designed for broadcast use. Bischoff used the CSS team to assist the building architect with designing the studio space and making it sound proof.

This was a fairly large-scale build but there were three primary factors in determining which construction material to use: quality of product, budget and availability. Rosenberg recommended the Auralex acoustic treatment for the walls of the studios. "We researched a number of options but we kept coming back to Auralex. A significant decider for this project was the ability of Auralex to ship a fairly significant amount of materials in a relatively short time frame in order to meet construction timelines."

To facilitate a smooth integration, CSS used its Pre-Wire Solution. This entailed having most of the pre-wire completed at its facility in

Equipment List

360 Systems Instant Replay, Shortcut
APC 1000 UPSs
Aphex 320 Compellor, 323A
Audion Voxpro
Auralex RC-8 Resilient Channel, Sheetblok Plus
Broadcast Tools SS8.1 II switchers
Carver TX-11B
Comrex Stac, Vector
Conex AS101 audio switchers
Crown D-45
DBX 1066, 168A, IEQ
Digidesign Protools
Enco Dad
ESE timing products
EV RE-20 mics
Eventide BD500
Fostex CR200 CDR
Hellerman Tyton modular RJ45 patchbays
Krone punchblocks
Marti RPU receiver
Middle Atlantic rack thermal monitoring and cooling system, racks
Mosely SL 9003T1 STL
Musicam Starguide III
Omnirax furniture
RDL modular connector system
Rolls RS7913
Sage Endec
SAS 32KD, Rubicon
Sony A6 DAT, BDS-E11 Minidisc
Symetrix 303 interface amps, 528E mic processors, 581 DA
Tascam 122MKII
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The KPAM Control Studio.

Colorado, including testing and initial documentation. This process makes on-site integration far less time consuming than compared to doing pre-wire on-site, and time was a factor in the creation of the studios. KPAM and KKAD had a fixed date to be up and running at the new building and each day spent on-site had to be dedicated to the more intricate integration processes and not the creation of cables, punch blocks and other time consuming tasks.

Hagans spent a week configuring the nine consoles and the router system. Of primary concern for Hagans was setting up the consoles so that the talent would not have too many choices to make on the new systems. "I spent a lot of time setting up display lists so the new systems would not be overwhelming to the talent."

In addition, Hagans had to configure the remote control items and account for the large number of sources and destinations coming into and out of the system.

On Aug. 24, the change was made from the old building to the new facility. It's not quite as simple as flicking a switch, but the transition from aging studios at an old location to a new state-of-the-art facility in an entirely new broadcast space went smoothly, or as smoothly as you can hope for.

"I think any time you're trying to make a step, it's going to be a bit painful," said Bischoff. "That's normal. But you have to take the opportunity to go forward. I'm pleased with the results."

Sheahan is communications manager with Creative Studio Solutions, Wheat Ridge, CO.

The technology behind KPAM

SAS Rubicon

The SAS Rubicon Broadcast Console Control Surface is the flagship console of the SAS Connected Digital Network. The Rubicon is available in frame sizes from 8 to 40 wide. Input modules feature eight bus assign buttons, an unlimited number of automatic mix-minus buses, pan/balance, mode select (stereo, reverse, mono, left, right), effects sends, record split for VoxPro/Shortcut phone recording, and extensive user programmability to do almost anything required in a sophisticated broadcast plant. Rubicon interfaces to the SAS RIOLink, the remote I/O interface that concentrates all studio wiring into a single CAT5 cable back to the TOC. At the TOC, the SAS 32KD Digital Router/Mixer is the hub of the Connected Digital Network, providing system-wide mixing, routing, control, communications, and intercom.

www.sasaudio.com
818-840-6749

Creative Studio Solutions

Pamplin Media contacted Creative Studio Solutions, Inc. early in its studio move and build process. Andrew Rosenberg, CSS CEO/chief engineer, provided Pamplin with the design and layout of their new studios including the soundproofing and studio infrastructure. CSS also provided all pre-wire and studio integration services for the entire project.

CSS worked closely with Pamplin's chief engineer, Dave Bischoff, to meet, not only the immediate needs of their stations, but to allow the technology utilized to be expandable and versatile to meet the needs of the future.

Pamplin's staff and the team from CSS, together, were able to create an aesthetically appealing, fully functional, technologically advanced, and significantly expandable broadcast studio facility that will serve Pamplin well for many years to come.

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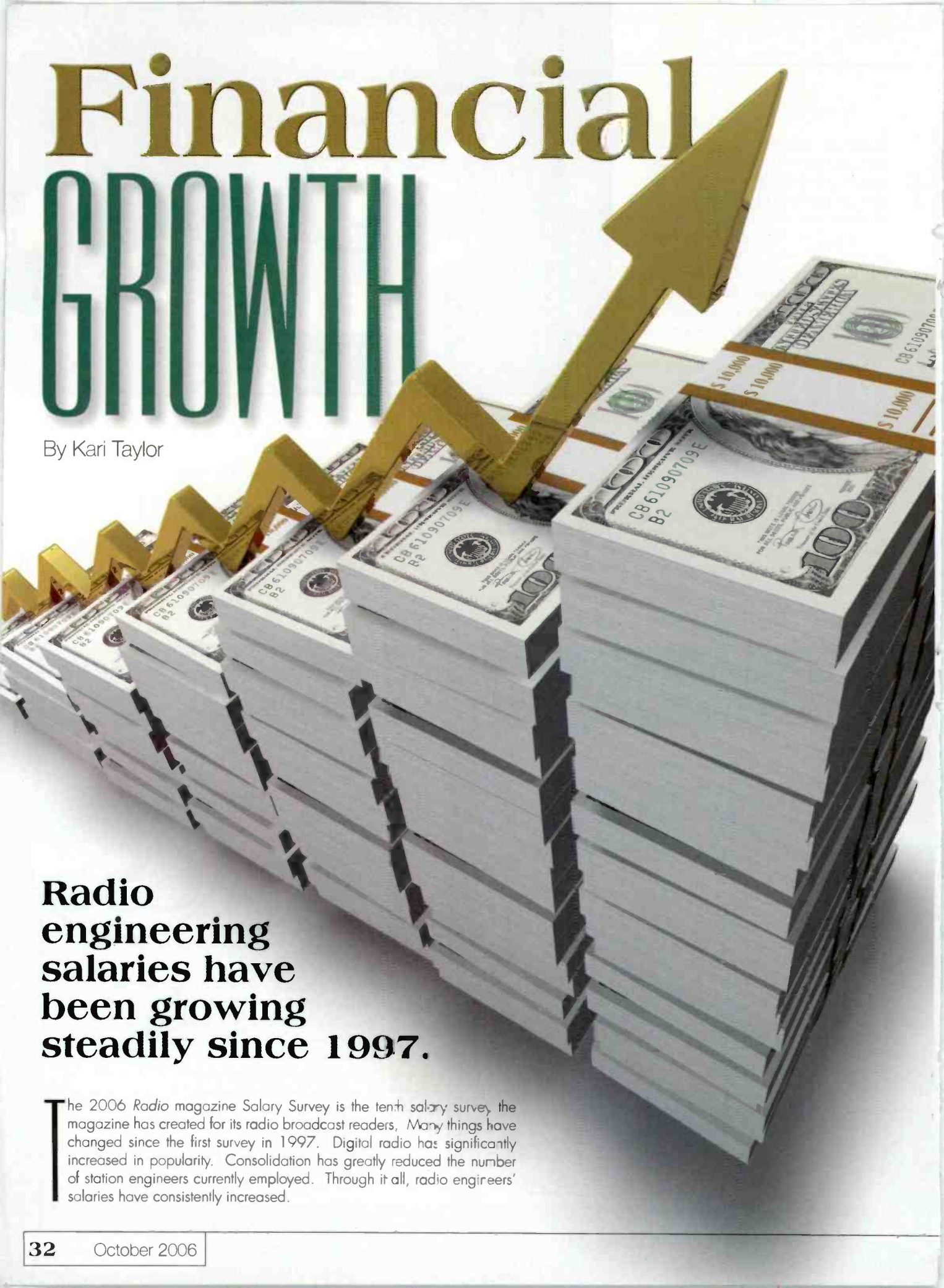
Financial GROWTH

By Kari Taylor



Radio engineering salaries have been growing steadily since 1997.

The 2006 *Radio* magazine Salary Survey is the tenth salary survey the magazine has created for its radio broadcast readers. Many things have changed since the first survey in 1997. Digital radio has significantly increased in popularity. Consolidation has greatly reduced the number of station engineers currently employed. Through it all, radio engineers' salaries have consistently increased.

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Financial GROWTH

In 1997, *Radio* magazine asked the question: How do you fare among your peers? That year, station management salaries showed a marked difference between large and small markets. The median salary for the Top 50 market was $44,374 and for the Below Top 50, the median salary was $32,916.

Surprisingly, $44,374 is less than the median Top 50 staff engineer earned on average that year: $52,999. But times have changed. According to the 2006 survey, station management now earn the highest salaries of everyone. The overall median salary for this category in 2006 is $87,999.

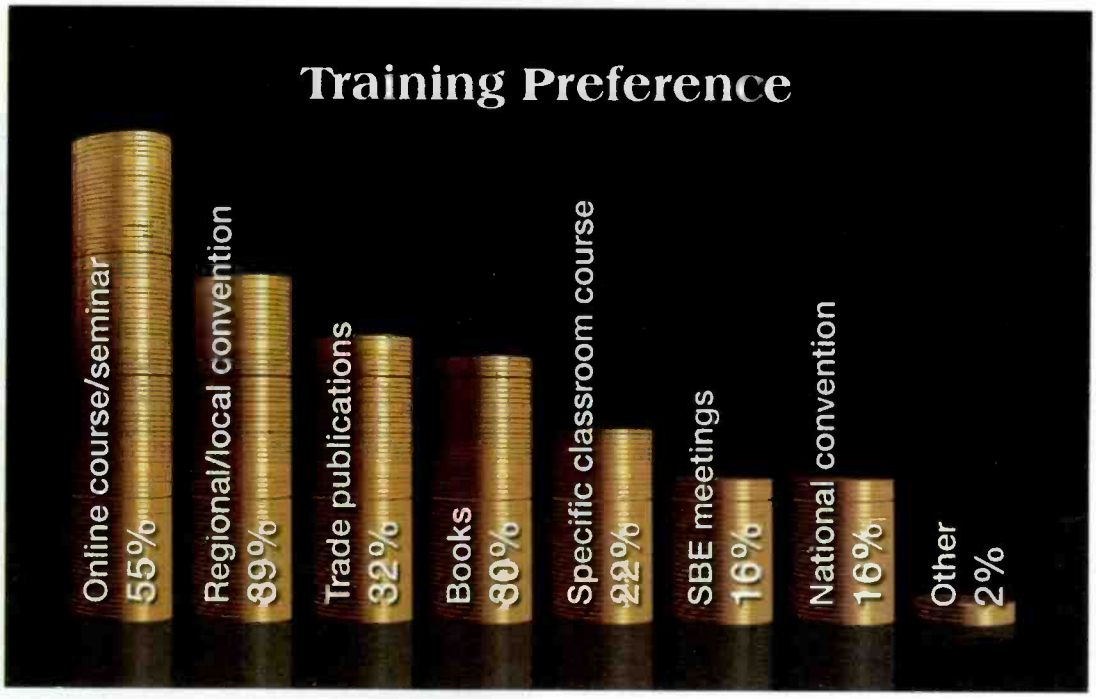
This year's salary survey shows a significant increase in salaries since 1997. The estimated median salary for station management in the Below Top 50 market is $52,857. This is actually a significant increase even from 2005, when the median salary was about $7,800 less.

In 1997, 30 percent of the survey respondents held the title of chief engineer. This job title has remained stable throughout the years and in the 2006 salary survey, 27 percent of respondents hold the title of chief engineer. These engineers' salaries have also remained stable with incremental increases each year. In the 1997 salary survey *Radio* magazine reported that the median salary for a chief/staff engineer in the Top 50 market was $52,999. In the 2006 salary survey the median salary in this market is $65,833. For the Below Top 50, the median salary was $33,999 in 1997, but in 2006 the median salary is $46,111.

There are many comparisons that can be made between the 1997 and 2006 salary surveys. For instance, the monetary difference between the Top 50 market staff engineer and Below Top 50 market staff engineer stayed the same throughout the years. In 1997 the difference between the median salary of a Top 50 staff engineer and a Below Top 50 staff engineer was $19,000. In 2006, the median salary difference between the two markets for a staff engineer is the same: $19,000.

Also, inflation has increased 27 percent since 1997. The inflation rate in 1997 was 2.3 percent. For the first half of 2006, the inflation rate average was 3.8 percent. (A $40,000 salary then is worth about $50,000 now.) Overall, radio engineers' salaries have grown by about 29 percent since the 1997 survey. Therefore, the radio industry has not only kept up with the inflation rate but also provided a little extra cash.

This year's survey revealed that more than half (56 percent) of contract engineers earn an hourly rate of $50 or more. This is a significant increase from last year's salary survey when only 39 percent of contract engineers



charged $50 or more an hour. Fifty-two percent of the respondents base their charges on time only. The rest base their charges on a combination of time and a fee. Also, according to the 2006 survey, on average, contract engineers bill 16.2 hours per week. Thus, the average contract engineer who negotiates a fee of $50 an hour and works 16.2 hours a week will earn about $42,120 this year.

Contract engineer or not, most respondents to the 2006 survey work for one or more radio stations. These engineers are personally responsible for an average of 3.6 stations. The average engineering department consists of two employees and those two people generally are responsible for four stations.

Growth spurts

The 1997 survey didn't review the job description for engineers, but suffice it to say they mostly worked on audio and RF equipment. In today's world, the radio engineer's job description has grown to include much more than these two staple areas of expertise. In this year's survey respondents were asked if computer, IS and IT functions are considered part of the engineering department's responsibility. Overwhelmingly, 68 percent responded yes.

Not only that, but digital radio and multicasting technology are propelling the industry in a new direction. One in four stations intend to commence IBOC operations

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The Engineer's Choice!

Financial GROWTH

and 19 percent already have. Engineers need to stay up-to-date on the latest technology.

Keeping this in mind, we asked how many of the respondents have attended seminars in the past year in an effort to learn new skills or learn about a new technology. Not surprisingly, 60 percent have attended an educational seminar in the past two years. Of that 60 percent, most of the engineers took an online course (55 percent) and several went to a regional or local event (39 percent). Trade publications accounted for 32 percent of training and books 30 percent.

There are several organizations that can improve a person's skill set. Twelve percent of respondents hold ARRL membership and four percent hold an IEEE membership. Similarly, six percent hold Microsoft certifications and two percent hold Novell certification.

The Society of Broadcast Engineers accounted for 19 percent of respondents taking an educational seminar. The percentage of engineers in 2006 who hold some level of SBE certification is 25 percent. And the estimated median salary in the Top 50 market for an engineer with an SBE certification is $72,999. It is $52,999 for an engineer in the Below Top 50 market.

According to the survey, regional directors/corporate

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Evaluating GROWTH

In May 2006 Prism Business Media e-mailed invitations to participate in an online survey to more than 3,500 subscribers of *Radio* magazine on an nth name basis. The results of the study are presented by job title group and market rank (Top 50 and Below Top 50). Where appropriate, medians have been presented for numeric responses.

The information gathered in the survey is intended to illustrate the broad trends in the industry. Treat the data as a starting point for salary ranges. Factors such as cost of living and the demand for a particular job are also important in determining a salary range.

engineers (46 percent) and station chief engineers (44 percent) are most likely to be SBE certified. Those engineers who hold certification are most likely to be at the CBNT (28 percent of respondents) or CPBE (26 percent of respondents) level. Operations staff and managers are the least likely to hold a SBE certification; only three percent of of these respondents hold a certification.

So what are the main reasons people don't hold any professional certifications? Each year as part of the salary survey, *Radio* magazine asks the respondents to answer open-ended questions. We asked the people taking the survey to tell us just that. The answers were broad but some of the more popular responses included:

- Not having enough time
- Their employer doesn't pay for it or doesn't require it
- Can generally get by with accumulated knowledge and customer service
- Not having them hasn't held them back
- No managers I know of respect a certification enough to make a difference.

Another question we asked in the 2006 survey was "What type of educational, instructional or tutorial topics would be most valuable to you?" Here are some of the responses:

- Anything technical, emerging technologies, RF refresher
- At this point in my career, how to be patient with my trainees
- Digital audio techniques, streaming
- HD Radio
- How does an older broadcaster survive in these changing times?
- More hands-on "how to" articles on using the gear and what can be done with off-the-shelf components

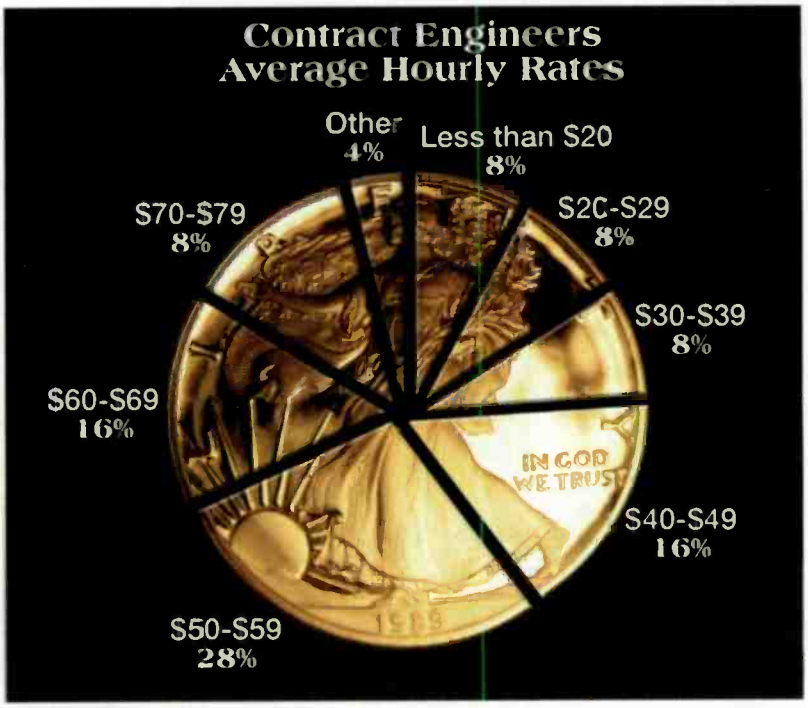
Growing pains

While salary growth is good news, it can also bring more work and more stress. Another question the survey asked respondents was "If you could change one thing to improve your current job, what would it be?"

Some of the answers were obvious (i.e. money) but others were more interesting:

- Get rid of nepotism
- Fire my boss
- Artificial deadlines imposed by management. You would think this is the hospital trauma center around here.
- Can I please get four or five extra hours in my day?
- Kill all the lawyers
- Massage therapist on staff
- I am really very fortunate. The two companies I work for are considerate and do not make unreasonable demands.

The radio industry has endured many changes since 1997, and that includes engineers' salaries. But of all the comparisons made between the 1997 survey and the 2006 survey, there is one enduring theme: the change in salaries has been positive with consistent growth.



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AKG
Perception 200

By Doug Irwin

If you have read any of my other articles about the use of condenser microphones in radio applications you already know that I'm a fan of them. While many of us have added EQ to the output of a mic preamp, nothing beats using a mic that produces the low-end that we want naturally, along with finely detailed high-frequency content. In a business where we strive to attract and keep listeners with our sound, and more specifically the sounds of announcer's voices, I can really think of no other more important single studio item than a good microphone. I like to process mics minimally—and this is easy with a good condenser—so that I give our announcers just an ever so slightly larger than life sound. Use of a large-diaphragm condenser microphone type is the key. Until fairly recently, mics of this type were beyond the budgetary reach of many radio stations, but lately there have been more condenser mics introduced to the market by more manufacturers, so the price points have dropped. AKG has introduced an economical large-diaphragm condenser microphone, the Perception 200.

Even at its low price point, this microphone appears to be rugged and well made. As you can see from its frequency response chart it has a relatively minor high frequency bump centered at about 12kHz and a flat low-end response. The bass cut switch allows the user to attenuate low frequency content through the use of a 12dB/octave HPF with a 300Hz corner frequency.

Performance at a glance

Single cardioid pattern

Gold-sputtered diaphragm

All-metal body

High volume capability (135dB SPL)

Switchable attenuator pad

Switchable bass-cut filter

Two-year parts and labor warranty

Includes shockmount and hardshell carrying case

Under test

KJR Sports Radio (950) in Seattle is a locally programmed sports and talk station at which the microphones make a significant contribution to the overall sound of the station. Edit-bay two is our test studio for new microphones, and we have reviewed many. The test procedure for the AKG perception was simple. A Mackie Onyx 1220 was used for the pre-amp for the AKG along with the mic that has been in use for quite some time (another large-diaphragm condenser). The test equipment is a pair of Sony MDR7506s and my ears. Mics are located adjacent to one another and by alternating them in to the program bus I can make a fair and quick comparison in the way they sound.

Overall I liked the sound of this mic. It was not quite as bright as our standard mic but it had a richer low-end; in fact it needs to be worked six to nine inches away so that the low end doesn't sound like too much. (In practice the low-frequency cut switch could be used should this be a problem.) "P-popping" would likely be an issue should the user work it too closely. The fact that you do work it farther far away means that the end user doesn't have to be quite as cognizant of where they are with respect to it; no one need be concerned with using the proximity effect to unnaturally build the low frequency content of their voices. This mic has its own rich low end that I feel many announcers would appreciate. The other side of the coin is that a microphone such as this needs to be used in a quiet room with the appropriate acoustical design. If the studio you use sounds lively with a more run-of-the-mill dynamic mic, then this is not for you. Room ambience will be exaggerated.

The use of condenser mics is a good way to make your station stand out. Sure, listeners won't know why your jocks sound more real, and usually more intelligible; they'll just realize that they do. The AKG Perception 200 is an economical way

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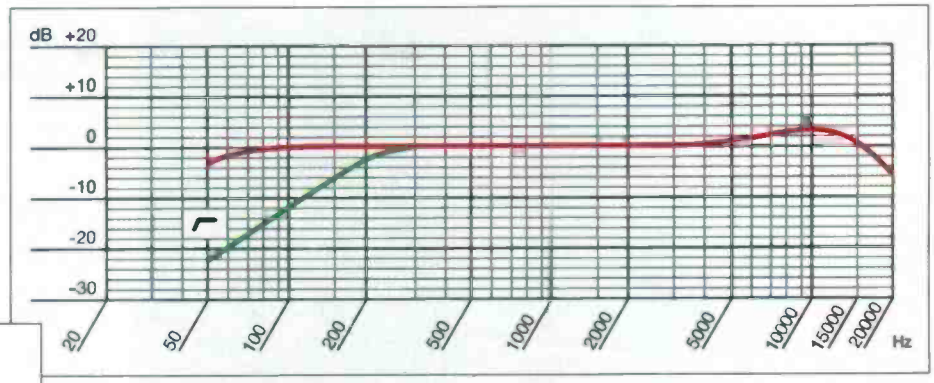

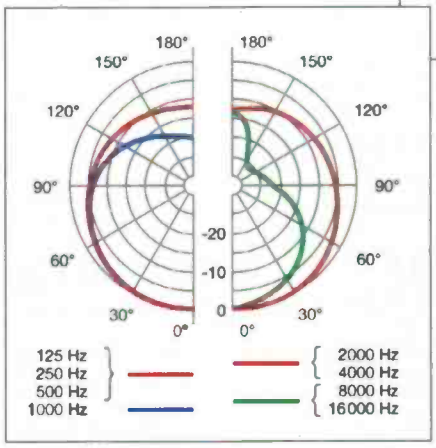

The pickup pattern and frequency response of the Perception 200.

to test the waters in the use of a condenser type mic, while minimizing the risk that the talent won't like it. More than likely, they'll love it.

Irwin is a contract engineer in Seattle.

Editor's note: Field Reports are an exclusive *Radio* magazine feature for radio broadcasters. Each report is prepared by well-qualified staff at a radio station, production facility or consulting company.

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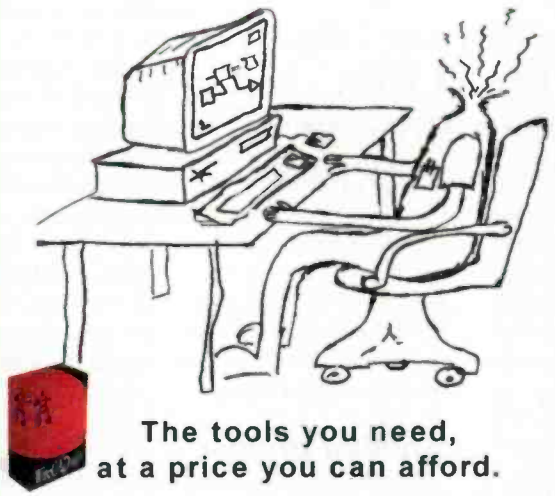

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Jampro JHPC

By Todd Noordyk

I have been in FM broadcasting full time since 1982. I currently own five stations. My father started an FM the year I was born in 1960. We owned several stations together back then. Working for Stu (my dad) was great training for me, and I've been around the radio business all of my life.

My experience includes building several RF facilities. In doing so, I have used many brands of antennas with power ranges from 800W to 100kW.

In the fall of 1991 our family expanded our Manistique, MI, business and built our first 700' structure and installed a medium-power Jampro antenna. For the installation we used an antenna with 1 5/8" antenna bay interconnects. This was a mistake because the bay interconnects can't survive in the windy conditions at that height. Jampro acknowledged that it was too light duty for that harsh environment. We learned this after experiencing a couple of burn outs.

> Experience has proved that all antennas are not created equal.

To remedy the situation, Jampro supplied new 3 1/8 interconnects, which cured the trouble. I've always appreciated this level of customer service from Jampro.

When we sold the station in 1999, it was forced to change frequencies. The new owners installed a new 10-bay antenna from another manufacturer for the new frequency. After the upgrade, an evaluation of the signal strength at 60 miles showed that the new antenna from another manufacturer did not perform nearly as well as the Jampro Penetrator that was used in 1991. The station was now non-existent in the market we previously served with the old 10-bay Jampro. Jampro proved its value to me once again.

The JHPC series of antennas are available to cover the entire FM band, and systems can be installed with a variety of options. Antennas can be made directional to fit a specific coverage area, and Jampro can perform pattern measurement studies to tailor an antenna's coverage. Likewise, reduced-RF arrays can be fabricated, and electrical beam tilt and null fill can be designed into a system. Custom mounting brackets can also be ordered for unique installations.

Performance at a glance

- Accepts 50kW input power
- Marine brass and copper construction
- Multiple-frequency designs available
- VSWR of 1.10:1 ±200kHz
- Available with radomes

Another project

In November 2001 I began working on another 700' tower project, this time in Marquette, MI. I called my old tower sales representative, who had joined a new tower and antenna manufacturing company. He visited the site and recommended a tower, transmission line and an antenna package that included the company that he had gone to work for. While I was already pleased with Jampro from past experience—and this package did not include Jampro—I accepted the proposed package, which allowed me to work with only

one vendor. I installed a four-bay and a 10-bay antenna from this company.

The last few days of 2005 brought rare and severe icing to Marquette, which lies outside the ice belt of the Midwest. To my dismay, my four-year-old four-bay failed. The antenna apparently took a winter lightning strike, accumulated ice, shorted and failed. I had to decide between replacing the four-bay with an antenna from that same manufacturer, or give Jampro another try. I decided to go with Jampro. I ordered a high-power Penetrator and added radomes to eliminate the potential icing problem.

This past April, the decision paid off again. After three months of tough weather, Marquette experienced more heavy ice. The new four-bay Jampro with radomes stayed on air when the 10-bay (mounted below the four-bay) yielded a high VSWR that tripped the transmitter. I could not use the 10-bay for three days until the ice fog left the area and the wind picked up to carry the ice away.

This experience showed me that all antennas are not created equal. Going forward, my choice of high-power antennas for high towers is simple: Jampro Penetrator with radomes. It stays on in the ice and delivers a farther reach. I need that.

Noordyk is president of Great Lakes Radio, Marquette, MI.

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The antenna can also be fitted with radomes.

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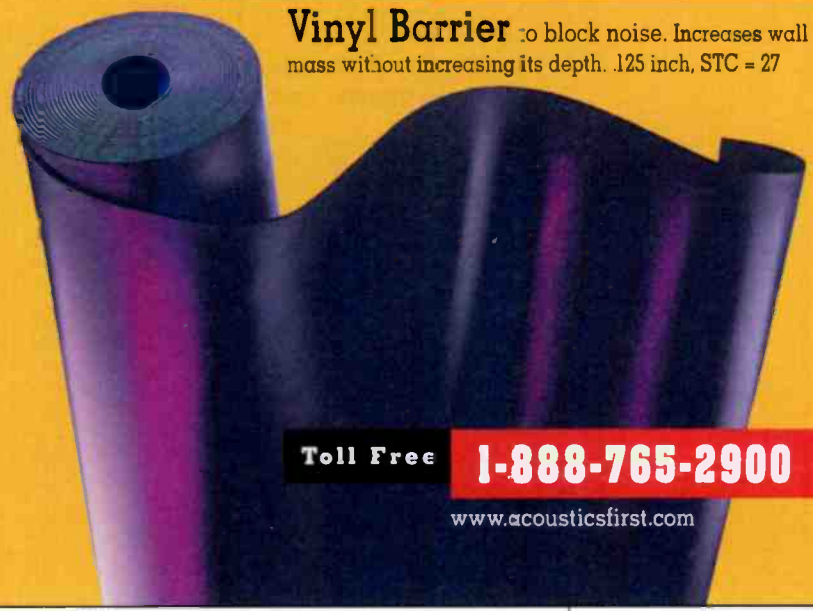

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by Kari Taylor, senior associate editor

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Tascam

US-122L: Record two tracks at a time with zero latency with this system. The interface provides MIDI input and output, 96kHz/24-bit recording and two XLR mic inputs with phantom power. Two analog line inputs are provided, with one switchable to high impedance for use with guitars and bass. The interface is USB 2.0 equipped.

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MXL.006: A cardioid condenser microphone, this product features a large gold diaphragm and connects directly to a computer via USB without the need for external mic preamps. The analog section features a 20Hz to 20kHz frequency response, pressure-gradient condenser capsule and a three-position, switchable attenuation pad with settings for 0dB, -5dB and -10dB. The digital section features a 16-bit Delta Sigma A/D converter with a sampling rate of 44.1kHz and 48kHz. Protecting the instrument's capsule is a heavy-duty wire mesh grill with an integrated pop filter.

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Multi-processor

DBX Professional Products

Driverack 4820: With a 96kHz processing engine, this processor features a blank front panel designed specifically for installations that need tamper-proof controls. The unit offers algorithms such as selectable DSP inserts on the inputs and outputs, EQ, delay, compression and limiting, bandpass and crossover filters. The system provides four inputs and eight outputs, and monitors and controls signal routing as well as the processing of multiple units—all using Ethernet equipment including routers and wireless access points.

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August issue

Congratulations to
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The mic can was in the upper left corner of the zebra print.

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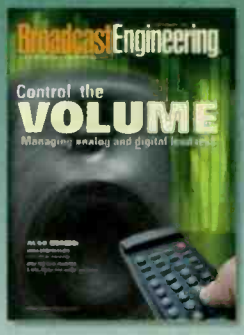

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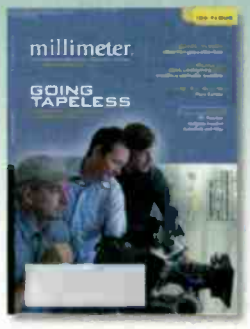

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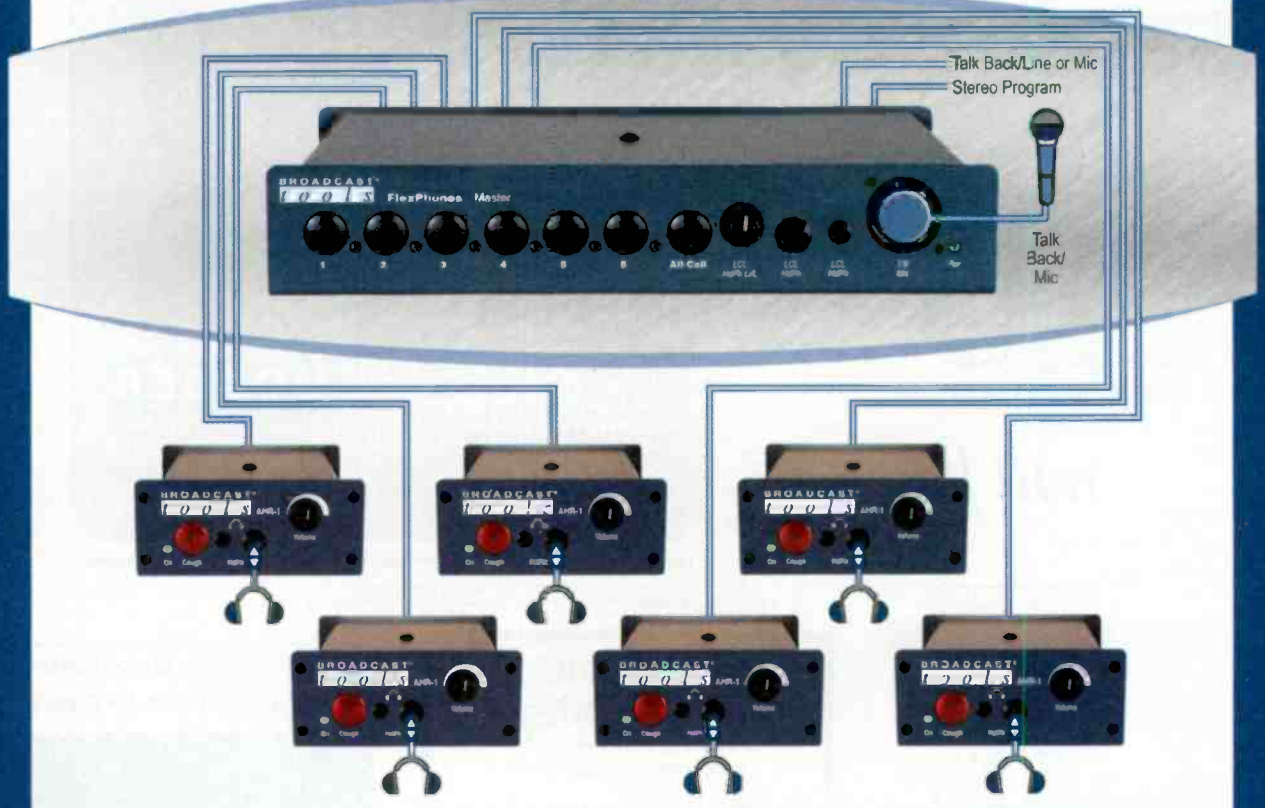

FlexPhones Master

The FlexPhones Master is a professional Broadcast/Studio six channe distributed headphone system with independent talkback capabilities. Each of the six channels provides stereo program monitoring and selective talkback with interconnection via CAT5 cable to multiple Active Headphone Remotes (AHR-1) and/or Monitor Selector Interface (MSI). Multiple masters may be cascaded to form larger systems.

The FlexPhones Master is equipped with inputs for stereo program and talkback audio. Rear panel program and talkback trimmers are provided to pre-set maximum input levels. The microphone/line level talkback input is available via a rear panel plug-in eurobiock connector, while the front panel XLR connector facilitates the use of a user-provided gooseneck microphone or headset. The front panel is equipped with a level control for local headphones with both 1/4" and 1/8" stereo headphone jacks. The six front panel talkback switches allow the user to independently communicate with each AHR-1 listener and can be configured to insert talkback audio into only the left or both ears and dim either or both program channels. Any combination of switches may be pressed, while the "All-Call" interrupts all listeners. The Talkback function can be remotely controlled. Six RJ45 jacks are provided to distribute audio and power via CAT5 cable to the AHR-1's, which conform to the Studio Hub format. Low-Z balanced audio distribution is used to preclude audio degradation with long cable runs.

AHR-1 Active Headphone Remote

The Active Headphone Remote (AHR-1) contains a stereo amplifier designed to work with any combination of high-efficiency headphones with impedances between 24 and 600 ohms. The AHR-1 is equipped with 1/8" and 1/4" headphone jacks, level control, user-configured utility momentary pushbutton and LED indicator. Two rear panel RJ45 jacks are provided for connection via CAT5 cable to the FlexPhones Master. The AHR-1 may be desktop mounted, under counter or with the optional HR-1/MP or HR-1/MP-XLR mounting plates, which may be turret or counter-top mounted.

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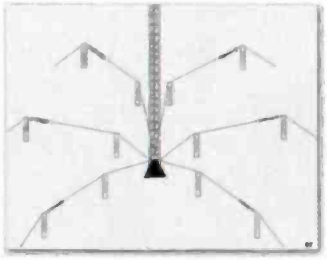

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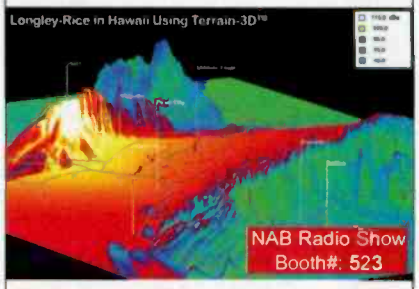

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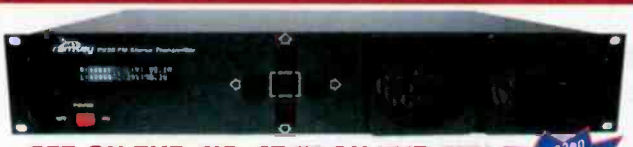

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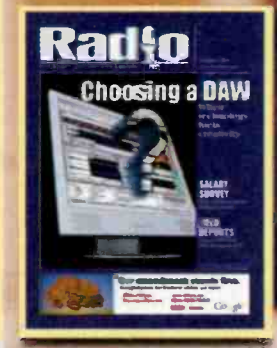

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Contributor Profile

Meet the professionals who write for Radio magazine.
This month:
Trends in Technology, page 16.

Jim Smith
Owner
Muddy Hole Studio
Martinsburg, WV

Smith worked in live sound through the 70s, and in 1983 he went to work for NPR.

His work included the first two all-digital production features for NPR's All Things Considered.

In 1990, Smith built the Muddy Hole Studios remote recording truck and put it on the road, recording CDs and broadcasting all musical genres.

Radio
THE RADIO TECHNOLOGY LEADER

Written by radio professionals
Written for radio professionals

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by Kari Taylor, senior associate editor

Do you remember?

Broadcast Electronics manufactured the Spotmaster 400 playback unit from 1959 until the mid-1980s, with several models in between. The average frequency response was a flat ±1dB with a signal-to-noise ratio in the low 50s. Wow and flutter was measured at about 1.5 percent. During its more than 25 years of production, many models were produced with varying improvements, such as record and playback, a delay unit and improvements in noise figures . The biggest improvement came with the releaseless solenoid. This was a mechanical arm with a pressure roller that raised the cart up and down.

Picture 1 is a Spotmaster in a wooden box. It was one of the first 100 cart machines ever made. Picture 2 is a Spotmaster still in operation at Internet radio station WJJD, a tribute station to the original Chicago station.

Photos courtesy of BE and Alan McCall.

Sample and Hold

Is radio important in consumers' everyday lives?

Source: American Media Services, April 2006, www.americanmediaservices.com.

That was then

On March 31, 2006, Greater Media turned 50 years old. On that day in 1956 Yale classmates Peter Bordes and Joseph Rosenmiller began broadcasting as a single radio station in Southbridge, MA. By the 1980s, Greater Media's business included radio, cable TV, printing, publishing and telecommunications operations.

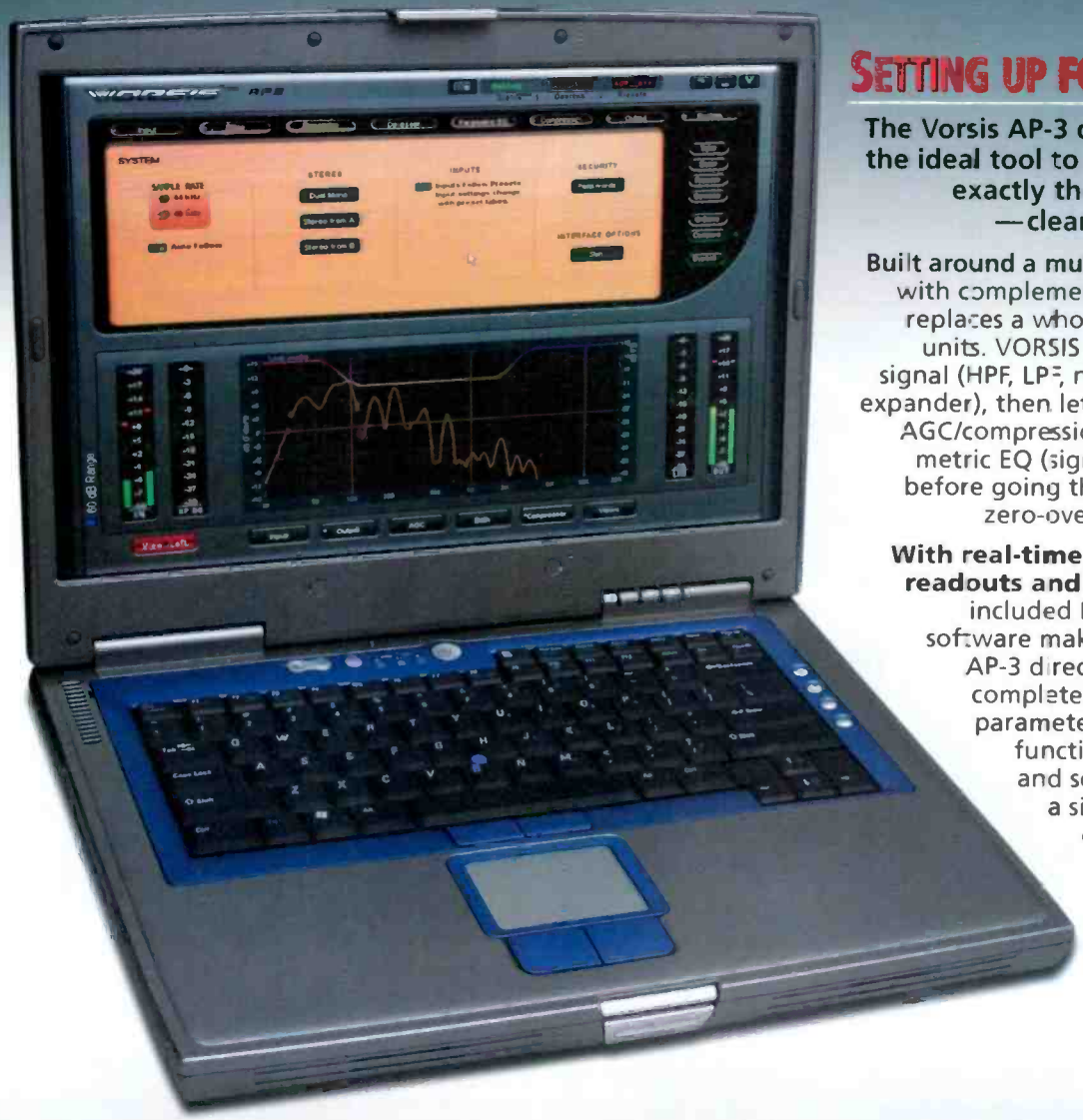
Today, Greater Media is the parent company of 19 AM and FM radio stations in Boston, Detroit, Philadelphia and New Jersey; a modern printing facility and a group of weekly newspapers in central New Jersey; and several telecommunications towers throughout the United States.

The photo shows WCTC's studio in New Brunswick, NJ, which was the second station Bordes and Rosenmiller operated. It was taken within the first five years of Greater Media's existence.

This Little Unit

Can Do BIG Things!

Our new AP-3 is the perfect HD Processor:



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The Vorsis AP-3 digital processor is the ideal tool to shape your sound exactly the way you want it —cleanly and efficiently.

Built around a multi-band compressor with complementary AGC, the AP-3 replaces a whole *rack* of dedicated units. VORSIS pre-conditions your signal (HPF, LPF, notch filter, de-esser, expander), then let's you apply 3-band AGC/compression *and* 4-band parametric EQ (signal chain reversible) before going through a final stage zero-overshoot peak limiter.

With real-time spectrum density readouts and full metering, our included PC graphic interface software makes operation of the AP-3 direct and easy, offering complete control of all audio parameters, presets, monitor functions, system settings and security—all through a single RJ-45 ethernet connection that lets you control one or many AP-3 units.

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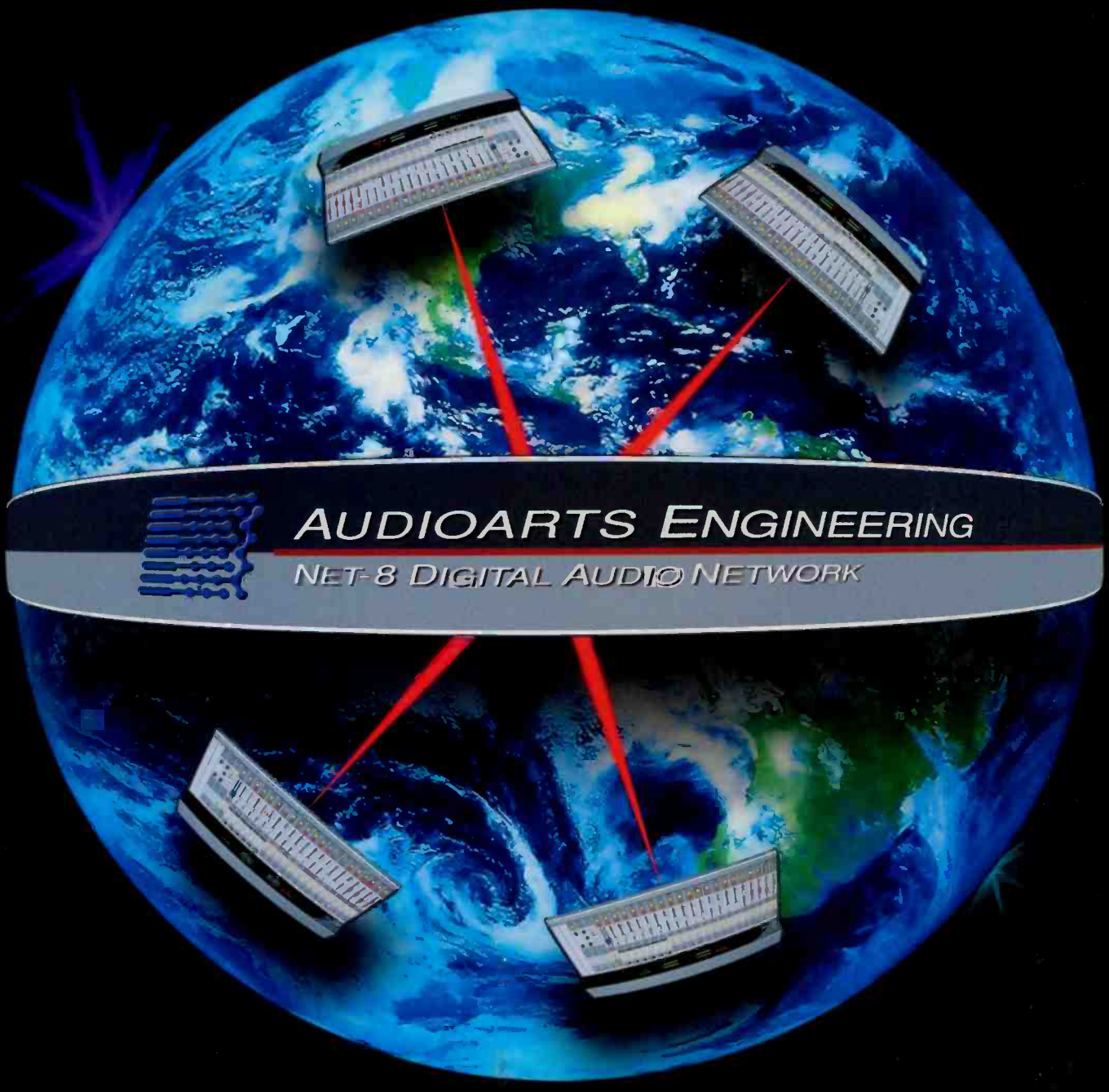

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