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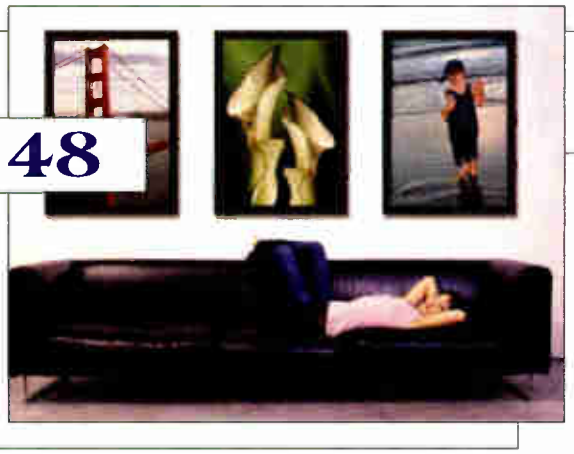

Features

Columns

Departments

ON THE COVER

Air America Radio reaches out with several outspoken talk-show hosts from its new facilities in New York. Photo by Howard Mullinack of SAS. Cover design by Michael J. Knust.

Remote Broadcasting over the Internet

The remote from Mexico was a spectacular success, in no small part thanks to the flawless sound which the Tieline G3 provided over the public Internet

-Mike Rabey Chief Engineer
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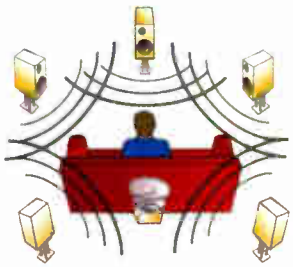
Currents Online

Selected headlines from the past month.



WGUC-FM Begins 5.1 Broadcasting with Neural Surround

The Cincinnati classical music station features surround programming on the analog and main digital signals. Neural Surround embeds the surround detail in a format compatible with stereo and legacy surround sound formats.

SBE Announces Election Results

The four officers were elected to second terms, and six board members were elected, five of which are serving renewed terms.

Eicher Joins SAS

Cam Eicher takes over as the director of sales after five years with Logitek as its director of sales.

Polk Ships I-Sonic HD Radio Receiver

Polk began accepting pre-orders of the units last month and is now accepting general orders for the $599 unit.

Dielectric Hosts First FM Engineering Conference

Over a three-day period, Dielectric hosted several radio engineering executives at a coast-side facility in Maine to discuss the aspects of transmission, monitoring and maintenance of HD Radio.

Sacks Promoted to VP of Axia Audio

Marty Sacks brings upper level management experience includes work with Telos, Systems and Electronics Research.

18 Markets Added to HD Radio Multicast Roll-out

The new multicast markets are within the top 100 markets and range from Austin, TX, to Ft. Myers, FL.

Site Features

Industry Links

The history, education and heritage of radio broadcasting is kept alive at schools, museums, associations and other sites in our list.

Digital Radio Update E-mail Newsletter

Stay up to date with the source of digital audio broadcasting news and information. The coverage extends to DRM, satellite radio and more. Subscribe today.

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Web links to the advertisers in every issue are available online. Find them all fast.

Industry Events

The *Radio* magazine Industry Events section lists upcoming conventions and conferences. This list is upaated regularly with the latest information. Send your event info to us today.

Engineer's Notebook Highlight

The electronic symbols True Type font is a popular download from the *Radio* magazine website. The font set is useful for inserting electronic symbols in documents or with a graphics program to make quick diagrams.

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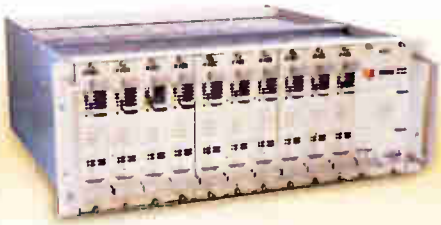

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A report card on HD Radio

While the HD Radio revolution continues to make its way through stations and to consumers, I figured that it was time to evaluate the presence of HD Radio in the stores. This has become an annual field trip where I visit a store, ask questions and decide if HD Radio is finally making its way into the hands and minds of consumers. The last time I reported on my field study was in the August 2005 issue.

I visited two national electronics retailers: Best Buy and Circuit City. I have visited these retailers before, so the return visits were a good opportunity to determine the current status. Neither store had any home or tabletop HD Radio receivers, so I moved to the auto sound department. When a sales person approached me, at both stores they started with the question, "Can I help you with something?"

I answered, "Tell me about HD Radio."

In previous visits, this question was always answered with, "Do you mean satellite radio?" Not this time. I was surprised (but pleased) that both sales people knew what HD Radio was and even knew something about how it worked. This gave me hope that the revolution had arrived. The truth is that word of the revolution had arrived, but the battle is still raging.

The opening question led to a discussion of the technology. I was told the basics of the technology, although I was spared the "FM sounds like a CD and AM sounds like FM" analysis. Instead, I was told how some stations transmit the signals, some do not. I was told that the bit rate of HD Radio is much higher than satellite radio.

Unfortunately, I was not being sold on the idea. Instead, both sales people asked me if I had considered satellite radio. I never mentioned satellite radio, but they were ready to tell me all about it. I'll give them the benefit that they have been satellite radio listeners for several years already.

The pressure was on me to forget HD Radio and buy satellite. I took a defensive position and questioned them as to why satellite is better than HD Radio. I was told that satellite radio is everywhere. HD Radio is only in a few places. One point for satellite. I was told that satellite has no commercials, unlike HD Radio. That's only partially true, and I expect that the commercial-free channels will begin to diminish, so call that a tie.

The argument that really perked my interest was presented by the Circuit City sales person. He told me that satellite radio is cheaper than HD Radio. This begged for clarification. I was told that HD Radio required an in-dash head unit and trunk-mounted tuner. (Circuit City carries the system from Eclipse, and Best Buy carries systems from Kenwood and Alpine.) Both stores only carry head units and do not stock the tuner modules, nor do they carry the in-dash units with HD Radio built in.) Of course, when I pressed I was told that the satellite systems required a similar setup, although the hardware for the basic HD Radio system was about $350 more.

The Circuit City sales person thought that he had convinced me to choose satellite until I asked about the subscription fee. He was proud to tell me that it was only $13 per month. I told him that in 2.5 years I would cover the difference in HD Radio hardware, and then I would still be paying. Even with the lifetime license of $500, HD Radio is cheaper in the long run. He didn't seem to care anymore because he knew that he didn't have a sale.

Unfortunately, consumers don't know which questions to ask, and when they hear the HD Radio ads to discover it, unless they visit Crutchfield online, they probably won't get the right answers.

The struggle to inform consumers about HD Radio and make them feel the need to invest in it continues.

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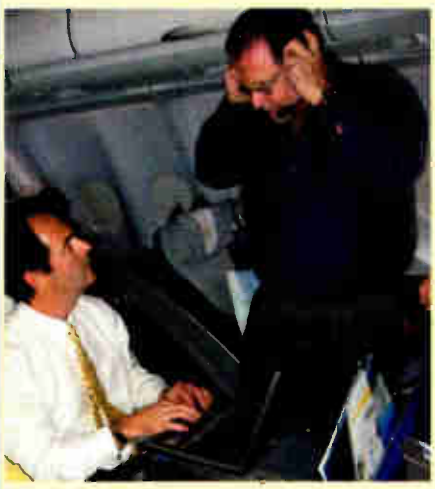

... successfully aired his three hour talk show from a commercial airplane [using ACCESS] at 37,000 feet on a regularly scheduled flight between Frankfurt, Germany and New York, US.

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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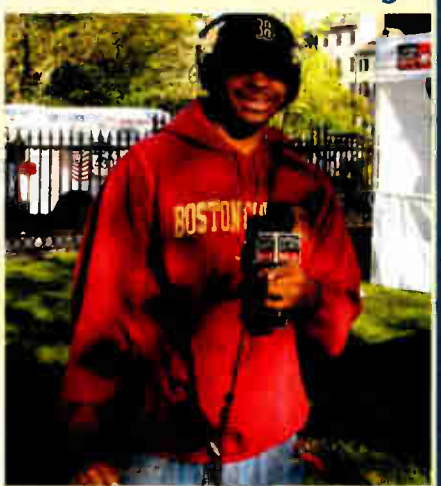
JAMN 94.5—Walk for Hunger



"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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Photo by Ken Wolf

FM antennas and radiation

By John Battison, P.E., technical editor, RF

The current state of FM antenna technology provides highly efficient radiators.

When broadcasting was in its infancy, amplitude modulation (AM) was the principal modulation system being researched and developed. Once efficient generation of useful RF signals was discovered and larger transmitter power output stages were developed broadcasters had to find an efficient radiator.

Horizontal wires, vertical wires and poles, loops, flat-top tee antennas and various other configurations were used, but it became apparent that the vertical antenna, whose height was determined by the operating frequency, was the most efficient and easiest to use. It did not suffer from undesired directional characteristics and it produced vertically polarized radiation, which was soon accepted as preferable for AM and its ground wave characteristics.

Throughout the years the vertical antenna with various modifications has become the standard for AM broadcasting. In recent years broadcasting efforts have been directed toward reducing the height of the vertical antenna, with considerable success. With the introduction of the Kintronic Labs Kinstar antenna radio has probably reached the peak of AM antenna miniaturization, after about 100 years of work.

On the other hand, the FM antenna has developed from knowledge of radiation gleaned mostly from AM and amateur radio antenna technology. Prior to World War II, a comparatively small amount of work occurred in the development of higher frequency antennas. Military usage was frequently confined to the dipole or folded dipole, steerable directional antennas and occasionally a loop.

For higher frequency transmitter operation various modifications of rhombic, curtain and other directional antennas with electronically steerable beams were developed for shortwave commercial radio. The prewar development of TV, with its need for greater bandwidth, opened the VHF and UHF bands. Then the plethora of UHF, radar, communication and detection equipment developed by the military in World War II widened the field.

Moving ahead

Work by Major Edwin Armstrong resulted in the first commercial FM broadcasting on the low band. But then World War II cut off experimental broadcasting and further development of its associated equipment. At the end of World War II the FCC doubled the authorized frequency slot assigned for the commercial FM band (88.1MHz to 107.9MHz) and the radio world expected to see commercial FM take off. Many new shapes and sizes of FM antennas and transmitting equipment were soon on the market. But, as we all know, FM progressed rather slowly.

Because of the differences in propagation between the AM and FM frequencies, antenna requirements for the new FM service were vastly different from the old AM system. In AM the distance to the service contour for a given power is mainly controlled by the ground conductivity and the operating frequency.

In FM the distance to the service contour is controlled mainly by the height of the antenna above ground (elevation above average terrain), ERP and lack of intervening obstacles. "Line of sight" is the major requirement.

Most AM transmitters require tall vertical radiators and it is fortunate that vertical polarization is the preferred choice. FM antennas are relatively small but efficient. Therefore, radiating systems can employ either horizontal, vertical or circular polarization. Because of the higher frequency,

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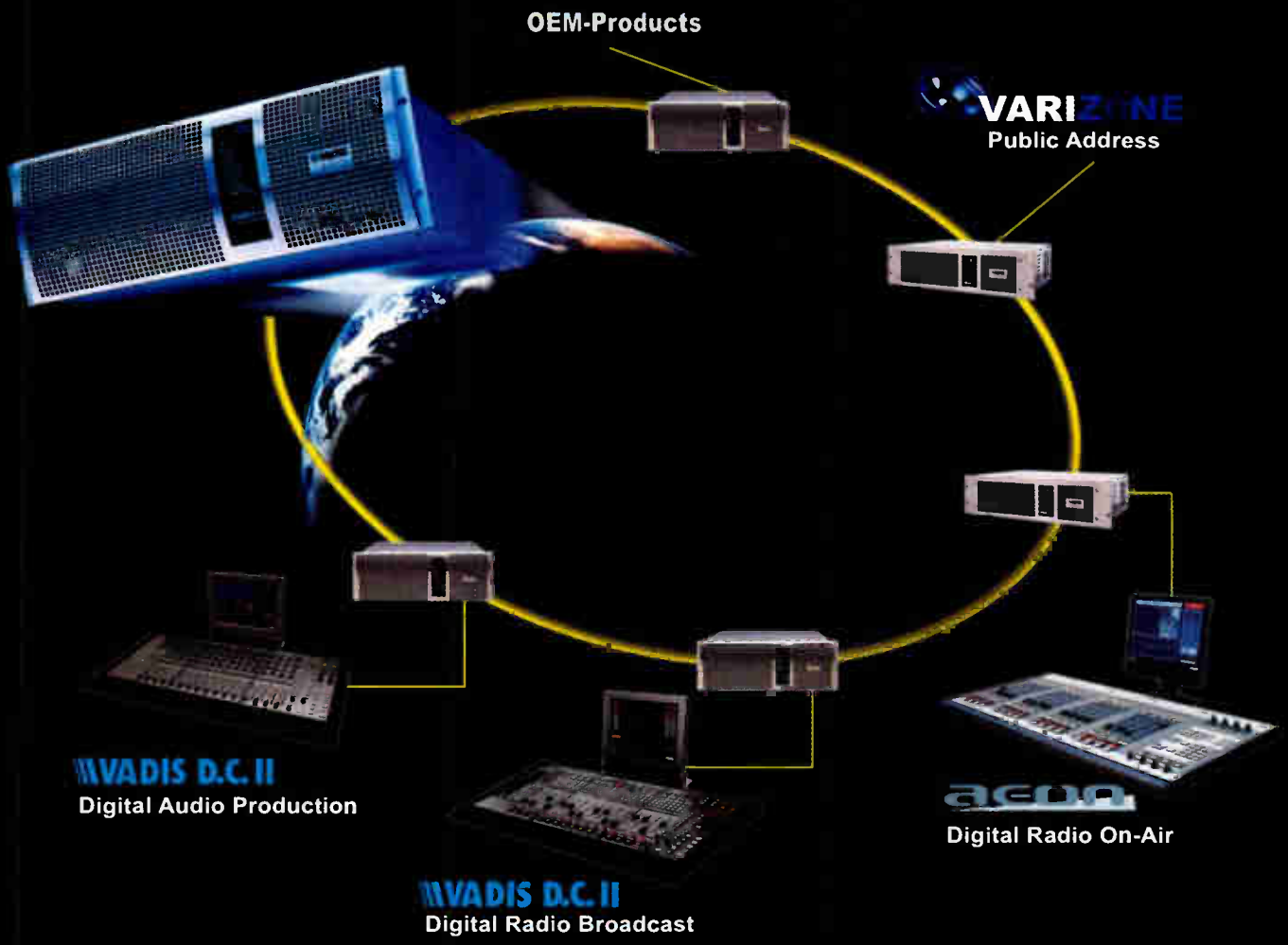

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and consequent smaller size, many FM antenna designs are possible.

Early FM

When FM broadcasting first commenced the FM antenna was mounted on a tall tower many feet above ground. It became obvious that existing AM stations could mount their FM antennas on top of their AM radiators and avoid the expense of additional towers. Many original FM antennas were designed as top-mounted radiators, which should produce a fairly uniformly circular radiation pattern. However, sometimes it became necessary to side mount an antenna because of overall tower height restrictions or other technical problems.

New construction can distort an AM station's anticipated service contour.

The AM transmitter operators were already aware of the problems of pattern distortion caused by closely adjacent vertical structures within the high field area of an AM radiator. This has become an increasingly difficult problem for FM operators. When small FM radiators are mounted a few feet from the face of a tower the original basically circular pattern of the FM radiator will be distorted by reradiation and reflections from the tower. Consequently, a coverage pattern far different from the expected may result.

Another point of difference between AM and FM broadcasting is the amount of horizontal real estate required by an FM antenna regardless of whether it is nondirectional or highly directional. Twelve tower arrays are not required, only a suitable supporting structure that will carry the desired number of FM antennas and will not conflict with EPA non-ionizing radiation requirements.

The nondirectional AM station may have areas within its service contour where there is excessive interference, there may be areas of low signal level due to the presence of large metallic objects and there may be skywave interference. A directional AM station may have additional problems due to new construction that distorts its anticipated service contour.

As radio broadcasting has progressed and FM finally came of age, automobile listening increased and is more used than AM today. The higher frequency (shorter wavelength) signal is susceptible to spurious reradiation from almost any metallic object within high signal level areas. Distant ground features, buildings and terrain can cause trouble through reflections and reradiation that interferes with the desired signal. A particularly irritating form of interference is picket fencing. This causes the desired signal to vary in signal level and sound like it was being received through a picket fence.

The terrain in the area of the FM transmitter is extremely important. Reflections from tall buildings and mountainous areas, as well as intervening large bodies of water, can produce interfering signals from several; this is known as multipath.

As our experience with FM has grown and our knowledge of high-frequency propagation has increased a large number of valuable technical service programs have become available.* Anyone who plans a new FM station should avail himself of one of these programs. A properly prepared and executed propagation/coverage program will frequently expose unexpected areas of poor reception from what otherwise appears to be an excellent site. This precaution can save a great deal of expensive site error correction after construction.

E-mail Battison at batcom@bright.net.

** A survey of available transmitter siting and coverage software programs appeared in the March 2006 issue of* Radio *magazine.*

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FAA proposes tougher tower approval rules

By Harry Martin

The Federal Aviation Administration (FAA) has proposed major changes to the factors it considers in determining whether proposed construction of new towers or modifications to existing communications facilities are hazards to air navigation. The proposed changes would have a significant effect on broadcasters by preventing or delaying tower construction, and restricting changes in existing facilities even where no new tower construction is proposed.

Under the existing FCC rules broadcasters must notify the FAA of any proposed new tower construction or modification that is 200 feet or higher or that lies within certain specified airport approach paths. The FAA evaluates these notifications to determine whether the tower is a potential physical obstruction to aircraft and, in the case of FM radio and VHF-TV facilities, whether the facility will potentially cause electromagnetic interference (EMI) to aircraft navigation equipment.

In its pending rule making, the FAA is proposing to expand the scope of its review of FCC-licensed communications facility applications, particularly their EMI effect. At a minimum the new rules, if adopted, will cause significant delays in the construction timetable for otherwise routine towers. Additionally, whole new classes of FCC applications will be made subject to prior FAA approval.

Among other changes, the FAA proposes:

- The filing of notices of proposed new construction for any man-made structure (whether a tower or a building) that will support a radiating element used for radio frequency transmission on the following frequencies: (i) 54MHz to 108MHz, (ii) 150MHz to 216MHz, (iii) 406MHz to 420MHz, (iv) 932MHz to 935/941MHz, (v) 952MHz to 960MHz, (vi) 1,390MHz to 1,400MHz, (vii) 2,500MHz to 2,700MHz, (viii) 3,700MHz to 4,200MHz, (ix) 5,000MHz to 5,650MHz, (x) 5,925MHz to 6,525MHz, (xi) 7,450MHz to 8,550MHz, (xii) 14.2GHz to 14.4GHz and (xiii) 21.2GHz to 23.6GHz. This covers the FM and VHF-TV bands as well as some frequencies used for remote pickup facilities.
- The filing of notices with respect to any change to a communications facility previously approved by the FAA that operates on any of the above frequencies, including a change in frequency, the addition of a frequency, an increase in ERP equal to or greater than 3dB and the modification of a radiating element, which increases the height of the antenna mounting location 100 feet or more, changes the antenna specifications (including gain, beam width, polarization or pattern), or changes the antenna azimuth/bearing (*e.g.*, point-to-point microwave).
- The filing of notices of any change in the type of antenna used by a communications facility operating on any of the above frequencies, if the antenna type was specified in a previous FAA determination.
- No-hazard determinations would not be effective until 40 days after their issuance, or after resolution of any appeals, instead of the current practice of making them effective on the date of issuance. Notices of construction would have to be filed 60 days in advance, instead of the current 30 days.
- The filing of notices of any proposed new tower construction or modification near a private use airport or heliport that has at least one FAA-approved instrument approach procedure. Notice of proposed new tower construction or modification on or near a private use airport or heliport is not currently required.
- To make changes in the FAA's evaluation scheme for the five airport runway "imaginary surfaces" (in FAA parlance, horizontal, conical, primary, approach and transitional surfaces), the agency uses to determine whether a proposed new or modified facility may potentially be a hazard.

Dateline

Oct. 2 is the deadline for radio stations in Iowa and Missouri to file their biennial ownership reports.

Oct. 2 is the date on which radio stations in Alaska, Florida, Hawaii, Iowa, Missouri, Oregon, the Pacific Islands, Puerto Rico, the Virgin Islands and Washington must place their annual EEO reports in their public files and post them on their websites.

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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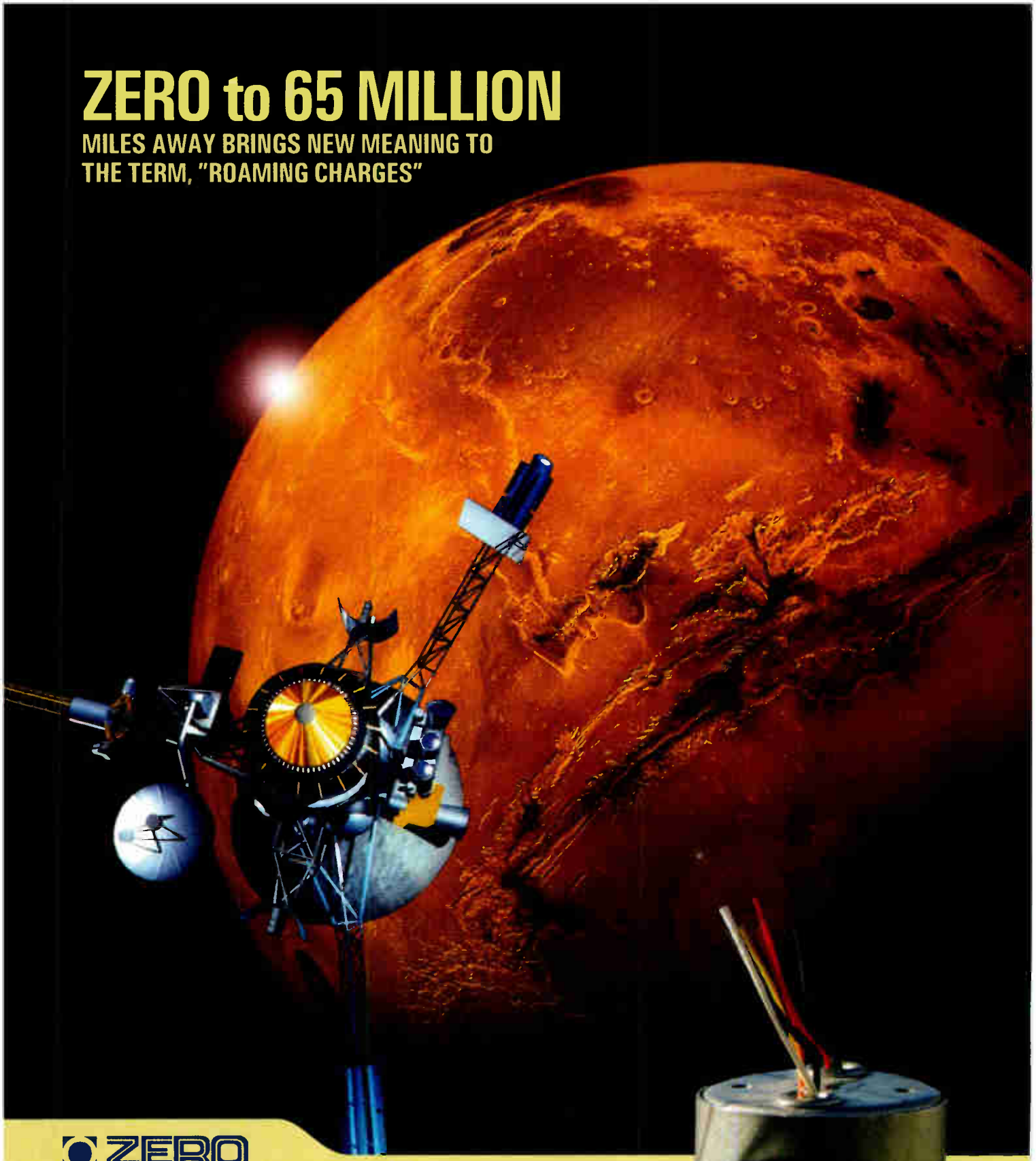

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New and nifty, or tried and true?

New options for the old standby

By Chris Wygal

The time finally arrives when your GM asks you to have a seat in his office. He explains that the company is headed in a new direction and looking for change. Just when you think you've lost your job, he says, "It's time to rebuild the on-air and production facilities." So now, as you enjoy relief and certain job security, the equipment list, floor plans, time schedules and budget issues start racing through your head. And because you're guaranteed to lose sleep for the next few weeks, you start thinking of some fresh new products you'd like to use and you ask yourself this question: "What's the one item in the facility that every on-air and production staff member will have an opinion about?" Chances are, they'll have something to say about the microphones.

There exists a breed of audiophiles who obsess over makes, models and manufacturers in their microphone arsenal. They miserably fiddle and fuss over placement, proximity and voice type when setting up mics for their sessions and on-air events. On the other hand, there is a rising number of audio engineers and production people who are less particular about microphones. They rely on good preamps, processors and postproduction techniques. This creates room for implementing less expensive microphones. Plus, the availability of inexpensive non-linear editing software has paved the way for new institutions such as podcasting and home recording studios. Thus, a massive crowd (with limited cash flow) is now in the market for inexpensive, yet effective microphones.

The rundown

AKG has recently introduced the Perception 100, 200 and 400 mics, which accommodate general purpose miking needs. The Perception 100 and 200 are much alike, offering a cardioid polar pattern and 1" gold-sputtered diaphragm (a design feature that prevents shorting in high SPL situations). The Perception 200 adds a bass cut filter and 10dB switchable preattenuation pad, adding increased headroom for close miking. The 200 is also packaged with a metal carrying case and elastic spider shock mount, an added plus when compared to the 100's metal stand mount. The dual-diaphragm deluxe Perception 400 takes the 100 and 200 design a notch higher in performance and price, offering features such as a polar pattern selector, which switches between cardioid, figure eight and omnidirectional pickup patterns. The Perception 400 is packaged with a metal carrying case and elastic spider shock mount and is better suited for more critical miking applications, especially when budgets are less limited. The 100, 200 and 400 models offer a rugged all-metal design and each weighs about 1lb. Optional accessories for the Perception series from AKG include a 48V battery supply and dc/dc converter, studio pop screen, external windscreen and floor stand.

The designs of the Audio-Technica 40 Series microphones seem the same at first glance, however each mic brings unique characteristics to the table. The A-T4033/CL, a tribute to the A-T4033, contains a vapor-deposited gold

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diaphragm that has been aged to ensure consistent performance and a nickel-plated brass acoustic element baffle that provides increased stability and sensitivity. The capsule and housing design are constructed to reject internal reflections, noise and vibration. The A-T4033/CL has a switchable 80Hz highpass filter to reduce unwanted low frequencies.

Designed much like the 4033/CL, the AT-4040 is a utility side-address condenser. The 4040 comes with a specially tensioned diaphragm. The 4040 has a switchable 80Hz highpass filter and 10dB pad.

The Audio Technica 30 Series offers the AT-3035 and AT-3060, two side-address condenser mics whose designs are more economical than the 40 Series, and still provide a great deal of quality for project studios and broadcast studios alike. The 3035 is designed much like the AT-4040, while the 3060 mimics the AT-4060 in its tube design. A real plus to the 3060 is the simple 48V phantom power supply requirement. Audio Technica also boasts the 20 Series that from a design perspective looks just like the 40 series. This includes the AT-2020, an affordable approach to general side-address miking needs, and the AT-2041, a package including an AT-2020 and AT-2021.

New choices from long-established manufacturers offer high performance with an economical price, such as the AKG Perception 400.

Audix has created the CX112 that fills the studio side-address condenser role in the extensive Audix microphone line-up. The single pattern cardioid contains a gold-sputtered diaphragm capsule that captures warm sonic characteristics, making it excellent for digital recordings. It lends itself strongly to instrument miking, as it can handle SPLs near 145dB. The mic comes equipped with a switchable 10dB pad, bass roll off, and can be switched on and off. The Audix SCX-25 is a unique condenser in its design and engineering. The large diaphragm capsule is mounted above a small, slender body that contains miniaturized circuitry, allowing the SCX-25 to leave a small, elegant footprint. The capsule is internally suspended, eliminating the need for an external shockmount.

Electro-Voice's RE-20 offers a heavy steel design and hum-bucking coil reject EMI, and an integrated wind filter reduces and nearly prevents pops and sibilance. The RE-20 behaves much like a condenser in its frequency and transient response; however, the dynamic Acoustalloy diaphragm makes it effective in high SPL environments. Proximity effect and off-axis coloration are greatly reduced by Variable-D technology. Electro-Voice didn't stop however with the RE-20. The RE-27ND is built just like the

Xtreme Radio Automation...

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The 'Bridge' hardware ...

supplied by Arrakis contains the audio sound cards, routing switchers, and control logic so that the PC requires NO special hardware or setup. This means that the PC can be off-the-shelf, and unmodified so that it is easily serviced locally. The Xtreme 'Solutions' program is per workstation for complete redundancy and backup. Imagine an AM/FM combo with production room for only $300 per month. With more than 15 years of automation experience and thousands of Arrakis automation systems in the field around the world, Arrakis can provide you with the solution that meets BOTH your business AND technology needs.

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a 16 x 3 stereo routing switcher, dual PC sound cards, & control logic

the XTREME '*Solutions*' program

Xtreme is a complete solution for live & automated On Air Radio systems. Pay one very low monthly fee, and we do the rest. We supply the audio hardware, software, and support, while all that you supply is the PC. Without a large initial equipment investment there is no financial risk or capital expense; the old automation system can be upgraded out of current operating costs. With free system configuration and training you receive the help you need to make a smooth transition to the new system. With free hardware replacement, ongoing repairs are worry free. Free telephone support helps train new staff, and free software upgrades means you have the latest product features at no cost. The only hardware that is not included is the PC computer and we can help you with that too... also for free.

...the risk free automation system
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970-461-0730 www.arrakis-systems.com **Arrakis**

New and nifty, or tried and true?

RE-20, except for its attractive satin nickel finish, and some changes in the diaphragm. The RE-27ND contains a neodymium alloy magnet and a reinforced diaphragm dome. This offers an increased output of nearly 6dB, and a noticeable response to high frequencies.

Other approaches

The Heil Proline is a series of dynamic cardioid studio microphones that not only meet or exceed sonic requirements, but are pleasing to those who appreciate classic radio aesthetics. The Heritage studio microphone mimics the Elvis microphone of the 1950s, with its chrome finish and birdcage design. Looks aren't everything however, as the

Resource Guide

Manufacturers of microphones

ADK
877-4 ADK MICS
www.adkmic.com

AKG Acoustics
615-620-3800
www.akgusa.com

Audio Engineering Associates
626-798-9128
www.wesdooley.com

Audio-Technica
330-686-2600
www.audio-technica.com

Audix
800-966-8261
www.audixusa.com

Avlex
877-447-9216
www.avlex.com

Behringer
877-672-0816
www.behringer.com

Beyerdynamic
800-293-4463
www.beyerdynamic.com

Blue Microphones
818-879-5200
www.bluemic.com

Brauner Microphones
702-365-5155
www.braunerusa.com

Cad Professional Microphone
800-762-9266
www.cadmics.com

Coles
207-773-2424
www.independentaudio.com

Countryman Associates
650-364-9988
www.countryman.com

DPA Microphones
303-823-8878
www.dpamicrophones.com

Earthworks
603-654-6427
www.earthworksaudio.com

Electro-Voice
800-392-3497
www.electrovoice.com

G Prime
212-765-3415
www.gprime.com

Looking to touch your listeners?

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Every element of the Model 230 is superior to any other voice processor's similar function...

- The RPA™ tube preamplifier provides warmth, image and detail.
- The Easyrider® Compressor controls output levels without pumping or breathing.
- The Logic-Assisted™ Gate won't false trigger or cut off words.
- The Split Band De-esser effectively cuts sibilance without dulling.
- The Big Bottom® and Aural Exciter® add resonance, depth, presence and clarity.
- The parametric EQ takes care of any frequency anomalies with surgical precision.
- Post-processing insert point, -10dBV and +4dBu analog outputs, 24/ 96 digital outputs on AES3, S/PDIF and Optical, word clock I/O, and a cough switch with soft mute allow the Model 230 to be easily interfaced into any system.

So if you *are* looking to touch your listeners, you should be looking at the Aphex Model 230.

www.aphex.com

Genuine APHEX

New and nifty, **or tried and true?**

1 1/8" aluminum low mass voice coil construction and close attention to the phasing plug assembly produce a linear cardioid pattern, reducing proximity effect and responding nicely from 40Hz to 18kHz (a design common in the Proline series). A blue foam breath blast screen fits inside the shell, replacing the traditional silk screens used in older microphones.

The Heil Classic Pro Studio Microphone is a throwback to the familiar 1930s RCA broadcast mic. However, while the Classic Pro and Heritage models may look old, they are equipped with today's technology. The Classic Pro is also a dynamic cardioid, and behaves sonically like the Heritage. Heil took the opportunity to have some fun

Resource Guide

Hebden Sound
+44 114 201 3687
www.hebdensound.com

Heil Sound
618-257-3000
www.heilsound.com

Holophone
416-362-7790
www.holophone.com

Joemeek/PMI Audio
877-563-6335
www.joemeek.com
www.pmiaudio.com

Lawson
615-269-5542
www.lawsonmicrophones.com

Marshall Electronics
800-800-6608
www.mxlmics.com

Mojave Audio
818-847-0222
www.mojaveaudio.com

Nady Systems
621-644-4466
www.nadywireless.com

Neumann
860-434-5220
www.neumannusa.com

OKM Soundman
207-773-2424
www.independentaudio.com

Pearl Microphone Lab
+46 42 58 810
www.pearl.se

Rode Microphones
877-328-7465
www.rodemic.com

Roland Corp
800-542-2307
www.rolandus.com

Royer Labs
818-847-0121
www.royerlabs.com

Samson Technologies
516-364-2244
www.samsontech.com

Sanken Microphones
323-845-1155
www.promediaaudio.com/sanken

Schoeps/Posthorn Recordings
212-242-3737
www.posthorn.com

SE Electronics
408-873-8606
www.seelectronics.com

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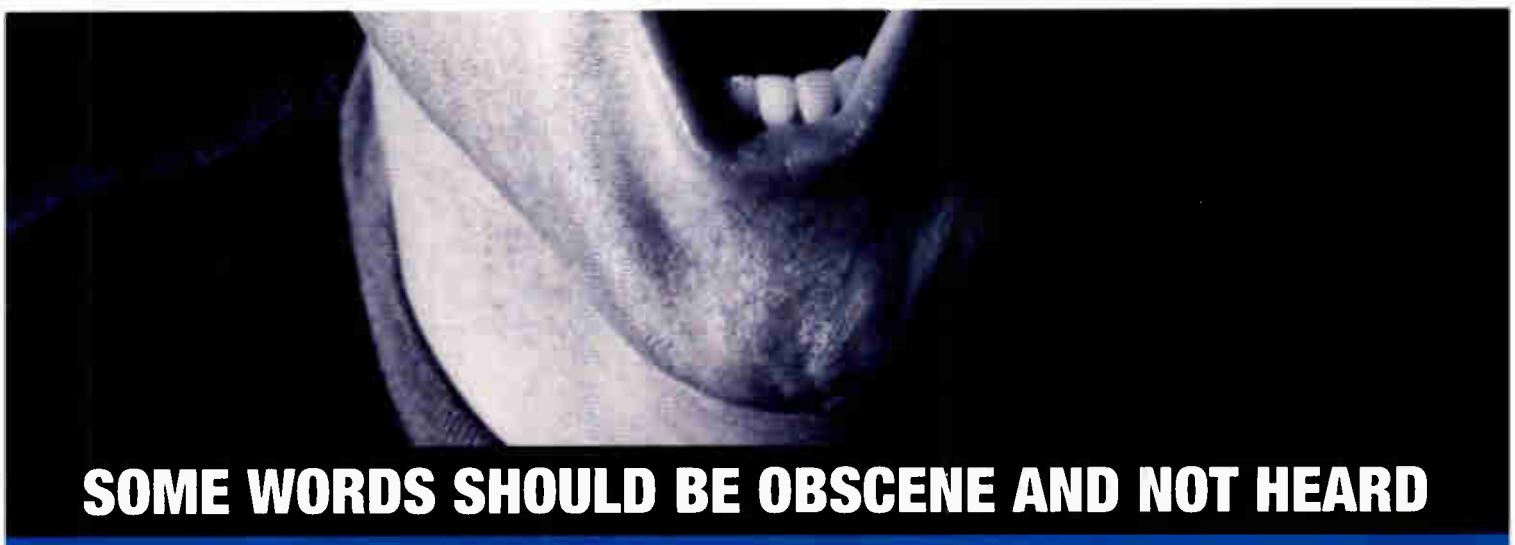


SOME WORDS SHOULD BE OBSCENE AND NOT HEARD

Eventide Broadcast Delays are designed to keep profanity off your air, and angry listeners, embarrassed advertisers, and the FCC off your back. We invented the obscenity delay and have a solution for stations large and small that provides up to 80 seconds of the highest quality revenue and license-protecting delay.

Our new HD compatible BD600, 24-bit delay, comes standard with AES/EBU, and provides up to 80 seconds of memory — twice as much as other delays. There are fully adjustable Delay and Dump functions, and a Sneeze function which "edits" audio entering the delay, allowing the host to sneeze, cough, or make a short comment without being heard on air.

The BD600 offers two different methods of delay buildup and reduction: Eventide's catch-up and catch-down system, and an exclusive fast-entry-and-exit feature which allows starting a broadcast with the delay already built up to a safe amount and ending it with a rapid reduction of delay.

For HD, the BD600 offers MicroPrecision Delay™ mode which allows up to 10 seconds of delay to be adjusted in real time in 100 nanosecond increments. This is useful for synchronizing analog and digital signals while on-air, without audible artifacts, to maintain a seamless user experience.

Whatever your size, whatever your format, you can't expect to protect the integrity of your air and the foundation of your business without an Eventide Broadcast Delay in your rack.

Eventide

HD COMPATIBLE

New and nifty, **or tried and true?**

with its retro Classic Pro and Heritage designs, but the Proline also offers microphone solutions that aesthetically compare to today's microphone construction.

The PR-20 and PR-30 are internally constructed much like the Classic Pro and Heritage Studio Microphones, using the same Proline element, low mass voice coil and sorbothane shock mount system. The PR-20 design matches that of a hand-held mic, while the PR-30 looks more like a standard shock-mounted studio microphone. Heil mixes things up with the the PR-40 by using a unique copper-wound voice coil, neodymium magnet structure and the Heil DM 6 dynamic element that creates frequency response as low as 28Hz. The PR-40 delivers the characteristics of an expensive condenser microphone, but without reproducing background noise, and eliminating the need for phantom power.

Sennheiser also has a stake in affordable studio microphones, touting the MD421II.

Function is important, but form can add some personality like the Heil Classic Pro.

The MD421II handles high SPLs and comes equipped with a five-position bass roll-off switch, making it flexible in correcting proximity effect.

Neumann has two mics tailored for broadcast use. The BCM 104 condenser mic offers an independent, functionally-optimized design derived from 3D simulations. The large-diaphragm condenser capsule features a cardioid directional pattern with internally switchable proximity effect compensation. A second switch allows the sensitivity to be reduced by 14dB.

Housed in a similar package, the BCM 705 is a departure from traditional Neumann designs because it uses a dynamic mic element. 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 KMS 105 and BCM 104 microphones are used in this mic, removing the need of foam in front of the capsule. The 104 and 705 have changeable, color-coded head grills for easier indentification.

Shure's KSM line boasts the KSM 27,32 and 44 side address condensers. These mics contain Class A discrete transformerless amplifiers (for fast transient response and no crossover distortion), 1" gold-layered low mass Mylar diaphragms, 15dB pads for high SPLs, three-stage pop protection grills, and internal shock mount design. The

Resource Guide

Sennheiser Electronic
860-434-9190
www.sennheiserusa.com

Shure
800-25-SHURE
www.shure.com

Sony Electronics
800-686-SONY
www.sony.com/proaudio

Sound Performance Lab
805-241-5140
www.spl-usa.com

Soundelux Microphones
323-603-3228
www.transaudiogroup.com/soundelux.shtml

Soundfield Research
+44 1924 201 089
www.soundfield.com

Studio Projects
310-323-9050
www.pmiaudio.com

KSM 44 has added features such as externally biased dual diaphragm construction, and a three-position low frequency filter for greater proximity effect correction.

The 55SH Series II is reminiscent of the classic Shure Unidyne II birdcage design. The 55SH is great for use in unfavorable acoustic conditions, because the dynamic unidirectional cardioid pickup pattern minimizes sound from behind the mic. The 55SH is outfitted with an on/off switch and cartridge shock mount to reduce stand noise.

The Shure SM7B is a dynamic studio mic. The cardioid polar pattern provides minimum coloration of off-axis sound; a valuable feature for inexperienced voice and on-air talent. The SM7B comes with bass roll-off and middle frequency emphasis adjustments to help tailor sound, and an internal air suspension shock isolation system that reduces mechanical noise. The SM7B ships with the A7WS windscreen for added protection against plosive Ps, and allows for warmer vocal pickup.

Other quality, yet affordable studio microphones to look for include the JoeMeek JM Series, the Studio Projects B and C Series, the Rode NT1-A, NT2-A, NT3, NTK, NT1000 and 2000, the Rode K2 and the Rode Broadcaster. All these microphones are a part of the growing number of mic models that our favorite manufacturers are making available to fit the expanding need for cost-effective microphones. While the availability of condenser, tube and dynamic studio mics have become more widespread, their quality hasn't fallen markedly, and if in fact newfound project studios are the driving force in making microphones more affordable, the radio industry can certainly take advantage.

Wygal is the programmer, engineer and Web designer for WRVL in Lynchburg, VA.

Get ready for the convention

The summer is ending, so it's time to plan for the fall conventions. While the NAB convention in the spring is the main event for broadcasting, it covers such a wide range of interests that radio is sometimes lost in all the activity. The NAB Radio Show is radio's chance to take the main stage and highlight everything that is of unique interest to radio broadcasting.

Dallas is a new site for the show, after having visited Philadelphia (twice), San Diego, San Francisco, Seattle and Orlando over the past several years. The two conventions in Philadelphia are considered big successes by the NAB and the exhibitors, and from your feedback to us, it seems like you as an attendee considered them a success as well. We'll see if Dallas proves to be a good location. Merging with the R&R convention this year is sure to increase attendance if nothing else.

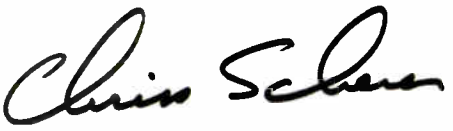
To help you make the most of your time during the convention, our preshow coverage includes four parts. New Products highlights some of the products that you'll find while visiting the exhibitors. Be sure to note that exhibit floor hours have changed this year compared to previous conventions.

Insight to Sessions previews the sessions with a technical focus as well as some non-technical events that may be of interest to the technology manager or engineer. Be sure to check the session guide on site for any updates to the schedule or to confirm a session location.

The Exhibit Hall Map will help you find the exhibitors fast. While the convention floor is much smaller than the exhibit floor in the spring, don't waste time wandering and wondering. Hone in on the manufacturers and service providers you need to see.

The Exhibitor List is the final piece to help you find your way. Some of the exhibitors—such as *Radio* magazine and the FCC—are outside the exhibit hall around the Chantilly Foyer. These exhibits are open at all times during the convention.

Make the most of your NAB Radio Show time with this preview, and I'll see you in Dallas.



— Chriss Scherer, editor

The 2006 NAB Radio Show heads to

Insight to Sessions

HD Radio takes the spotlight again

By Chriss Scherer, editor

The exhibit floor and the sessions are the two main activities during any convention, and this year's NAB Radio Show has a full agenda of sessions slated. With the NAB's and the industry's interest in HD Radio, it's no surprise that this topic is prominent in the technical sessions.

With the show heading to Dallas this year, the organizers of another Dallas-based conference decided to band with the NAB and not hold its own convention. The Society of Broadcast Engineers Dallas Chapter 67 worked with the NAB to provide technical session on the morning of Sept. 20. In addition, the chapter will proctor an SBE Certification exam session on Wednesday afternoon. The SBE recommends that anyone interested in taking an SBE Certification exam should register with the national office in advance (contact 317-846-9000 or mclappe@sbe.org); however, a limited number of on-site exam registrations will be accepted before the afternoon exam session.

While we will profile the technical sessions here, there are plenty of non-technical sessions to attend as well. To get a complete picture of all the session activity, consult the NAB Radio convention guide at the show.

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"The XM Washington location is the largest broadcast facility in the world and it's wired exclusively with StudioHub."

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"In a facility where we're already putting up 160 channels - tomorrow I know that they'll come up with the 161st. StudioHub helps me respond to this constant growth."

Ed Schwartz
VP, Broadcast Engineering
XM Satellite Radio

"One of the early and important choices I made in designing the XM facility was the selection of StudioHub for our audio and data wiring infrastructure. Now, six years later, I've never regretted that decision."

Tony Masiello
Senior VP, Operations
XM Satellite Radio

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Phone: 856-467-8000 • Fax: 856-467-3044 • www.studiohub.com

The 2006 NAB Radio Show heads to

DALLAS

Tuesday, Sept. 19

2 p.m. to 5 p.m., Miro Room

HD Radio: All the Basics and More

Broadcast Electronics has arranged a three-part tutorial on HD Radio. Each one-hour portion will cover a different aspect of implementing HD Radio and start on the hour. Each session focuses on items of interest to everyone involved in the HD Radio transition, but specific interests will be included and are noted in parenthesis. The HD Radio conversion topics (in order) are processes, pitfalls, strategies and successes (managers and programmers); technical planning and realization (engineers, business staff, owners); and nuts and bolts technical issues (engineers).

This seminar will be repeated on Wednesday from 2 p.m. to 5 p.m.

Wednesday, Sept. 20

9 a.m. to 9:55 a.m., Metropolitan Ballroom

Planning Considerations for Upgrading to HD

Presenter: Alan White, Continental Electronics

White will review the basic elements to consider when planning an HD Radio installation, including general site considerations, STL and audio path requirements, audio processing, studio equipment needs and transmitter equipment needs. Stations that have not begun an HD Radio installation will find this session helpful.

10:10 a.m. to 11:05 a.m., Metropolitan Ballroom

Transmitter Installation, Setup and Tuning Process

Presenter: Richard Garrett, Continental Electronics

The transmitter side of an HD Radio installation can be the largest physical portion of the effort. Garrett will cover more details of site preparation and planning and review the installation process. From there he will cover the operational characteristics of tuning an HD Radio amplifier and how it differs from tuning an analog amplifier, monitoring and evaluating the HD Radio transmitter operation and maintaining the HD Radio system.

11:05 a.m. to noon, Metropolitan Ballroom

System Verification and Measurement Procedures

Presenter: Daniel Dickey, Continental Electronics

Going deeper into the test and measurement details, Dickey will discuss the test equipment needs of a station transmitting an HD Radio signal, and describe the required measurements to ensure that the system is operating within the spectrum mask and at its best efficiency. He will also review several measurement techniques and ways to document these measurements.

2 p.m. to 5 p.m., Metropolitan Ballroom

SBE Certification Exams

To take an SBE exam during the NAB Radio Show, it is recommended to submit a certification exam application to the SBE National Office in advance. Some on-site exam registrations will be accepted. Download and complete the SBE Exam Application from www.sbe.org before arrival to save time. On-site applications will be accepted beginning at 1:30 p.m.

Thursday, Sept. 21

9 a.m. to 10:30 a.m. - Radio Technology Forum Part I

9 a.m. to 9:45 a.m., Metropolitan Ballroom

Real Time Adaptive Correction Explained

Presenter: Geoff Mendenhall, Harris Broadcast

An explanation of the basics of how linear and non-linear pre-correction works in HD Radio or DRM systems without a lot of math so the typical radio station engineer can understand the concepts.

9:45 a.m. to 10:30 a.m., Metropolitan Ballroom

Radio Studio Buildouts: Tools, Process... Results!

Presenter: Steve Davis, Clear Channel Radio

An overview of the process of planning and overseeing radio studio construction projects, from the architectural and equipment selection process, through installation and move-in.

2:30 p.m. to 5:30 p.m. - Radio Technology Forum Part II

2:30 p.m. to 3:15 p.m., Metropolitan Ballroom

Networking and Link Issues When Implementing Multicasting

Presenter: Richard Hinkle, Broadcast Electronics

This will be a practical approach to understanding the issues encountered when implementing multicasting for your HD station. The focus of this paper will be how to set-up networks to ensure a robust multicast system without compromising your main network. In addition he will provide insight into STL link issues, limitations and possible solution.

3:15 p.m. to 4 p.m., Metropolitan Ballroom

Adventures in AM IBOC Implementation

Presenter: J.S. Sellmeyer, Sellmeyer Engineering

A discussion of some of the RF issues involved with properly implementing AM IBOC issues together with examples of the steps necessary for an optimum load on the transmitter.

4 p.m. to 4:45 p.m., Metropolitan Ballroom

Audio Processing In Transition

Presenter: Frank Foti, Omnia Audio

As broadcasting moves closer to a full digital transmission system, the requirements for audio processing have changed dramatically. There is an effect on FM and AM within the traditional analog channel and the digital path. This discussion will provide comprehensive insight about the implementation of audio processing in a digital broadcast facility.

4:45 p.m. to 5:30 p.m., Metropolitan Ballroom

HD Radio Coverage and Interference Issues

Presenter: Doug Vernier, V-Soft Communications

This review will cover the major signal issues facing the transition to HD Rradio. Where will my coverage go? Will my analog station receive interference? What new research is being done and where will it take us?

Friday, Sept. 22

9 a.m. to noon, Metropolitan Ballroom

Digital Radio Measurement Workshop

Presenter: David Maxson, Broadcast Signal Lab

Broadcast engineers familiar with analog signal measurements are now challenged to master new techniques for evaluating their digital signals. To ensure good signal quality and minimize interference, it is necessary to make accurate measurements of hybrid IBOC signals. In this session, David Maxson will review scalar measurement techniques with spectrum analyzers and power meters, and will provide an introduction to vector measurements of IBOC signals. He will also attempt to answer the vexing question, "Is my spectrum analyzer up to the task?" The session will also touch on the effects of amplifiers, filters and antennas on AM and FM IBOC signal characteristics.

Exhibit floor hours

Wednesday, Sept. 20
2 p.m. to 8 p.m.

Thursday, Sept. 21
9 a.m. to 5 p.m.

The 2006 NAB Radio Show heads to

DALLAS

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AEQ	**521**
Air Force Recruiting	619
Airshift Media	**227**
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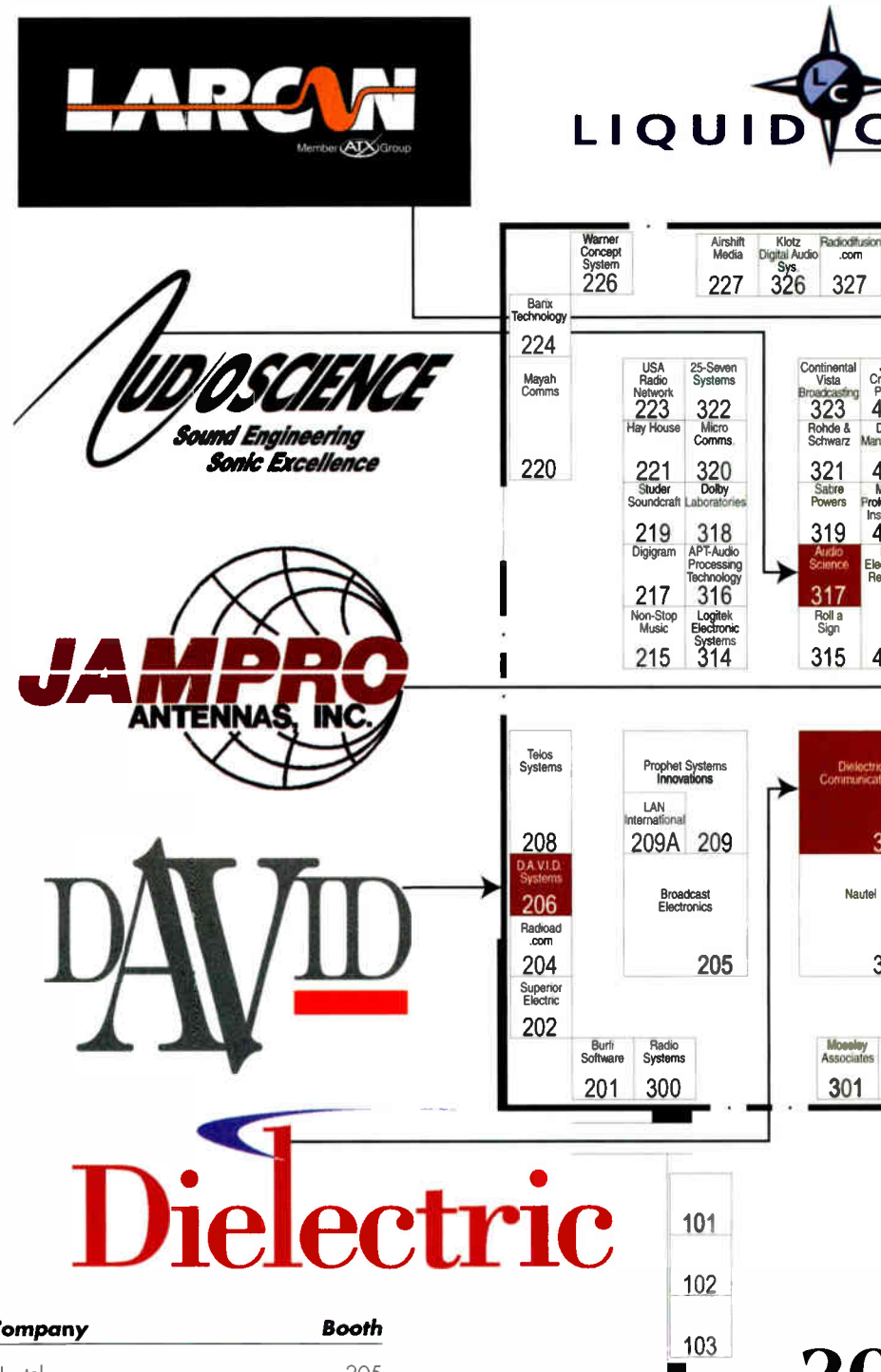
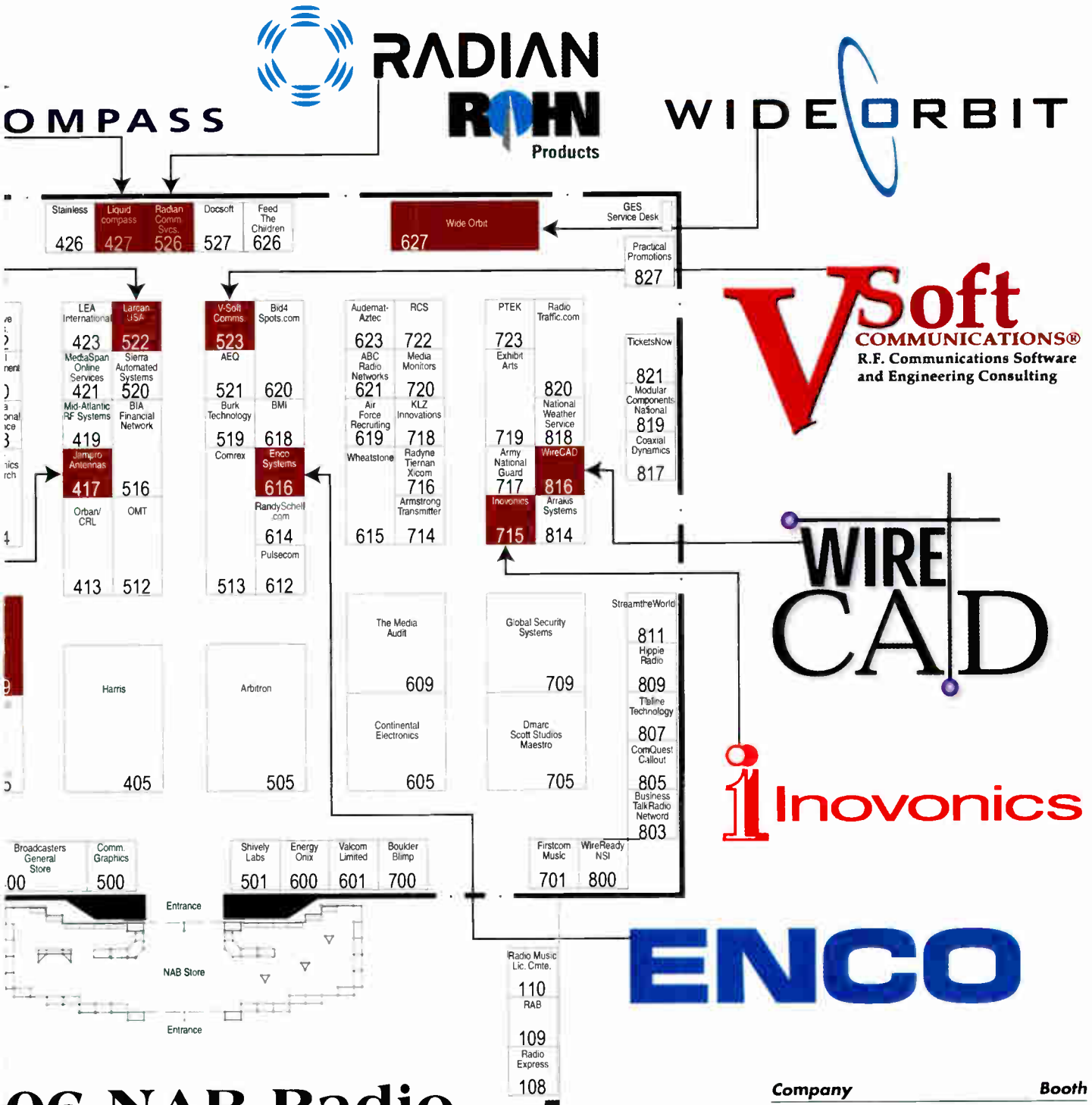
Arbitron	505
Armstrong Transmitter	**714**
Army National Guard	717
Arrakis Systems	**14**
Audemat-Aztec	623
Audioarts	**615**
Audio Science	**317**
Axia	**208**
Barix Technology	**224**
BIA Financial Network	516
Bid4Spots.com	620
BMI	618
Boulder Blimp	700
Broadcast Electronics	**305**
Broadcasters General Store	400
Burk Technology	519
Burli Software	**201**
Business Talk Radio Network	803
Christian Hit Radio Satellite Network	819
Coaxial Dynamics	**817**
Communication Graphics	500
Comquest Callout	805
Comrex	**513**
Continental Electronics	605
D.A.V.I.D. Systems	206
Dalet Digital Media Systems	20
Dielectric Communications	**309**
Digigram	217
Docsoft	527
Dolby Laboratories	318
Enco Systems	616
Energy-Onix	600
ERI-Electronics Research	**414**
Exhibit Arts	719
FCC	115
Feed the Children	626
Firstcom Music	701
Global Security Systems	709
Google	**705**
Harris	**405**
HayHouseRadio.com	221
Hippie Radio	809
Inovonics	**715**
Isee Radio	323
Jam Creative Productions.	422
Jampro Antennas/RF Systems	417
Klotz Digital Audio Systems	**326**
KLZ Innovations	718
Lan International	209A
Larcan	522
LEA International	**423**
Liquid Compass Streaming Media	427
Logitek Electronic Systems	**314**
Magic Egg Software	614
Mayah Communications	220
Media Monitors	720
Media Professional Insurance	418
Mediaspan Online Services	421
Micro Communications, Inc.	320
Mid-Atlantic RF Systems	419
Moseley Associates	301
NAB PAC	111
National Campaigns	116
National Weather Service	18



Company	Booth
Nautel	205
Neural Audio	405
Non-Stop Music	215
Omnia	**208**
OMT	**512**
Orban/CRL	413
Practical Promotions	827
Prophet Systems Innovations	**209**
PTEK	723
Pulsecom	612
Radian Communications Services	526
Radio Advertising Bureau	109
Radio Express	108
Radio magazine	107
Radio Membership	112
Radio Music License Committe	10
Radio Systems	**300**

Company	Booth
Radio Traffic.com	820
Radioad.com	204
Radiodifusion.com	327
Radyne-Tiernan-Xicom	716



06 NAB Radio Hall Map

Company	Booth
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Company	Booth
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Shively Labs	**501**
Sierra Automated Systems & Eng.	**520**
Stainless	426

Company	Booth
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Studer Soundcraft	219
Superior Electric	**202**
Telos Systems	**208**
The Media Audit	609
TicketsNow	821
Tieline Technology	**807**
USA Radio Network	223
Valcom Limited	601
Vorsis	**615**
V-Soft Communications	**523**
Warner Concept System	226
Wheatstone	**615**
Wide Orbit	627
WireCAD	816
Wireready NSI	800

Arc and flame detector
Burk Technology
Booth 519

AFD-1: The AFD-1 detects electrical arcs or flame and sends a contact closure for integration with alerting devices or the station's remote control system. The unit can be used near equipment cabinets, transmitters, lightning arrestors or anywhere threatened by high voltage arcs or flame.

800-255-8090; www.burk.com; soles@burk.com

Internet RPU
Energy-Onix
Booth 600

E-caster: This system permits a broadcaster with an Internet connection at his studio to originate a 15kHz mono program from the E-caster, which is portable and contains a four-channel microphone mixer. The system includes facilities to talk back from studio to remote.

888-324-6649; www.energy-onix.com
energy-onix@energy-onix.com

Mass distribution of alerts
Global Security Systems
Booth 709

Emergency Warning Receiver: This wireless, battery-driven receiver is designed for mass distribution of alerting messages to the public. The system uses the national FM transmission network to deliver data to the receiver. Through advances in FM receiver products, the receiver achieves a nationwide footprint. There is a cost of membership.

228-255-7220; www.gssnet.us; info@gssnet.us

IBOC monitor
Audemat-Aztec
Booth 623

Goldeneagle v1.4: Firmware version 1.4 of the Goldeneagle HD includes the addition of time and level alignment monitoring and RF mask monitoring. This allows the Goldeneagle HD to send an alarm when it detects out-of-tolerance conditions. The digital demodulator for FM analog modulation monitoring can now measure 67kHz and 92kHz SCA signals. A new software called the Broadcast Manager centralizes management of Goldeneagle HD and transmitter remote control units.

305-249-3110; www.audemat-aztec.com
contact@audemat-aztec.com

AM transmitters
Nautel
Booth 205

XR3, XR6: The XR3 and XR6 base units come with dual exciter sections that have an auto transfer function in the event of a low-level circuit malfunction. A second power module can be added with an auto transfer function in the event of a circuit malfunction. The transmitters offer redundant modules for cantinuous broadcast, 128 event logs to facilitate troubleshooting and power programmers that allow for a full year of nighttime automatic power selections. Both transmitters meet the basic requirements for HD Radio and DRM compatibility, high efficiency and advanced man/machine interface.

207-947-8200; www.nautel.com
info@nautel.com

Antenna
Jampro Antennas
Booth 417

JMPC-HD: The medium power version of the FM Penetrator antenna, the Penetrator HD, available with and without de-icers or radomes, has been designed for HD Radio broadcast. Rated at 10kW maximum input, each bay consists of a Penetrator-style radiating element with a 1⅝" shunt feed line. Each antenna is factory tuned to any frequency in the FM band II range on a tower structure that best simulates the customer's actual tower. Multiple frequency design is also available. The true circular polarization of the antenna offers performance for HD Radio, stereo and SCA operation. Typical VSWR is 1.1:1 ±200kHz.

916-383-1177; www.jampro.com
jampro@jampro.com

FM exciter
Harris
Booth 405

Micromax: The 30W, 1RU exciter can interface with any existing Harris transmitter. The exciter combines time-proven PLL technology with modern RF amplifier circuits and abundant features to provide driving power to any FM transmitter. Other features include a built-in stereo generator and automatic power control at any power level. An optional AES/EBU digital audio input is also available.

800-622-0022; www.broadcast.harris.com
broadcast@harris.com

Broadcast engineering software
V-Soft Communications
Booth 523

AM-Pro 2: AM-Pro 2 is an upgrade to the AM-Pro allocation and coverage mapping program. The new version supports grid-style calculation of ground wave and sky wave field strengths and interference. Daytime allocation studies now remove overlap area over water and accommodation for the existing facility. Night allocation studies now support full clipping. Other new features include a cancel button and enhanced equivalent distance methodology.

800-743-3684; www.v-soft.com; info@v-soft.com

Network audio decoder
Barix Technology
Booth 224

Exstreamer 100, Instreamer 100: The Instreamer 100 encodes audio from analog and digital devices into the MP3 format in real-time for point-to-point or multipoint delivery over the Internet or IP-based systems. The serial port in the Instreamer 100 allows the operator to remotely control additional devices over the same network connection. The Exstreamer 100 is a network-based audio decoder that pulls digital audio from an IP network and converts it to music or voice at the receiving address. The Exstreamer 100 offers one USB port, allowing connection of a USB Flash Drive for backup or stand-alone playback applications; "streaming client" software supports new hardware features such as USB for backup audio, switchover between multiple sources, WMA and MMS support and network updateable and reconfigurable over the network in a secure fashion.

866-815-0866
www.barix.com; info@barix.com

Digital audio console
AEQ
Booth 521

Arena: The console can monitor all the signals present in the system, as well as use the configuration presets in relation to the Swap Page. The dedicated controls for dynamic, EQ, routing and select located above the faders have dual function. In the other mode of operation, these controls turn into send buttons that route the signals to buses, such as master 1, master 2, aux 1 and aux 2. The user may request the on and off controls on top or below the faders. To facilitate easy maintenance, each console offers changeable modules.

954-581-7999; www.aeqbroadcast.com
sales@aeqbroadcast.com

Newsroom software
Prophet Systems Innovations
Booth 209

News Builder: News Builder is the comprehensive, stand-alone newsroom software that enables reporters to write newscasts, receive and revise wire copy and digitally record, edit and playback audio.

877-774-1010; www.prophetsys.com
sales@prophetsys.com

Sound cards
Audio Science
Booth 317

ASI6500, ASI6600, ASI 6544, ASI 6522: The ASI6500 series is smaller, faster and has more functionality than the equivalent ASI6000 card. These products are also lead-free and compliant to the EU RoHS mandate. Models ASI6544, ASI6522 and ASI6514 offer balanced analog and AES/EBU I/O and the ASI6540 and ASI6520 are analog only.

302-324-5333; www.audioscience.com; sales@audioscience.com

Software
Airshift
Booth 227

Aishift Airtime: Airshift Airtime supports the workflow of the small- and medium-size radio station traffic process. Manage customers, contracts, campaigns and single spots, and schedule them on daily playlist with this system. Airtime stores all the data in a fast SQL database, which is stored locally on the same computer. The main window provides real-time information of the scheduling process.

+358 50 365 0577; www.airshift.tv; sales@airshift.tv

IP codecs
Audio Processing Technology
Booth 316

Worldcast Horizon, Worldcast Meridian: Worldcast Horizon and Worldcast Meridian are the first products in this new generation of APT audio codecs featuring IP connectivity as their core functionality. The Horizon offers digital audio over IP for bi-directional stereo audio transport. It operates using Enhanced Apt-x

coding technology for to the transport of audio over packet-switched networks. Based on DSP architecture, the Horizon provides contact closures and opto-couples for remote status alarms. The Worldcast Meridian is a fully duplex, multi-algorithm audio codec offering IP and leased line connectivity. Users can choose from a suite of coding options including: Enhanced Apt-x, G.711, G.722, MPEG Layer II, MPEG Layer III, AAC, AA LD and AAC LC.

800-955-APTX
www.aptx.com; aptmarketing@aptx.com

Production console
Wheatstone
Booth 615

G-7: This console features 12 user-programmable switches, automatic failsafe DSP/CPU card options, a redundant power supply option, switched meters with system-wide access, GUI setup software, automation-friendly protocol and event scheduling software. No PC is required for independent operation. The console also features a mixing router based topology, expansion and compression on all input channels, four-band parametric EQ on all input channels, variable high- and low-pass filters on all input channels, event storage and recall, four stereo output buses and eight mix-minus outputs.

252-638-7000; www.wheatstone.com
sales@wheatstone.com

Console
Logitek
Booth 314

Artisan: This flexible, modular control surface for the Logitek Digital Audio Engine offers multiple frame sizes to accommodate two to 30 faders along with two master mixes, eight sub mixes, four aux mixes, 24 mix-minus outputs and three monitor outputs. 5.1 surround processing is available on one master mix, one sub mix and one monitor out. Available modules include fader, monitor, master and effects. Two sizes of meter bridges are also available, along with the Vscreen software application, which allows the user to build full-screen meter banks as well as router controls. All parts in the surface are isolated from the ac mains power for safety. The power supply includes 25 GPI in and 25 GPI out connections for external device interfacing.

800-231-5870; www.logitekaudio.com
info@logitekaudio.com

Keynote Address
Thursday, Sept. 21
10:30 am – 11:45 am
Keynote Address Sponsored by
BMO Capital Markets

Keynote
Former Harley-Davidson Spokesman tells Radio to 'Make Some Noise'

Ken Schmidt
Communications Expert
Former Harley-Davidson Executive

State of the Industry Address

David Rehr
President & CEO
NAB

Extreme Thinkers Super Session
Friday, Sept. 22
10:30 am – 11:45 am

Radio Luncheon
Wednesday, Sept. 20
12:30 pm – 2:00 pm
Luncheon Sponsored by:
ASCAP

Special Interview

Troy Aikman
Pro Football Hall-of-Famer, Sports Analyst & Host, *Sporting News Radio*

NAB National Radio Award Recipient

David Kennedy
Former CEO
Susquehanna Media

NAB Marconi Radio Awards Reception, Dinner & Show
Thursday, Sept. 21
6:00 pm
MARCONI Radio AWARDS
Sponsored by HD DISCOVER IT!

Host

Big Boy
Big Boy's Neighborhood
Power 106
Los Angeles

Panelist

Arianna Huffington
Co-host of public radio's *Left, Right & Center*
HuffingtonPost.com

Moderator

Scott Kirsner
Contributing Writer for *Fast Company* & *Wired* magazines

Entertainment provided by broadcasters band, *The Formats*. Led by:

Steve Cropper
Legendary Blues Guitarist & BMI Songwriter

Panelist

Bill Taylor
Founding Editor
Fast Company
Co-author
Mavericks at Work

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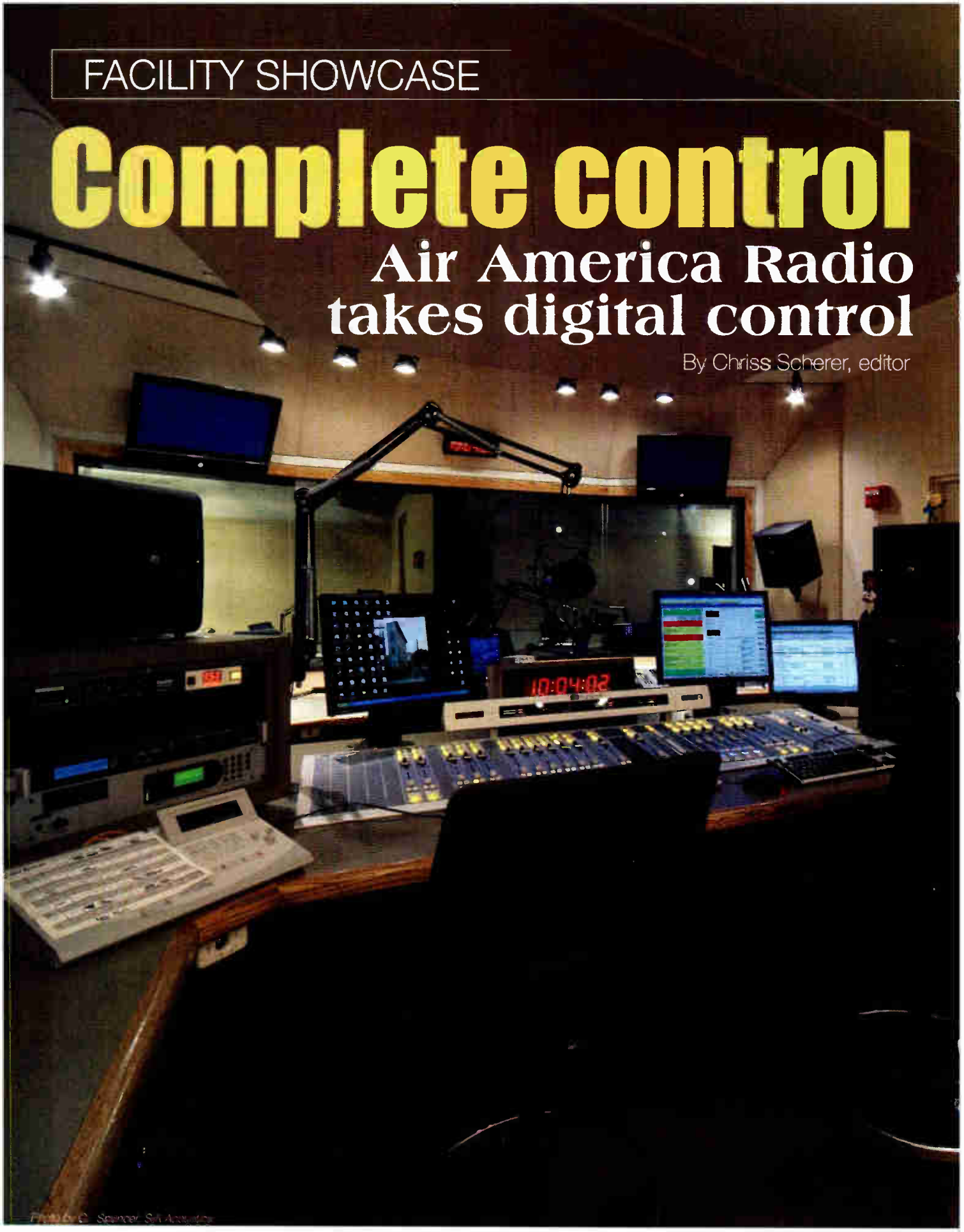
Dallas, Texas

www.nabradioshow.com

Complete control

Air America Radio takes digital control

By Chriss Scherer, editor



Air America Radio is a national, progressive-entertainment, talk radio network that launched in March 2004. The network is known for its outspoken personalities including Al Franken, Jerry Springer, Randi Rhodes and Mike Malloy. And while some listeners may take issue with the views and opinions of the show hosts, the New York radio facility is based on a solid operating platform.

When Air America Radio launched it used a small facility with one studio for the talent and the board operators and one studio for the show producer. While this facility worked, space was tight and the equipment did not meet the reliability needs of the network. In addition, the lease on the space was due to expire in about a year. The work began to relocate.

While planning the new facility, several priorities were established at the beginning. The equipment had to be reliable; Network outages were unacceptable. The facility had to meet the ergonomic needs of the staff—there needed to be more than one studio to accommodate the programming needs.

A site was selected and the work began in July 2005. The clock was running to vacate the old facility, and Juan Diaz, then vice president of engineering, had to keep a tight schedule. It took two months to build and relocate the facility, which went live on Sept. 15, 2005, but the transition was not without a few obstacles.

The work begins

The overall facility layout was conceived by Diaz. He took the ideas to Chad Phielen at Roscor who developed drawings. A centralized audio routing and mixing system was planned, and Sierra Automated Systems was chosen to supply Rubicon surfaces and a 32KD router.

Roscor also designed and built the custom furniture, created the prewiring assemblies and provided the on-site integration services.

The facility houses three live talk radio networks. They are the Air America Radio main channel, the Air America Radio syndication network and the feed for Greenstone Media. All of the programs carried on these networks originate from the New York studios or from various satellite studios around the country. The network programming is delivered to radio affiliates and XM via satellite by Westwood One. A T1 line with ISDN backup delivers the audio to the WW1 uplink. The Internet feeds for Real Networks, Windows Media and MP3 are fed from encoders at the studio to Shoutcast for distribution. Up until Sept. 1, Air America also fed WLIB New York directly via a T1 with ISDN backup and provided a feed with local commercials and IDs.

Studio overview

The main control room, also called mission control, is the largest studio and is centered around the largest Rubicon audio control surface manufactured to date. The 40-slot

Complete control

console features a built-in telephone system control, intercom, talkback, studio-to-airchain routing and delay control. The four producer positions, each with SAS turrets for talkback, monitoring and live-to-air mic control, look in to the two adjoining talk studios.

Talk studio A, the larger of the two talk studios, has a 24-slot Rubicon surface, which is used when AAR originates several live talk shows at the same time or when the intimacy of talent and board op in the same space is appropriate. Talk studio B is the smaller studio and it is equipped with a small Mackie mixer.

The news studio is used to provide on-the-hour news, while a third control room is used for production. The production studio houses a 16-slot Rubicon console.

The Rubicon surfaces share audio sources and destinations through a network of the SAS 32KD router and several Rio frames. This centralized routing system allows any source to be called to any input of any control surface. As many as four airchains are used at any given time, although more outputs are available. To ensure that the wrong words are never aired, each control surface airchain feeds a profanity delay. The flexible audio routing presented a challenge

The host position in the large talk studio faces the in-studio engineer position and the main control room.

to the facility to ensure that the control and status of each delay unit was provided and displayed to the appropriate talent, producer and board-op position. SAS designed a logic system to analyze which airchain is being fed from each surface, and then route the appropriate status and control to the proper positions.

As a backup for audio routing, each studio has two 25-pair trunk cables that run to the rack room, with patch bays inserted around the router. The goal of equipment reliability has been achieved, and the backup routing has not been needed for any emergency use yet. The patch bays have been used for planned maintenance on the router system for system updates and additions.

Construction challenges

Any construction in New York has to face challenges, and this project was no exception. At the beginning it was understood that the studio building, having been built in the 1920's, was considered a landmark. As such, nothing could be done to the building's exterior, and nothing could be added that was visible from the street

Equipment List

360 Systems Instant Replay
Aphex 320-A
Bitree Bantum 32
Broadcast Tools SRC-8 III, SS16.4, SS4.1 III, SS4.2
CDQ Prima 220
Circuit Werks AC-12
Comrex Matrix
Crown D45
Electro-Voice RE27ND
Eventide Eclipse
Fostex 6301
Gefen Extendit 1500R
Henry Engineering Matchbox HD, Superelay, Twinmatch
HHB CDR 830PLUS
JBL LSR 6328 P, SP6C
Mackie DFX-12
Moseley Starlink SL9003T1
O.C. White mic booms
Radio Systems CT 2002
Rane ME30B
RDL Labs Summing Amp
Roscor interface panels
SAS 32KD, Rio, Rubicon, TP-M
Sony MDR-7506
Symetrix 528E
Tascam 112-MKII, CD-450, LA-112, LA-450, MD-350
Telos 2101, 2×12, Zephyr Xstream
Wireready Controlready

or from adjoining buildings. This prevented AAR from installing a generator at the site. Instead, a 150kW UPS was installed. The UPS can support the facility for 10 hours. To accommodate the weight of this unit, the fourth floor that AAR occupies in the eight-story building had to be reinforced.

In case of a long power outage, AAR has a contract with a company to deliver a drive-up generator in less than three hours if it is needed. Power lines from the transfer switch were routed to the street level to connect to the temporary generator. In addition, all the necessary permits were secured to allow the generator to be parked on the street, and to allow AAR to move any vehicles that might be in the way.

Another difficulty was encountered after the project began. The original architect had limited experience in business design and none in studio design. As the limitations were discovered, a new architect, Jensen Design Associates, was brought in to complete the project. The project was already on a tight schedule, and several days were lost when some walls and a door had to be relocated.

Now that the facility is complete, the staff has the room it needs to operate comfortably and the equipment reliability to provide uninterrupted programming. Like many facilities today, the focus has turned from audio routing to data routing, and the SAS routing system fills this need well. The IT staff ct AAR, Director of IT Michael Borges

Photo by C. Spencer, SIA Acoustics

Complete control

and IT Support Tech Gonzalo Londono, are charged with the responsibility to maintain this part of the operation.

There's a lot going on in this facility, and thanks to digital routing, Air America Radio maintains complete control.

Thanks to Juan Diaz, formerly of Air America Radio, Roy Pressman of Pressman Engineering and Technology, and Howard Mullinack of SAS for assistance in preparing this article.

Photo by Howard Mullinack, SAS

The production control room.

Acoustical Design Details

By Sam Berkow

When we began our design efforts for the new Air America Studios, we had to address four main issues: studio layout, accommodation of technical equipment, acoustic isolation and internal room acoustics. These are key issues in any studio design, but raised some unusual challenges in this installation.

Studio layout

The Air America Studio Suite houses the company's news team, show producers, administration and technical staff. We first created a space programming document that described the wish list for each space, including the expected functionality of each space, the expected staff size and the equipment load. This document was reviewed and revised by Air

America's management, technical staff and key producers.

From the space programming document we drew a number of configurations for the studio suite. We started with two control rooms, two studios and several production and edit rooms. After reviewing the available space and functionality, we combined the two control rooms into one larger space that could serve both studios. The small engineering station in each studio allows multiple studios to be operated simultaneously, with isolated producers.

Technical equipment

A key consideration in the design was to define the equipment locations and cabling requirements. We redesigned the studios at Air America to support on-air radio and in-studio video shoots. A cable trough and a cable raceway were laid within the technical spaces, and these two cable paths were linked to a cable tray system outside the suite.

Acoustic isolation

Acoustic isolation is a vertical and horizontal problem. Vertically in a NYC high-rise, tenants above and below the studio cannot be disturbed. Horizontally, the need for isolation was increased so adjacent studios can work on independent projects simultaneously. Using a built-up isolated floor helped achieve this isolation and provided space for the cable trough system without having to disturb the floor slab. Lastly, the ceilings for the studios and control room were designed to be supported by the sidewalls of the rooms themselves. This design eliminates any rigid connection between the ceiling and the slab above, and can simplify duct runs.

Internal room acoustics

To address the acoustics of the studios and the control room, we set two goals: tonal balance and quiet. Tonal balance requires that low frequencies are controlled without making the room too dead. Sound absorbing acoustical panels and diffusive sound elements were used to treat the room. A band of fabric-covered panels containing absorptive and diffusive materials rings both studios. Each room was shaped to reduce modal low frequency behavior, with walls and ceiling slanted to direct sound into treated areas, which included a soffit in each room designed to control low frequencies.

Silence is an extremely important and often overlooked criteria for broadcast spaces. The ambient noise criteria for each room in the suite was for the ambient noise to be lower than NC-20. This criteria is not particularly stringent, but realistic in a NYC high-rise environment. To achieve this, the box-in-box isolated construction was complemented with a low-noise HVAC design. ■

Berkow is founder of SIA Acoustics, New York.

FACILITY FOCUS

The technology behind Air America

HHB Flash Mic DRM85

By Chris Wygal

We live in a time when electronics are shrinking in size, while at the same time they are providing unprecedented availability to endless media sources. The Ipod is a prime example of a downsized personal media device that adds functionality to our lives. Fortunately, the broadcast industry has followed suit, because capturing audio is easier today than it was just two years ago. Who would have thought that CD and Minidisc technologies are already facing obsolescence?

HHB has teamed with Sennheiser to place the cart behind the horse so to speak, and economically employ a familiar item from the news gathering industry. At press conferences, print media reporters put flash recorders in front of the interviewee, but a radio news reporter would hardly consider using these types of devices to capture on-air material. But what if HHB was to take the idea and combine a premium Sennheiser hand-held mic and a user-friendly flash recorder into one unit? It is called the Flash Mic DRM85. It's a news and interview gathering powerhouse the size of a typical wireless hand-held mic. Weighing 13 ounces, the mic changes the way reporters capture the news and it fits nicely in the palm of your hand.

Performance at a glance

- Switchable AGC
- Internal 1GB flash memory
- USB Interface for file transfer
- 10 second pre-record buffer
- Omni-directional Sennheiser mic capsule
- 18.5 hours of recording time
- Nine user templates for settings
- Uses two AA batteries
- Headphone amplifier

2006 PICK HIT Radio

Few people enjoy tough learning curves and lengthy instructions, so when the mic arrived with its thin 40-page booklet explaining features and specifications, it was a breath of fresh air. After leafing through the manual (to find out what the three buttons and jogswitch do), my goal was to insert the batteries and use the Flash Mic until I had to read the enclosed literature. I simply pushed the red record button, and put the mic in front of co-workers and asked them to talk. I used the AGC function to ensure good levels and to see how the processing affected recorded material. To my surprise, the compression and limiting in the mic AGC were transparent. I heard great levels and good sonic response from the soft-spoken and loud-mouths alike. The LCD display indicated that the flash drive was recording and clearly displayed audio levels. After stopping the record function, the Flash Mic automatically saved the material and assigned each file a track number. To test the user-friendliness of the mic, I gave it to our afternoon drivetime host to use at a speaking engagement. She recorded her speech with no problems. I officially deemed the Flash Mic a true plug-and-play device.

In the field

On July 2 at an Independence Day concert I took the mic backstage to grab some interviews with producers and talent for a radio segment. Most were confused by my only holding a microphone, but after a brief explanation even the seasoned audiophiles in the group were impressed by the concept and design. In addition to its novel appeal, I found that the Sennheiser omnidirectional microphone capsule captured clear and true sound. As an added bonus, handling noise is suppressed by its solid and stable construction.

Windows and Mac recognize the mic as a removable storage device (connected using the supplied USB cable) and dragging and dropping is quick and easy. However, on July 2 I didn't have non-linear editing capabilities. So with some patch cord creativity using the headphone output, the Flash Mic became a playback unit. Of course, the headphone output is traditionally used to monitor recording levels. As far as inputs, the mic uses the omnidirectional condenser microphone only. There are no auxiliary line or mic inputs.

Sometimes noting a particular spot in interview material comes in handy. The Flash Mic makes this task easy. While recording, tap the record button to create a "marker." When the audio file is opened, using software such as Adobe Audition or Sound Forge V4, a flag is placed on the file making the marked portion easy to locate.

More features

The Flash Mic is packaged with a Flash Mic Manager CD-ROM application, which is Windows and Mac compatible. The Flash Mic Manager is not necessary for standard operation, but it allows for detailed control and customization of the Flash Mic. For example, software allows the user to upload as many as nine presets to the Flash Mic and it comes with an interface that imports audio to a PC or Mac.

HHB

PHONE 860-434-9190
WEB www.hhbusa.com
E-MAIL sales@hhbusa.com

With 1GB of fixed internal memory, the Flash Mic offers six available 16-bit linear PCM or MPEG recording formats ranging from uncompressed 48kHz WAV (three hours of recording), to compressed 32kHz MP2 (18 hours and 25 minutes of recording). A record lock feature prevents accidental stoppage during recording and levels are manually or automatically controlled. The mic also features a switchable 100Hz high-pass filter and an internal real-time clock.

The big question concerning the mic dealt with battery life. It takes two AA alkaline or nickel metal hydride rechargeable batteries. I conducted a battery life test with fresh alkaline batteries and it recorded continuously for seven hours. When the battery life begins to dwindle, the LCD display and backlight begin to flash. Changing batteries does not erase recorded material, but the batteries must be changed within 60 seconds or the internal clock will reset.

Detail of the operating controls, display and connections.

Having used the latest technology in media storage and transfer, this product is a considerable milestone for HHB and Sennheiser. Reporters, public speakers and anyone looking to capture audio on the fly now have an easy, economical avenue. Not only is the Flash Mic a great idea, it delivers excellent sounding audio with no strings (or wires) attached.

Wygal is the programmer, engineer and Web designer for WRVL in Lynchburg, VA.

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.

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.

by Kari Taylor, senior associate editor

Multi-processor
DBX Professional Products
Booth 801

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 new algorithms such as selectable DSP inserts on the inputs and outputs, EQ, delay, compression and limiting, and bandpass and crossover filters. The system provides four inputs, eight outputs, and monitors and controls signal routing as well as the processing of multiple units using Ethernet equipment.

801-568-7660
www.dbxpro.com; customer@dbxpro.com

Digital headset
HM Electronics
Booth 1243

WH200 Comlink: Weighing 5.7 ounces and being wireless circumvents the hazard of cables snagging on other equipment. The headset's ergonomic shape provides a stable fit while the digital design provides clear communication. Operating in the license-free, 2.4GHz frequency band, the unit provides digital sound quality with no interference from neighboring systems.

858-535-6060; www.hme.com

Acoustic absorption panels
Media Specialty Resources
Booth 843

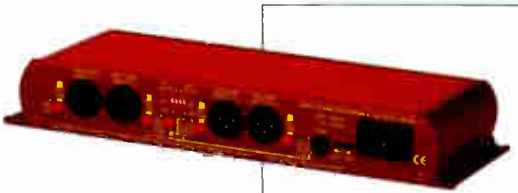
Salon Acoustics: Salon Acoustics are acoustic panels available in a myriad of graphic designs. The sound absorbtion panels are engineered to offer absorption down to 500Hz. Available in a variety of standard and custom sizes, these panels are 2" deep. Using a proprietary fabric printing process, a favorite photo or painting can become the fabric cover for a sound absorber that reduces undesirable sound reflections or echoes in a production room.

800-497-2087
www.msr-inc.com; info@msr-inc.com

Digital mics
Neumann
Booth 402

KM183 D, KM184 D, KM185 D: The modular KM 183 D, KM 184 D and KM 185 D combine omnidirectional, cardioid and supercardioid capsules with the KM D output stage to offer three different directional characteristics. The A-to-D converter is located next to the capsule. All standard sampling frequencies, from 44.1kHz to 192kHz, are supported. The integrated DSP functions include gain, a compressor/limiter with de-esser and a peak limiter. The digital system permits the peak limiter to operate across the entire available dynamic range.

860-434-5220; www.neumannusa.com
neumlit@neumannusa.com



Dual limiter
Sonifex
Booth 1234

RB-ML2: This stereo microphone and line-level limiter can operate in stereo or dual mono mode, so it can be used as a stereo line limiter or dual mic limiter. Two mic/line inputs have independent gain, filtering and phantom power selection. The VCA limiter circuit can operate jointly on the signals or independently and the characteristics of the limiter can be set via level threshold presets. The equipment offers line or mic level outputs.

207-773-2424; www.independentaudio.com; Info@independentaudio.com

NEW PRODUCTS

Sound control
Auralex Acoustics
Booth 1605

Audiotile: The new 24-piece set absorbs echoes and other undesirable reflections though a wide range of frequencies. The set includes step-by-step instructions on how to build seven designs that effectively treat one 8' x 10' wall or ceiling.

317-842-2600; www.auralex.com; auralexinfo@auralex.com

Condenser boundary mic
Sennheiser Electronic
Booth 402

Evolution 912: The pre-polarized condenser microphone with half-cardioid pick-up pattern offers a frequency response from 20 to 20,000kHz and a maximum sound pressure level of 136dB. A rubber plate on the underside ensures that vibrations are not transmitted. The preamplifier electronics are integrated into the microphone and the gold-plated XLR-3 connector is surrounded by the enclosure.

860-434-9190; www.sennheiserusa.com; lit@sennheiserusa.com

LPFM forum

With regard to your editorial, *Micromanaging the FCC* in the July issue, it sounds like you don't realize that it was the FCC who had ruled, repeatedly, that third-adjacent channel protections were not required, and that second-adjacent channel separation was sufficient. It was lobbying on Congress that forced the FCC to adopt third-adjacent channel separation despite the FCC's stand that there was no reason for it.

You are undoubtedly correct that many LPFM stations will fall away over time. Many people will not appreciate the challenge that is 24/7/365 broadcasting. But others will do a great deal of good with these licenses. In our case, I represent a small private school that has been awarded a construction permit and we are well into the planning for a student-operated radio station with near professional quality recording studio facilities and multiple studios. We have partnered with a local radio club to get additional technical resources. We will be creating original radio theater, original local musical performances, talk format and other things. One of our talents is a gentleman who has spent most of his life creating and preserving old-time radio theater techniques and scripts.

There is a certain freedom in not having to generate a profit. If you have the right mix and quantity of dedicated talent willing to support a program like this as a labor of love, it can accomplish things that neither commercial stations, nor the average PBS/NPR station can do.

If many stations fall away, then nobody but they are the poorer for it, but the community can benefit from LPFM.

Tom Scott
Wilsonville, OR

Safety first

I read with interest your article *Tower Inspecting and Climbing* in the July issue of *Radio*. I have just celebrated 50 years in broadcasting. My jobs have ranged from chief engineer (before some smart guy invented transistors) to station owner. However, as a 14-year-old, I started by climbing towers for a small firm in northeast Texas. I discovered at an early age the value of leather pegs over the nails in the soles of my boots.

My main concern is the photo in the article that shows two young men climbing in tandem. Any old climber (and I mean really old, like myself) will tell you don't climb in tandem. If the lead (the guy on top) falls, he will take out the climber below. The bottom climber should be on the other side of the tower. No exceptions.

Enjoyed the article.

Paul R. Beane
owner, KLVT AM-FM, Levelland, TX and KZZN-AM Littlefield, TX
general manager, KRBL-FM, Lubbock, TX

Good point, Paul. Safety should always be the top priority, and this was a bad example that slipped by us.

The shape of things

Chriss,

I enjoyed your June Viewpoint *More to Digital Radio* very much. It was prophetic and challenging. On the technical career side of things, I'd like to share some observations.

I suspect in 10 to 15 years commercial radio as we know it will be quite different, and this will affect the role of the broadcast engineer. There is a mixture of dread, curiosity and excitement in my conversations with my colleges across the country. Nothing is happening slowly these days and it can be a bit unnerving at times. What are the associated emotions?

Dread. I think because we don't know what radio station we will work for; I mean, who really knows where all the IP stations live and do they even have an office for a CE? Where is the transmitter site? Think about a computer in the dashboard of a car that can receive a thousand signals from Wi-fi, to satellite, to terrestrial. The listener doesn't care where it comes from, so long as it's what he wants and it's affordable. Television will face the same issues.

Curiosity and excitement. Technical people are naturally drawn to new technology and the techno tsunami is coming fast! Perhaps faster than we would like. Positioning for the broadcast engineer in the brave new world you described will require some homework, open minds and fast feet!

Keep up the good work. Keep sounding the trumpet!

Steve Comer
president
Broadcast Works
Tyler, TX

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Contributor Profile

Meet the professionals who write for Radio magazine.
This month:
Field Report, page 44.

John Boehm
Transmitter Supervisor
Clear Channel Chicago

Boehm has been involved in radio broadcast since high school in the early 1970's.

His introduction to a real broadcast environment was at Homewood-Flossmoor high school, when he walked into WHFH for the first time as a freshman in 1971.

Since 1978, Boehm has held engineering positions with a variety of licensees and has been the the chief engineer of six stations.

Radio
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Written by radio professionals
Written for radio professionals

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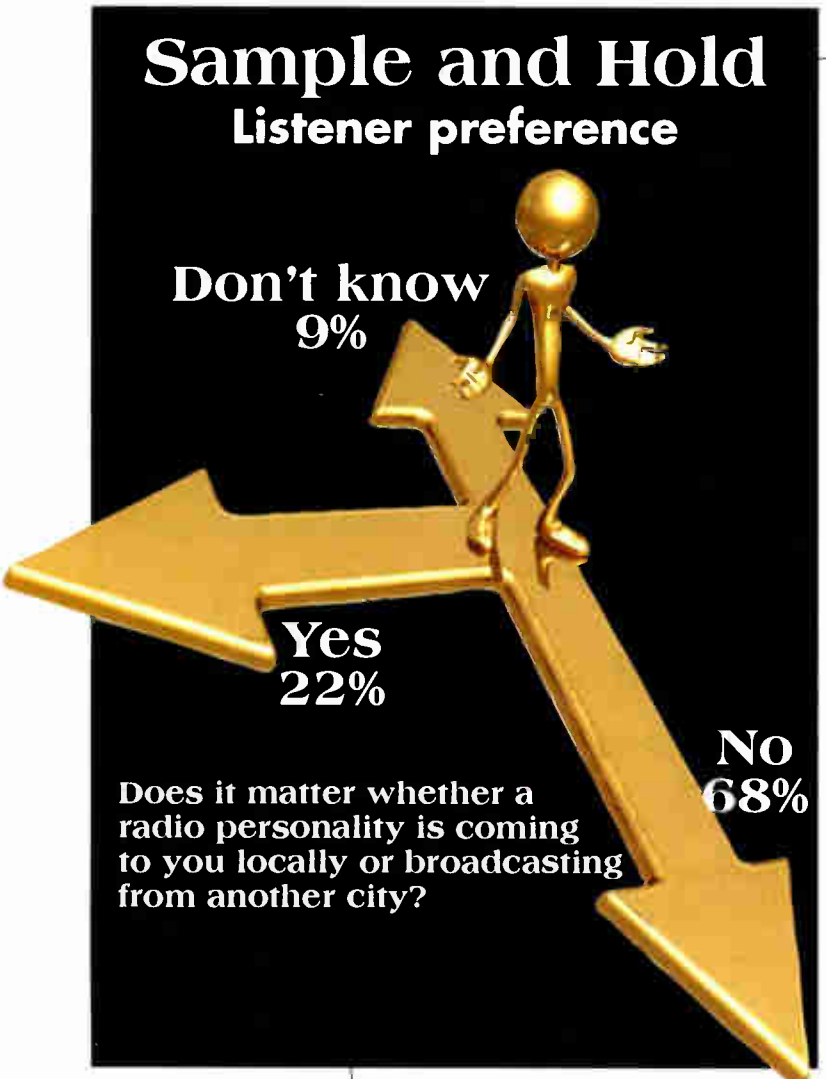
ADVERTISER INDEX

This index is a service to readers. Every effort is made to ensure accuracy, but *Radio* magazine cannot assume responsibility for errors or omissions.

by Kari Taylor, senior associate editor

Do you remember?

The McCurdy SA 14023 extended range meter provided accurate self-contained audio measuring in 2RU. It featured a VU meter and optional peak program meter to allow simultaneous monitoring of average and peak signal characteristics. The meter offered a wide input level range from -50 to +30dBm in 2dB steps. It supplied 600Ω termination or a 20kΩ bridging balanced input via front-panel 1/4" phone jacks or via rear-panel barrier terminals. The front-panel jack was provided for an isolated monitor output. Simultaneous balanced output provided fixed monitoring. This photo is from 1988.



Source: Paragon Media Strategies, 2006

That was then

The hard drive turns 50 this year. The RAMAC, or Random Access Method of Accounting and Control, was the original hard drive. It began shipping in the fall of 1956. The system used 50 spinning, 24" -wide disks and offered about 5MB of space. In the 1980s, desktop computer hard disks were introduced with 5MB using 5.25" platters.

Today's entry-level drives have at least 8,000 times more capacity. Just look at the Apple Ipod Nano: 0.27" thin with 4GB of storage. The hard drive has come a long way in the last 50 years.

Photo courtesy of the Magnetic Disc Heritage Center www.magneticdiskheritagecenter.org

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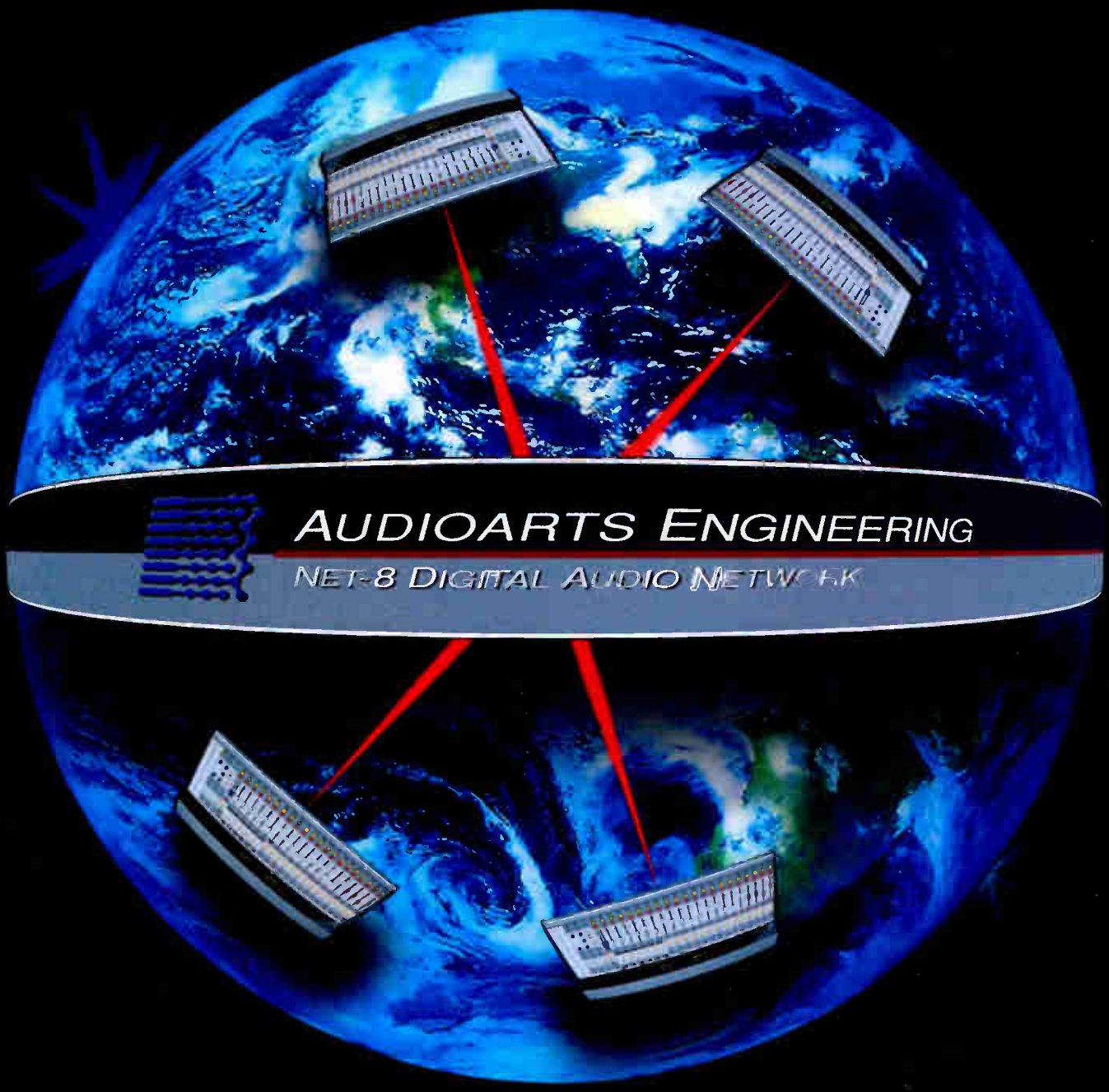

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