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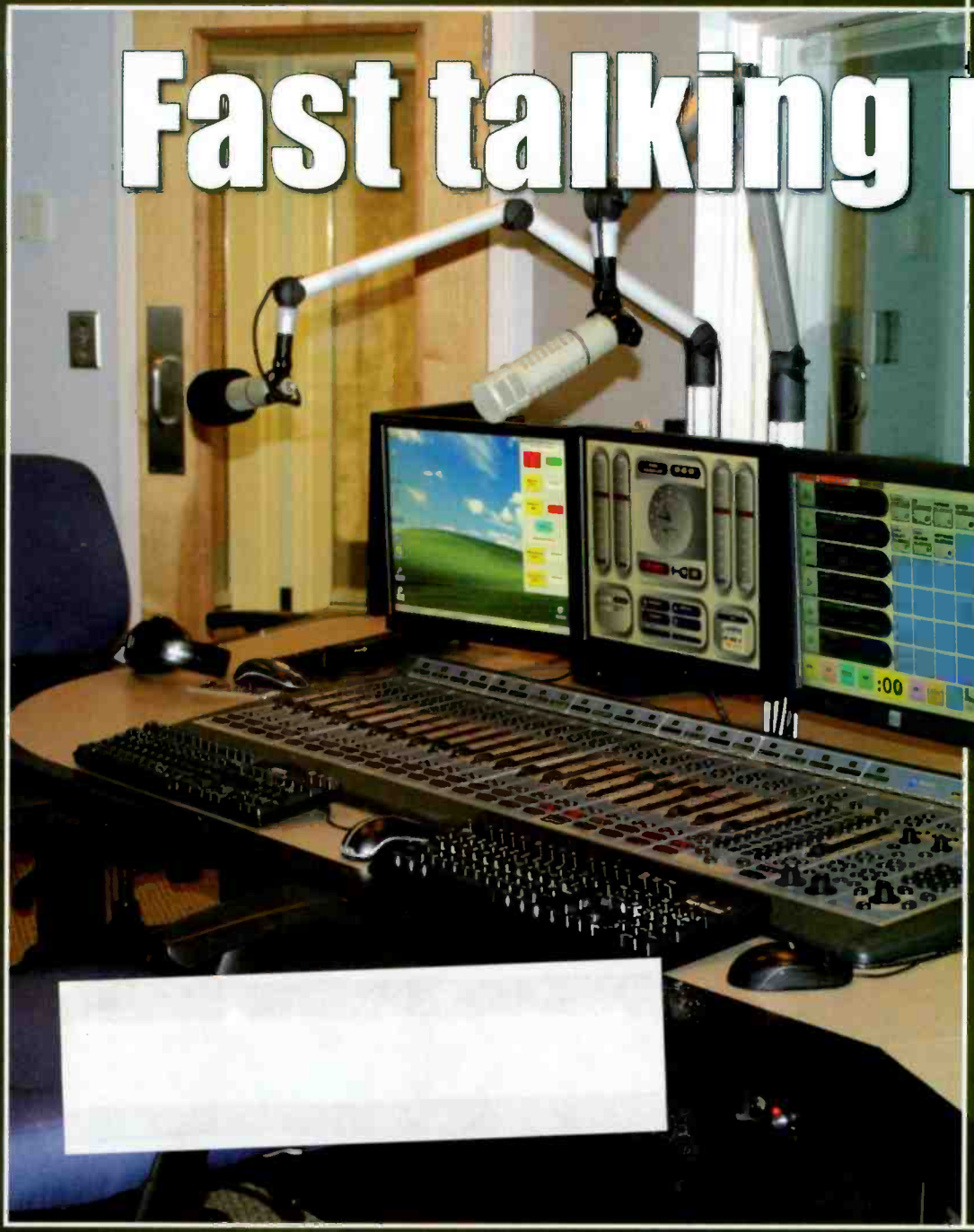
THE RADIO TECHNOLOGY LEADER
December 2007
RadioMagOnline.com

Fast talking radio

MRN's new HQ



2008 RADIO BUYERS GUIDE

FIELD REPORTS

KRK VXT6 and Mackie 1642-VLZ3

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Condition your Signal

with the New Vorsis® HD-P3

What Is It?

A four-band parametric equalizer feeding a three-band limiter with adjustable crossover points, AGC and selectable filters for FM, AM or streaming audio formats. The HD-P3 includes a variable de-esser, an expander and dual digital outputs (one with user selectable HD latency FM delay), plus high pass, low pass and notch filters, *and* a signal de-correlator to optimize bass content. All this controlled by an ethernet protocol computer interface that lets you run one or many HD-P3s from your office or internet based locations.

What It's For:

Processing for your new HD signal, improving your existing FM or AM signal chain, preprocessing streaming audio-over-internet, a standalone HD processor or a realtime DJ monitor feed—and finally—a KILLER studio production tool.

What's It Like?

"PERFORMANCE WITH OVERDRIVE"

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It's What's Next in Processing

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ONE

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ZX™ Series

FM tri-mode transmitters featuring multiple PA modules and power supplies for maximum redundancy. When used with the FlexStar™ HDx Exciter, the ZX™ Series can operate in either digital only or FM/FM-HD. ZX transmitters are available from 500 W to 3500 W.

FlexStar™

HDx Exciter brings HD Radio™ and analog audio to a new level. Featuring real-time adaptive correction for increased power and efficiency and the latest iBiquity platform in HD Radio™—Exgine—HDx Exciter unlocks new revenue streams.

Destiny™ 3DX-50

Highly efficient, medium-wave transmitter, and the latest in the DX™ family of world-class digital AM transmitters. Fully compatible with HD Radio. Harris AM transmitters are available from 1 kW to 2 MW.

PR&E NetWave™

Modular, network-enabled, high-performance radio broadcast console packed with features that are perfect for small to medium studios. Share all your studio resources throughout the facility with the Harris® VistaMax™ audio management system.

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ON THE COVER

MRN Radio, the voice of NASCAR, covered 500 miles to build new studios and learned that not everything is as fast as race cars. Cover design by Michael J. Knust.

Wireless Broadband Internet Remotes

"The first time out with the Tieline was a brilliantly simple experience for everyone involved. For lack of a better phrase, the codec just worked."

- **Christian Vang**
  Chief Engineer
  Clear Channel St. Louis

"The codecs sounded great. My management was very, very impressed with the demos"

- **Grady Jeffreys,**
  Technical Manager,
  Mackay Communications

"The remote 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
  Entercom Indianapolis

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Currents Online

Selected headlines from the past month.

Arbitron to Delay PPM Rollout in Nine Cities

Arbitron will extend the use of the paper and pencil diary system as it works with customers, the Media Rating Council and others on the research and business issues of the Portable People Meter radio ratings service.

NAB Seeks Nominations for 2008 Engineering Achievement Awards

Established in 1959, the awards recognize an individual's accomplishments and contributions to the broadcast industry. Nominations are due by Jan. 15.

NAB Engineering Achievement Award Winners

Want to see who has received the Engineering Achievement Award in the past? Read the list the we compiled.

HD Radio Tagging Makes CEA Awards List ➲

The Alpine Electronics TUA-T550HD and the Polk Audio I-Sonic Entertainment System 2 include the technology.

FCC Adopts New LPFM Rules

The order and further notice or proposed rulemaking cover a series of ownership, eligibility and technical rules and seeks comment on additional technical matters for LPFM.

Continental Electronics Completes Phase 1 of Mississippi Project

Four of the eight analog and digital transmission systems for Mississippi Public Broadcasting have been commissioned.

SBE, NFL Renew Game-day Coordinator Agreement

The one-year renewal marks the ninth year of the partnership.

Find the mic and win!

Tell us where you think the mic icon is placed on this issue's cover and you could win a Heil mic courtesy of Transaudio Group.

We'll award a different Heil mic each month during 2007.

This month, enter to win a Heil Sound PR-40.

Enter by January 10.
Send your entry to

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Include your name, mailing address and phone number.

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Site Features

New Products Extra E-newsletter

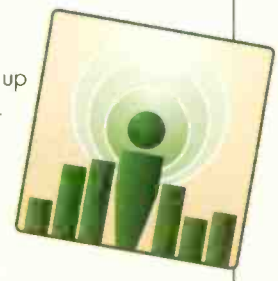
In November, we launched a new e-mail newsletter to bring you the latest information on new products. Subscribe today and stay up to date.

Digital Radio Update and Currents, Too

And we still offer your best source for information about digital radio and industry news with our existing newsletters.

Podcasts Bring You More

The Radio Currents Podcast is posted every week to make it even easier for you to stay up to date. Also look for special podcasts, too.



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Industry Events

The *Radio* magazine Industry Events section lists upcoming conventions and conferences. Be sure to tell us about your event so it can be added.

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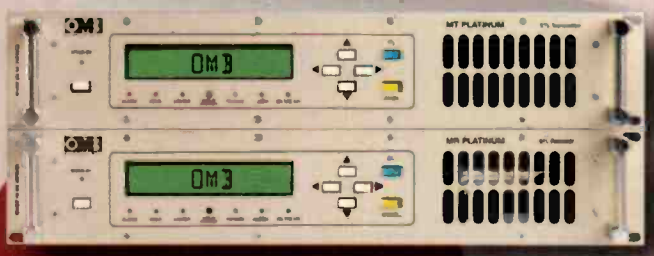
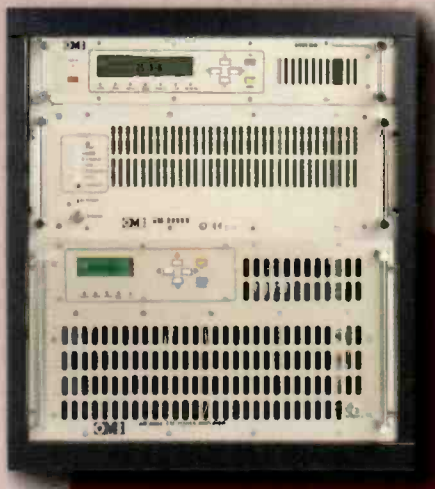
All transmitter powers with the best quality price ratio



MT/MR PLATINUM

is a high-performance Studio-to-Transmitter Link. It is made up of the 5W MT transmitter externally synthesized in 10kHz sub-bands with a step of 100kHz, and the MR double conversion receiver, that is externally synthesized, too. The MT is microprocessor controlled, and includes LCD display for the visualization of the most relevant transmission parameters (frequency (6-digit), forward and reflected power, modulation level), balanced Mono, Stereo (MPX). The MR receiver has the same visualization system as the transmitter. It includes balanced Mono and Stereo (MPX) outputs. Furthermore, the MT/MR Platinum STL includes a jumper in order to get a proper operation with digital signals.



EM 2000

is a 2000W FM transmitter made up of the EM 25 DIG exciter (or EM 20/30 exciter) and the AM 2000 FM amplifier. AM 2000 includes eight 300W high-efficiency MOSFET technology amplifying modules, fed by 2 independent switching power supplies, which are made to withstand the working conditions. The amplifying modules work independently thanks to a power combining structure that provides high isolation between them.

EM 10000

is a 10000W FM transmitter made up of the EM 25C COMPACT DIG exciter and three control units which combine the power of six AM 2000 FM amplifiers. AM 2000 includes eight 300W high-efficiency MOSFET technology amplifying modules, fed by 2 independent switching power supplies, which are made to withstand the working conditions. The amplifying modules works independently thanks to a power combining structure that provides high isolation between them.

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Engineered for business

Engineers are good at many things. We have analytical minds. We can dissect a problem by evaluating the conditions, formulating possibilities and determining a course of action. We can usually learn the skills needed to accomplish a task. We have to be flexible to adapt to situations. On average, I would say that the engineer is the one person at the radio station who really could handle any job within the station. We may not do that job perfectly, but we can at least comprehend the duties and learn the skills.

At the same time, engineers are often bad at business. This is not necessarily a bad thing, but it has its problems.

Why do radio engineers choose their career in radio engineering? We obviously have the aptitude and the skills for the job, but there are other reasons. I think many engineers will tell you that they do their job because it's not really like work. It's like getting paid to practice a hobby.

That's a blessing and a curse. Our personal reward of a job well done in defeating a challenge provides satisfaction, but many engineers tend to accept less than what they are worth. Engineers are often enablers, and through the desire to get the job done will unintentionally compromise their own circumstances. The compromise often affects these engineers financially.

I sometimes contract my engineering services for special projects. The rate that I charge depends on the project. While any project will utilize all my acquired knowledge, it may not use all my skills. That affects my rate. In addition, the level of decision-making on my part is considered in my rate. Simply building some wiring harnesses to a dictated spec is less involved than designing the logic routing of a networked system and then determining the necessary cabling requirements to build the harnesses.

The problem is not always directly tied to the salary. Consider this example.

You are a station employee. A project begins, and it is determined that a certain hand tool is needed for the job. You own this tool personally, but the station does not. What do you do: Buy the tool you need, or bring your own tool in to complete the project? For this discussion, let's say that the tool is not a capital expense item.

When I was faced with this situation, I would first evaluate the need. If it was obvious that I would use the tool repeatedly, I would just buy it. (A station engineer should have a certain discretionary budget.) If I would only use it once, I didn't mind loaning my tool to the station for that one-time use. The decision to buy the tool for the station happened when I needed the tool a third time. If I used my own tool once or twice, it was no big deal. If I needed it a third time, it was time to buy it.

Taking this tool scenario a step further, I have visited stations where employees have brought in their own equipment to help the station get through an emergency. The loaned equipment is still in place after many months or even years. Again, being a hero and saving the day is a good thing, but when the crisis is over, it's time for the business to take care of its own needs.

It's fine to help an employer in a crunch, but you shouldn't have to subsidize the station with your personal equipment or tools.

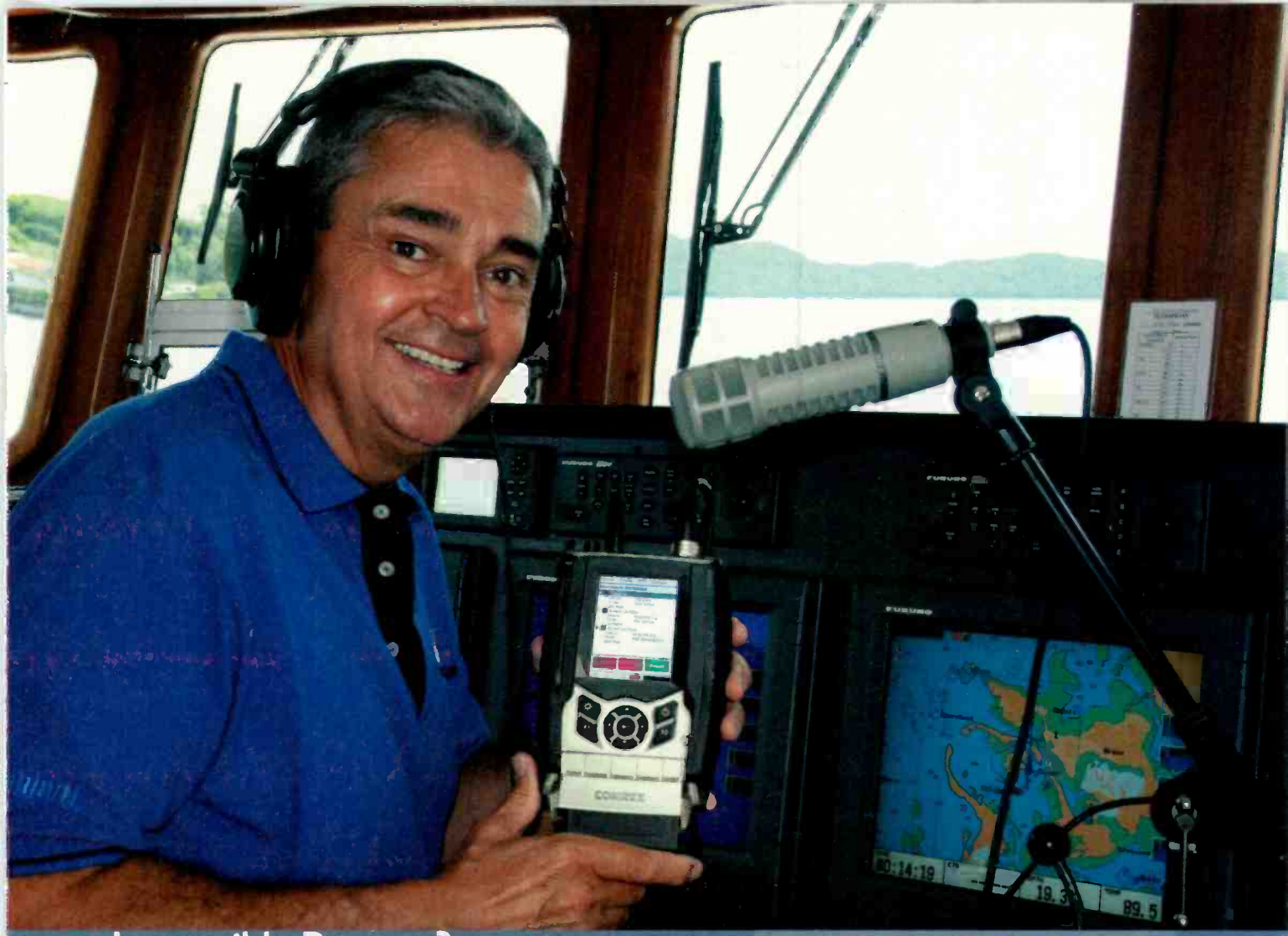
Likewise, evaluate your own professional worth. Market conditions will affect this as well, but there are times when it is better to pass an undervalued opportunity so that you are available for a more lucrative one later.

Also watch for what I call the bright, shiny objects. Gracious praise in private, embroidered jackets or hats, and even food are nice, but they can devalue your worth. The praise should be public. The gifts should not be a substitute for fair compensation.

The short answer: Earn what you are worth.

Chris Scherer

What's your opinion? Send it to radio@RadioMagOnline.com



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Keith DeGreen says: "Whether I'm a thousand miles out to sea, visiting unusual ports of call or exploring remote inland places, my Comrex ACCESS Portable empowers me to project a broadcast-quality signal back home at anytime from virtually anywhere."

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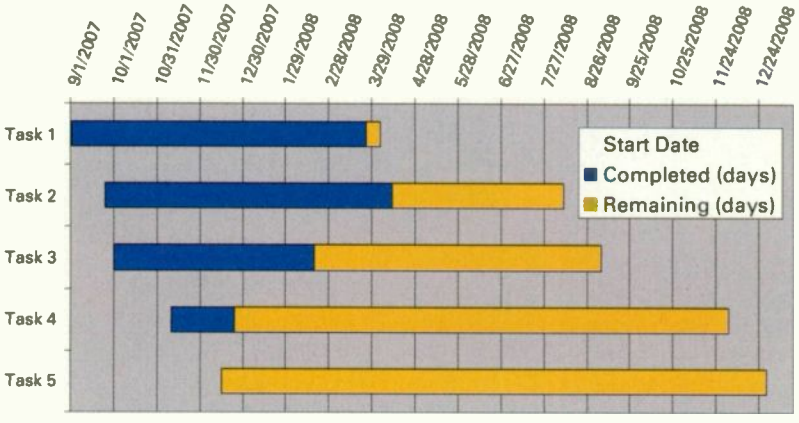
Project management

By Kevin McNamara, CNE

While the term has been around since the 1950s, the concept of project management has been around since the beginning of history. The project management professional (PMP) has only recently become a specialized credential recognized in a wide variety of businesses. In fact, many companies now consider formal project manager training and certification for new hires or employees seeking to grow within an organization.

History

Some concepts behind modern day project management can be traced back to the builders of the pyramids. Interestingly, the predecessors to what we now call engineers were in fact the first project managers, as they were tasked with finding efficient, cost-effective and timely methods to complete complex (for the day) tasks. In the 19th century, spawned by the industrial revolution, the U.S. government started to undertake major infrastructure development, including the transcontinental railrood, interstate highways and the beginning of creating systems for the delivery of water, sewer, power and telephone to major cities.



A Gantt Chart can quickly show the relative status of various projects. These charts can be created in Excel.

Events in the 20th century, particularly the World Wars, created a general labor shortage throughout the country. Without a plentiful workforce, government and private organizations were forced to seek better methods to manufacture ships, airplanes, weapons and other materials needed to support the wars. Frederick Taylor is credited with being the first to apply scientific reasoning to work processes while working with the Navy to improve the quality and delivery time for ship construction. Essentially the first efficiency expert, he was able to break down smaller tasks and create methods and processes that made positive improvements across a number of industries. His partner was Henry Gantt, who was concerned with the order in which work was performed and felt the flow of work had a significant impact on the outcome of the particular project. To address the problem, he created some processes and graphical tools to analyze the work flow. His best known tool is the Gantt Chart, which is a stacked bar graph indicating start and stop duraticns for individual tasks.

In 1954, Bernard Shriver combined much of the research and techniques created by Taylor, Gantt and others while working on the U.S. Air Force's missile program. He coined the name project management and is known as the father of project management.

Recognizing the need to identify the "Critical Paths" in a project, the U.S. Navy and DuPont sought better tools that could be implemented. The result came in 1955 when the Navy (and subcontractor Booze, Allen & Hamilton) created the PERT (Program Evaluation and Review) to use in the Polaris missile program and in 1957 DuPont created the "Critcal Path Analysis" (CPM). Both of these methods are useful to determine how a number of tasks interact on a large scale.

Project management concepts

Traditional project management is based on three basic constraints: time, cost and scope. If you place each of these on one line of a triangle, it is within this triangle that a project manager must operate while maintaining quality throughout.

The PMI breaks projects into smaller pieces based on five process management groups and nine knowledge areas. You will need to understand how each of the knowledge areas fits in each process management groups. The five process management groups are Initiating, Planning, Controlling, Executing and Closing. The nine knowledge areas are:

- Integration Management – Coordinating the elements of the project.

Article continues on page 71.

Success comes from knowing what you do best, and then doing it. At ENCO, we know broadcast software, and that's what we do. DAD, from ENCO, is reliable, powerful audio playout and automation that's easy to use...and affordable to purchase. Since 1992, ENCO has provided mission critical systems to small, medium and large markets as well as major radio networks and groups. Your business depends on the audio you play, and you can rely on DAD.

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IP Subnets

IP Class address ranges:

Class A = 1.0.0.0 to 126.0.0.0
Class B = 128.0.0.0 to 191.255.0.0
Class C = 192.0.1.0 to 223.255.255.0

Reserved address ranges for private (non-routed) use:

10.0.0.0 to 10.255.255.255
172.16.0.0 to 172.31.255.255
192.168.0.0 to 192.168.255.255

Other reserved addresses:

127.0.0.0 is reserved for loopback and IPC on the local host
224.0.0.0 to 239.255.255.255 is reserved for multicast addresses

Linear Digital Audio Data Rates and Storage

Data Rate (kb/s) = # channels × samples per second × bits per sample
Data Rate (KB/s) = # channels × samples per second × bits per sample ÷ 8
Data Rate (MB/min) =
channels × samples per second × bits per sample ÷ 8 ÷ 1,048,576 × 60
Storage Requirement (hours/GB) =
1 ÷ (# channels × samples per second × bits per sample ÷ 8 ÷ 1,073,741,824 × 3600)

Explanation:

Divide by 8 – convert bits to bytes
Divide by 1,048,576 – convert bytes to megabyte (1024^2)
Divide by 1,073,741,824 – convert byte to gigabytes (1024^3)
Multiply by 60 – convert seconds to minutes
Multiply by 3600 – convert seconds to hours

Prefix Multipliers

Prefix	*Abbreviation*	*Multiplier*
yotta	Y	10^{24} (1 000 000 000 000 000 000 000 000)
zetta	Z	10^{21} (1 000 000 000 000 000 000 000)
exa	E	10^{18} (1 000 000 000 000 000 000)
peta	P	10^{15} (1 000 000 000 000 000)
tera	T	10^{12} (1 000 000 000 000)
giga	G	10^{9} (1 000 000 000)
mega	M	10^{6} (1 000 000)
myria	ma	10^{4} (10 000)
kilo	k*	10^{3} (1 000)
hecto	h	10^{2} (100)
deca	da	10
deci	d	10^{-1} (0.1)
centi	c	10^{-2} (0.01)
milli	m	10^{-3} (0.001)
micro	µ**	10^{-6} (0.000 001)
nano	n	10^{-9} (0.000 000 001)
pico	p	10^{-12} (0.000 000 000 001)
femto	f	10^{-15} (0.000 000 000 000 001)
atto	a	10^{-18} (0.000 000 000 000 000 001)
zepto	z	10^{-21} (0.000 000 000 000 000 000 001)
yocto	y	10^{-24} (0.000 000 000 000 000 000 000 001)

* one exception: K is used to mean kilo only when used in the abbreviation for kilobytes (KB)
** (or u by convenience)

TCP/IP Port Numbers

Port #	*Description*
1	TCP Port Service Multiplexer (TCPMUX)
5	Remote Job Entry (RJE)
7	ECHO
18	Message Send Protocol (MSP)
20	FTP - Data
21	FTP - Control
22	SSH Remote Login Protocol
23	Telnet
25	Simple Mail Transfer Protocol (SMTP)
29	MSG ICP
37	Time
42	Host Name Server (Nameserv)
43	Whols
49	Login Host Protocol (Login)
53	Domain Name System (DNS)
69	Trivial File Transfer Protocol (TFTP)
70	Gopher Services
79	Finger
80	HTTP
103	X.400 Standard
108	SNA Gateway Access Server
109	POP2
110	POP3
115	Simple File Transfer Protocol (SFTP)
118	SQL Services
119	Newsgroup (NNTP)
137	NetBIOS Name Service
139	NetBIOS Datagram Service
143	Interim Mail Access Protocol (IMAP)
150	NetBIOS Session Service
156	SQL Server
161	SNMP
179	Border Gateway Protocol (BGP)
190	Gateway Access Control Protocol (GACP)
194	Internet Relay Chat (IRC)
197	Directory Location Service (DLS)
389	Lightweight Directory Access Protocol (LDAP)
396	Novell Netware over IP
443	HTTPS
444	Simple Network Paging Protocol (SNPP)
445	Microsoft-DS
458	Apple QuickTime
546	DHCP Client
547	DHCP Server
563	SNEWS
569	MSN
1080	Socks

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Welcome

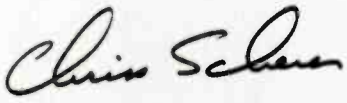
To the 2008 *Radio* magazine Buyers Guide

You always hear that good things get better with age, and we believe that this can be applied to more than wine and cheese. This is the fifth annual edition of the *Radio* magazine Buyers Guide, and our annual compendium continues to not only grow, but improve. This year's version is loaded with the information you need to find the manufacturers and service providers you want. We have sorted this information into two sections. The first section provides a categorical listing of products and the companies who provide them, while the second gives you the contact information for these companies. We have solicited information from manufacturers during the past few months to update this information and present it to you in a reference that you can access all year.

We know that you save your issues of *Radio* magazine, and we've made it easier for you to access this reference at any time by making it a pull-out section. Store the December issue like you always do, but keep the Buyers Guide handy for quick access.

But our Buyers Guide extends beyond the printed form you're holding. This information has also been uploaded to the *Radio* magazine website at RadioMagOnline.com. Look for the Buyers Guide link, and you can access the same information anywhere that you can get online.

As always, I welcome your input on this resource. We continually strive to improve it and make it more useful each year.



The information in the *Radio* magazine Buyers Guide is provided by the listed companies. Every effort is made to ensure accuracy.

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Wireless Broadband Internet Remotes

"The first time out with the Tieline was a brilliantly simple experience for everyone involved. For lack of a better phrase, the codec just worked."

- **Christian Vang**
  Chief Engineer
  Clear Channel St. Louis

"The codecs sounded great. My management was very, very impressed with the demos"

- **Grady Jeffreys,**
  Technical Manager,
  Mackay Communications

"The remote 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
  Entercom Indianapolis

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Acoustic and building materials

Includes soundproofing, doors and windows

Acoustic Sciences Corp.
Acoustic Systems
Acoustical Solutions Inc.
Acoustics First Corp.
Auralex Acoustics Inc.
illbruck Inc./SONEX
Industrial Acoustics (IAC)
Noren Products Inc.

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Russ Berger Design Group
SE Electronics

Antennas

Includes all antenna categories except wireless mics

Acorn RF/Teracom Components
Acoustek Corp.
Advanced Antenna Technologies Inc.
Andrew Corp.
Antenna Concepts Inc.
Antenna Systems & Supplies Co.
Armstrong Transmitter
Bext Inc.
Bird Technologies Group
BixTech LLC
Clear Channel Satellite
DAWN Co.
DH Satellite
Dielectric-Tower Operations
Electronics Research Inc.
Fanfare Electronics Inc.
Jampro Antennas Inc.
Kathrein Inc., Scala Div.
Kintronic Labs Inc.
LBA Technology Inc.
Lightning Prevention Systems
NicomUSA Inc.
Nott Ltd.
OMB America
Allen Osborne Associates Inc.
Patriot Antenna Systems
Propagation Systems, Inc. (PSI)
Radio Frequency Systems
Radio Frequency Systems GmbH
Radiosophy
Ramsey Electronics Inc.
REALcoverage.com
RF Specialties of Texas
Sabre Communications Corp.
SAMCO Antennas Inc.
Shively Labs
Superior Broadcast Products
Swager Communications
SWR Inc.

TELEWAVE, INC.

Telewave Inc.
Teracom Components
Valcom Mfg Group

Audio accessories

Includes converters, adapters and utility items

Acoustek Corp.
Acoustics First Corp.
ART-Applied Research & Technology
ATI Group Inc.
ATI - Audio Technologies, Inc.
Audio Accessories Inc.
Broadcast Devices
Crane Song Ltd.
DW Electrochemicals Ltd.
ETA Systems
Great Electronics
Henry Engineering
JK Audio Inc.
Kramer Electronics
Littlite LLC Div. of CAE Inc.
Lucid
Lynx Studio Technology Inc.
Markertek.com
Pacific Radio Electronics
Pomona Electronics
Prime Image Inc.
Radio Shack Commercial Sls. Div.
Radiosophy
RDL Radio Design Labs
Rolls Corp.
RPG Diffusor Systems Inc.
Selco Products Co.
Sierra Video Systems
Sonifex Ltd.
Sonifex Ltd.
Studer Professional Audio AG
Switchcraft
Terra Sonde
Videoquip Research Ltd.
Yamaha Corp Of America Commercial AudioSystems Div.

Audio delay systems

Eventide
Logitek Electronic Systems
Rane Corp.
Sonifex Ltd.
Symetrix
25-Seven Systems

Audio distribution, between locations

ATA Audio
Barix AG
Bay Country Broadcast Equipment Inc.
Broadcast Devices
Digigram Inc.
Energy-Onix Broadcast Equipment Co. Inc.
ESE
Harris Broadcast Communications, Networking & Infrastructure Solutions
KLZ Innovations Ltd.
NPR Satellite Services
Pulsecom
Riedel
Satcom Resources
Sierra Automated Systems
Spacecom Systems
Sundance Systems Inc.
Telos Systems
Tieline Technology
Ward Beck Systems Ltd.
Yamaha Corp Of America Commercial AudioSystems Div.

APT Audio Processing Technology

WorldCast Horizon Stereo IP Audio Codec: The professional, affordable choice for IP audio networking, WorldCast Horizon provides a fully duplex stereo pair over IP with broadcast-grade audio quality and incredibly low delay. With rock-solid reliability, a highly intuitive management software package, Contact Closures, Opto-Inputs and an RS232 Data Channel, the unit offers everything the professional broadcaster requires. Both analog and AES/EBU units are available.

Audio loggers

Axia Audio
dcsTools.com
Fifty Thousand Watt Software
KLZ Innovations Ltd.
Mediatron GmbH
OMT Technologies
Sonifex Ltd.
Telos Systems
WireReady NSI

Audio processing, on-air

Includes stereo generators

Audemat-Aztec Broadcasting Innovation

Audemat-Aztec, Inc.
AXI
Bay Country Broadcast Equipment Inc.
Broadcast Warehouse Ltd.
CMBE Inc.
Crown Broadcast IREC, Int'l Radio & Electronics
IDT-Impact Development
Inovonics Inc.
Logitek Electronic Systems
Neural Audio Corp.
Omnia A Telos Co.
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Audio processing, production

Includes production and mic processors

25-Seven Systems
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AIR Corp.
ART-Applied Research & Technology
AXI
Behringer USA Inc.
BIAS-Inc.
BSS Audio
Circuit Research Labs Inc. (CRL)
Crane Song Ltd.
DACS Ltd.
Daking Distributed by Las Vegas Pro Audio
Dan Dugan Sound Design
dCS Ltd.
Dolby Laboratories
Drawmer Distributed by Transamerica
Eventide
Fifty Thousand Watt Software
Hyatt Audio
Kahn Communications Inc.
Klein + Hummel GmbH
Korg USA Inc.
Lectrosonics Inc.
Logitek Electronic Systems
Lucid
Modulation Sciences
Neural Audio Corp.
Omnia A Telos Co.
Omnia Audio
Orban/CRL
Peavey Electronics Corp.
Prism Media Products
Rane Corp.
RML Labs
Rolls Corp.
Sofratec
Solid Electronics Labs
Studio Technologies Inc.
Symetrix
TC Electronic
TC-Helicon
Trans Audio Group/Soundelux, Soundfield, GML, Pauly, Heil
TransLanTech Sound LLC
Yamaha Corp Of America Commercial AudioSystems Div.
Yellowtec
Z-Systems

Audio routing and distribution within a facility

Includes routers, distribution amps

APT Audio Processing Technology
ATI Group Inc.
ATI - Audio Technologies, Inc.
Audio Accessories Inc.
Audioarts Engineering
Australian Monitor
Axia Audio
Benchmark Media Systems Inc.
Broadcast Tools Inc.
BSS Audio
Clear Channel Satellite
Digigram Inc.
Drawmer Distributed by Transamerica
Ghielmetti Inc.
Henry Engineering
Innovative Devices
Intelix
Kramer Electronics

Logitek Electronic Systems

Logitek's digital Audio Engine is a full X-Y audio router for Radio and TV applications, providing digital and analog audio selection and distribution through a variety of control surfaces. A fully configured engine can handle 128 mono inputs and outputs, 64 stereo inputs and outputs or a combination of both.

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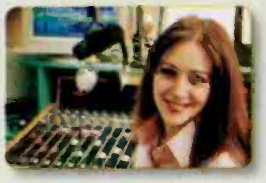
Clean, flexible, easy to use and seamless: AirTools Broadcast Audio Delays.

With the help of Symetrix AirTools 6100 Broadcast Audio Delays, NASCAR race fans are transformed from distant observers to virtual co-pilots by listening to the clear and profanity-free, live, in-car communications of their favorite NASCAR drivers at every Nextel Cup Series™ race. (PHOTO CREDIT: GETTY IMAGES)



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Q: How do you get consistently great sound from one mic used by many voices throughout the day?

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The AirTools 6200 Digital Voice Processor provides two independent mic channels programmed from the front panel or a Windows® GUI. Each unique voice can be recalled upon demand using any of a number of convenient methods: front panel, AirTools RC-1 desktop remote, Windows (over your LAN if you like), or the 6200's internal calendar.

Economy... efficiency... great sound. Two processors in one rack space for your host and cohost or guest – by the market leader in broadcast voice processing.

Easily customize your voice chain with the 6200's Drag 'n Drop modules.

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Ward Beck Systems Ltd.
Wheatstone Corp.

Automation systems

Arrakis Systems Inc.
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Broadcast Software Int'l
Broadcast Software Solutions Inc.
Broadcast Technical Services Group
Burli Software Inc.
D.A.V.I.D. Systems Inc.
Dalet Digital Media Systems
Dawning Technologies Inc.
dcsTools.com
Digital Juke Box
Enco Systems
Fifty Thousand Watt Software
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NETIA
OMT Technologies
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Powergold Music Scheduling Software
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Codecs, hardware and software

Includes POTS, ISDN, IP and others

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Lynx Studio Technology Inc.
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Smarts Broadcast Systems, On Air Digital Inc.
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Includes engineering services

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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 build-up 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.

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Profline BV
Satellite Lynx LLC
StratosAudio, Inc.
Telos Systems

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Allied Electronics
Cartguys.Com
Comet North America Inc.
DH Satellite
DK-Technologies A/S
EAO Switch Corp.
Flex-Core Div. Morlan and Associates
Great Electronics
Kay Industries Inc.
LEA Intl.
LEDtronics Inc.
Masterclock Inc.
NKK Switches
Staco Energy Products Co.

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Broadcast Software Solutions Inc.
Danagger Audio Works
DM Engineering
Gorman-Redlich Mfg.
LEDtronics Inc.
TWR Lighting Inc.

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Satellite Lynx LLC
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Includes webcasting, site hosting

Advanced Telecom Services
Kenneke Communications
Lightningcast
Liquid Compass
Live365.com
Omnia Audio
Telos Systems
Warp Radio
WireReady NSI

Microphone accessories

Includes stands, windscreens and wireless mic equipment

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Mooretronix
Yellowtec

Microphones

AEA
AKG Acoustics US
Beyerdynamic
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MXL Microphones
Neumann
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Shure Inc.
Studio Projects
Zaxcom Inc.

Microphones and mic accessories

Acoustek Corp.
AEA
AIR Corp.
Audio Intervisual Design
Audio-Technica US Inc.
Audix USA
Azden Corp.
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Crane Song Ltd.
DACS Ltd.
DPA Microphones Inc.
Electro-Voice
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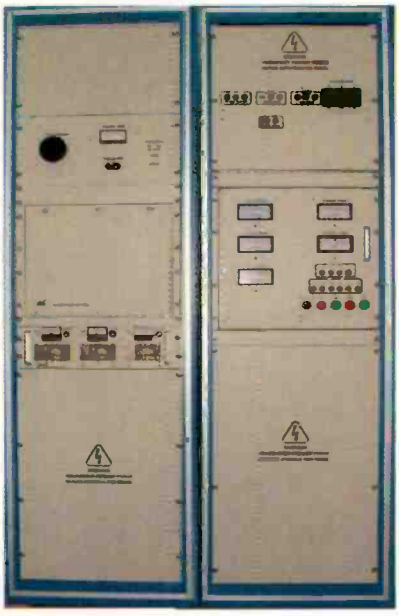

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"Our furniture from you not only fit into our budget and timeline, it was very well constructed and looked beautiful. I expect to be outfitting many more facilities with Omnirax..."

"I was impressed with the exceptional care given packaging for shipment. A few very large and potentially fragile components made it cross-country completely unscathed"

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KCWU, Ellensberg, WA

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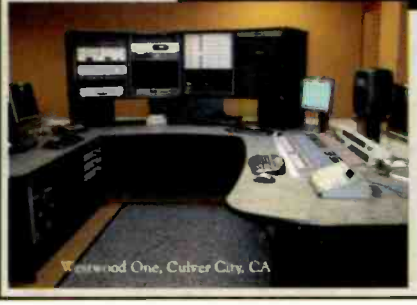

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The Engineer's Choice!

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Ram Broadcast Systems
Rode Microphones
Royer Labs
Sabine
SE Electronics
Sony Electronics/Broadcast Div.
Soundfield Distributed by Las Vegas Pro Audio
Sweetwater
Systems Wireless
TAI Audio
Trans Audio Group/Soundelux, Soundfield, GML, Pauly, Heil

Microwave, STL and RPU equipment

Includes wired and wireless equipment

Antenna Systems & Supplies Co.
Barix AG
Broadcast Richardson
Broadcast Systems
Delta RF Technology Inc.
Harris Broadcast Communications, Networking & Infrastructure Solutions
Kathrein Inc., Scala Div.
Marti Electronics
Mimix Broadband
Moseley Associates Inc.
Multidyne Video & Fiber Optic Systems

Nautel
Richardson Electronics
SAMCO Antennas Inc.
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Silicon Valley Power Amplifiers (Delta RF)
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APT Audio Processing Technology

WorldNet Oslo IP & T1 STL Platform: A modular, flexible and professional STL platform designed for mission-critical applications, the WorldNet Oslo delivers multiple channels of audio and data over IP or T1 links. A large selection of plug-in audio cards enable anywhere from 4 mono/2 stereo to 28 mono/14 stereo channels of linear or apt-X encoded audio.

Mixers

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AUDIO TIME MANAGER doesn't just shift time, it shifts the clock paradigm. Imagine inserting an extra traffic report in a network show, with no loss of content. Imagine backtiming into the network perfectly every time, even when breaking local news means you're running long. Imagine eliminating make-goods. Now shift your thinking about time, because your old clock just got a new face.

"The 25-Seven Systems box is an amazing device and leaves all others in its dust. It's truly the **SECRET WEAPON** to make your station sound tighter, time shift segments and never miss a network cue again. We're still finding new and creative ways to use the 25/7 every week."

-Gabe Hobbs
Senior Vice-President of Programming, News/Talk/Sports
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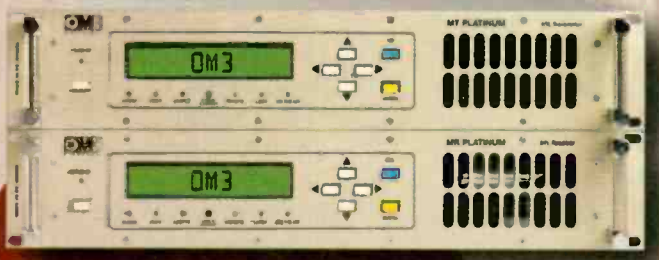
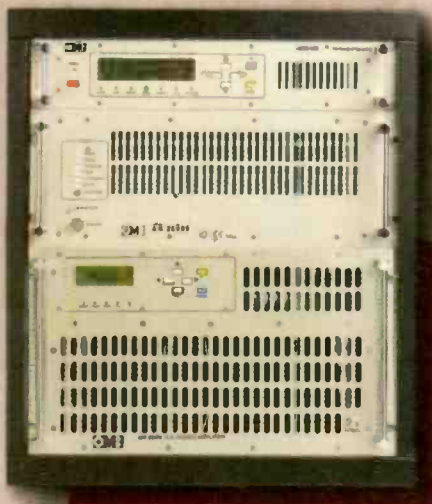


MT/MR PLATINUM

>1GHz is a high-performance Studio-to-Transmitter Link. It is made up of the 5W MT transmitter externally synthesized in 10MHz sub-bands with a step of 100KHz, and the MR double conversion receiver, that is externally synthesized, too. The MT is microprocessor controlled, and includes LCD display for the visualization of the most relevant transmission parameters (frequency (5-digit), forward and reflected power, modulation level), balanced Mono, Stereo (MPX). The MR receiver has the same visualization system as the transmitter. It includes balanced Mono and Stereo (MPX) outputs. Furthermore, the MT/MR Platinum STL includes a jumper in order to get a proper operation with digital signals.



EM 2000

is a 2000W FM transmitter made up of the EM 25 DIG exciter (or EM 20/30 exciter) and the AM 2000 FM amplifier. AM 2000 includes eight 300W high-efficiency MOSFET technology amplifying modules, fed by 2 independent switching power supplies, which are made to withstand the working conditions. The amplifying modules work independently thanks to a power combining structure that provides high isolation between them.

EM 10000

is a 10000W FM transmitter made up of the EM 250 COMPACT DIG exciter and three control units which combine the power of six AM 2000 FM amplifiers. AM 2000 includes eight 300W high-efficiency MOSFET technology amplifying modules, fed by 2 independent switching power supplies, which are made to withstand the working conditions. The amplifying modules works independently thanks to a power combining structure that provides high isolation between them.

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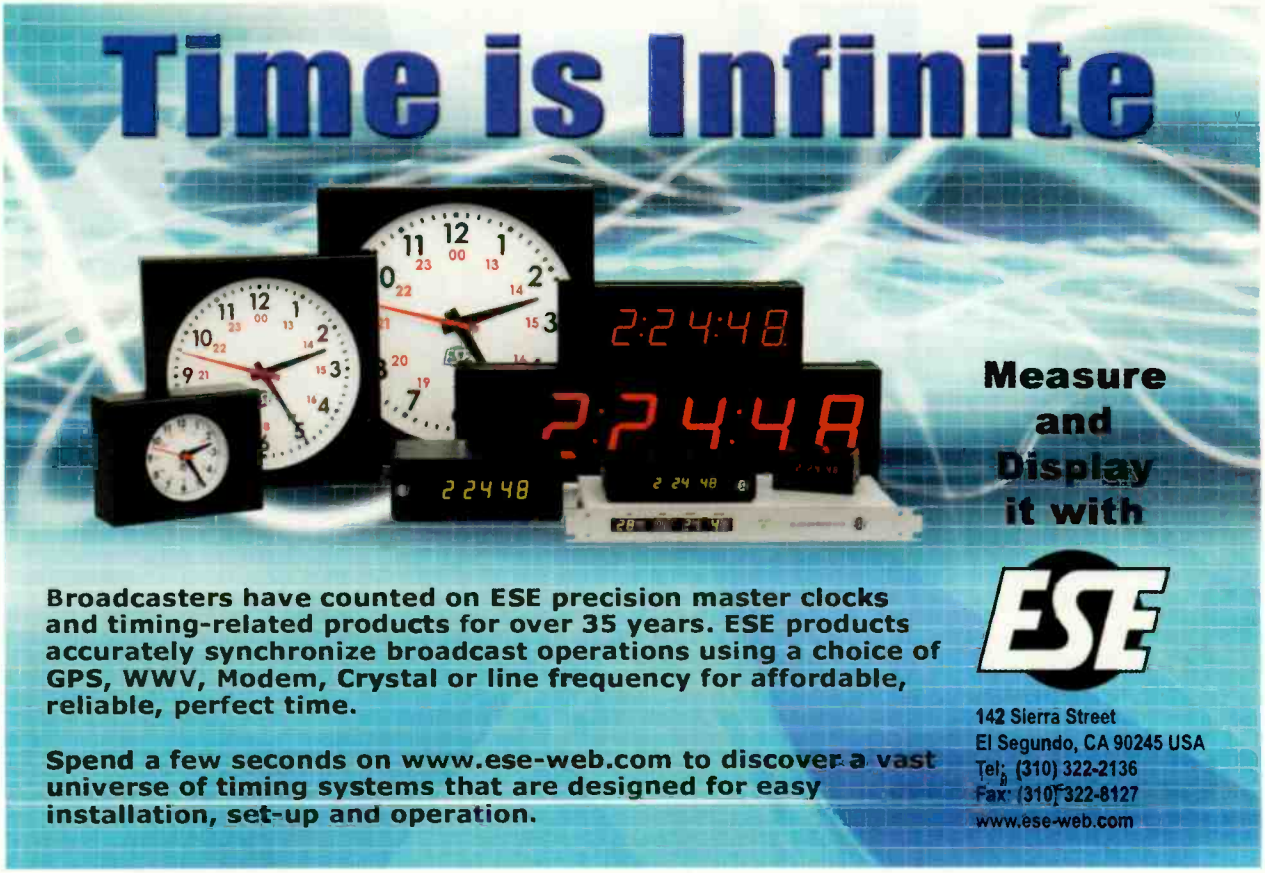

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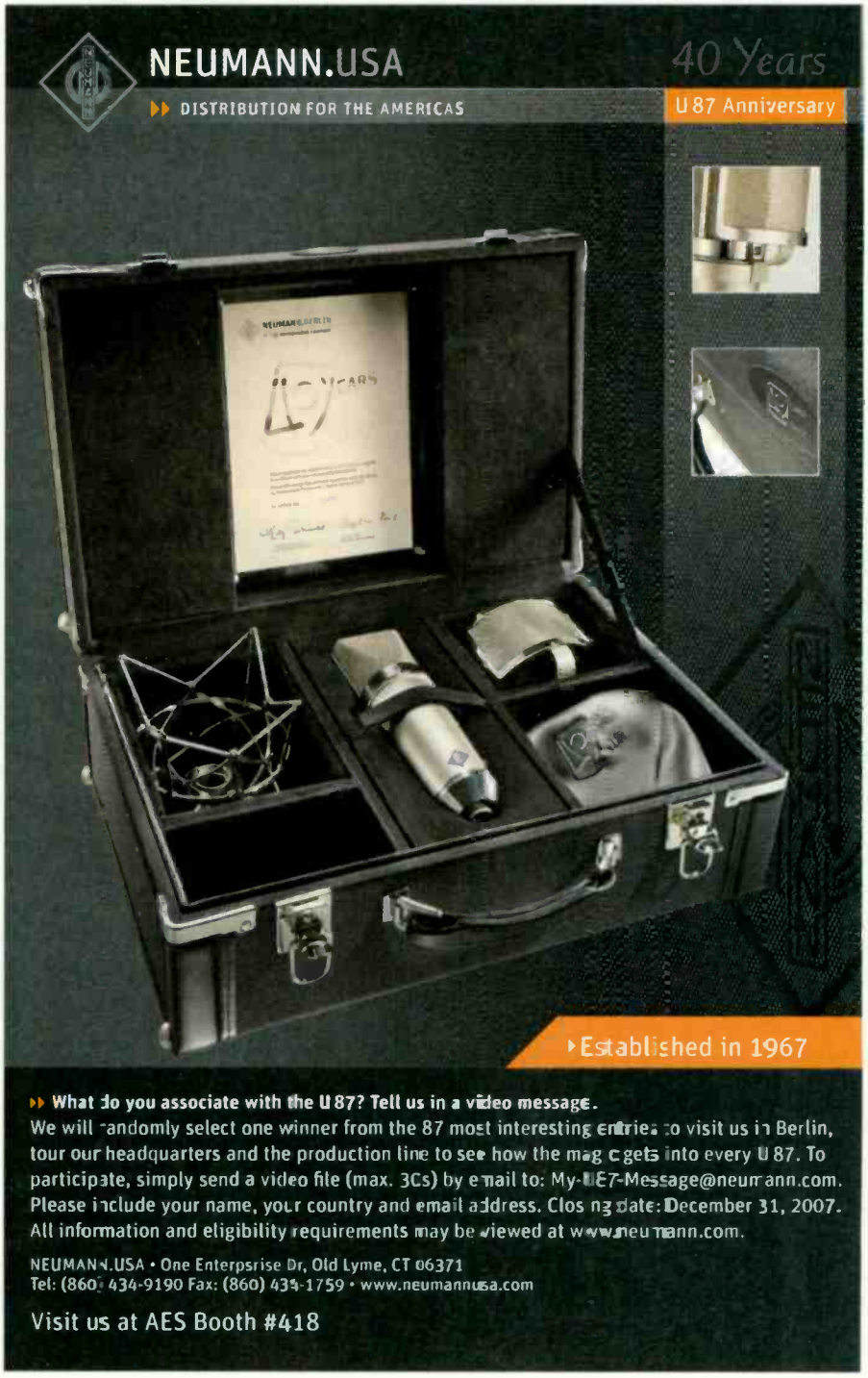

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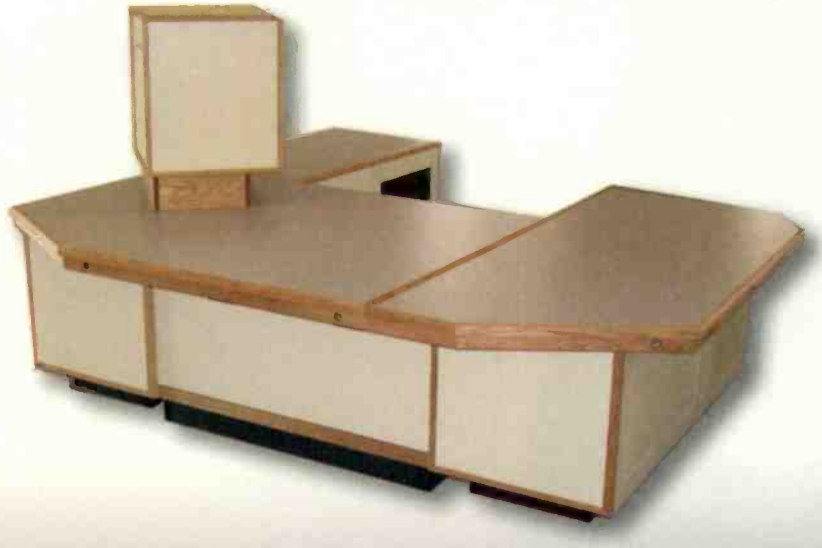

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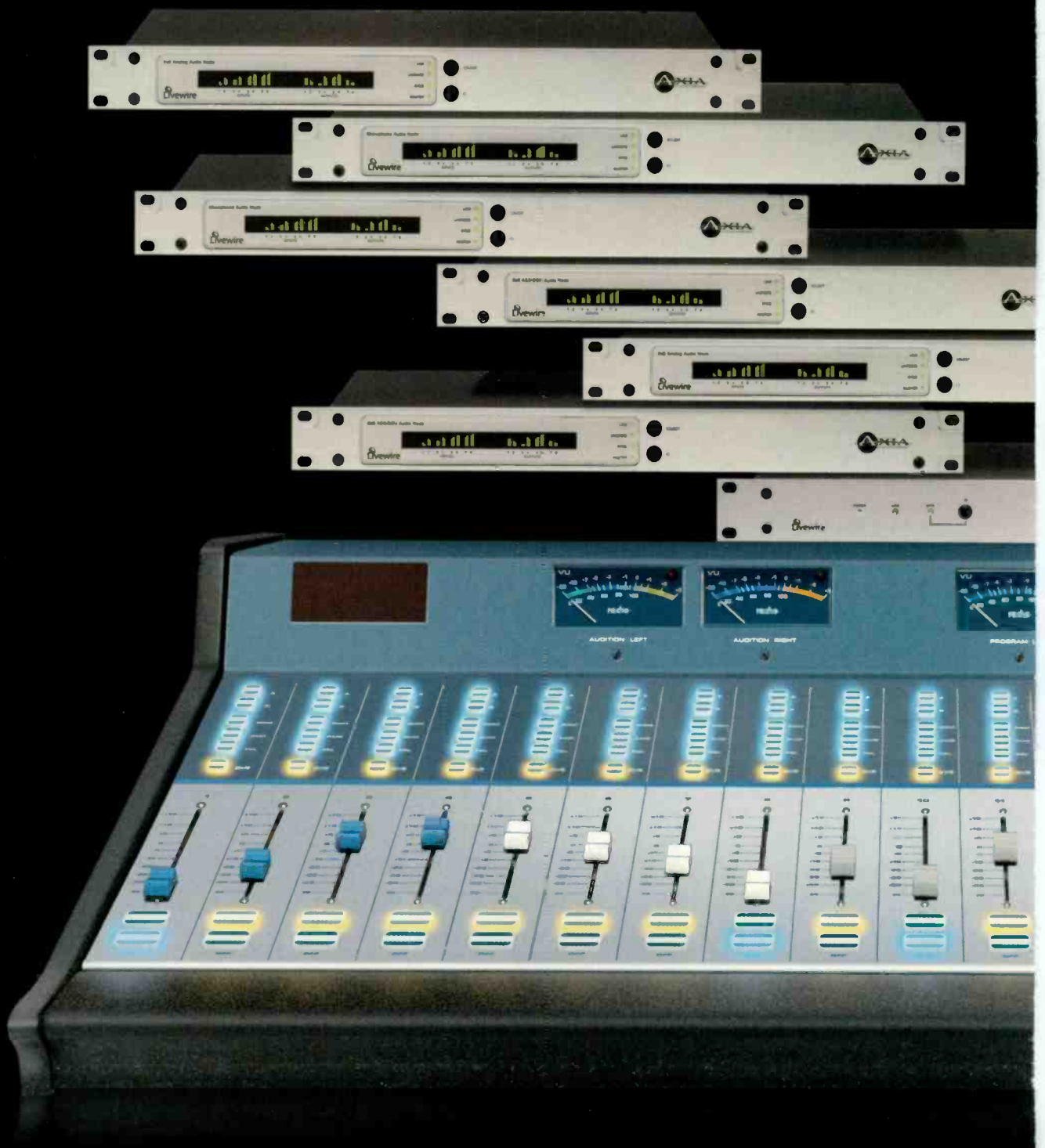

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Stinger- instant acess to 288 'rapid fire' audio files

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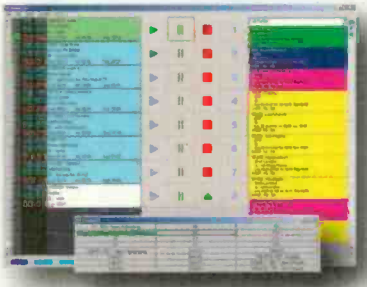

WaveCart - the original on-screen cart machine

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SkimmerPlus - professional audio logging and skimming

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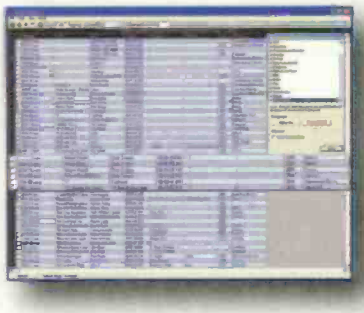

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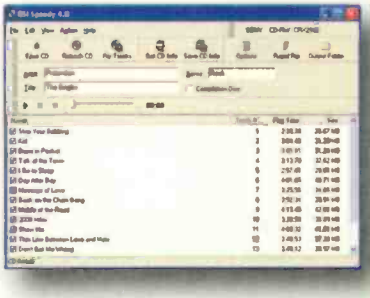

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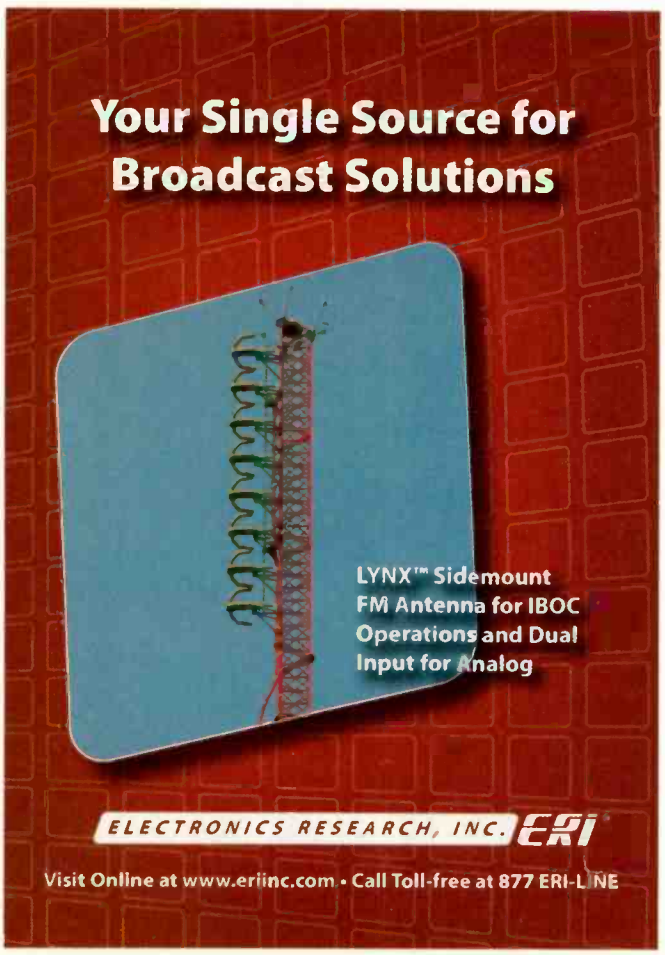

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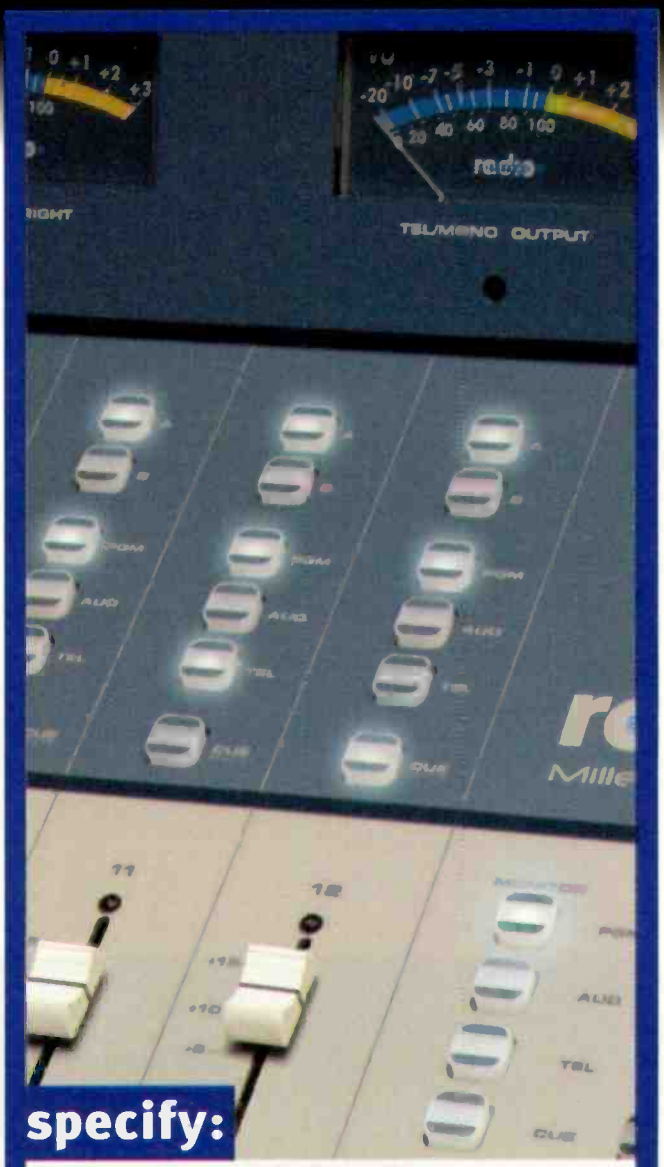

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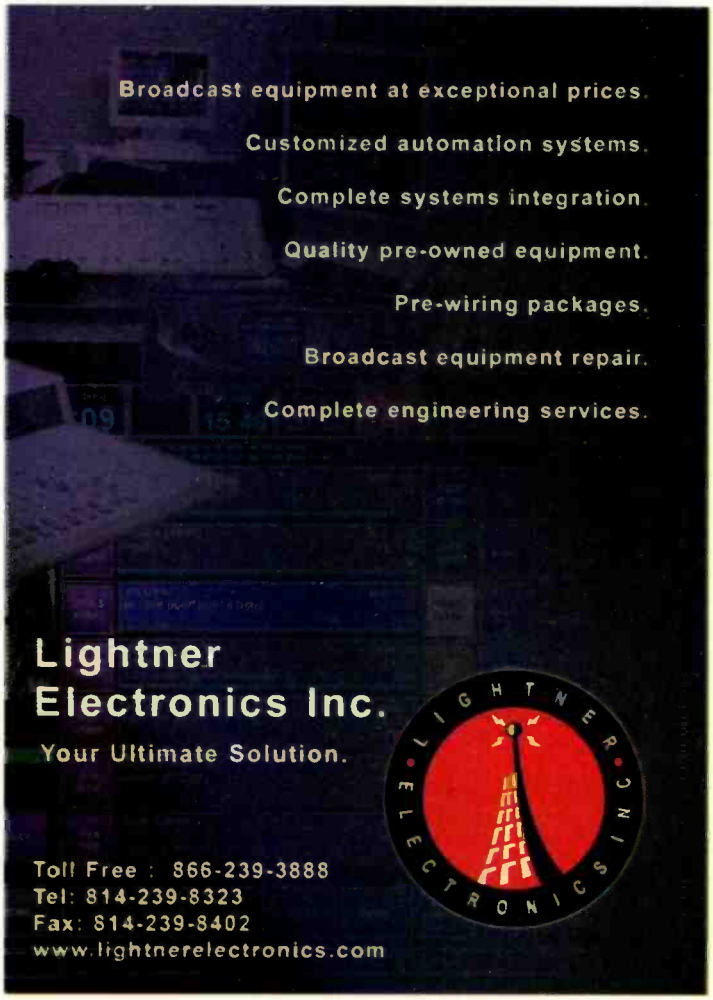

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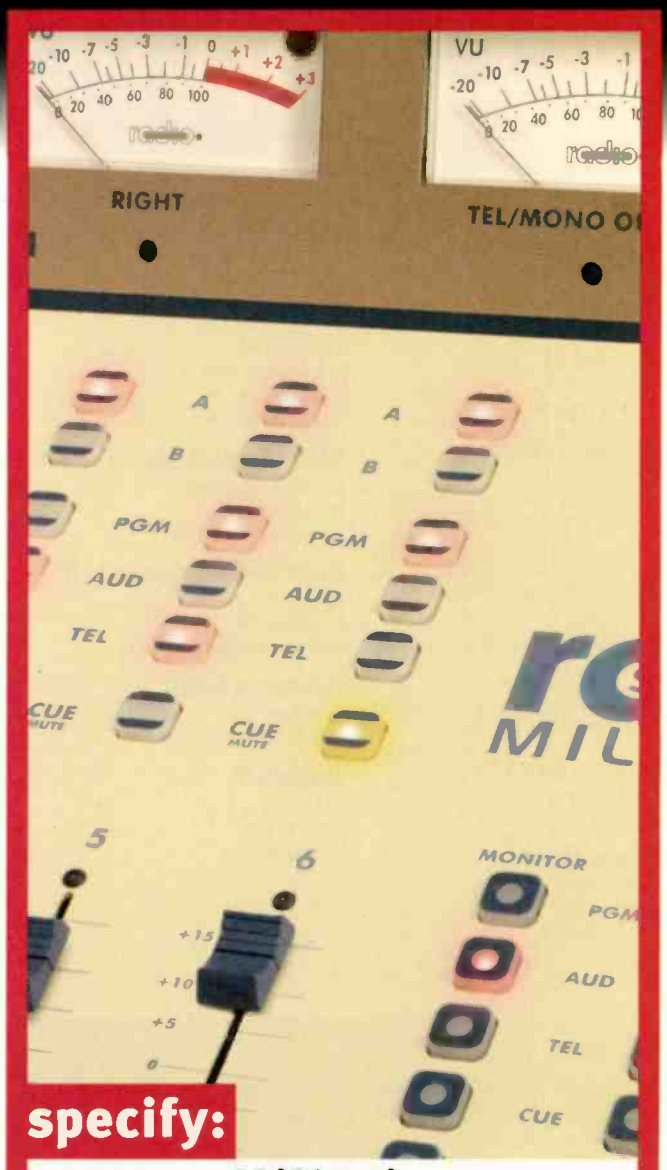

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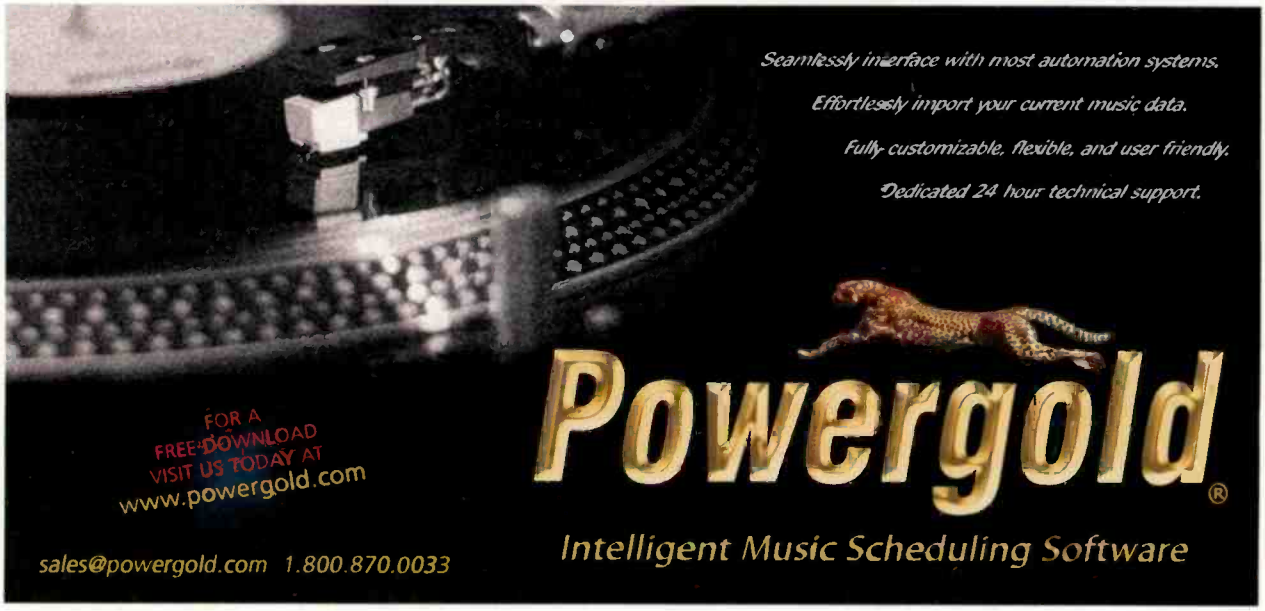

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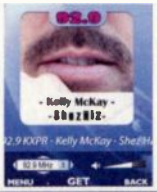

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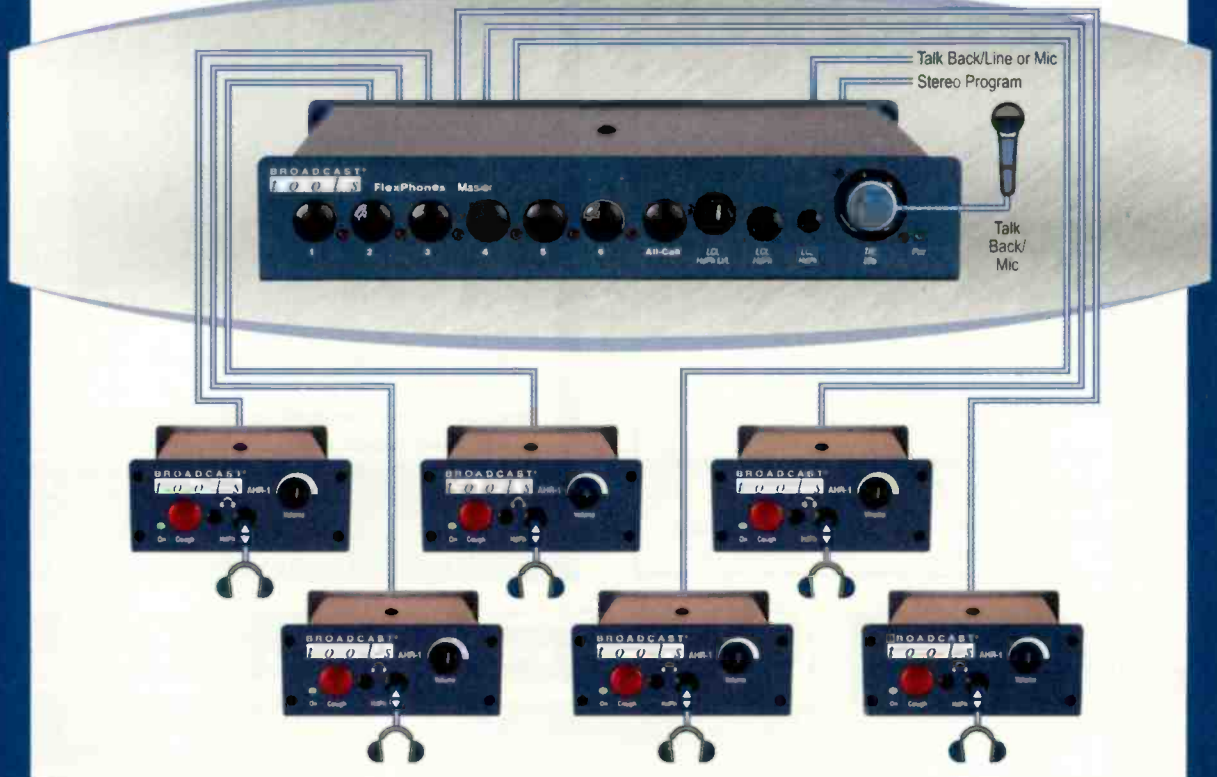

FlexPhones Master

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

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

AHR-1 Active Headphone Remote

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

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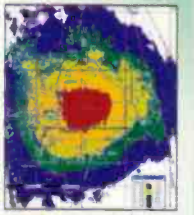

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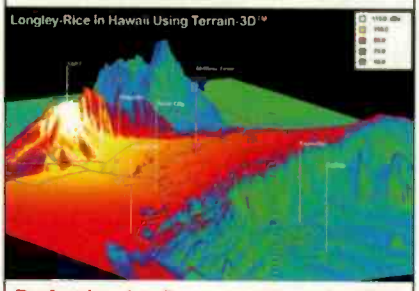

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Photo by Gary Wachter

Through practical experience, many station engineers already possess many of the skills of an effective project manager.

- Cost Management – Ensure the project is completed within budget.
- Communications Management – Put in place and manage the collection, dissemination, storage and disposition of project information.
- Scope Management – Identify all work required to complete the project successfully.
- Quality Management – Ensure project satisfies customer requirements.
- Risk Management – Identify, evaluate and respond to all potential risks.
- Time Management – Ensure project is completed on time.
- Human Resources Management – Manage all project resources.
- Procurement Management – Procure all necessary materials to complete the project.

To better visualize how this works, imagine a matrix diagram with the five process management groups on the X axis and the nine knowledge areas on the Y axis. The goal is to have a complete understanding of how each of the respective processes interacts. Just to make things more interesting, the nine knowledge areas also break into 39 component processes, each of which can map across the five process management groups. Space doesn't permit a detailed explanation of all these groups, knowledge areas and component processes; however, they are addressed in the PMBOK or the many books and websites dedicated to professional project management.

You probably already have a great deal of project management experience. The project management professional is an excellent credential to add to your resume and soon will become a necessity to compete in the job market.

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

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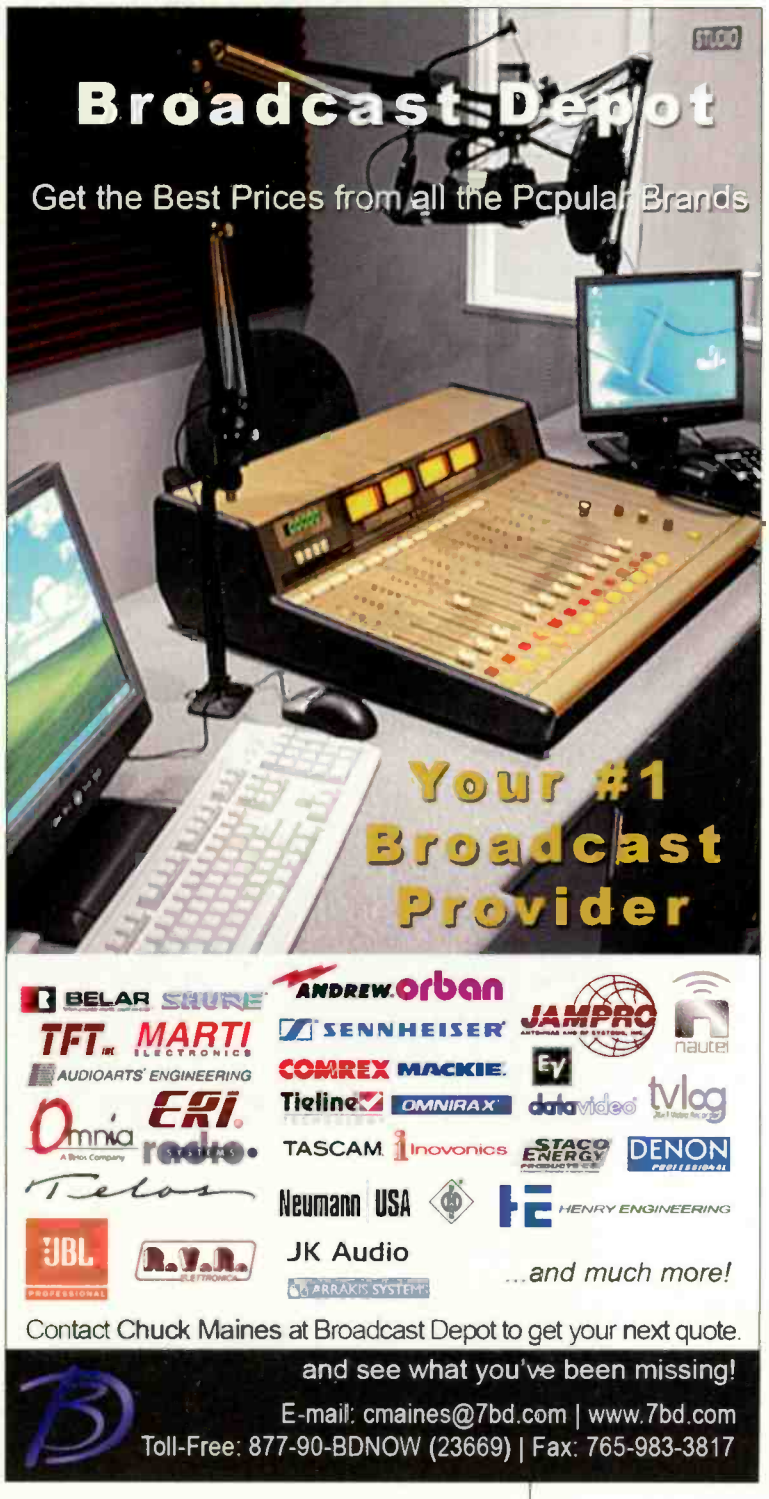

FCC Issues Surface in Presidential Race

By Harry Martin

Only a month or two before the 2008 presidential nominees face off in primaries, and less than a year before the general election, top candidates from both major parties are discussing key issues affecting communications policy. The picture will undoubtedly become clearer as of Feb. 5, 2008, this year's Super Tuesday, when up to 20 states will hold their primaries. But several big names have already given indications of where they stand on some of the most important issues facing the FCC.

Senator Barack Obama (D-IL) has been very vocal on FCC issues. He is adamant about preventing further media consolidation. He issued a statement at the FCC's September localism hearing in Chicago expressing his disappointment at the Commission's leniency in permitting consolidation. Obama's comments echo the sentiments of Democratic commissioners Michael Copps and Jonathan Adelstein, who agree that the Commission should be doing more to encourage diversity in ownership in broadcast media, promote the development of new media outlets and the expression of diverse viewpoints.

Obama issued a second statement in October, commenting on reports that Chairman Kevin Martin intended to issue proposed media ownership rules in mid-November and schedule a vote on them for Dec. 18, 2007. Obama said that date is far too early in view of the issues that need to be considered. "I believe both the proposed timeline and process are irresponsible," Obama wrote, saying more time for public consideration is warranted because, "minority owned and operated newspapers and radio stations play a critical role in the African American and Latino communities and bring minority issues to the forefront of our national discussion."

In addition to suggesting that a special panel be commissioned to address minority ownership concerns, Obama favors shorter broadcast license renewal terms and more scrutiny from the commission regarding whether broadcasters are addressing their public interest obligations.

Dateline

Feb. 1 is the deadline for submission of biennial ownership reports by radio stations in Arkansas, Louisiana, Mississippi, New York and New Jersey.

On Feb. 1, radio stations with more than 10 full-time employees located in Arkansas, Louisiana and Mississippi must file their Broadcast EEO Mid-Term Reports (Form 397) with the FCC. These reports must now be submitted electronically.

Also on or before Feb. 1, radio stations in the following states must place their annual EEO Reports in their pubic files: Arkansas, Kansas, Louisiana, Mississippi, Oklahoma, Nebraska, New Jersey and New York.

Online debate

Net neutrality, a policy that generally disfavors ISP discrimination among Internet users in terms of functionality and pricing, is another hot-button issue being referenced by candidates and is likely to come up throughout the election campaign. The Democratic candidates, most notably Senators Obama and Clinton (D-NY), support net neutrality. Taking a contrary view, Rudy Giuliani released a statement saying that the federal government must fight the urge to unnecessarily tax and over-regulate the Internet. Senator John McCain (R-AZ) has expressed a similar view, stating that the FCC should interfere only in markets where there are demonstrable infractions or unfair competition.

Another communications issue that could generate considerable talk throughout the election is the deployment of broadband in the U.S. and America's progress compared to that of other countries. Most of the candidates who have spoken out have focused on the social benefits of broadband and its ability to provide improved access to health care, education and other vital services.

Due to the increasing importance of communications issues to the economy and, more broadly, to social discourse, we can expect more attention to be devoted to these vital issues as Campaign '08 continues to unfold.

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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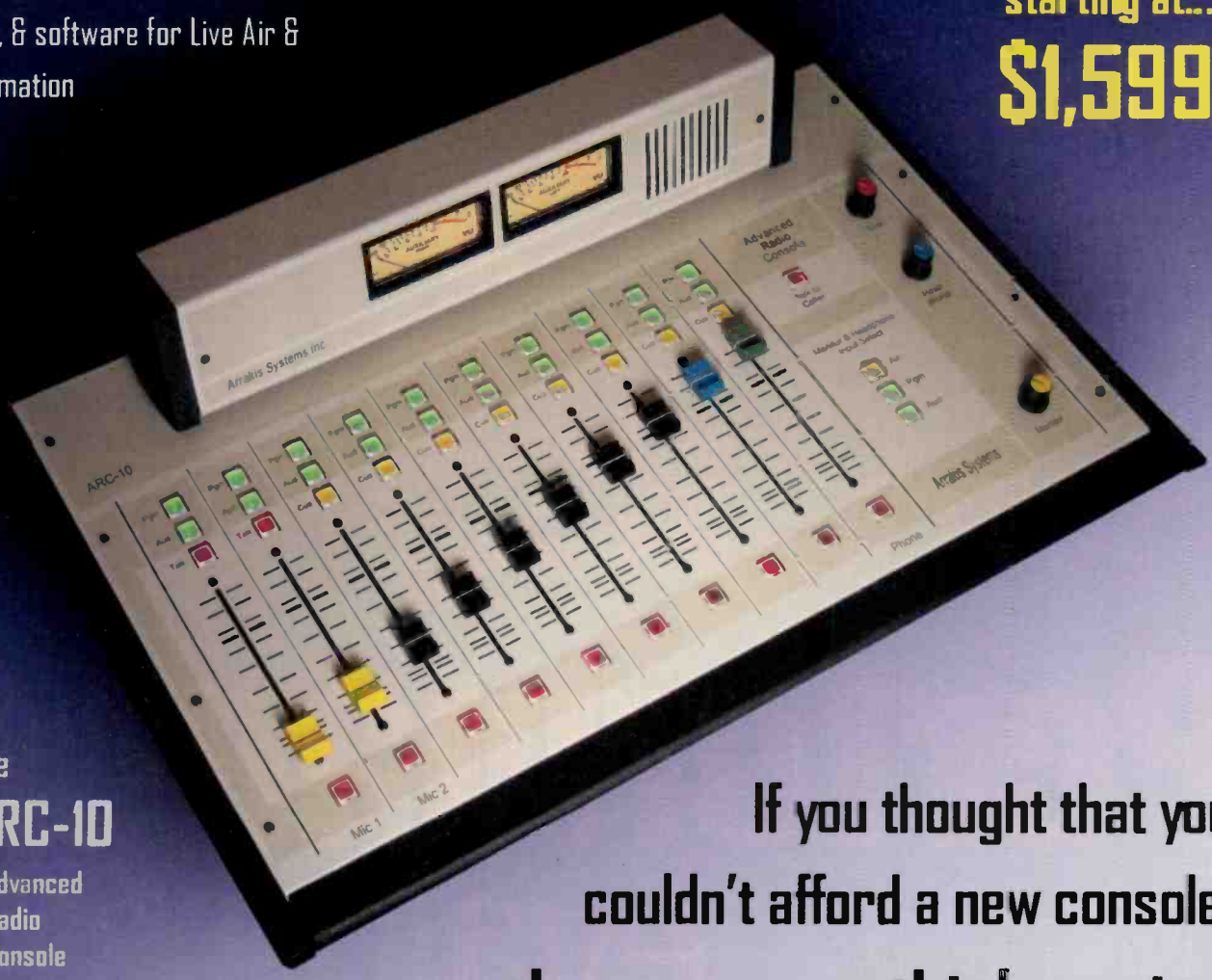

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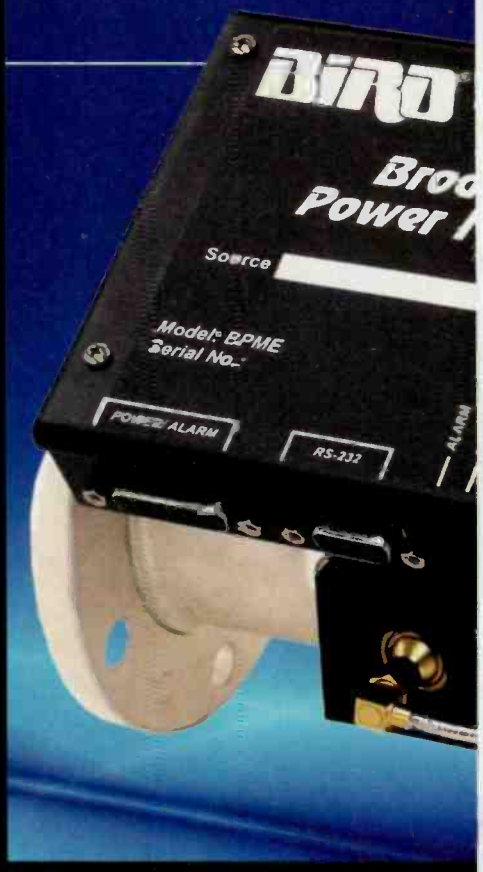
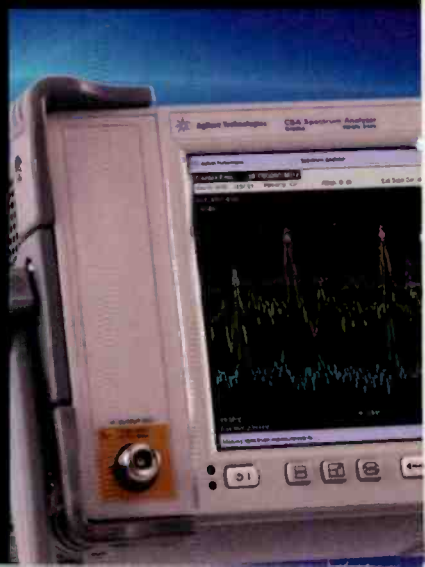
After months of learning, planning, budgeting and finally executing the project, your station is now on the air with HD Radio. But what comes afterward now that it's up and running?



Performance evaluation

By Doug Irwin

Once an HD Radio system is operating in a stable fashion, the various parameters and data streams associated with the MPS and the SPS (and perhaps even another SPS) must be monitored. It used to be that all a station really needed to do was watch the peak modulation level, and in addition with FM, the pilot level and once in a while the L-R level (for the occasional out-of-phase song). Now with HD Radio, it's important to monitor and measure the time alignment and level alignment between the analog modulation and the MPS, and stations will likely want to monitor the RBDS on the analog channel along with PAD data for both the MPS and SPS. Fortunately, there are now multiple monitoring devices made specifically for HD Radio, and each of these devices gives the end user options about which parameters are to be measured, and how the device is to alert the user once a problem is detected. Do you want a contact closure to signal your legacy remote control? Or do you want an e-mail about an out-of-tolerance parameter? Want to browse into the monitor itself via the Internet? Well then, you're in luck: That's a common feature now.



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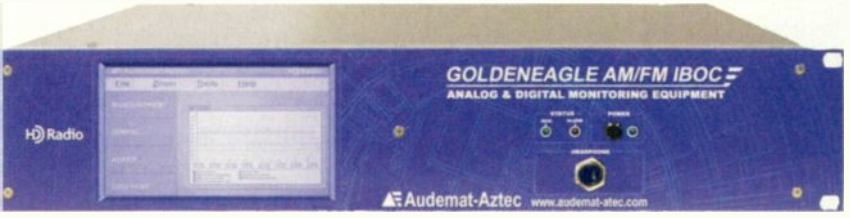
Here's a rundown of several major monitoring products available today.

Belar Electronics offers the FMHD-1, a combination analog and HD Radio monitoring system. This radio has three antenna inputs: one for off-air reception, and another group of two to be used while the device is located at the transmitter site. One input of that group is used for high-level RF from an analog transmitter, the other is used for high-level RF from the HD Radio transmitter. The monitor receives and demodulates the analog and digital signals simultaneously, displaying them on a 640 × 240 color LCD display. (A rotary knob/encoder completes the basic user interface.) The display is used to show HD Radio status, data, time alignment, and configuration information; for the analog transmission, it displays total modulation, pilot, L, R, L+R and L-R. Additionally, the display can be used to show a spectrum of the analog and digital signals.

Belar FMHD-1 analog and HD Radio monitor.



Audemat-Aztec Golden Eagle AM/FM monitor.

Day Sequerra M4.2R monitor.

The time alignment scales are ±375ms (±16384 samples) and ±5.8ms (±256 samples).

The FMHD-1 has eight user-assignable audio outputs on its rear apron that can accommodate the analog versions of the FM signal plus the MPS, SPS1 and an SPS2. The unit also has three user-assignable AES-3ID outputs (75Ω unbalanced). There are two demodulated composite outputs and two LVDS outputs (RJ-45, 100Ω).

This monitor can be controlled by a computer via its Ethernet capability or the RS-232 serial connector. Wizard for Windows is the Belar software that allows the user to remotely monitor the FMHD-1. And finally, there are four user-assignable relay contacts to indicate alarm conditions.

Audemat-Aztec offers three different versions of its HD radio monitoring system: the Goldeneagle HD FM, the Goldeneagle HD AM, and the Goldeneagle HD FM/AM.

These units will constantly monitor a station's (or stations') parameters and generate alarms should any of the selected parameters fall outside their pre-programmed tolerances. The unit will display all RBDS and PAD for HD Radio. It has an embedded Web server (used with client software supplied by Audemat) to study the detected parameters from afar via the monitor's Ethernet capability. Another feature of the Web server is that of streaming audio: The end-user can listen to a stream of embedded left and right audio, or alternately, the left channel can be a stream of the analog audio while the right channel is a stream of the digital audio. This obviously facilitates the time alignment adjustment. Of course if you are in the same room with the unit, the audio is available on a headphone jack, or via balanced analog audio, or a balanced AES version.

Alarms are reported via e-mail or optionally by voice or contact closures that signal an in-place remote control.

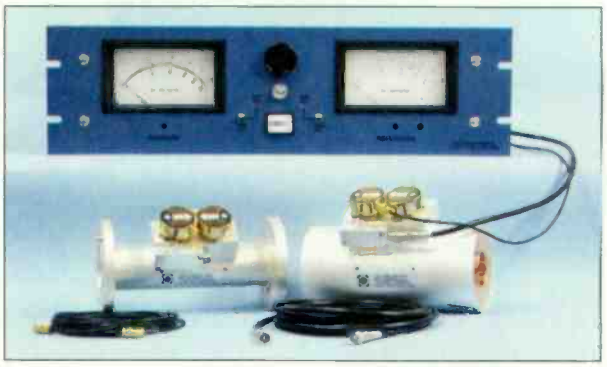
An optional FFT spectrum analyzer module enables the end-user to see the real-time spectrum of the complete RF signal. Thresholds can be set with respect to a spectrum mask so out-of-tolerance conditions can be detected and reported. With the spectrum analyzer option comes what Audemat refers to as the Digital Demodulator, which provides representation of total modulation, pilot and RBDS injection, and the analog and digital levels displayed in a bargraph format.

Day Sequerra has a wide line of HD Radio monitoring products such as the M4.2R (an updated version of the M4). This monitor will tune both AM and FM bands and has the capability of storing up to 20 presets. It will detect and display RBDS data (Program Service and Radio text fields) for the analog modulation, plus PAD data (station long and short name, program type, song file, artist, album, genre and comment fields) for each HD channel.

It has six alarm relay contacts that can be assigned to represent loss of RF carrier, audio, OFDM, RBDS, PAD, multicast or time alignment. These same alarms can be reported to the end-user via e-mail. Day Sequerra's remote control software is called Remote Dashboard and communicates with the M4.2R via its Ethernet port. There again, if you are in the same location as the monitor itself, you can listen to the demodulated signals via the front headphone jack or via balanced analog (+4dBU) outputs on the back. A transformer-isolated 110Ω source SP/DIF digital output comes from a rear-apron XLR-type connector.

I have the power

If you've installed an FM band HD Radio transmitter then you likely relied upon the unit's power meter (calibrated at the factory) to set the digital power level. You may very well want another means, though, to monitor digital power. And since the in-line wattmeters we've all used over the years are not adequate for measuring the power out of an HD Radio transmitter (because wattmeters associated with these transmission line sections are calibrated to read average power, and don't work well



Coaxial Dynamics 91090 Digital Wattchman monitor and alarm system.

when there is a high peak-to-average ratio as there is with the IBOC technology we are using) you'll probably want to consider the purchase of a new wattmeter.

Coaxial Dynamics offers the 91090 Digital Wattchman monitor and alarm system. This unit is similar in function to its more familiar 81090 series, but Digital Wattchman makes use of two digital plug-in elements so it can monitor forward and reflected power simultaneously. (Using the digital plug-in elements allows the user to measure the power of complex modulations schemes such as those used in DAB and DTV.) The 3RU display unit includes two 4.5" mirrored analog meter movements. Accuracy of the power measurement is specified as ±5 percent; alarm response time for the unit (including the time for necessary for the relay contacts to move) is specified as 15ms. Amplified dc outputs are also included so your remote control can be connected directly.

Bird Electronics offers the BPM-E (Broadcast Power Monitor-Enhanced) for the measurement of complex RF waveforms such as those encountered in the transmission of HD Radio. The BPM-E comes mounted to a Bird Thru-line section, and has the simultaneous forward and reflected monitoring capability expected today. It also includes an integral RF test port that allows for

Resource Guide

Manufacturers of test equipment

Agilent Technologies
800-829-4444
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All the features you expect from a professional broadcast codec are supplied as standard: analog and AES/EBU I/Os, adjustable silence detection, alarm ports, contact closures, speed dials, embedded auxiliary data and many more...

Configuration and control of the WorldCast Eclipse is straight-forward and simple thanks to APT's powerful and intuitive Codec Management System (CMS). Offering extensive real-time management of multiple codec units, the CMS enables alarm monitoring, logging and performance monitoring as well as configurable user and audio profiles.

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convenient testing of the spectrum of the RF mask. Both RS-232 and Ethernet communications means are included for remote monitoring via a Web interface. The unit interfaces with a Bird 3129 display unit (1RU) so power can be read locally at the unit.

Bird Electronics Broadcast Power Monitor-Enhanced.

Analyze this

After installing and commissioning an HD Radio transmitter, a proof of performance needs to be run. A spectrum analyzer is needed for this, and perhaps you'll be lucky enough to have one at the ready. Fortunately there are several relatively inexpensive analyzers out there that fill the bill.

First is the *Boonton* 9102, which is a hand-held device that measures from 100kHz up to 4.0GHz (optionally up to 7.5GHz). The display features Resolution Bandwidth from 100Hz to 1MHz, and video bandwidth from 10Hz to 1MHz; and one of its power measurement capabilities is known as channel power – probably the most accurate way of measuring the HD Radio power spectrum. The 9102 also has an Ethernet interface that allows TCP/IP communication via a LAN or WAN.

Another instrument manufacturer with a real legacy in broadcast engineering is *Agilent Technologies* (formerly known as HP). One of its newest offerings is the N1996A CSA spectrum analyzer. This unit covers from 100kHz to 3GHz (optionally to 6GHz) with RBW in 10 percent adjustable steps between 10Hz and 200kHz, and then in steps of 250kHz, 300kHz, 1MHz, 3MHz and 5MHz. VBW can be set between 1Hz and 8MHz. This unit can also perform the channel power type of

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Agilent Technologies N1996A CSA spectrum analyzer.

LP Technologies LPT-3000 spectrum analyzer.

measurement, and features Ethernet connectivity as well as USB connectivity.

LP Technologies offers the LPT-3000 spectrum analyzer. This device covers from 9kHz through 3GHz, measures channel power, has the appropriate resolution and video bandwidth settings, and even has pre-programmed Ibiquity-specified RF masks. It also has storage space for up to 900 waveforms and it can convert its measured data to an Excel file format. Communication with the unit can be made via serial or USB, with Ethernet as an option. LP Technologies also makes a rackmount version of the same analyzer (LPT-3000R) that is specifically designed to live at a remote site. This unit has an optional four-input RF switcher that gives it the ability to multi-task. It is also priced at less than half the cost of most other analyzers.

HD Radio is a modern technology that requires the station engineer to learn about new techniques in RF communications. Let's face it: AM and FM technology date from the 1920s and 1930s, and share very little technologically with digital radio. The inclusion of HD Radio necessitates new test and monitoring capabilities; fortunately the proliferation of digital transmission has attracted many manufacturers to build the necessary equipment, thus keeping the prices reasonable. That benefits us as broadcasters, and by extension, our listeners as well.

Irwin is the chief engineer of WKTU-FM, New York City.

Sleek, fast and ready to move

By Chriss Scherer, editor

These are important traits in NASCAR, and they not only apply to the cars but to the new MRN Radio studios.

Being quick is important for NASCAR drivers, but building a studio is a project that shouldn't be rushed. Still, timelines and deadlines are set for a reason, and they must be met. In early October of this year, MRN Radio, the voice of NASCAR, crossed the finish line by moving to its new studio facilities. While one advantage of this move was that the facility did not support a 24-hour on-air operation, it was not simply a move across town. The studio moved 500 miles.

The showcase studio counter top is angled so lobby visitors have a better view of the operation.

Sleek, fast and ready to move

After many years in Daytona Beach, FL, the MRN Radio operation has relocated to Concord, NC, a suburb of Charlotte. The Daytona Beach location was used because the city is the home of NASCAR and International Speedway Corp., the parent company of MRN Radio. When it came time to rebuild the studios, it was a chance to start from a clean slate. The new studios and offices could be designed exactly to current needs. The fresh start also provided a chance to consider a new location.

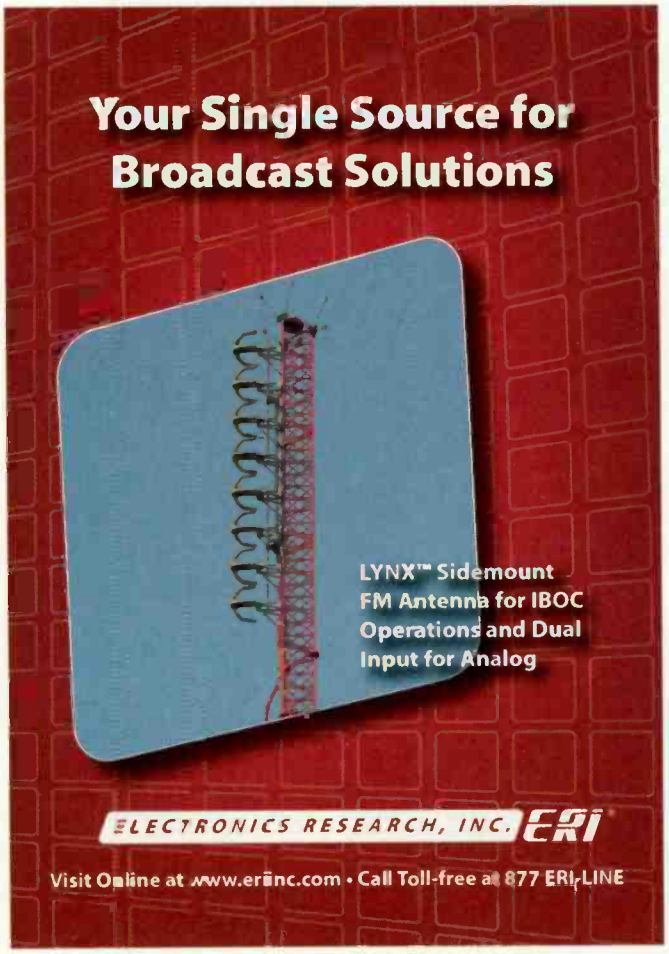
So why North Carolina? For MRN Radio, the decision was fostered by the fact that many NASCAR racing teams are based in the Charlotte area. This puts MRN Radio in the heart of its core. The building that MRN Radio now occupies even has a direct tie to NASCAR: It previously housed Darrel Waltrip's race shop.

Planning the move

When planning for the new facility began, MRN Radio Chief Engineer Doug Watson was able to take the fresh start and build exactly the facility the network needed. This started with locating the right building. Obvious factors, such as sufficient space for the studios, business and operations staff were a given. One important consideration for the new facility was not based on the studios and staff, but rather the MRN vehicles.

MRN Radio operates four vehicles to cover racing events around the country. Like any remote vehicle, these rolling studios require occasional maintenance. What's

The talk studio base includes a rack to mount the audio equipment, power supplies and the talk studio computer.



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Sleek, fast and ready to move

different about these vehicles is that they are not the traditional panel vans like most radio stations operate. Two of them are 53' long semi trailers. There is also a satellite uplink truck and an 18' trailer that is pulled by a pickup truck. These complete mobile studios are in constant use during each season, so the time to give them the heaviest maintenance is during the off-season in December and January. Working on them outside is not a preferred method, especially during the winter. A garage able to house both vehicles was on the required needs list. In the end, finding a building with a previous tie to NASCAR was just an added bonus.

Covering nearly 25,000 square feet, the facility includes a garage that measures 41' wide by 157' long (about 6,440 square feet). When Waltrip used it, the building had six office spaces in the front, while the remainder was used for the car shop. MRN Radio kept the existing front offices and integrated them into the floor plan. Additional offices were built, as well as two control rooms, two talk studios, a production studio, four identical audio edit suites, three identical video edit suites and a rack room in the open area.

There are two large spaces currently used for storage. Both measure just over 1,500 square feet and provide plenty of expansion space for the future.

A prime need for the new facility was an area that could house the various remote vehicles.

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The two air studios and talk studios are built in a mirrored fashion. The main reason for this was to provide natural redundancy for the on-air operations. While they are functionally identical, they are not completely cosmetically the same. The studio nearer to the entrance was built to be a showcase, and it is visible from the lobby. The other air studio is toward the rear of the building and does not have the same public visibility.

While the front studio has large windows looking into the lobby, the showcase design was also applied to the furniture itself. The control room counter top is not parallel with the wall looking into the talk studio. Instead it is slightly angled to show more of the console surface when viewed from the lobby. The talk studio table is also angled to avoid having one guest's back directly toward the lobby window. The control rooms and talk studios measure about 20' by 11'.

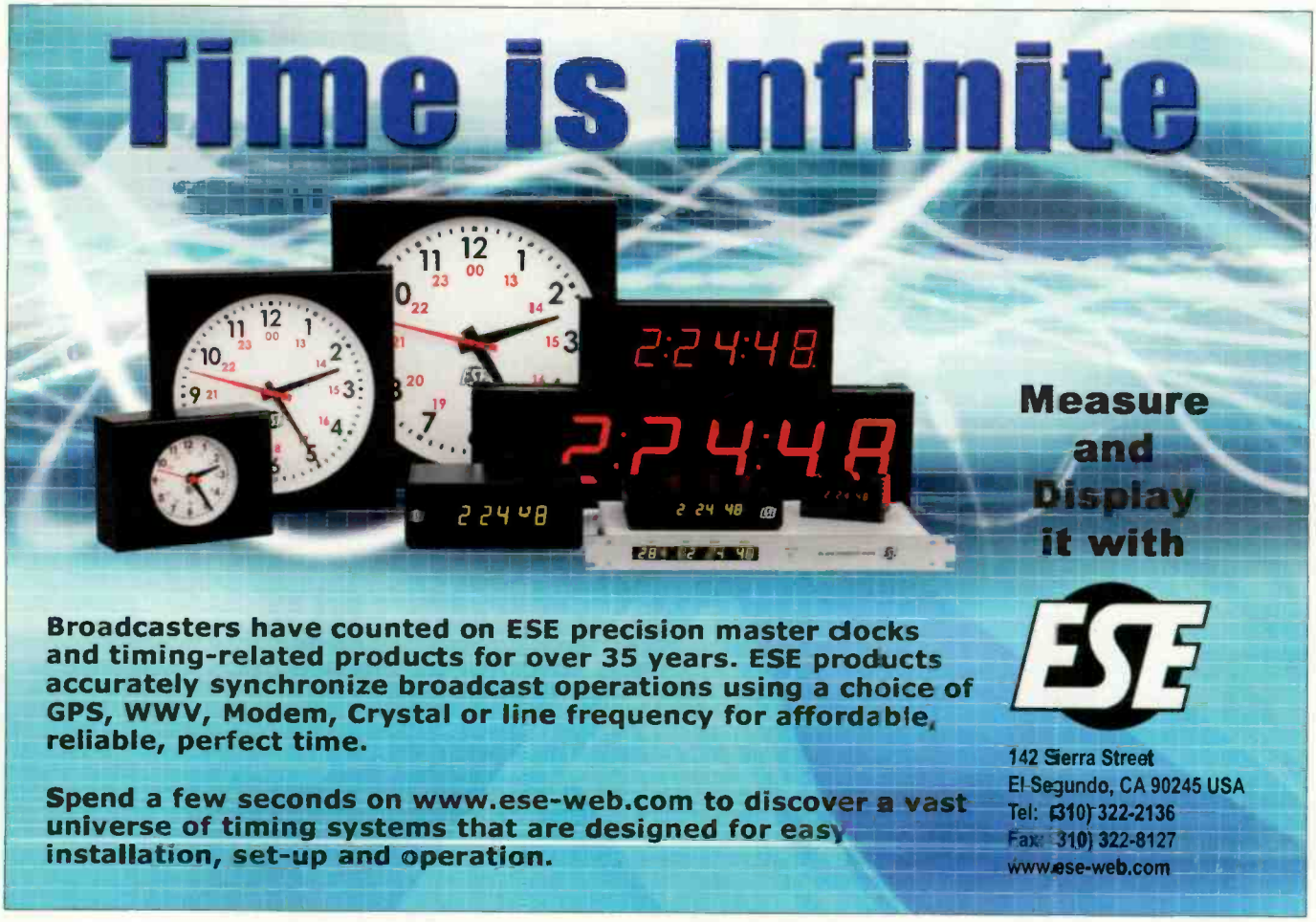
The production studio, while in place, is not yet built completely. The redundant air studios and edit suites provide sufficient capability to serve the network's needs for now. Except for the studio furniture, the room stands empty now.

One of the four audio edit suites.

Studio dedication

The two air studios have been dedicated to two people with long histories with MRN Radio. MRN A was dedicated to Barney Hall, one of the original MRN announcers. He started with the company when it was formed in 1970.

MRN B was dedicated to Harry O. Howard. Howard was the chief engineer of MRN from 1974 to 2007. He retired when the network moved to Concord.



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The new building as seen from the street.

The technical operations center, in the engineering shop, is adjacent to the climate-controlled work bays where the remote trucks are housed. One truck can be seen through the window.

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New facility, new technology

The long-distance move covered not only many miles, but also a large technology gap. The old studios were built around traditional audio production consoles, not broadcast consoles. Each studio was a stand-alone island, and each operator had a plethora of knobs and buttons in front of him. The operators learned what each was for, but this is still a radio facility. The new studios would have radio consoles. Watson chose Axia Livewire with Radio Systems Studio Hub+ interconnects for the job.

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ESE ES185 GPS clock
EV RE 20
Google SS32
Luxo 13610
Media Technology Group-James Nance, Accoustical Consultant
Middle Atlantic racks and accessories
Studio Hub+ panels, headphone amps
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Tannoy Reveal 5A, 6A
Tascam CD-RW901, MD-350
Telos Assistant Producer, Desktop Director, NX12, Xstream
Wohler AMP1A-4PLS
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Equipment dealers

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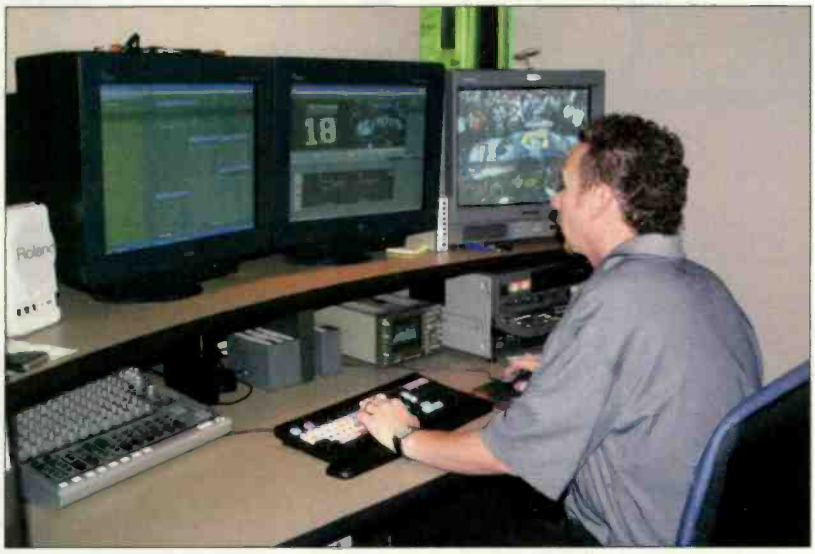

A major part of MRN's operation, Nextel Vision produces the video entertainment for the screens at the race tracks. Josh Lieberman is at the controls

compared to the previous facility exemplifies the technology jump. The operators had to learn a completely new approach to audio routing and control. While the previous consoles had many controls at the user's fingertips, the Axia surfaces place many of these controls under menus because they are not really needed that often. In addition, the operators had to learn a new automation system as a Google SS32 system was installed in the new facility. The installation of the new audio systems also provide a simplified means of routing audio.

Watson and the installation crew quickly learned another advantage to installing a networked audio system: installation time. In this case, there were fewer wires to strip and connectors to attach because of the extensive use of pre-fab RJ-45 cables.

The rack room is in the engineering shop, and it houses the expected audio codecs, computers and other equipment, as well as the satellite uplink and downlink equipment. The satellite dishes are mounted behind the building. MRN Radio is currently using a temporary C-band uplink from NPR Satellite Services until the network's uplink license is granted by the FCC.

Backup power is provided by a 150kVa generator. The generator also supplies power to a 80kVa UPS system that feeds the air studios, one audio edit suite, one video edit suite and the rack room. Because of its back-up power and location, the facility will also serve as a back-up data center for International Speedway Corp. in Daytona. This will provide an off-site back-up should the Daytona facility go off line.

The project followed a fairly strict schedule, and it went live on Oct. 2, 2007. The first show to originate from the new facility was *NASCAR Live*. When all went well with that show, it was decided to originate *Sirius Speedway* from the new location on Oct. 3, but some unexpected difficulties arose, so that day's program was transferred back to Daytona. The bugs were fixed, and *Sirius Speedway* officially moved to Concord on Oct. 4. The Daytona facility was left in place for a week as a back-up, but no problems arose.

Read about one of the remote vehicles

http://radiomagonline.com/automation/radio_road_motor_racing/index.html

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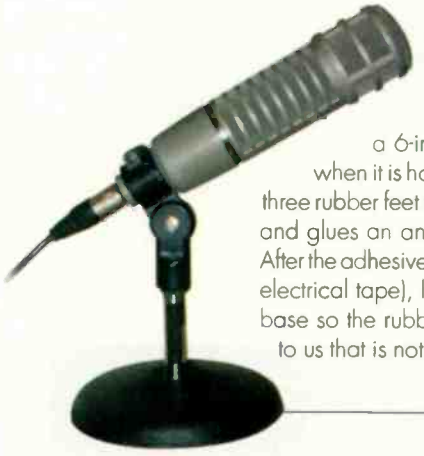
Tips, tricks, hints and more

By John Landry, CSRE

Remote rack mounting

With the new year comes the time to gear up for remote season. Rack mounting equipment is convenient, but when it comes time to ship that rack the mounting will not hold up well to shock and stress. On many of my remotes, I need to mount gear originally intended for desk top use in a rack. Many manufacturers make adapter kits, but many of them are of poor design and often will not survive more than one trip. The photo at right shows a desktop distribution amplifier that I mounted to a Middle Atlantic 2RU rack shelf. What is different is the original rubber feet on the amplifier (which have through holes in them) act as bushings (similar to the way a car's engine is mounted). I have found this to be the only way to mount these particular amplifiers. And experience has found this method to outlast the manufacturers accessory rack mount.



From the Tech Tips Mailbag

From Minnesota, DH writes a suggestion to help keep a 6-inch Atlas desk mic stand steady when it is holding an RE-20. DH removes the three rubber feet from the bottom of the stand base and glues an anti-slip rubber mat to the bottom. After the adhesive dries (he suggests Starbrite liquid electrical tape), he uses a utility knife around the base so the rubber mat is not visible. It appears to us that is not only an improvement for steadiness but also an improvement acoustically – the rubber mat probably helps keep rumble from the table out of the mix.

DH should also be aware that Electro-Voice has made several different mounting schemes for the RE-20. The mount shown in Figure 1 is the preferred one for mounting on a short desktop stand. The "cage" mounting (the 309A) is meant to be suspended from a boom. EV, AKG, Shure and most other mic manufacturers maintain on-line parts lists. Consult them if you run into mics you can't control. You probably don't have the right parts.

Studio head room

No matter how many times we measure an empty studio before construction, and even though we have CAD programs that can calculate clearances, there always seems to be a head room issue. Not electronic, but a physical one with hanging speakers. And more often than not, either one of the talent using that room or a guest will not fit below the speakers. For one solution, don't think industrial, think preschool. Cardinal Gates is a specialty manufacturer of childproofing accessories. The company also has an excellent speaker bumper. It is called a Corner Cushion, and is available in several colors. In addition, the company manufactures a rubber moulding that can cushion soft edges of any cabinet or other surface that juts out in the way.

Cardinal Gates
www.cardinalgates.com

Tape machine maintenance

I discussed analog tape machine maintenance in the last two issues, and a few readers have e-mailed to ask about sources for replacement rubber pinch rollers. I suggest Terry's Rubber Rollers. Terry can rebuilt just about any pinch roller or idler wheel (such as those used in a QRK or Russco turntable) and he has on-the-shelf replacements for many of the professional tape machines such as Otari and Studer. For cart machines, a suitable replacement for the ITC Delta and 99 machines is available from McMaster-Carr. The Delta roller is part number 2483K12.

Terry's Rubber Rollers
www.terrysrubberrollers.com

McMaster-Carr
www.mcmaster.com

Landry is an audio maintenance engineer at CBS Radio/Westwood One, New York.

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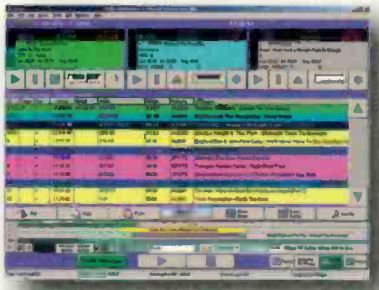

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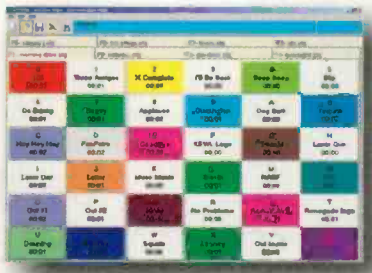

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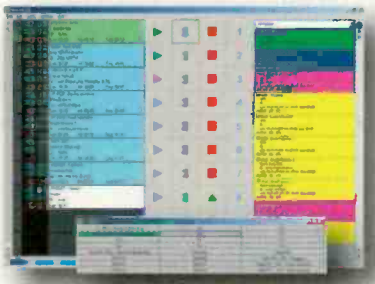
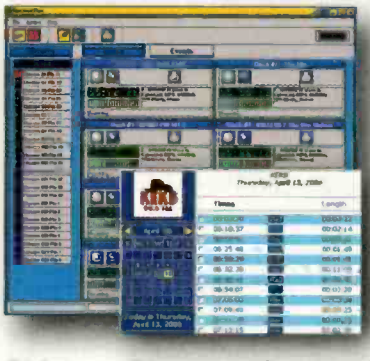


WaveCart - the original on-screen cart machine

Audio Logging



SkimmerPlus - professional audio logging and skimming

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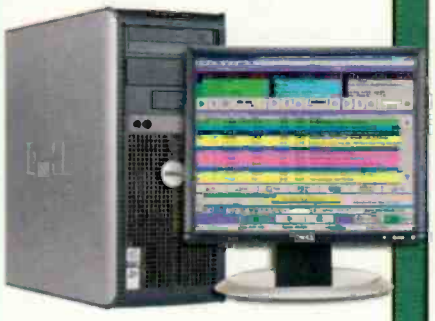

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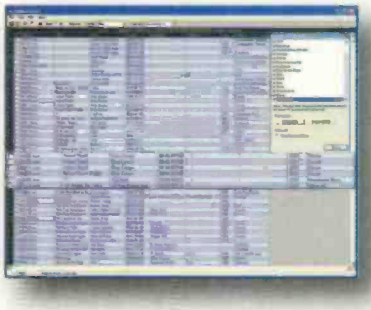

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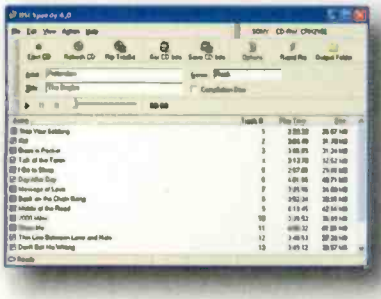

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BSI

KRK VXT Series

By Dan Israel

Practically gone are the days of machine room amps and 10 gauge runs of speaker cable. For the most part, we can consider this progress. Having personally witnessed the foray of nearfield monitoring into the studio, the evolution of powered monitors brought a welcome quality to this practice. Ironic because the ritual of nearfield monitoring was mostly about how mixes would translate to lower fidelity speakers. But full quality sound being reproduced from smaller and smaller boxes is enabling studios and control rooms to forgo main monitors. Enter the new KRK Systems VXT series.

The series has three models, VXT4, VXT6 and VXT8, each corresponding to their low frequency driver sizes of 4, 6 and 8 inches. According to KRK the curved design and improved structural integrity are responsible for extending the low end while decreasing the port turbulence.

The monitor input is a Neutrik combo connector that accepts XLR, 1/4" TRS, and 1/4" TS connections. Customizing controls include a continuously variable potentiometer for signal input (-30dB attenuation to +6dB gain). A ground lift switch is useful for those without grounding schemes or custom made cabling. The Audio Mute feature would be more appropriately named Sleep Mode. According to the manual, the switch engages a timing circuit that senses a lack of audio over a period of time and then places the monitor's power supply in an energy saving standby state.

The Clip Indicator/Limiter switch allows the user to select one of three modes. In the left position, the front LED illuminating red indicates potential driver damage – no audio is affected. The right position engages an actual circuit that limits the audio and prevents possible damage. Varying degrees of compression are indicated by the intensity of the front panel LED illuminating green. The middle position disengages the indicator and limiting circuits completely. The limiting circuit is not transparent enough for use in critical mixing or mastering environments (though the indicator only mode might prove useful). In contrast, the limiting mode would be a great asset in use for on-air control rooms where durability supersedes minute mixing decisions.

The VXT6s and VXT8s also have two shelving controls that the VXT4s do not. The HF adjustment provides the ability to add or subtract 1dB above 2kHz. The LF adjustment is designed to compensate for any low frequency coupling due to monitor placement. The manual describes each of these settings and has some typical setup diagrams for placement.

The bottom panel is coated with a neoprene rubber that provides enough grip on slippery surfaces to prevent vibration from walking the speakers around unbeknownst to the listener. For control rooms short on counter space, the bottom also accepts standard Omnimount hardware.

Performance at a glance

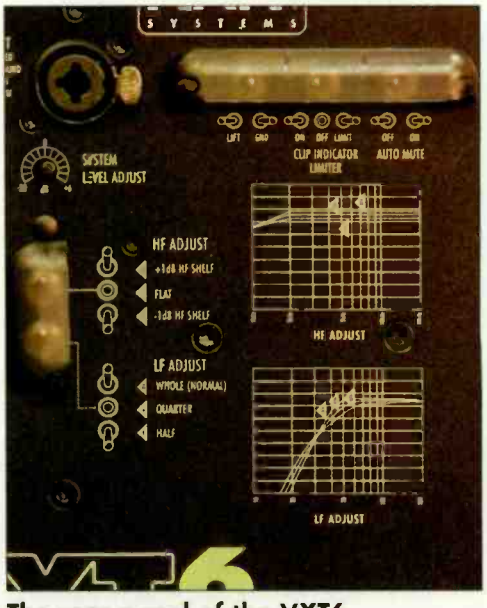
Extended low frequency reproduction

Bypassable limiting protection circuit

Omnimount ready

1" silk dome tweeter

Woven Kevlar woofer



The rear panel of the VXT6.

In use

So how do they sound? For this review, I received a pair of VXT6 monitors. To my ear, the monitors seem to be relatively flat, although this may not be what you desire or have become accustomed to. In my testing, I ended up setting the HF adjustment for the 1dB boost while leaving the LF adjustment at the default of whole. The most impressive part of the new cabinet design is the clarity of audio in the low-mids (100Hz to 800Hz). The reproduction in this range is very good. The mids are smooth and the overall imaging is well defined.

My first listen was Flim and the BB's, *This Is A Recording* (George Massenburg). The piano was clear and true. The woodwind was almost silky. In Dishwalla's *Opaline*, the extended low end was noticeable, without feeling woofy. When listening to pop and synth genre, I felt the high frequency energy was somewhat diffused. This seemed to be more than my unfamiliarity to a new response curve. The overall excitement of the mixes just seemed to be more subdued on the VXTs. I also felt some room ambience from Barenboim's Brahms *Symphony No. 3* was missing. Although with classical recordings, the imaging of the orchestra was notable.

Next, I substituted Pro Tools HD for the CD player. The low-end clarity was again immediately apparent. Kick drums and percussion sounded tight and punchy. The bass guitar was round and full of bottom end. Personally I feel the acoustic piano is one of the most demanding tests in pro-audio. The transients in these raw tracks have a way of subtly distorting microphones and high frequency drivers. But the VXTs seemed up to the task. For soloing vocals, I wanted to reach for some EQ. These tracks just felt lacking in air.

Another caveat when using these monitors for tracking and mixing music was headroom. In my control room the nearfields are approximately four feet away from the listening position. At that distance, the VXT6s delivered 86dB SPL before clipping. While this is adequate volume for listening to final product, both speakers indicated overload as well as audibly clipped while soloing individual drum tracks. If you track without main monitors and like to feel the music, the VXTs may fall short. I would highly recommend you check into the VXT8s for this purpose as they have a larger amplifier.

Finally, I used the VXTs during some network production for the NFL. For this I engaged the limiter function. Strangely, my dissatisfaction with sung vocals wasn't prevalent in voice-over work. Both male and female voice-overs were smooth and distinct. The VXTs were easy to listen to for long periods, their output volume was more than enough for production and the limiting function is transparent enough to make the speakers almost indestructible to rogue audio.

Model		XVT4	VXT6	VXT8
Freq. Response		56Hz to 22kHz	49Hz to 22kHz	37Hz to 22kHz
Power	HF	15W	30W	60W
	LF	30W	60W	120
Max SPL		104dB	108dB	111dB

As with microphones, a monitor's sonic beauty is best judged by the ear of the beholder. For KRK groupies, these are a home run. Their brand ancestry is definitely audible. The company has retained the good from their previous mid-level lines, while improving other facets of their design. For broadcasters these boxes pack a lot of punch for a modest price. And the limiting circuit and ready-to-mount abilities make them good candidates for the control or production room.

Israel is president and CEO of Short Circuit Electronics, producer/engineer of First Run Productions, and executive producer of the Chiefs Radio Network, Kansas City, MO.

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Mackie 642-VLZ3

By Jeff Smith, CEA CBNT

I have been using Mackie consoles for years for everything from remotes to live mixes and even an occasional production room mixer. The consoles have always performed well for the price. The issues I have continually heard about Mackie mixers is that the mic preamps were never all that great and the EQ sections left a lot to be desired. Well, Mackie apparently heard the same complaints and delivered big in both areas with the VLZ3 line of mixers.

Recently I had the chance to use a new Mackie 1642-VLZ3 for several remotes. I was also able to test it in a more controlled studio environment. The first thing I noticed is that the physical appearance is very similar to the older 1642 VLZ Pro. It has solid steel construction so it can handle the radio remote circuit without a problem. Similar to the VLZ Pro it has eight channels of mono mic/line input, two channels of mic/stereo line input and two channels of stereo line input. It also has three-band EQ with a sweepable mid frequency on all the mic channels and a four-band EQ on the stereo line channels.

Redesign

The big differences with the 1642-VLZ3 are the mic preamps and the EQ sections on the console. Mackie totally redesigned the mic preamps for this line. The new XDR2 preamp does not disappoint. It offers a ton of headroom with no distortion. The mic preamp sounds like a more expensive external preamp that you may have needed with older Mackie consoles. The best thing I can say about the XDR2 mic pre is that it is quiet and adds no color to inputs, even with hot levels.

The channel EQ has also undergone a change in the VLZ3 line. The first eight mic channels have a three-band active EQ set at 12kHz and 80Hz but has a sweepable mid EQ that can be set at a peak anywhere from 100Hz to 8kHz providing the exact sound you are looking for. The remaining channels have a four-band EQ with set frequencies on all bands. Mackie claims it's designed to be "musically-correct" and it does seem to work well for line level inputs; however, two of these channels will also handle mic inputs and I did find the EQ used on the first eight mic channels to work better for mic inputs. That being said, Mackie has really made improvements on the sound of all the EQs on this console compared to earlier consoles.

The other thing I really liked abut this console – and all Mackie consoles – is that they are built tough. Mackie continues to use sealed pots in the VLZ3 consoles, which helps when a soda is dumped on the console. Mackie also has the pots ride just above the chassis so if something is dropped on the console the impact is absorbed by the steel frame and not the circuit board. To that end, even the internal circuit boards are set on shock absorbers to help prevent damage.

As I said earlier, I used this console at a number of remotes with no issues. It travels well, sets up easily and allows for a number of configurations needed for broadcasts. With the four aux sends in addition to the main and tape out, it is easy to set up different feeds for different needs. You can send a different mix to a house PA or ISDN unit or even use the aux feeds for monitor feeds for a live band mix without difficulty. Mackie also allows for some aux feeds to be used as a pre-fader send, which works great for a talkback channel to the studio.

The mid EQ is slightly different for the upper input channels.

Performance at a glance

20Hz to 20kHz frequency response

THD of <0.0007

Newly designed XDR2 mic preamps

Newly designed EQ sections

Multivoltage power supply

Mic, line and stereo line inputs

Rack mountable with optional rack ears

Steel chassis construction

In the studio

The console also easily fits into the studio environment. With the new, very clean sounding mic preamps and the new, better-sounding EQ sections, the 1642 VLZ-3 worked nicely in a pinch as a console for an imaging studio. It has enough direct bus outs to work with any DAW system for multi-track recording.

Mackie even built-in a power supply that easily switches between 110/120 and 240 for use anywhere in the world without needing an adaptor for the power.

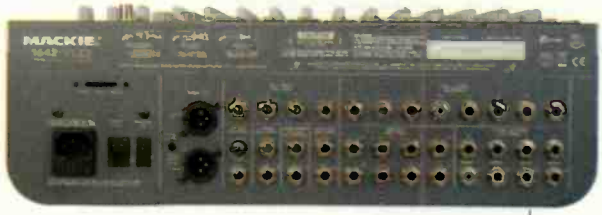
Mackie

P 425-487-4333

W www.mackie.com

E productinfo@mackie.com

Mackie really showed that it listens to its customers with the entire VLZ3 series and the 1642 VLZ3 in particular. The company took the time to rework a mic pre from the ground up that sounds much better than its previous products. It sounds good enough to save you the trouble of buying an expensive external preamp. The company also reworked the EQ on this console. Be they the three- or four-band EQ, they sound good. The EQs are cleaner with less distortion than previous attempts. My only issue, a minor one, is that mic channels 9 and 10 don't have the same EQ section as the first eight mic channels.



The rear panel sports a host of connections.

Mackie delivers a great product with the 1642 VLZ3, and for the price it will be tough to beat.

Smith is chief engineer at WWPR New York City and supervisor broadcast/studio systems at Clear Channel Radio-NYC.

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.

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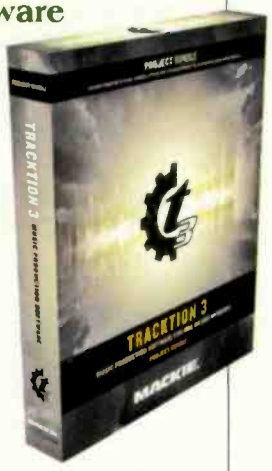
by Erin Shipps, associate editor

Audio recorders
HHB

DRM85-LI DRM85-CLI: Developed in direct response to requests from broadcasters, the new models are line-input-equipped versions of the existing DRM85 omni-directional and DRM85-C cardioids, enabling journalists to record feeds often provided at press conferences. Both Flashmics feature a bantam TT jack input on the base of the microphone body. An XLR-to-bantam jack cable is supplied that switches out the microphone signal, recording only the line input signal. The Flashmic also now supports MP3 files. Existing owners can download the updated Flashmic Manager software free of charge at www.flashmic.info.

860-434-9190; www.hhb.co.uk.com
sales@hhbusa.com

Digital audio and MIDI production software
Mackie



Tracktion 3: The new production software 3 introduces more than 150 new features and improvements, while retaining the single-screen user interface. Tracktion 3 also continues to offer cross-platform compatibility, and support for industry-standard plug-in, virtual instrument and video formats. Among the enhancements in Tracktion 3 are the addition of time stretching and pitch shifting, and a loop browser that supports Apple, Acid and Rex.

800-898-3211; www.mackie.com
productinfo@mackie.com

Inline surge protector
LEA International

SL: LEA's SL is a high performance, inline surge protector ideal for safeguarding UPS and critical loads from damaging transients. The SL is available in single-phase 120V and 240V configurations and is rated for system exposure per IEEE C62.41 Category A.

800-654-8087; www.leaintl.com
lea@leainternational.com

Mic line mixer
Avlex

MX8-1RM: The Avlex MX8-1RM mic-line mixer is a 1RU rack-mounted audio mixer supporting eight mic/line channels – each with its own volume and tone control – is the ideal tool for a wide range of sound reinforcement applications. The front panel features a master volume control and a power on/off switch, and the MX8-1RM provides quick access to the mixer's most critical functions. To accommodate a broad range of input sources, the MX8-1RM's rear panel provides six channels with balanced XLR and quarter-inch TRS (tip-ring-sleeve) mic/line inputs, along with two channels of RCA unbalanced line inputs and quarter-inch TRS balanced mic/line inputs. With the ability to accommodate everything from wired and wireless microphones to CD players, the Avlex MX8-1RM Mic-Line Mixer is well suited for most any sound reinforcement task.

877-447-9216; www.avlex.com
sales@avlex.com

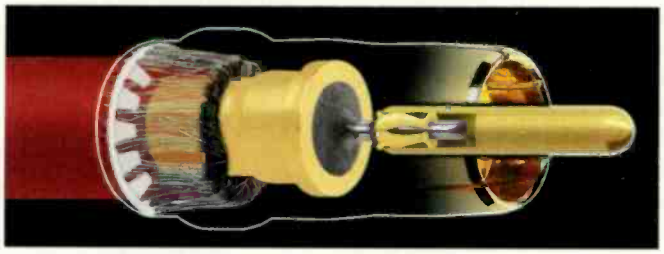
Inventory management
LAN International

Viero transact: This system exposes available inventory to an expanded pool of advertisers for all types of media buys from any location. Its traffic-centric approach tracks current available inventory and historical usage, recaptures inventory not sold by Google, and places advertisers into that availability. Throughout the process the platform ensures fulfillment with real-time spot insertion and verification. The system can use the existing infrastructure to conduct electronic business transactions, and is scalable and adaptable to changing revenue models.

949-425-3300; www.lanint.com
ro.catalfo@lanint.com

NEW PRODUCTS

Nickel-plated connectors
Audioquest



ITC (Instant Tool-less Connector): These nickel-plated connectors do not require a tool for termination. The ITC tool-less system lowers costs by reducing termination time, complexity and failure rate. To ensure long-term, reliable connections, the connectors feature a captive center pin that securely grips onto the center conductor using a unique spring tension system for maximum contact and conductivity. Thus, the connectors can be easily reused. The new nickel-plated series of ITC connectors is available in F, BNC and RCA connector configurations for 18-AWG, 20-AWG and 24-AWG coax cable.

949-585-0111; www.audioquest.com; info@audioquest.com

Antenna arrays
Dielectric

HDR Plus Series: This series of antennas interleaves a digital antenna within an analog antenna's aperture. This allows a station to transmit an analog and a digital signal with very high isolation between the two. Operating costs are substantially reduced by as much as 10 percent due to the system's efficiency. The two interleaved antennas also provide redundancy since both arrays are capable of supporting either the digital or analog signal.

800-341-9678; www.dielectric.com; dcsales@dielectric.com

EAS station multiplexer
DM Engineering

Multi Station Relay Adapter: This device expands the allowable controlled number of stations from a single Sage Endec to a total of four. It is a microprocessor-based, three-stereo-channel accessory that interprets the Endec audio commands to select the appropriate station or stations for EAS broadcast. The MSRA communicates with the Endec via RS-232, and the EAS audio for the MSRA is derived from the Endec speaker line output. A multi-turn, recessed front panel input gain trim potentiometer and individual multi-turn station gain controls are provided for controlling the active stereo distribution amplifier sections having balanced output levels capable of greater than +12dBm into a 600Ω load impedance. An optically isolated open collector tally output for user control applications is provided and is active when any or all of the three controlled stations are activated, and remains active until the end of the EAS activation.

800-249-0487; www.dmengineering.com
info@dmengineering.com

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Livewire is a registered trademark of TLS Corp.

CD, DVD duplicator
Disc Makers

Medley: This an all-in-one disc duplicator and printer is enclosed in a protective housing with a small desktop footprint. It is designed for a wide range of uses and applications requiring DVD or CD duplication, on-disc printing, and automated ripping of audio CDs. Graphics software allows any user to create full-color images directly onto the disc face. The Medley also integrates with Itunes and Windows Media Player to automate audio disc ripping.

856-661-5532
www.discmakers.com
andre@discmakers.com

Connectors for CAT-6 cable
Neutrik

Ethercon series: This rugged patch cable includes a metal housing for RJ-45 cable connectors to protect the connector against mechanical load. It is equipped with Neutrik's chuck-type strain relief with a separate push-pull locking mechanism, to avoid accidental unplugging. The cable is available in custom lengths and the receptacle will accept a standard RJ-45 cable end in addition to the Ethercon patch cable.

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

FM transmitter
Crown Broadcast

FM300E, FM300R, FM300T: The FM150 broadcast transmitter offers a frequency-agile front panel, SWR metering from remote control and the ability to control output power from a remote control. The FM300 is available in three configurations: FM300E is a basic exciter with composite input only. The FM300T is suited for lower power broadcasters with its built-in audio processor and stereo generator. The 20 percent upgrade in power over the company's previous FM250 accommodates line loss without upgrading to the next higher power unit. The FM300R is the translator option with built-in receiver. With low loss circuit boards and copper heat spreaders in the RF chain, the unit functions with less heat and improved life span. A robust power supply with switching voltage and power regulators for ac or dc operation allow the FM300 to be used anywhere power can be generated.

800-262-8919; www.crownbroadcast.com; fmsales@irec1.com

Attenuators
Coaxial Dynamics

6902-BNCF Series: The broadband 6902-BNCF series of 2W BNC attenuators rated from dc to 4GHz includes WiMax, Wi-fi and WiBro testing applications. VSWR is 1.25:1 maximum through 4GHz and the accuracy is 0.3dB to 6dB, 0.5dB to 20dB and 0.75dB to 30dB. Standard decibal values include 3, 6, 10, 20 and 30dB with others available on special order. All BNC models have bi-directional operation and other connector types are available. The length is 1.4 inches maximum.

800-COAXIAL; www.coaxial.com
sales@coaxial.com

Find the mic winner
October issue

Congratulations to

Alfred Petzke

of Rockford, IL.
His name was drawn from the correct entries for the October issue. He won a Heil Sound PR-30 from Transaudio Group.

The mic icon was on the left edge of the image inside the zero.

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LED bulb
Ledtronics

B321-XIW: This multiple voltage, bipolar 9mm miniature bayonet-based LED bulb is designed to replace many incandescent bulbs. Operating voltages include 6V, 14V, 24V, 28V, 48V, 60V and 120Vac lamps. The bulb comes in a T 3-1/4 bayonet base that mounts directly into standard sockets. Solid-state lamps are iimpervious to shock, vibration, frequent switching and environmental extremes. With an average life span of 100,00-plus hours, LED lamps operate more than 20 times longer than the equivalent incandescent lamp.

800-579-4875; www.ledtronics.com

Asset management extranet
Winmedia Software

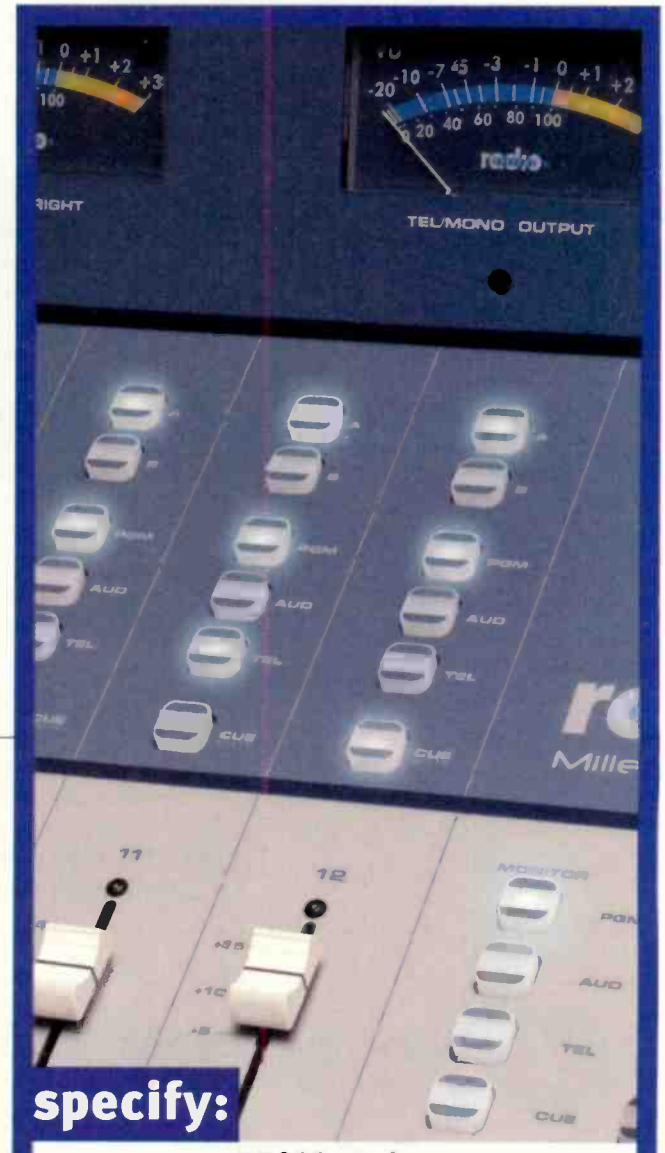
Winweb: Winweb is a series of software modules to organize the station workflow. The Sales Module allows the sales director to set objectives so account executives can handle their prospects, realize their offers and input their ad-booking demands in a collaborative booking grid that will calculate the price in real times on a seniority basis on the fill rates, the volumes and the demands anteriority. The Producer Module defines and plans spots and voice tracking to be produced. The last module supervises announcer schedules, organizes and checks contests and stock of prize inventory.

514-984-4912; winmedia.ca; jerome@winmedia.fr

Router control software
Axia Audio

Pathfinder PC: This software package allows the user to construct custom, conditional audio routing applications for Axia IP-Audio Networks. Pathfinder PC automatically scans an audio network for Axia audio nodes and gathers information about the audio sources and destinations and presets it to the user. Snapshots can be created and recalled to make multiple routes with a single mouse click. These snapshots can make changes to many routes, or it can make changes to just a few routes, such as routing audio from one studio device to another. Pathfinder PC also combines audio and machine logic into a single virtual router to route bi-directional audio and GPIO simultaneously. Built-in audio metering, combined with a configurable silence sense, sets up automated watchdogs on important audio sources, automatically switching to a backup source if audio is not present.

216-241-7225; www.axiaaudio.com; inquiry@axiaaudio.com



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Tower ice and rain sensor
New Avionics Corporation

Ice Meister Model 9734: This ice sensor can be tuned for the specific installation to function as an ice/no-ice indicator. At maximum sensitivities, it detects the incipient formation of any kind of ice. It will even sense the condensation from human breath. At minimum sensitivity it distinguishes between ranges of accumulation of ice. The unit offers an optional deice heater for system reset. The unit consumes about 1W of power from an ac or dc supply. Data is output via indicator LEDs and isolating relay contacts.

954-568-1991; www.newavionics.com
info@newavionics.com

Stereo microphone
MXL Microphones

V67Q: As a studio quality stereo condenser microphone, the new V67Q features dual 22mm capsules with gold sputtered diaphragms aligned in a 90-degree XY configuration. With electrically balanced output and low self-noise, this pressure-gradient stereo condenser microphone produces a smooth, even frequency response ranging from 30Hz to 20kHz. Additionally, the V67Q is internally wired with Mogami cable. The V67Q includes a 10-foot, 5-pin cable that breaks out to two, three-pin XLR cables.

800-800-6608; www.mxlmics.com
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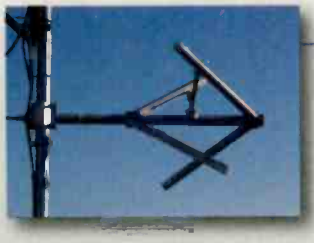

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Nott

Copperweld: Nott now distributes Copperweld grounding wire. This wire has been used by the electric utility industry for many years and just now comes to broadcasting. Standard Copperweld wire is not annealed, making it very springy. However, their ground wire is annealed and handles just like pure copper wire. It can also be silver soldered like pure copper. Tests indicate erosion may occur at the ends of buried wires, but will go no more than two wire diameters into the metal. In the case of #10 wire, this is less than 1/4". RF current travels only on the outer surface of a wire due to skin effect, so most of the current will be flowing in the copper skin. Bending it into a sharp radius does not cause the copper skin to crack. Wrap it as tightly as needed, then silver-solder it.

800-443-0966; www.nottltd.com; ron@nottltd.com

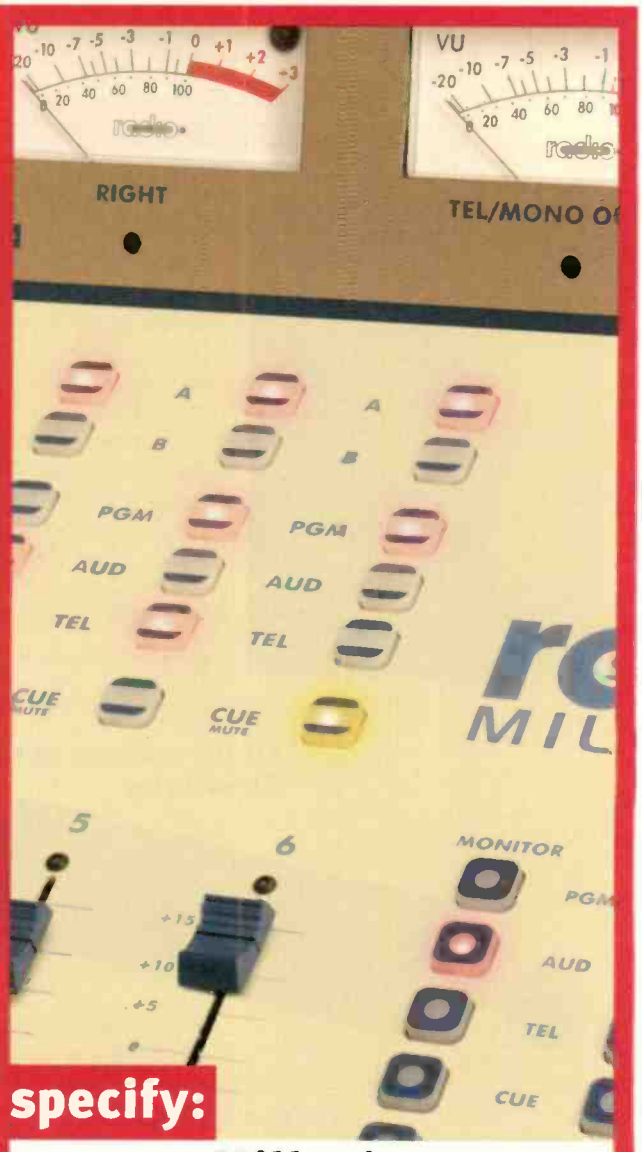
Shared media storage system
Editshare

Editshare v5.0: The new version improves ergonomics, simplifies administration and expands capabilities to the Editshare shared-storage environment. New administration features and functions allow Editshare administrators to synchronize two or more servers regardless of geographic location, receive daily health reports detailing server activity, and minimize time to deploy with a new plug-and-play configuration. The simplified file management structure enables users to more easily organize media files.

617-782-0479; www.editshare.com; 617-782-1071

UPGRADES and UPDATES

Auralex Acoustics' Part Science Space Array and Space Coupler have recently passed the requirements of a Class B fire rating in accordance with ASTM E84. (www.auralex.com)...***Burk Technology*** is now shipping the Plus Connect for Harris Z transmitters. The Plus Connect brings more than 400 transmitter parameters onboard the ARC Plus using a single serial connection. (www.burk.com)...***RCS*** has enhanced RCS News. Version 3.1 features a revamped toolbar that can be customized to only show the commonly used tasks, the ability to more easily dock and undock windows, and new messaging when key mappings are applied. (www.rcsworks.com)...***V-Soft***'s Probe 3 program will incorporate an automatic update that will be implemented in two stages. In Probe, there will be a new item under the Help menu allowing a user to set the update settings including the username, password, location of where to save previous versions, and number of backups to keep. (www.v-soft.com) ■



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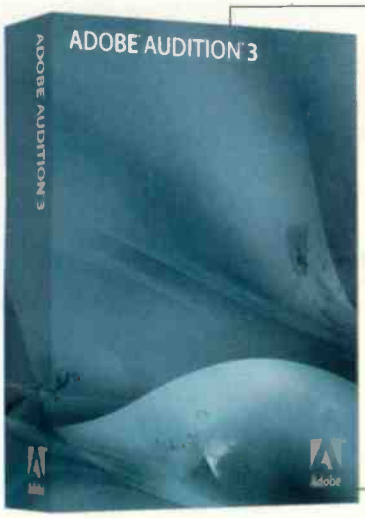

Audio editing software
Adobe Systems

Audition 3: With comprehensive audio mastering and restoration capabilities, Adobe Audition 3 helps professionals create music and radio spots, as well as restore imperfect recordings with sophisticated editing tools. New features include VSTi virtual instrument support with MIDI piano roll, enhanced spectral editing options, fast fade and cross fade controls, and advanced multi-core support.

800-833-6687; www.adobe.com

Measurement software
Audio Precision

APX500 v2.0: The APX is a dedicated multi-channel audio analyzer. Now available in an 8- or 16-channel configuration, the APX is capable of taking 14 measurements in seven seconds, automatically generating a report of results and saving all test settings in a single, sharable project file. The analyzer is designed specifically for power amp and CD/DVD/MP3 manufacturers for use in R&D and production test, with multiple channels, Dolby/DTS confidence testing, multi-tone analyzer, input regulation, and CEA-2006 and EIA/CEA-490-A measurements.

800-231-7350
www.audioprecision.com
sales@audioprecision.com

Audio cabling system
Wireworks

DT12: Ideal for broadcast trucks, where space is often limited, the Wireworks DT12 welded steel breakout boxes are a quarter the size of traditional stageboxes. Wireworks' slim in-line DT12 breakout box is engineered to withstand the rigors of being dragged across a stadium or field. At just three inches square - virtually the same size as the DT12 connectors themselves - the DT12 breakout box is compact without compromising strength or dependability. The breakout box also features male and female DT12 connectors with cover caps. Recessed Neutrik XLR black/gold connectors and dual-sided channel identification allow for use in any orientation. Wireworks' DT12 trunks are manufactured with full-sized 22 AWG conductors, providing lower signal loss, especially in long run cables commonly required in remote sporting environments. All cables are 100 percent shielded to prevent electrical interference and cross talk.

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www.newertech.com

A/D converter
Lavry Engineering

Lavry Black DA 10: A complement to the Lavry DA 10 digital-to-analog converter, Lavry's design philosophy is one of transparency in conversion. Like the DA 10, the AD 10 offers ultra-stable clocking, extremely low THD and wide dynamic range. The AD 10 has -10dbV TRS and +4dBu XLR inputs, and clocks externally from 32kHz to 100kHz. Both units operate at fixed sample rates of 44.1-, 48-, 88.2- and 96kHz. The AD 10 obtains its time reference from an internal crystal, while the DA 10 operates in crystal mode to reduce jitter effects.

360-598-9757
www.lavryengineering.com
sales@lavryengineering.com

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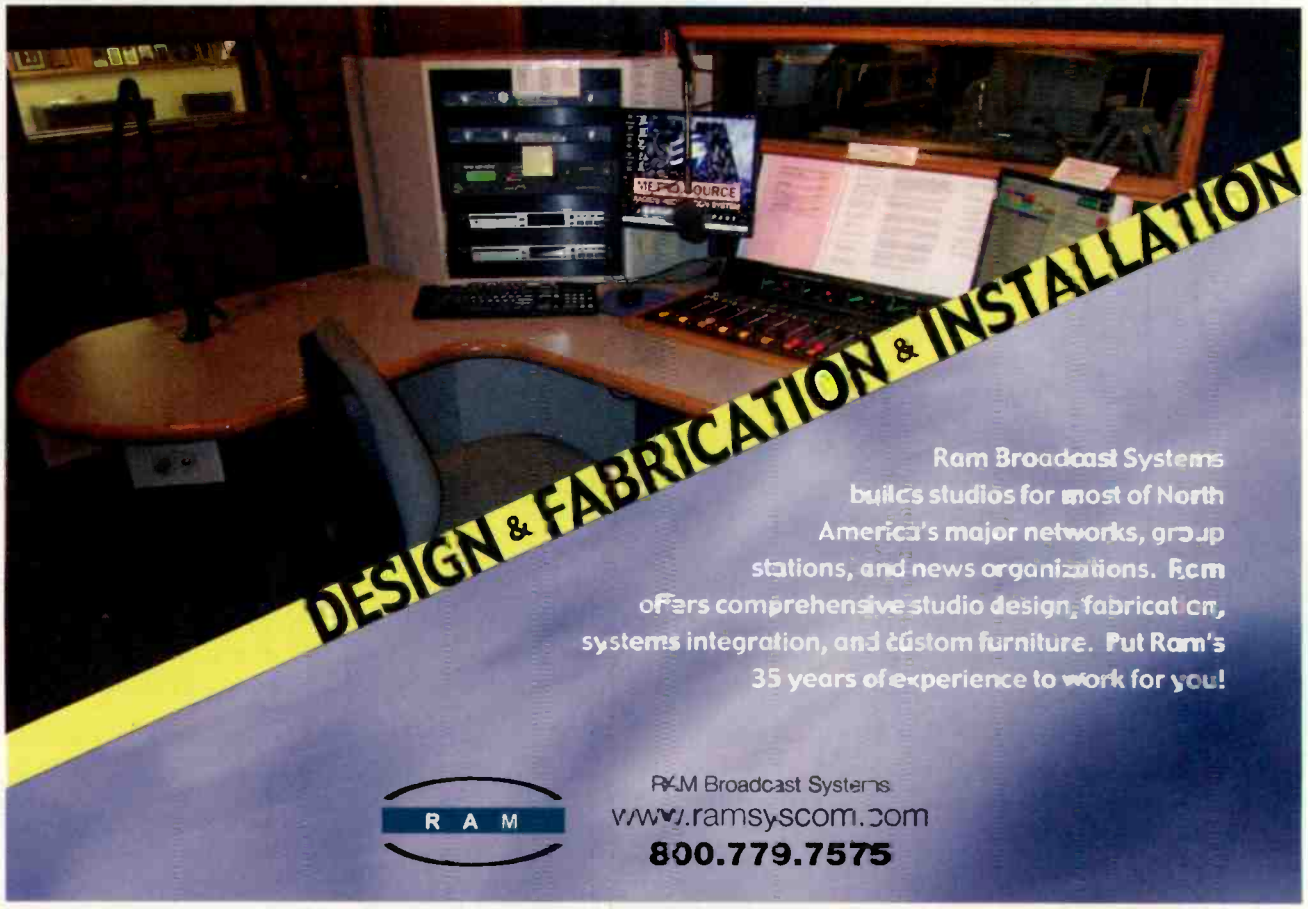
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20 KW	1989	QEI FMQ 20,0000B
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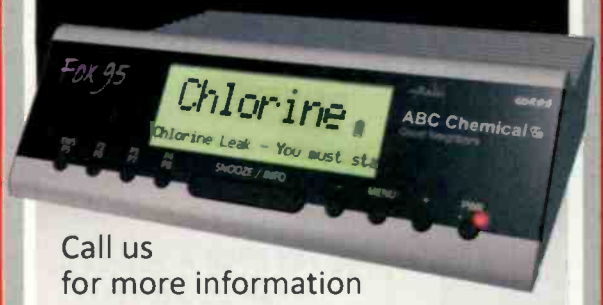

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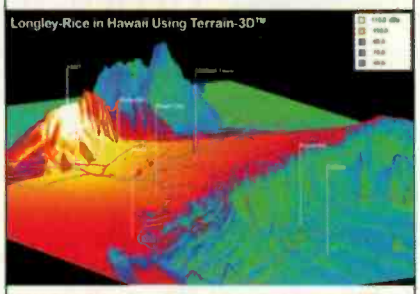

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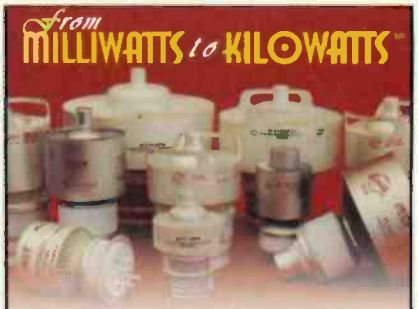

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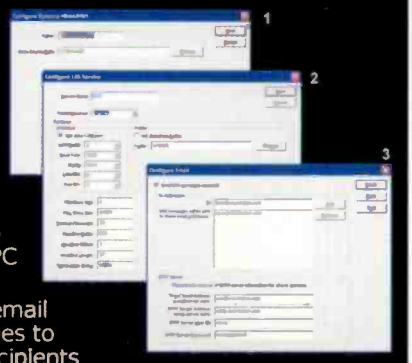

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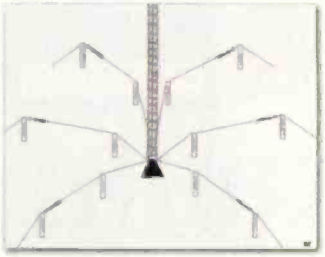

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Contributor Profile

Meet the professionals who write for *Radio* magazine. This month: Field Report, page 92.

Dan Israel
Executive Producer
Chiefs Radio Network
Kansas City

During his 25 years of production, Israel has produced and engineered for NBC-Universal, CBS, ABC Sports, ESPN, NFL Films and HBO. His production company, First Run Productions, has film and music credits for Sony Music, Dream Works and Disney. This company spawned a technical division, Short Circuit Electronics, that is rooted in broadcast engineering and specializing in radio.

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by Erin Shipps, associate editor

That was then

This is a 1968 shot through the newsroom window into the on-air studio of WXVW. Air personality Daon Fugate is shown at the mic. Dan Steffen is shown holding a 45rpm record. Notice the Western Electric console. It is probably from the 1930s and still worked great in 1968.

The cart machines were Sparta-Matic, the reel-to-reel deck, barely visible in this shot, was a Magnecord and the mic was an EV-666.

WXVW-AM was in Jeffersonville, IN, right across the river from Louisville, KY. In 1968 it was a 1kW, AM station operating at 1470KHz.

Do you have any staff photos from the past? Send them to us at radio@RadioMagOnline.com.

Sample and Hold

Current vs. Future Usage of Mobile Phones

Forty-nine percent of phone users (ages 18+) currently use their phones for more than just making and receiving calls. Fifty-seven percent anticipate using their phones for more than this in the next three years.

	2007	2010
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Men	9%	27%
Women	6%	17%
E-mail		
Men	12%	37%
Women	7%	25%
Photos		
Men	21%	34%
Women	27%	35%
Scheduling		
Men	14%	27%
Women	11%	21%
MP3s		
Men	7%	21%
Women	4%	19%

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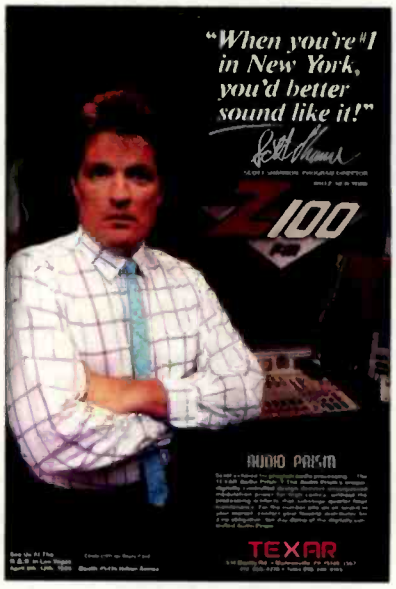
Source: Harris Interactive

Do you remember?



A Texar ad in the March 1988 issue of *Broadcast Engineering* featured a photo of WHTZ New York Program Director Scott Shannon. The advertisement touted that Shannon's choice for program audio processing was the Texar Audio Prism. "The Audio Prism's unique, digitally controlled design delivers unsurpassed modulation power for high cumes; without the processing artifacts that sabotage quarter-hour maintenance," the company wrote. It offered no-obligation, 10-day demos of the product.

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