

\*\*\*\*\*3-DIGIT 857  
 S117298 DOB 9903  
 TOM MILLER  
 ASST CHIEF ENGINEER  
 KTZR  
 2033 S AUGUSTA PL  
 TUCSON AZ 85710 7905

817

**Business Software**

The latest Traffic & Billing products in Buyer's Guide.

See Page 51

**A Gathering of the Faithful**

What's on the minds of station managers as they convene for NRB 2000 in Anaheim?

See Page 25

# Radio World

The Newspaper for Radio Managers and Engineers



January 19, 2000

**INSIDE**

**NEWS**

▼ A leading equipment supplier steps up its call for a single IBOC proposal.

See Page 3

▼ Will DAB receivers sport this new logo?



See Page 5

**ENGINEERING**

▼ Dick Burden reviews the second edition of "The New Stereo Handbook."

See Page 10

▼ We kick off a series to help take the mystery out of directional antenna array maintenance.



Photo by Alan R. Peterson

See Page 24

**GM JOURNAL**

▼ All Things Web, in Web Watch.

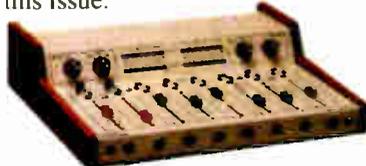
See Page 27

▼ What you need to know about the new Arbitron ratings for Web radio.

See Page 30

**STUDIO SESSIONS**

▼ Autogram's Mini-Mix, Shure's updated SM7A, Roger Keeler of KTCL(FM) in Denver and more. In this issue.



Visit RW Online at [www.rwonline.com](http://www.rwonline.com)

**NEWS MAKER**

## Panero: XM Sees 2000 As Critical

**WASHINGTON** This could be the year of satellite radio, and Hugh Panero is smack in the middle of it.

Panero is president and chief executive officer of XM Satellite Radio, one of two companies that hold FCC licenses to begin subscription digital satellite radio services to U.S. consumers.

In recent months, XM has changed its name from American Mobile Radio Corp., raised millions of dollars and is working to convince investors, advertisers and receiver manufacturers and retailers that Americans will pay to listen to the radio.

Before the Consumer Electronics Show, Panero, who came to satellite radio from the cable TV industry, spoke with RW News Editor/Washington Bureau Chief Leslie Stimson about bringing this new technology to market, about competitor Sirius Satellite Radio and his plans for



Hugh Panero

See XM, page 6 ▶

## E-Mail? Web? Your Car Radio Will Do It All

by Leslie Stimson

In the world of mobile electronics, size matters — smaller is better, especially for car receivers.

Receiver manufacturers say there is only so much room in the dash. As Americans want their car receivers to be able to do more, manufacturers must fit more technology into that premium real estate.

Making the car receiver do more in the same space is one of several changes manufacturers were grappling with as they convened for this month's Consumer Electronics Show.

Smaller components, bigger displays and the convergence of several technologies in the head unit, such as telephony, the Internet, CDs, MP3, global positioning systems, and both forms of digital audio broadcasting are the com-



Shown is a mock-up of Kenwood's new MP3 playback unit.

"We're going to have to make it fit in the present box," said Ben Benjamin, senior vice president, product management, Lucent Digital Radio. "Auto manufacturers are not going to make cars wider" to accommodate bigger receivers, he said jokingly.

When manufacturers run out of room in the dash, they put some of the receiver components in the trunk, where they face space limitations as well.

ing trends in the car receiver market, said manufacturers.

Some of these capabilities are available now, but within the next five to 10 years, they predict, the mobile consumer will be able to search the Web, have e-mail read or see it on a display and hear music in a preferred order — all at the direction of one box in the dash.

"I see down the road the head unit being

See RECEIVER, page 5 ▶

# powerStar™

▶ AM/FM

▶ digital audio inputs

▶ solid-state technology

▶ exclusive Digital Signal Processing System

▶ modular design

▶ future ready

CONTINENTAL ELECTRONICS CORPORATION

**DR** DIGITAL READY™

[www.contelec.com](http://www.contelec.com) 1.800.733.5011

# ◆ NEWSWATCH ◆

## USADR Submits IBOC Data

**COLUMBIA, Md.** USA Digital Radio submitted field and lab test data of its in-band, on-channel digital audio broadcasting system to the National Radio Systems Committee on Dec. 15, 1999. USADR was the only IBOC developer to submit data. It previously announced an alliance with Digital Radio Express (RW, Jan. 5). Competitor Lucent Digital Radio said it intended to submit data this month.

The results submitted to the NRSC were from tests conducted at the USADR lab, Columbia, Md.; digital radio labora-

tories of Xetron Corp., Cincinnati; the independent laboratory test bed established for USADR at the Advanced Television Technology Center, Alexandria, Va.; USADR's experimental digital AM test station WD2XAM, Cincinnati; WPOC(FM), Baltimore and WETA(FM), Washington, D.C.

"We have been aggressively testing our AM and FM IBOC DAB system, have compared both with existing analog as required by the NRSC, and have provided evidence in our report that IBOC DAB is superior to existing analog," said Glynn Walden, vice president, broadcast engineering, USADR.

Walden said USADR would make

additional test data available as part of the company's ongoing test program.

## Sinclair Radio Sale Closes

**BALTIMORE** Sinclair Broadcast Group closed the sale of 41 radio stations to Entercom Communications Corp. for an aggregate purchase price of \$700.4 million in cash.

Entercom's agreement to buy four stations from Sinclair in Kansas City remains pending Entercom's divestiture

of three stations in that market to meet ownership requirements. Sinclair now owns 58 TV stations in 38 markets and six radio stations in one market.

## Electro-Voice Chief Retires

**BUCHANAN, Mich.** Electro-Voice President Paul McGuire is retiring after 27 years with the company — the last nine as president.

Electro-Voice is a division of Telex Communications Inc., which makes audio, wireless and multimedia communications equipment for commercial, professional and industrial customers.

McGuire said he wanted to spend more time with his family, and, at the

See NEWSWATCH, page 3 ►

# Take a LOOK at THIS:



## Then look at our competition.

**OF COURSE** many stations are cost-conscious these days—just remember why you wanted a new console in the first place: to **UPGRADE**.

**The R-60** has what's needed, with all the right features: our **SIMPLE PHONE®** module for easy error-free talk segments; twin six bank preselectors, so you won't run out of input capacity; onboard machine control panel, clock, timer, a well-designed cue system, and a truly effective control room and studio monitor interface. And because it's totally modular, service is easy—even while you're on-the-air! Documentation: this can determine whether you have an installation day or an installation week. We've done it right to guide you through. And **PERFORMANCE?** Of course we've handled that; simply compare our specs.

**DON'T MISS your opportunity to upgrade.** Choose the R-60 radio console from **AUDIOARTS**.

<b>FREQUENCY RESPONSE</b>	
Line (10Hz-20KHz)	±1/10dB
Mic (20Hz-20KHz)	±1/10dB
<b>THD+N (20Hz-20KHz)</b>	
Line, +4dBu	.005%
Mic & Line, +16dBu	.005%
<b>IMD (SMPTE)</b>	
Mic & Line, +4dBu	.004%
<b>DIM</b>	
Mic & Line, +16dBu	.05%
<b>DYNAMIC RANGE</b>	
Line	114dB
Mic	98dB
<b>HEADROOM</b>	
ref +4dBu	24dB
<b>OFF &amp; ASSIGN ISOLATION</b>	
1 KHz	-110dB
20 KHz	-105dB
<b>BUS CROSSTALK</b>	
1 KHz	-100dB
20 KHz	-75dB

600 Industrial Drive, New Bern, NC, 28562  
tel 919/252-638-7000 / fax 919/252-637-1285  
E-mail: email@wheatstone.com



**AUDIOARTS® ENGINEERING**

## Index

### FEATURES

<b>Stereo Soundbook Updated</b> by Richard W. Burden	10
<b>VOA Installs Digital Platform</b> by Paul J. McLane, Paul Kaminski	12
<b>Marketplace</b>	18
<b>Workbench: Orban, Burk and GPS Hams</b> by John Bisset	20
<b>What Do I Do When It Breaks?</b> by W.C. Alexander	24

### GM JOURNAL

<b>NRB 2000: Convention Preview</b> by Craig Johnston	25
<b>Net Radio Is the New Way Now</b> by Bill Mann	26
<b>Brand Your Station Online</b> by Bill Mann	26
<b>Web Watch</b> by Carl Lindemann	27
<b>Arbitron Study Rates Web Radio</b> by Carl Lindemann	30
<b>Lund Marks 20 Years as Consultant</b> by Robert Rusk	36

### STUDIO SESSIONS

<b>Win2k: A New Era in Production?</b> by Carl Lindemann	39
<b>KTCL's Roger Keeler — Production That Rocks</b> by Ken R.	39

<b>Tiny Texas Console Rides Tall</b> by Alan R. Peterson	41
---	----

<b>SM7A: The Changes Are Internal</b> by Paul Kaminski	42
---	----

<b>Product Guide</b>	44
----------------------	----

<b>New Studio Products From Tascam</b>	45
--	----

<b>Compressor Has Unique Sound</b> by Loren Aldrin	46
---	----

### BUYERS GUIDE

<b>DeltaFlex Keeps Accounts Payable</b> by Donald W. Kirkish	51
---	----

<b>Traffic C.O.P. Software Moves Sales Invoices</b> by John Godfrey	51
--	----

<b>CJDS Unifies Stations, NBA Team</b> by Bill Ashenden	52
--	----

<b>Readers Forum</b>	62
----------------------	----

**GUEST COMMENTARY**

# A Supplier's View of DAB Alliance

by **Jim Woods**

As a radio supplier and manufacturer, Harris Corp. applauds the December decision by USA Digital Radio and Digital Radio Express to work together on an IBOC (in-band, on-channel) digital radio system. We see this action as more than a positive step in the right direction: We believe it is an essential one if U.S. radio broadcasters intend to continue to define the quality and the service of the mobile digital audio entertainment they offer.

If we are to maintain our right to define our future, we must act now. Satellite radio is a rapidly approaching reality. Other digital mobile multimedia services are being proposed to the FCC, and Internet radio access over the cellular telephone network is now imaginable. All of these services foresee a future where radio broadcasters' dominance of the

gy will equip radio broadcasters to deliver audio quality which is on par with the best new delivery services and also to take advantage of new opportunities for alternative revenue streams by providing data services.

Development work and testing over the past decade has proven the tremendous promise of IBOC and, although there are still issues to resolve and engineering work to complete, we as an industry have every reason to be confident in the fundamental technology. In fact, Harris (as well as many other manufacturers) has done extensive work verifying the performance and compatibility of our current products with the various IBOC waveforms. That said, we can only go so far. At a time when we should be investing in next-generation fully integrated IBOC products, we cannot. With competing standards, implementation scenarios

**It is time for broadcasters, equipment manufacturers and proponents to go to the FCC with a single IBOC proposal.**

mobile audience becomes a thing of the past (like network television).

We must also act together. As positive as the USADR/DRE announcement is, it is only the beginning. While this alliance narrows the number of major IBOC proponents from three to two, two strong forces working independently is still one force too many. Unless all proponents are willing to work together to develop and win FCC approval for a single, "best-of-the-best" U.S. standard, there is an enormous risk that IBOC will go the way of AM stereo.

Most in the industry remember that AM stereo — a development that offered significant benefits to radio broadcasters and their listeners, ultimately was derailed by a battle of egos and dueling standards. If this happens to IBOC Digital Radio, everyone will lose, from radio suppliers to broadcasters themselves. We simply cannot afford to repeat the AM stereo debacle — a debacle that would put us at risk of relinquishing our right to define the future of over-the-air radio in a manner that benefits our listeners and extends the brand identity that local radio broadcasters have worked to develop.

There is no question that IBOC has incredible potential. Not only does IBOC digital radio preserve our nation's radio broadcast infrastructure, but the technolo-

and a questionable timeline, we can only do investigative technology assessments and performance testing.

To go further, the industry has reached the critical juncture where it will be best-served by an IBOC alliance that brings the best minds together to resolve the remaining issues — a synergistic, unified effort rather than divisive parallel initiatives. It is time for the radio broadcasters, equipment manufacturers and proponents to go to the FCC with a single IBOC proposal.

The U.S. broadcast industry has a strong model on which to base such an IBOC alliance — the approach that was used to develop and implement a digital television standard. Working together, U.S. DTV proponents not only managed to reconcile technical differences, but they managed to do so quickly and effectively — together.

Certainly the approach was not easy; no approach that is based on proponents with a great deal at stake entering into a give-and-take arrangement is ever easy. But by keeping their eye on the goal, a best-of-the-best DTV standard, the HDTV Grand Alliance succeeded, and today the United States is the first country to be well on the way of implementing a nationwide DTV infrastructure.

Harris is fully conscious of the need to move forward with IBOC digital radio and to do it now. To this end, we called for the formation of a single IBOC digital radio coalition at NAB99. Since that time, both USADR and Lucent Digital Radio have acknowledged that such an approach is the best way to move forward. In fact, both proponents have invited the other to join their coalition. At this time, it appears that all that remains is the final negotia-



Jim Woods

tion to put the structure in place.

It is our fervent hope that this will happen quickly. It is time to put IBOC on the fast track it deserves — a track that is essential if radio stations are to protect their positions by deploying this vital new service for their listeners. And it is time to act now, before it is too late.



*Woods is vice president of the Radio Systems Business Unit of the Broadcast Communications Division of Harris Corp. RW welcomes other points of view.*

**NEWSWATCH**

► NEWSWATCH, continued from page 2  
same time, it was evident he "maximized the level of contribution" he could make to the overall direction of Telex. He continues with the firm as an advisor until February.

## Emerging Product Categories at CES

**LAS VEGAS** With 16 specialized pavilions, the 2000 Consumer Electronics Show, Jan. 6-9 in Las Vegas, spotlighted the hottest emerging technologies, from digital radio to MP3 to e-commerce and DTV.

"As CES continues to be the launch pad for the latest in traditional consumer technologies such as audio, video, computers, telephony, mobile electronics, wireless communications and more, we're also bringing new industry advancements to light with a new product pavilion," said Robbi Lycett, CES vice president. "Some of these pavilions work as incubators for emerging companies and their technologies as they test the market's waters. Others allow attendees to see all the latest innovations in a new product category in one concentrated area."

See coverage, page 1.

# WHAT COMES AFTER DIGITAL?

In the beginning, there were stone axes. Then came fire, the wheel, and the steam engine. Then came analog audio and then digital audio. What comes next?

Certainly the stone wheel must have looked to the caveman to be the greatest discovery that ever could be. And to the simple farmer of the 1800's, the steam engine was the most modern contrivance that his mind could imagine. But neither was a terminal technology. Both have been replaced as time marches on.

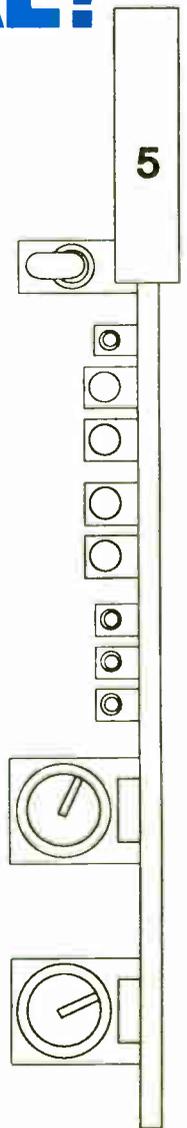
Digital audio is also not a terminal technology. It is simply where we are now.

Want to know what comes after digital? Call (724) 772-2310 and ask for our white paper "Artificial Intelligence, It's What Comes After Digital". While you're at it, you could also ask for a no-obligation, 10-day demo of COBALT BLUE™, the world's first Neural Network audio processor.



221 Commerce Park Drive,  
Cranberry Township, PA 16066-6403  
(724) 772-2310 Voice (724) 772-4770 FAX

5



### Correction

The item "NBG Offers New Services" in the Oct. 13, 1999, issue misstated the location of NBG. The company is in Portland, Ore.

Also, Dean Gavoni's e-mail address is [dean@nbg-radio.com](mailto:dean@nbg-radio.com)

# Radio Books Are Winter Companions

I love to read. As a child, I spent many a rainy day (and sunny ones, too) tucked away at the end of the sofa, letting Isaac Asimov, J.R.R. Tolkein, Robert Louis Stevenson and Arthur Conan Doyle spirit me away to wonderful adventures.

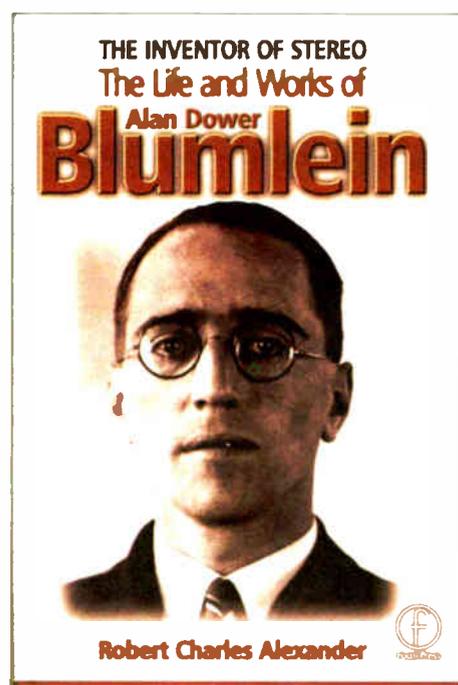
So I have a soft spot for books.

On page 10 of this issue, Dick Burden looks inside the updated "New Stereo Handbook." Meanwhile, there's a pile of promising texts sitting beside me in my office at the moment, books that will be of interest to **Radio World** readers.

Here's a rundown of three.

## Life of Blumlein

If you enjoy the history of technology, Focal Press offers "The Inventor of



Stereo: The Life and Works of Alan Dower Blumlein."

This 448-page hardcover, written by Robert Charles Alexander, aims to be a definitive study of the British inventor who held 128 patents, including a Binaural Recording System in 1931,

and did important work in audio, radar and circuits that were used in television. Born in London in 1903, Blumlein died in a bomber crash in World War II at the age of 38.

Alexander is a consultant and former audio trade journalist. He presents a detailed history of Blumlein, whose story will be new to many people, and accompanies the text with many illustrations and technical drawings.

Although the list price of \$56.95 is a bit steep, this is an impressive research effort. Call (800) 366-2665 to order.

## Radio roundtable

This next book is of interest to me as a journalist who spends my time talking to people about radio.

Michael Keith, who has written several books about radio and audio production, has compiled "Talking Radio: An Oral History of American Radio in the Television Age," published by M.E. Sharpe.

Keith is a senior lecturer of communication at Boston College. He takes the oral history approach here by gathering comments from approximately 100 "legendary and prominent" radio spokespeople.

The list of people he quotes — many of whom have also appeared in **RW** over the years — is remarkable. They include Studs Terkel, Ed Shane, Rick Ducey, Stan Freberg, Lynn Christian, Steve Allen, Donna Halper, Gordon Hastings, Walter Cronkite, Pierre Bouvard, Shel Swartz, Marlin Taylor, Dick Orkin, Newton Minow and many others.

The mix of people produces some interesting viewpoints.

For example, consider this from Steve Allen: "On commercial stations we see a shameful overload of commercials, a frenetic rush-rush of sensory impressions, evidently based on the general perception that the average American listener now has the attention span of a gnat and an astonishing lack of interest in assorted standards and values."

Compare to this remark by Paul Harvey: "I bristle a little bit when I hear people talk about the golden age of radio, because today is the golden age ... the medium these days is infinitely more powerful than it was, certainly per dollar, for selling most products."

The topics are broad, including the impact of TV, the rise of FM, format trends, radio news, the impact of talk radio, deregulation, public radio and the future of the medium.

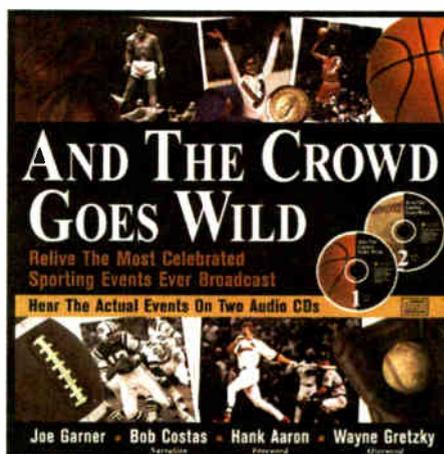
As usual in such books, radio technology isn't well represented. But if you love to sit and chew the fat about the state of our business and its history, try this one out.

It's \$29.95 and available at (800) 541-6563.

## Hear it, read it

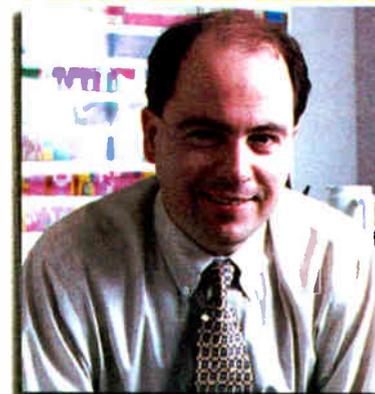
You may have found this book in your stocking last month.

"And the Crowd Goes Wild" by radio veteran Joe Garner is not really a radio book, it's a coffee-table multimedia trophy for any sports fan. The cover promises you will relive the most celebrated sporting events ever broadcast, and you can, thanks to two audio CDs included in the \$49.95 price.



Garner understands that our sports memories are interwoven with how we heard them happen on radio and TV. The book has spectacular photos and ade-

## From the Editor



**Paul J. McLane**

quate text, but the sounds and the announcer's calls are the heroes here.

Louis knocks out Schmelting. Ruth calls his shot. Chamberlain scores 100 points. Havlicek steals the ball. The '69 Mets triumph. The U.S. women win the World Cup.

The voices of Curt Gowdy, Lou Gehrig, Lindsey Nelson, Vince Lombardi, Russ Hodges, Chris Schenkel, Jack Buck and others remind us of the power of the spoken word, whether from announcers or participants. Bob Costas narrates. It's a lot of fun.

"And the Crowd Goes Wild" is published by Sourcebooks Inc. and is available from major book retailers.

★ ★ ★

Last, some congratulations are in order.

AMFM has announced that Mark Lapidus will be director of marketing at WMZQ-FM in Washington, in addition to his current duties as DOM at WTEM(AM). Mark authors the popular column *Promo Power* in **RW**.

A tardy tip of the hat to SBE Executive Director John Poray, who married Reann Lydick in September and engineered an escape to a Caribbean honeymoon, avoiding a couple of hurricanes in the process.

And very close to our hearts, **RW** Managing Editor Sharon Rae married Pete Pettigrew on Dec. 12. We think he's one lucky guy.

Felicitations to all.

**Relax...  
AutoPilot<sup>®</sup>  
is Engaged**

Burk's AutoPilot provides the SOLUTION to your transmitter remote control needs.

"It's almost like standing in front of the transmitter!"

**BURK**  
TECHNOLOGY

1-800-255-8090 • Web Site: www.burk.com

# Web, E-Mail in Future Dashboards

► RECEIVER, continued from page 1

the main component to drive these entertainment/communications elements," said Terry O'Flynn, executive vice president and general manager for Recoton Mobile Electronics' OEM and accessory unit.

For consumers who would want Internet capabilities in the car, as an example, Flynn said, Internet capability could be a modular component, an add-on feature that consumers could build onto a center unit in the dashboard.

Upgrades and add-ons are important to consumer electronic retailers who want to move product and have to face declining price points as sales grow the longer a product has been on the market. The promise of digital radio has some manufacturers and retailers excited at the thought of marketing units that have better sound, an improvement beyond a cosmetic model change.

"Even if you sold an AM/FM/CD receiver to someone five years ago, digital radio will allow you to sell upgrades," said Rick Mathies, director of operations for the

Mobile Electronics Retailers Association.

For people who live far away from stations who complain about reception, he said, satellite-delivered digital audio broadcasting gives retailers a chance to sell the service and receivers.

New services face many obstacles, including name recognition. For instance, CD Radio recently renamed itself Sirius Radio, and adopted a dog in its logo, a reference to the "dog star" of Greek mythology.

Will one of the desirable demos, 16- to 24-year-olds, recognize the reference?

"They're going to have to promote it. If it becomes accepted as an avenue, they'll just know it as Sirius," Mathies said.

"To me, it doesn't matter. The main thing is it's a cool logo," said Jim Frazer, engineering manager of the mobile electronics division of Blaupunkt.

He believes both satellite-delivered DAB developers, Sirius and XM Satellite Radio, are doing a good job of creating demand for the digital pay-radio service, which is planned for launch in late 2000 or early 2001.

Blaupunkt has been talking to both satellite DAB developers about producing receivers, but had no agreements as of press time. "If it actually works like they say it's going to work by the middle of next year, that has tremendous potential," said Frazer.

As for in-band, on-channel DAB, Blaupunkt has not made a commitment to that technology either. It sells Eureka-147-capable receivers in Europe.

Asked when Americans could see a receiver that integrates AM, FM, IBOC and satellite, Frazer said the public has to be aware of digital radio first. He estimated the incremental price a consumer would be willing to pay for a digital receiver, whether IBOC or satellite, at \$99.

He believes the satellite DAB developers' plans — which include plug-and-play adapters and aftermarket receivers with an external black box before the receivers are integrated into the car platform — will sell.

"(Receiver) manufacturers are not interested in integrated solutions," said Frazer. "Manufacturers want components; components make up a flexible system you can build onto."

Car dealers gain additional benefits from selling the components as well, he said.

Recoton is working with IBOC proponent LDR and satellite DAB proponent Sirius to develop receivers.

Recoton does not see the two technologies as competitors, but as different applications, said O'Flynn. He predicted manufacturers could produce an integrated IBOC/satellite/analog receiver approximately two years after both technologies are operating.

Kenwood USA is working with USA Digital Radio to develop IBOC receivers compatible with the USADR system. Both Bob Law, vice president of mobile electronics for Kenwood USA; and LDR's Benjamin predicted analog/IBOC/satellite integrated receivers could be on the market in 2002 or 2003.

For now, manufacturers say, the emergence of MP3 from the computer world feeds a growing demand for consumers who want to download music from the Internet at home, encode it with MP3

technology, burn it to a CD, and play it on a car player that can decode it.

The next step, they agreed, is to have that recording capability in the car.

"Once that happens, think about the ability to take your entire music library anywhere you want," said Mathies. "That's what it's coming to. And then probably, the availability to random access those files."

At CES, Kenwood planned to introduce its Model Z919, a receiver that includes a CD player capable of playing almost 10 hours of MP3 CDs.

With more capabilities and the convergence of emerging technologies in the dash, displays are a concern. In general, manufacturers are making the displays larger and more colorful. But how to accomplish that, plus add more text or graphic display information without distracting drivers, is the subject of on-going debate.

As one solution, Kenwood planned to introduce a "heads up" accessory at CES. The device sits on top of the dashboard and displays text such as station frequency, time, and temperature both in and outside the car, all so the driver does not have to look down at the receiver to get that information.

In general, consumers will be able to accomplish more in the vehicle in the future. Some navigation and telephony is capable now at a high price. When those prices drop in the future, consumers will be able to do more in the car, especially

Internet applications by 2002-2003, sources predicted.

"We will see commercial applications in commercial vehicles first and then in cars," said Benjamin. "Say I've got a document to move to someone who's on the go. You'll see that information come into cars." Or, consumers may want to download a Web document while in their car.

But if consumers are going to cruise the Web, send a fax, make a phone call and download music off-air in their car, manufacturers agree either voice recognition or text-to-voice technology needs to improve.

Voice recognition technology needs to overcome confusion over different languages and the different speeds at which people speak. The technology also needs to distinguish between a command and other noise coming from inside or outside the vehicle, sources said.

For a long document, a text-to-voice system may be most practical.

"If I'm trying to read my e-mail and I'm driving, I don't want to look at it," said Benjamin. "The question is, do you want to put that type of system on the receiver end or on the network end, and, as a result, serve a larger population of people with a single installation."

He said Lucent and IBM are part of an industry group that is reviewing that question.

In general, manufacturers continue to trim their receivers that play cassettes and add more receivers that include CD players to their product lines. Receivers that can play MDs, they agreed, are dead in this country, outstripped in popularity by the CD player.

## DIGITAL NEWS

# USADR Reveals 'iDAB' Logo

**LAS VEGAS** USA Digital Radio does not believe consumers will cozy up to the name the industry is calling terrestrial digital audio broadcasting, "in-band, on-channel DAB."

Therefore, USADR has trademarked a new symbol for use on



The AM & FM Digital Experience

receivers capable of receiving its IBOC signal. The "iDAB" symbol will be used on IBOC receiver faceplates and light up when tuned to a station transmitting the USADR IBOC signal.

"The symbol is part of our commercialization campaign to brand the technology," said USADR Director, Marketing and Public Relations David Salemi.

"When we get into formalized licensing arrangements with receiver manufacturers they will be licensed to use the iDAB symbol," he said.

IBOC proponents predict an equipment rollout in 2001, assuming a standard is chosen this year.

The company planned to introduce the symbol to receiver manufacturers at the Consumer Electronics Show in Las Vegas.

— Leslie Stimson

# Digigram POWERED

The best sounding, most reliable digital audio systems use Digigram sound cards.

Does yours?



Digigram Inc. 2101 Wilson Boulevard, Suite 1004 Arlington, Virginia 22201  
Phone: +1.703.875.9100 • Fax: +1.703.875.9161 • E-mail: input@digigram.com • Web: www.digigram.com

# XM's Panero Keeps Eye on Goal

► XM, continued from page 1  
launching XM service.

**RW:** Sirius claims a first-to-market advantage over XM in getting its satellite-delivered digital audio broadcasting system operational. What's your timetable for launch and how much of a difference is there between XM and Sirius Satellite Radio in this regard?

**Panero:** We will be in commercial operation the second quarter of 2001. ...

You were talking about any kind of a time-to-market issue with our competitor. There really is none. If I had a crisp hundred-dollar bill, I would bet you that we're going to be launching right on top of one another or maybe even launch before them. ...

It's a three-legged stool in terms of the kind of things that you need to have a successful service. Your satellites need to be up, you have to have your broadcast facility in place, but the most important piece is the radio receivers. You need to have the radio receivers manufactured and in the market in order to have a successful service, and I think that we are pretty on top of that.

That's the gaining item.

**RW:** The gaining item?

**Panero:** For both companies — you could have satellites up a year before launch; you could have the broadcast facilities up a year before your launch, that's fine. You're actually just depreciat-

es. Our satellites go up the end of December 2000 and in the first quarter of 2001. We've signed a lease for broadcast facility here in D.C. at Eckington Place ... for 120,000 square feet. We'll occupy that over the next year.

So, we're actually right on schedule to efficiently lay together the critical elements of the actual technical distribution center.

**RW:** What is the status of the patent infringement lawsuit that Sirius filed

against you last spring? feet being dedicated to special studio space, which is significantly higher than our competitor has allocated for that because we have a different strategy about how we're doing programming.

Our programming strategy is to be a lot more dynamic in our programming with, at times, live DJs, programming hosts.

**RW:** Sirius was in Washington, D.C., and chose to move to New York City. Why has XM chosen to remain in Washington?



Photo by Leslie Stimson

Hugh Panero

**This is a service that is predicated on building distribution, and the only way you build distribution is to have a radio receiver.'**

against you last spring?

**Panero:** The lawsuit is going through the pre-trial process. Our position on it is simply, we believe the lawsuit has no merit. ...

We feel very comfortable that this is an issue that is going to go away.

**RW:** When will your studios be complete?

**Panero:** This is a growing mecca for wireless companies, Internet companies, as well as entertainment companies and you can have an amazing quality of life for your employees (that is) very different than being in Los Angeles or New York. ...

The concept that you have to be in a midtown Manhattan location, paying \$45 a square foot, for the ego being amidst the skyscrapers because you think that gives you some advantage ...

It's all about who has a good business.

**RW:** I think the question most radio engineers and managers would want answered is, how can you be sure your technology is going to work?

**Panero:** This is a typical business that is based on technology where you go through various elements of conceptualizing the concept and then ... applying the science that you have based your assumptions on into a real-life environment.

I've done it in the cable television industry for a number of years. Members of my staff have done it in a wireless business, communication business or consumer electronics. DirecTV, who is a partner of our company and an owner, went through the same process in deliver-

ing satellite television to consumers. ...

I realize that in the radio business there haven't been a lot of advances, but this has been done in the satellite business, the wireless communications business, done in cable television, and done in satellite broadcast television.

**RW:** What are the challenges that you have had to overcome?

**Panero:** We're really building an entertainment company that happens to touch on a lot of different industries. There's part of a satellite industry, there's a consumer electronics component to the business, there is sort of an entertainment packaging, like cable television or DDS component to the business, and obviously there's an automobile segment of the business. ...

In the cable television industry, we brought cable television to parts of New York City that never had it before. It had the same challenges, like how do you build a cable television in New York City with the union situation and the way the houses are constructed. ... You are dealing with the federal cable regulations, the local city; it's the same kind of stuff.

**RW:** It's been said by some observers that SDARS companies in general will not obliterate traditional radio, that you'll nibble at its market share.

Yet, traditional radio, and in the past, the NAB, has unofficially portrayed you and Sirius as the 'Death Star.' Should radio fear you?

**Panero:** I don't know if that's how the NAB portrays us. The NAB is made up of a lot of companies — one of them being Clear Channel Communications, which is an owner of our company. We

See XM, page 7 ►



Shown is an artist's conception of the building in which XM Satellite will be located, now under renovation.

ing those assets faster.

You really have to have the radio receivers out there. We're pretty comfortable with the timing of our other launch-

**Panero:** We'll occupy them in the June/July frame. They're actually being worked on right now. It's about 120,000 square feet. There's over 60,000 square

# PORTABLE ONE

## DUAL DOMAIN

True Dual Domain Audio Testing at an Attractive Price Point

- Comprehensive analog audio analyzer
- True digital domain analyzer with -140 dB residual noise
- Independent analog & digital audio generators and analyzers
- Generate and measure interface jitter
- Digital interface analyzer
- View AES/EBU status bits
- Loudspeaker monitor for digital & analog signals
- Internal save and recall of 30 test setups

**Audio precision**  
Audio Precision  
PO Box 2209  
Beaverton, Oregon 97075-2209  
Tel: (503) 627-0832; Fax: (503) 641-8906; US Toll Free: 1-800-231-7350  
Email: techsupport@audioprecision.com; Web: www.audioprecision.com

► XM, continued from page 6  
have relationships with Hispanic Broadcasting Corp., Radio One Inc. and Salem Communications Corp. ...

We're just providing another option in the car. People are now in traffic and commuting longer than they ever have before. ... Having entertainment options in the car is going to become increasingly important.

**RW:** Which translates into ad growth for traditional radio, or you?

**Panero:** I think for both, at some points in time.

A Clear Channel or CBS, because they dominate a certain region, (are) going to be able to sell national advertising in a very effective way across large demographic segments that they cover. We will also provide a more-targeted element for national advertising.

On our Hispanic channels, we could have six minutes of advertising where we can reach Hispanic audiences in small markets where it's not cost effective to have a commercial radio station available.

**RW:** What is XM's agreement with

Clear Channel, one of your investors? Are you going to have such a programming relationship or is it also an advertising relationship?

feel at liberty to describe.

**RW:** And Clear Channel has invested in USA Digital Radio, which is develop-

pany. They are working to improve their position in reaching this out-of-home advertising market.

They have investments in the satellite platform; they have an investment in digital technology, IBOC, investment in the Internet, investment in billboards.

**RW:** What is the advertising relationship that XM shares with Clear Channel?

**Panero:** With all of our programming partners it is based on an advertising split.

The people that we enter into a programming agreement with are bringing a lot of expertise — whether it's a CNN or a Bloomberg or a Hispanic Broadcasting Corp. or a Radio One, who really know the urban environment — and then we grow the business together by splitting

See XM, page 8 ►

**'If I had a crisp hundred-dollar bill, I would bet you that we're going to be launching right on top of one another.'**

**Panero:** Basically, Clear Channel has made an investment in our company and they are going to provide some programming expertise, which I don't

ing a terrestrial form of digital audio broadcasting.

**Panero:** Yes. This is why the Mays are so smart. They're a big media com-

**Company:**  
XM Satellite  
Radio Inc.



**Address:**  
1250 23rd St., NW, Suite 57  
Washington, D.C. 20037

**Web site:** [www.xmradio.com](http://www.xmradio.com)

**Ownership:** Founded in 1992 as American Mobile Radio Corp., the company was renamed XM Satellite Radio in October '98. In October '99, XM completed a successful initial public offering on NASDAQ and trades under the symbol "XMSR." American Mobile Satellite Corp. (NASDAQ:SKYC) holds controlling interest in the company.

XM's other investors include Clear Channel Communications Inc.; DirecTV, a unit of Hughes Electronics Corp.; General Motors Corp. and a private investment group comprised of Columbia Capital; Telcom Ventures L.L.C. and Madison Dearborn Partners, which together invested \$250 million in July '99.

**Manufacturing partners:** Hughes Space & Communications International and Alcatel are building XM's two high-powered, direct-broadcast satellites.

Clarion Co. Ltd., Alpine Electronics, Delphi-Delco, Mitsubishi Electronics Automotive America, Motorola; Pioneer Electronics Inc. and Sharp Corp. are manufacturing XM receivers.

**Programming partners:** Through its XM Originals programming unit, XM plans to offer a mix of music, talk, news, sports and children's formats. XM has signed programming agreements with a number of content providers, including The Weather Channel, USA TODAY, the BBC World Service, Black Entertainment Television, the Hispanic Broadcasting Corp. (formerly Heftel), Bloomberg News Radio, C-SPAN Radio, CNN/Financial Network, CNN/Sports Illustrated and others.

List current as of Dec. 28, 1999.

**Try it.**  
*you'll like it!*

**Engineer Tested,  
GM Approved!**

The Vector delivers full fidelity, two-way audio that can please even the fussiest program director. Networks and stations worldwide are using this popular codec on a single dial-up phone line for their remote broadcasts.

**Try a Vector on your next remote. You've got to hear it to believe it! Call us today to schedule a 10 day demo.**

Comrex Corporation, 65 Nonset Path, Acton, MA 01720  
Tel: 1-800-237-1776 Fax: (978) 635-0401 Fax-on-demand: (978) 264-9973  
Email: [info@comrex.com](mailto:info@comrex.com) [www.comrex.com](http://www.comrex.com)

**COMREX**

# XM Readies for Satellite Launch

► XM, continued from page 7 advertising revenue.

**RW:** How many subscribers do you and Sirius need to break even, and over what period of time?

**Panero:** I think in both companies, the analysts are projecting 4 million subscribers to break even. This can probably be achieved 3 or 3-1/2 years after launch.

What's compelling about it is that there are 200 million licensed automobiles on the road today, and to get to 6 million subscribers, you need only 2 or 3 percent of that audience.

**RW:** How are you going to convince people to pay for radio?

**Panero:** Convincing is an interesting term. As I mentioned I worked 10 years in the cable industry. We went through this process. People said, "Who's going to pay for cable television if you currently have free over-the-air broadcast TV?" ...

We have a product the people want, we have a market demand for it, which has been demonstrated by various studies, and then we're going to have to package this product and have content. ... We're going to have channels that are commercial-free, we're going to have channels that are provided by brand-name content companies, people who recognize and have experience with.

We're going to have people from the radio industry that have expertise in cer-

tain kinds of areas produce those things and that package of content is going to resonate with consumers.

**RW:** Let's talk about your business relationships and money. How much have you raised, how much do you need?

**Panero:** We've raised close to \$500 million in equity. The company has no debt. We need about another \$630 million to get to commercial launch. We are

**There are 200 million licensed automobiles on the road today, and to get to 6 million subscribers, you need only 2 or 3 percent of that audience.'**

exploring a number of ways to do that. ...

We have strong corporate sponsorship in some of the biggest companies, like General Motors, DirecTV and Clear Channel. ...

That financing round that we went through in July where we brought in all these partners that are helping us build a business together and the recent IPO we did in October (mean) that we're here to stay.

**RW:** What is your relationship to Hughes and GM? Who owns what?

**Panero:** GM and DirecTV are among our strategic partners.

In July 1999, General Motors, Clear Channel, DirecTV (which is a unit of Hughes Electronics) and a group of private investors made a combined investment in XM of \$250 million, with \$75 million each from Clear Channel and the private investment group, and \$50 mil-

lion each from GM and DirecTV.

So we are backed by the number-one car manufacturer, the number-one radio group and the number-one satellite TV company in the United States.

General Motors will also factory-install XM-capable radios in their cars. We have an exclusive long-term agreement with GM to market AM/FM/XM radios in their vehicles.

Recently, GM placed the first order ever for satellite radios through Delphi Delco. We expect other car manufacturers to join us.

**RW:** What's the status of receiver interoperability?

**Panero:** One of our goals is to develop an interoperable solution. To that end, we have been working with Sirius to solve the technical, cost and implementation issues associated with interoperability.

Although interoperability will not be available in the first generation of satellite-capable radios, it is part of our planning for future generation receivers.

**RW:** And the repeater deployment?

**Panero:** We're on schedule.

*(Editor's note: When asked if XM and Sirius are considering sharing some repeater sites, Panero said that was being discussed, but nothing had been decided.)*

**RW:** What are your thoughts on general radio trends? IBOC and SDARS DAB are being developed at the same time along with the Internet. How will that affect the future of radio?

**Panero:** The promise of these new technologies is injecting a shot of energy into the industry. ...

Radio has stayed pretty much the same since the introduction of FM 50 years ago. These new radio technologies offer a vast opportunity for variety and diversity in listening choices, and for more artists to get national exposure.

We believe that satellite radio is out in front of the other new technologies. Satellite radio will go to market with commercial service many years before the other technologies, which are still working out standards issues with the FCC and are in the earlier stages of development.



Photo by Leslie Simmon

Hugh Panero

**RW:** What will receivers look like five years from now?

**Panero:** The biggest change will be in car audio systems. The receiver head unit will be more integrated into comprehensive in-car communications packages that will include navigation and security systems, wireless communications and entertainment products like XM.

But I think the basic design will remain as simple as possible. You will be able to easily push a button to jump from XM to AM or FM.

**RW:** What do you think consumers would be willing to pay over what they pay now for a digital-capable receiver?

**Panero:** In 1998, 7-1/2 million people paid to replace their existing car radios in the car radio aftermarket. We see our aftermarket radios costing only incrementally more than today's units, about \$150 more, a price which will come down over time with volume production.

## Hugh Panero: From Cable to Satellite Radio

Hugh Panero, 43, has gone from New York bureau chief at cable trade magazine Cablevision to president and chief executive officer of XM Satellite Radio.

Panero became president/CEO of XM in 1998, when it was called American Mobile Radio Corp.

Before joining XM, Panero was president and chief executive officer of Request Television, a pay-per-view network owned by TCI's Liberty Media and 20th Century Fox. He also served as president and chief operating officer of the parent company Request Holdings Inc.

Prior to joining Request Television, Panero spent 10 years at Time Warner Cable of New York City, where he helped build the world's largest cable system.

He is an honorary chair of Cable Positive, the cable industry's non-profit AIDS awareness organization and founder of the Anti-Theft Cable Task Force.

Panero received a B.A. in Government and Sociology from Clark University in Worcester, Mass. and a Masters Degree in Business Administration from Baruch College in New York City. He is married and has two children.

HARD DISK - DIGITAL AUDIO AUTOMATION

# THE PHANTOM

The Phantom Control Room ... Your Station's Busiest, Most Efficiently Run Operation.

**rds**  
Register Data Systems

-Rock Solid • Easy-To-Use • Radio-Friendly-

1691 Forsyth St., Macon Georgia  
Phone 1-800-521-5222 Fax 912-745-0500  
registerdata.com

# TALK DIGITAL TO ME

**The advantages of ISDN are clear:** Faster set-up, intelligent call handling and the superior performance of digital audio. And now Telos Systems brings the benefits of ISDN to the talk show environment.



**The TWOx12** digital talk show system plugs right into ISDN BRI phone lines. Your callers sound louder and cleaner with the isolation performance that only a true four-wire system can deliver. And if you don't have ISDN in your studio yet, the TWOx12 lets you start with POTS and upgrade to ISDN whenever you're ready.

**As easy as picking up the phone.** Call management is fast and easy with our new Desktop Director, a fully integrated telephone and switch console. Intuitive operation is enhanced by the exclusive Status Symbols™ graphical icons that convey line and caller status at a glance.

**Finally, a breakthrough** in telephone technology. Up to 12 callers can be routed to the two all-digital hybrids. Self-contained, easy-to-install and maintain, the TWOx12 simplifies even the most complex talk shows.

**Ready to talk digital?** For more information or to get in touch with your Telos Systems dealer, contact us or visit our web site.



**TELOS SYSTEMS 2101 SUPERIOR AVENUE CLEVELAND, OH 44114 USA**  
TEL: +1 (216) 241-7225 FAX: +1 (216) 241-4103  
E-MAIL: [info@telos-systems.com](mailto:info@telos-systems.com) [www.telos-systems.com](http://www.telos-systems.com)

**TELOS SYSTEMS EUROPE**  
JOHANNISSTRABE 6 D-85354 FREISING GERMANY  
TEL: +49 81 61 42 467 FAX: +49 81 61 42 402  
E-MAIL: [europe@telos-systems.com](mailto:europe@telos-systems.com) [www.telos-systems.com](http://www.telos-systems.com)

Telos Systems, the Telos logo, TWOx12 and Status Symbols are trademarks of TLS Corp.

BOOK REVIEW

# Stereo Soundbook Updated

Richard W. Burden

If you have even a slight interest in the subject of the stereophonic illusion, the second edition of "The New Stereo Handbook" by Ron Streicher and F. Alton Everest is for you. A wealth of information in an easy-to-understand text is presented within its cover.

This is not the type of book that you can pull from your bookshelf and use as a handy guide or "how-to-do-it" text to set up microphones for recording or remote broadcast. Rather, it provides the thought process to evaluate the environment in which the recording will be made and the

tools with which you have to work.

While we may think that stereophonic reproduction is a 1950s and 1960s kind of thing, this book pays homage to the pioneers and the early efforts of stereophonic in the '30s. Take time to read this. Much of this work is in vogue today.

Higher math is avoided in this book, which first appeared in 1991. Illustrations and a concise text present the fundamentals in a simple manner. The table of contents includes chapters on auditory basics such as "How Stereophonic Information Is Conveyed."

Take time to read about Stereo and the Auditory System. This is an interesting

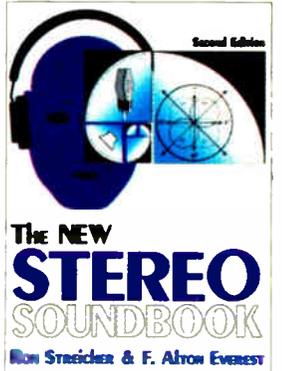
and informative discussion that explains the auditory effects of time, frequency and amplitude and their relationship to the stereophonic illusion.

The text presents the basic approaches of various microphone techniques and explains the relative advantages and disadvantages of each. Each of the techniques has a chapter devoted to its particular approach. Attention to these chapters will guide the reader in selecting the wisest approach to recording in the particular situation.

The chapter on "Audibility of Reflection" is another must. Too often, the pickup is marred by inattention to the

properties of the room, the microphone placement and polar pattern of the microphone employed.

The topic of spaciousness, the techniques of Surround Sound and multichannel 5.1 are all covered in the book. Included also is text on improving the listening environment.



### Blumlein's vision

The book concludes with an appendix containing the British patent of Alan Blumlein. His vision of how to capture the stereophonic illusion and reproduce it is a cornerstone of stereophonic disc recording and the matrix employed in stereophonic broadcasting. His basic research appeared a quarter century before the reality of his early efforts was realized. This is interesting reading, especially when you relate his early work with the standards employed today.

Photos, diagrams and a glossary of terms are included.

Before you embark on any recording project or remote broadcast, read the chapter on "Philosophical and Pragmatic Approaches to Stereo." Don't leave home without reading it. The thought process in evaluating the desired result before you embark on the project is well worth the price of the book.

"The New Stereo Handbook, Second Edition" is available from Audio Engineering Associates in Pasadena, Calif., for \$54.50. For information, call (800) 798-9127 or visit the Web site at [www.stereosoundbook.com](http://www.stereosoundbook.com)

# Citadel Selects Scott Studios as "the Best" Digital System



Larry Wilson (at right), CEO of Citadel Communications Corp., shakes hands with Dave Scott as Citadel standardizes on Scott Systems for its 124 stations and future acquisitions.

Citadel Communications Corp., one of America's top 10 radio groups in 1998 revenues, selects Scott Studios Corp. as its sole supplier of on-air digital audio delivery systems for its 124 radio stations and future acquisitions.

"We thoroughly investigated all of the competitive digital air studio systems and decided upon the best one," says Larry Wilson, CEO of Citadel Communications. "Our regional Presidents and Vice Presidents of engineering and programming spent nearly a year analyzing different options. While no system or manufacturer is 100% flawless, it became obvious to us that Scott Studios is the very best. Their long history of excellent service commitment, the quality of their digital studio products and competitive pricing were our primary reasons for selecting Scott Studios."

Dave Scott, CEO of Scott Studios Corp. says, "It's an honor to be Citadel's sole digital audio vendor and take their other brands as trade-ins on our new equipment. Our systems are designed by announcers, for announcers."

"Of Scott's 61 employees, 43 are former jocks and PDs with 700 years collective radio experience. Competitors work more from the engineer's perspective, although we have 20 former chief engineers on staff also. Scott Studios' digital fits DJs like a glove."

After adding five Oklahoma City stations and other pending transactions, Citadel will own or operate 124 radio stations in 23 mid-sized markets such as Providence, Salt Lake City and Albuquerque.

Citadel is well known across the country for attaining topnotch competitive programming success, and the addition of Scott Studios announcer friendly technology will help Citadel announcers deliver superior information, entertainment and service to their 8,000,000+ weekly listeners.

Citadel's stations are not the only ones who choose Scott: More U.S. radio stations use Scott Studios' than any other digital system, with 5,046 Scott digital workstations in 2,202 U.S. stations. Nine of the ten top-billing groups have Scott Systems.

Scott Systems are the easiest to use! They're intuitive, straightforward, simple, yet the most powerful!

Scott Studios is famous for our uncompressed digital systems at a compressed price, (but we work equally well in MPEG and MP3). Scott Studios' audio quality is the very best and plays on laptops or PCs with ordinary sound cards. We pre-dub your startup music library free. Your PD can auto-transfer songs digitally in seconds with a CD-ROM deck in his or her office.

Scott gives you industrial quality 19" rack computers, but nothing is proprietary: functional equivalents are available at computer stores. You also get 24 hour toll-free tech support! Scott also lets you choose your operating system: Linux, Novell, NT, Windows, DOS or any combination. You also choose from three systems: Good, Better, Best. One's right for you!

The Scott System 32 (pictured at the upper right) is radio's most powerful digital system. Your log is on the left side of the LCD touch screen. Instant access Hot Keys or spur-of-the-moment "Cart Walls" are on the right with lightning-quick access to any recording. Phone calls record automatically and can be edited to air quickly. You can also record and edit spots or voice tracks in the air studio or go on the air from production.

Options include seamless redundancy, self-healing fail-safes, newsrooms, 16-track editors, time and temperature announce, and auto-transfer of spots and voices to distant stations over WAN or Internet. Check our web site and call us toll-free.

8:15:38A On-Air 2	R-E-S-P-E-C-T Aretha Franklin :11/3:30/F HIT HM9834 8:15 The Queen of Soul!	1-2-3 Len Barry L 7/7 4p N 7/10 2a	409 Beach Boys L 7/1 5a N 7/8 10p	96 Tears & Mysterians L 6/27 2p N 7/9 5p
Start 3	Ferry 'Cross the Mercy Gerry & the Pacemakers :17/4:13/F HIT HM2608 8:18	A Beautiful Morn. The Rascals L 7/8 4p N 7/12 7a	A Day in the Life The Beatles L 7/6 11a N 7/18 9p	A Groovy Kind of Mindbenders L 7/4 2a N 7/12 7p
Start 3	Home Depot Q: Better at Home :00/0:30/F COM DA2214 8:22	A Hard Day's Nite Beatles L 7/2 3a N 7/9 3p	A Little Bit Me, A Monkees L 7/2 7p N 7/13 8a	A Little Bit o' Soap The Jarmels L 7/5 5p N 7/13 6p
Start 3	McDonald's Q: Prices may vary :00/0:06/F COM DA2215 8:22	A Lover's Question Clyde McPhatter L 6/29 5a N 7/13 9a	A Summer Song Chad & Jeremy L 7/2 8p	A Teenager in Lov Dion & Belmonts L 7/4 3a N 7/11 5p
Start 3	Bob's Bargain Barn Q: Sale Ends Saturday :00/2:45/C COM DA1234 8:23	A Thousand Stars Kathy Young L 7/2 9p N 7/15 4p	A Town W'out Pity Gene Pitney L 7/2 10a N 7/15 3p	A Whiter Shade of Procol Harum L 7/1 3p N 7/13 7a
Start 3	Cool 105 Fast Jingle Q: Cool 105 :00/0:30/F JIN DA4315 8:23	A World W'out Lov Peter & Gordon L 7/4 10a N 7/12 11	Abraham, Martin & Dion L 7/1 9p N 7/20 10p	Act Naturally Beatles L 7/2 2a N 7/14 3p
Stack	Artists Time Year Cat.	Action Freddy Cannon L 7/5 8p N 7/13 5a	After Midnight Eric Clapton L 7/5 12m N 7/9 11	After the Gold Rus Neil Young L 7/5 7p N 7/18 8a
Auto	Back Forward Stop	Afternoon Delight Starland Vocal Bar L 7/3 1p N 7/17 9p	Ain't No Mountain Diana Ross L 7/3 7p N 7/12 5a	Ain't No Sunshine Bill Withers L 7/1 11p N 7/12 3p
	:04	Ain't No Woman Four Tops L 7/6 1p N 7/14 8a	Ain't Nothing Like Marvin/Tammi L 7/4 12n N 7/13 8p	Ain't She Sweet Beatles L 6/27 1p N None
	ABCDEFGHIJKLMNOPQRSTUVWXYZ	Ain't That Peculiar Marvin Gaye L 7/5 2a N 7/12 7p	Ain't That A Sham Fats Domino L 7/2 3p N 7/16 6p	Along Again, Natu Gilbert O'Sullivan L 7/1 10a N 7/15 9p

The Scott System is radio's most user-friendly. You get instant airplay or audition of any song simply by spelling a few letters of its title or artist. You see when songs played last and when they'll play next. You also get voice tracking while listening to music in context, hot keys, automatic recording of phone calls and graphic waveform editing, all in one computer!

**Scott Studios**  
 13375 Stemmons Freeway, Suite 400  
 Dallas, Texas 75234 USA  
 Internet: [www.scottstudios.com](http://www.scottstudios.com)  
 (972) 620-2211 FAX: (972) 620-8811  
 8 0 0 7 2 6 8 8 7 7  
**(800) SCOTT-77**

### MARKET PLACE

#### Tool Cuts Duct Fingers

Panduit is out with a new Duct Finger Cutting Tool.

It cuts away duct fingers in tight spaces where there may not be room to remove the fingers by bending and breaking them.



The company says the tool is ideal for use on its Panduit Type G and E Slotted Wall Duct and that it easily cuts two-inch-tall fingers. Taller pieces can be removed in multiple "bites."

For information, contact Product Management, Network Systems Group, at Panduit in Illinois at (888) 506-5400, ext. 8287, e-mail to [info@panduit.com](mailto:info@panduit.com) or circle Reader Service 71.

- Best Price Guarantee\*
- Same Day Shipping\*
- Extended Hours
- Knowledgeable Sales Staff
- Flexible Terms

# The Sound Of Broadcast Professionals Worldwide

*Shure microphones and circuitry products are used extensively throughout the world by broadcasters who demand nothing but the best. Robust mixers designed for the rough and tumbled world of life on the road. Microphones that cater to all kinds of voices in all kinds of settings. When thousands of listeners and (your career) are on the line, settle for nothing less than.....Shure.*



SM7A



SM2



M367



FP33



FP42



FP410



SM58



KSM32



SM57



VP64A



SM63LLC



FP22



**To Order Call BSW 1-800-426-8434**

BSW is open from 6:00 AM to 6:00 PM Pacific Time.  
You can also fax us anytime using our toll-free number  
(800-231-7055) or better yet email us at [info@bswusa.com](mailto:info@bswusa.com).

\* Call or see [www.bswusa.com](http://www.bswusa.com) for details.

Circle (11) On Reader Service Card

World Radio History

**NEW**

BSW's Online Catalog  
[www.bswusa.com](http://www.bswusa.com)

# VOA Installs Digital Platform

Paul J. McLane and  
Paul Kaminski

America's radio voice is joining the digital revolution in a big way.

As part of an extensive audio modernization effort at Voice of America, the U.S. government awarded a \$3.1 million contract to Dalet Digital Media Systems.

The contract covers the first pieces of an Integrated Digital Audio Production System, or IDAPS, for the global broadcaster.

VOA broadcasts news and information to more than 90 million listeners weekly, in 54 languages ranging from Afan Oromo and Albanian to Uzbek and Vietnamese. Its signals are aired on medium-wave (AM) and shortwave, as well as local stations and the Internet.

This project deals with how audio is handled at VOA headquarters, located within sight of the U.S. Capitol.

## Digital keystone

There, VOA handles massive amounts of audio, around the clock, every day of the year. Much of that recording and editing is done on analog tape, as evidenced by rooms filled with row upon row of reel-to-reel decks and other tape machines.

The Dalet 5 Digital Audio System will let the staff acquire, edit, store and share linear digital audio on computer servers. The project is a central building block in VOA's efforts to integrate audio functions and handle audio in the digital realm. It will concentrate multiple audio functions onto the screen, so employees can work more efficiently.

IDAPS is part of a broader Digital Broadcasting Program at the International Broadcasting Bureau, which oversees VOA. The bureau describes IDAPS as the "keystone" that will unite various program components into what it believes will be the world's largest fully integrated digital broadcasting network.

The IDAPS contract, considered lucrative thanks to the size and prestige of VOA, was awarded to Dalet in September. Three other companies offered bids: Broadcast Electronics, Netia and b-i-t-s.

The contract covers three "task orders." That work is on a fast-track footing and is expected to be complete by spring. The project eventually will include 10 such tasks, with the additional contracts to be awarded as work proceeds.

The contract is one of Dalet USA's largest, according to President Anna Mae Sokusky. The project "will be one of the largest single-site digital audio installations of its kind ever in the United States and possibly the world," she said.

VOA will start by installing the system in departments that take audio from the field and distribute it. Those three tasks encompass approximately 250 audio workstations. Installation work is underway.

The tasks covered by the initial contract include modernization of VOA's Audio Services Department "Sound on Demand" system, its English-language Correspondent Report Intake Center, nicknamed the "bubble," and its extensive Central Newsroom operation.

As work proceeds, additional contracts will extend the system to VOA's foreign-language "bubble," its Central Recording facility, core broadcast and production studios and the music library.

Then, once the IDAPS system is up and running on audio intake and distribu-

tion duties, VOA can extend it further to its seven language divisions and, later, to remote news centers and bureaus.



Voice of America Headquarters in Washington, D.C.

tion duties, VOA can extend it further to its seven language divisions and, later, to remote news centers and bureaus.

To the computer user, IDAPS will look like another suite of software applications.

The Dalet 5 system includes an audio editor called Surfer, which allows simultaneous editing of audio while it is being recorded to the server, and allows access to that audio by any client on that system.

The system will make storage simpler for VOA, with real-time, "near-on-line" and archival storage of audio, similarly available to any client on the system.

A typical screen will include a database manager, Surfer audio editor, mixer

panel and Navigator on-air playback system. What each user sees will depend on the user's job and access rights. Some users need heavier DSP editing, some simpler work, so certain workstations will be equipped with high-end Digigram audio cards, and others will use Soundblaster cards.

## Plenty of bandwidth

Little physical renovation is required to install the system, according to VOA officials; it will use mostly existing desktop hardware and the existing IP/ATM computing network infrastructure (although some new workstations will be purchased and the ATM network enlarged).

Several high-end IBM clustered servers run Microsoft Windows NT Workstation and NT Server over the ATM network. VOA uses Windows NT as its computing system of choice. There are more than 1,200 Pentium-based computers throughout VOA.

IDAPS audio and database servers,

associated storage devices and ATM switches will be located in VOA's former Master Control room, which became available after the completion of a new Digital Master Control facility in 1999.

"It is a perfect fit, with existing raised flooring, stand-alone HVAC system and redundant power with UPS and generator backup," said Michael Serafini, IDAPS technical director for IBB/VOA.

The capacity of the Dalet system has not yet been defined, but it will provide at least 1.5 Terabytes in primary storage for the initial contract work. Eventually the IDAPS system could grow to approximately 700 workstations or user "seats."



When IDAPS is operational, the VOA staff will handle audio more efficiently.

Immediate access to audio will allow newsroom and language-service staffers to respond to events quickly and reduce the need for multiple copies of each feed, which are in demand throughout VOA.

## Better bubbles

Every day, reporters and stringers file stories from around the world, most often from three news centers in London, Hong Kong and New York and 14 small news bureaus, to one of the correspondent center "bubbles" in Washington.

The English-language bubble, for instance, can take up to four audio feeds at once via various connections, including POTS, ISDN and T1. This bubble is the hub for all English-language feeds.

In a typical application, a reporter feeds audio to VOA headquarters using dial-up analog or ISDN phone lines. Once IDAPS is in place, a technician in the correspondent center "bubble" will record the audio using an IDAPS workstation, onto an audio server. The technician will choose a database category in which to save it, and enter a title.

This audio file will be available within seconds to newsroom personnel responsible for editing. Once the cut is approved for air, it will be placed in a predefined database category reserved for on-air audio.

Newsroom personnel will create the schedule and lineup of cuts for use in the newsroom air studios. Once in the studio, the studio technician will load scheduled cuts into the IDAPS cart-replacement application, for playback to air.

See VOA, page 14 ►



## Lucent Digital Radio

Fact, not fantasy. Lucent Digital Radio's In-Band On-Channel (IBOC) delivers digital quality audio that's interference-free. Live, on-air tests prove it.

[www.lucent.com/ldr](http://www.lucent.com/ldr)



We make the things that make communications work.™

## THE RESULTS ARE IN:

Three out of four of the highest billing radio stations in the U.S. use Omnia.\*

Four out of five of the top-rated radio stations in New York City use Omnia.\*\*

Five out of six of the most listened-to radio stations in the U.S. use Omnia.\*\*



■ For the name of your Omnia dealer, contact us at 1 (216) 241-3343 or visit our web site at [www.nogrunge.com](http://www.nogrunge.com).

\* Source: *Duncan's Radio Market Guide*, 1999 edition

\*\* Source: *The American Radio* by Duncan's American Radio; based on Arbitron Spring 1999 12+ TS& Cume, Mon-Sun, 6:00am-12 midnight.

## VOA, From Tapes to Servers

► VOA, continued from page 12

Also, VOA producers now spend a great deal of time collecting and editing actualities, music and sound, and must physically locate the materials from around the large facility. The Dalet database browser will let producers access various audio segments directly from their desktop.

IDAPS also will change the way producers create playlists for programs. The long-term goal is to replace the stacks of audio carts and tapes that producers carry with a "cart wall" or similar function that can be modified easily in the control room, on screen.

Serafini said IDAPS is VOA's first venture into computer-based storage and editing, so it will take a hybrid approach.

"We know we'll have to gradually phase out the older analog equipment, but we would like to focus first on eliminating the need to use cartridge machines, followed by reel-to-reel," he said.

Until the digital system is implemented fully, control room technicians will record and play material from analog tape, carts and MiniDisc as well as IDAPS.

### Work flow

"It's amazing how much time is spent in this operation moving audio around, particularly managing resources for complex programs," said Jonathan Roberts, chief of the users' group for the IDAPS installation and executive producer for the Arabic language branch.



Jonathan Roberts, left, and Michael Serafini meet with Joyce Craig of Dalet.

The transition to a digital management system will affect how VOA staffers han-

dle their work. For example, one task planned for later will include a new way of archiving audio. Material to be archived for a short time will be stored on hard drives and data tape, and be available quickly. For long-term storage, important audio will be burned to CD-R.

And in the future, VOA plans to outfit its facilities in London, Hong Kong and New York with IDAPS capabilities.

The standard file format chosen throughout IBB/VOA headquarters is the linear Broadcast Wave file format, or BWAV.

The computer infrastructure has been set up to accommodate the demands of linear, uncompressed audio. VOA planners wanted to avoid any problems associated with data reduction, in an environment where they are routing so much audio from so many different sources to so many destinations via so many distribution channels.

As for how the audio is fed to VOA, it most often comes via ISDN or leased phone lines, but VOA officials say the method of transferring files into the central IDAPS system will vary according to the geographical area and means of communication in the field.

In areas where bandwidth is cost-prohibitive and ISDN lines questionable, correspondents have experimented with sending MP3 files via the Internet to the newsroom, where they are reconverted to WAV format.

### Replacing Insta-Carts

Another task for Dalet involves the replacement of VOA's Sound-on-Demand setup, an Insta-Cart tape-based system in use since the mid-1980s.

Sound-on-Demand provides writers, editors and producers with important correspondent reports and actualities available during a given day. Currently that information is broadcast internally by the Insta-Cart system and picked up by tape-based receivers located in each of the seven language service departments.

With IDAPS, the audio will be loaded on a centralized file server with "housewide" access, thus allowing staffers direct digital access to the audio.

It is also available via T1 line to Miami staffers of Radio Marti, another IBB organization. Once IDAPS is running, Radio Marti will have access to Washington's database and audio servers with the use of PC-anywhere connectivity, to an IDAPS workstation dedicated to this function.

The Radio Marti staff can dial in the cut they would like and have the associated audio fed down the T1 circuit.

The Dalet5 Digital Audio System is described by the supplier as an "enterprise-wide system designed to help radio stations and groups manage the acquisition.

See VOA, page 18 ►

## The GSM moved his big meeting up by a week, and he was desperate . . .

If he thought it was in the traffic system, he wanted it. Sales reports. Historical data. Projections. Multiple copies, of course. And NOW.

**When you called CBSI customer service, Liz answered.**

She walked you through setting up report sequences that you could print with just a few keystrokes. Gave you hints and ideas you hadn't even thought of before. When you called back later with just one more question, you got right through – and she was as friendly, patient and knowledgeable as the first time.

**Thank goodness you had someone like that in your corner when you really needed her.**

CBSI's customer service team is full of people like Liz. Radio professionals who know your challenges through and through, because they've been there themselves. They're available toll-free, on a 24/7 basis, and they're ready to show you how to make your CBSI software a resource as well as a workhorse.

**Call and find out what CBSI can do for you, and ask about our 30-minute customer service guarantee.**

**cbsi**  
Custom Business Systems Inc  
800 547 3930  
www.cbsi.org

# The Scoop Reporter II Redefines "CONSOLIDATION"

CONSOLIDATED STATIONS INC.

WAAN	102
KMI	103
WANC	104
WMLK	105
WSOP	106
KXMC	107
KYYP	108
K...	109

**3 CHANNEL MIXER**

**ISDN & POTS**

**AUTO-"D" CELL BACKUP**

**Millennium Special**

**\$3,250**

**PC PROGRAMMABLE**

**WORLDWIDE AC VOLTAGES**

**99 AUTODIAL PRESETS**

It's interesting how a single word like "consolidation" can have so many implications.

But, when it comes to the Scoop Reporter II, it means only one thing: Real Savings! That's because the Scoop Reporter II is the world's first codec to combine ISDN, POTS, auto-battery backup, 3 channel mixer, PC programmability, and lots more! As a result, "consolidation" means a cost effective, "all-in-one" solution that inspires confidence when you are out in the field.



Linking Innovation With Clarity

AETA AUDIO CORPORATION  
75 Fleetwood Dr. Suite 200 • Rockaway, New Jersey 07866  
Phone: (973) 659-0555 • Fax: (973) 659-9555  
www.aetausa.com

If time is money, what  
could you get for an extra  
radio commercial every  
ten minutes?

If you're in the radio business to  
make money (and who isn't)  
you need

**"Cash"**

Through an exclusive time-  
shifting process, Cash creates  
additional broadcast time to  
sell. It does it in real time, right  
on the air. It does it without  
reducing program content. It  
does it without affecting pitch  
or creating a "chipmunk effect."  
It does it in stereo or mono. It  
does it in variable amounts,  
adding from zero to five  
minutes, within two minutes to  
two hours.

Cash, from Prime Image - you  
don't need one unless you want  
to make some.



**Prime  
Image**

The Digital Video People

662 Giguere Court #C, San Jose, CA 95133 • Tel (408)867-6519 Fax (408) 926-7294 Service (408)926-5177  
Primeimagein@earthlink.net • www.primeimageinc.com

# ◆ MARKETPLACE ◆

## Products for the Radio Broadcast Professional

Mail info and photos to: RW Marketplace, P.O. Box 1214, Falls Church, VA 22041

### Henry Rolls Out DigiStor II

If you need a small amount of affordable audio storage for special applications like news delay and traffic and weather reports, Henry Engineering has a box for you.

The DigiStor II is a solid-state digital audio recorder that can store up to 16 minutes of audio with a bandwidth of 6.5 kHz.



The unit also has applications for translator ID, local inserts, call-in listener info lines, message-on-hold, news and actuality telco lines, and travelers' information radio.

The device supports multiple play modes (single, repeat, auto-sequence). It features remote control capability, EOM tally output, and an automatic phone coupler for auto-answer message playback via phone lines. Messages are stored in non-volatile memory and are retained even if power is off. No backup battery is needed. The unit is sold through popular broadcast dealers.

For information contact the company in California at (626) 355-3656, visit the Web site at [www.henryeng.com](http://www.henryeng.com) or circle Reader Service 61.

### Lista's Enhanced Computer Cabinet

The Computer Cabinet from Lista International is designed to protect PCs, terminals and peripherals located in difficult environments where contamination can harm sensitive components.



The cabinet is equipped with a pull-out drawer designed for ergonomic keyboards. The monitor door has a clear Plexiglas window, with an opening for monitors of up to 20 inches. The cabinet also has a roll-out printer tray, surge suppresser and flush bottom shelf. A sliding door option is available.

Lower sections provide secure storage for CPU and printer behind lockable doors. An improved air intake fan with guard and filter creates positive pressure to eliminate dust.

For information contact Lista in Massachusetts at (800) 722-3020, e-mail to [sales@listaintl.com](mailto:sales@listaintl.com) or circle Reader Service III.

Manufacturers: The readers of *Radio World* want to know about new products and services that have applications in FM and AM radio stations.

Send your news and photographs to *Radio World*, Attention: Marketplace, P.O. Box 1214, Falls Church, VA 22041, or e-mail to [radioworld@imaspub.com](mailto:radioworld@imaspub.com)

Products for the production studio

should be sent Attention: Product Guide.

Products and services for business, programming and sales should be sent Attention: GM Journal.

### This Rat Sniffs Out Cable Problems

Rat testers are pocket-sized XLR cable testers from AudioControl Industrial.

The Rat Pack comprises two small pieces, the Sniffer and the Sender.

The Sniffer shows the cable is good or has faults via green and red LEDs. The Sender is powered by battery; the Sniffer works on phantom power or on power from the Sender.

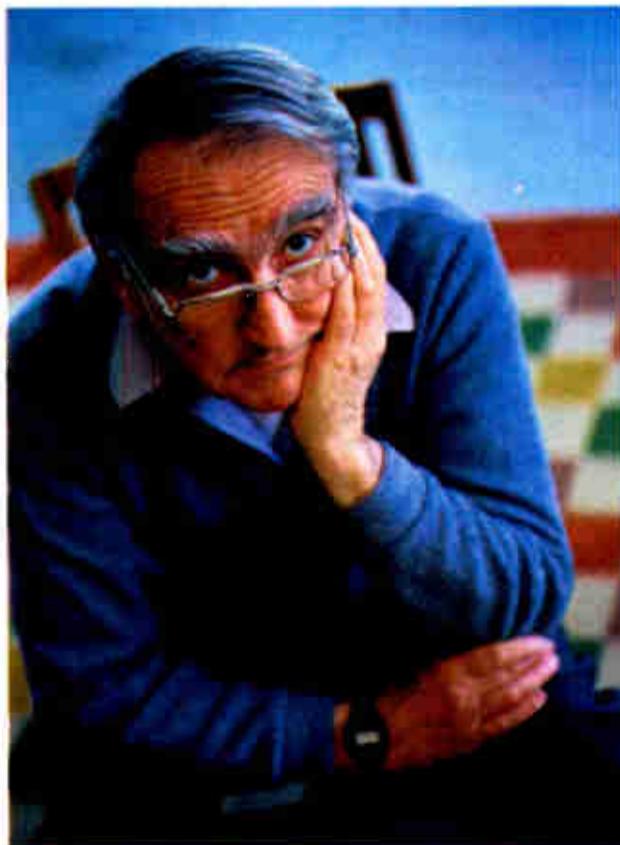
The units are compact, with diameters

of 5/8-inch, and lengths of 3 and 5 inches respectively. The Sniffer costs \$24.95.



The Rat Pack containing both is \$45.95.

For information contact the company in Washington state at (425) 775-8461, fax to (425) 778-3166 or circle Reader Service 101.



**This is  
a really  
boring ad  
for Broadcast  
Electronics  
Transmitters**

**But isn't that what you want  
from a transmitter?**

Face it. The last thing you need from a transmitter is excitement. In fact, what you're looking for are transmitters and exciters that work. No fuss, No muss. Broadcast Electronics Transmitters are known throughout the industry for reliability, stability, and serviceability. And in that rare occasion when one of our units go bump in the night, our 24x7 service department is legendary. Or, if you have recently been visited by Andrew, El Nino or some other nasty mother nature type event, in most emergency situations we can get you a transmitter, on site, the very next day. Just ask the 30 or so customers we rescued last year.

Spectacular audio performance, a wide range of products and services - why don't you call and find out just how boring a BE transmitter really can be.

**BE TRANSMITTERS**

[www.bdcast.com](http://www.bdcast.com)

OR 888.232.3268



**Broadcast Electronics  
Quincy, Illinois**

RW1180 ©1993 Broadcast Electronics, Inc. The BE emblem is a registered trademark of Broadcast Electronics, Inc.

# IDAPS and VOA

► VOA, continued from page 14  
production, scheduling, storage, and broadcast of music and news.”

As used by VOA, the system includes Surfer, an integrated multitrack editor. The company says Surfer significantly reduces time to air by allowing audio to be edited while being recorded.

A three-tier hierarchical storage management system will include real-time, “near on-line” and archival storage so that users can access audio regardless of where or how it is stored.

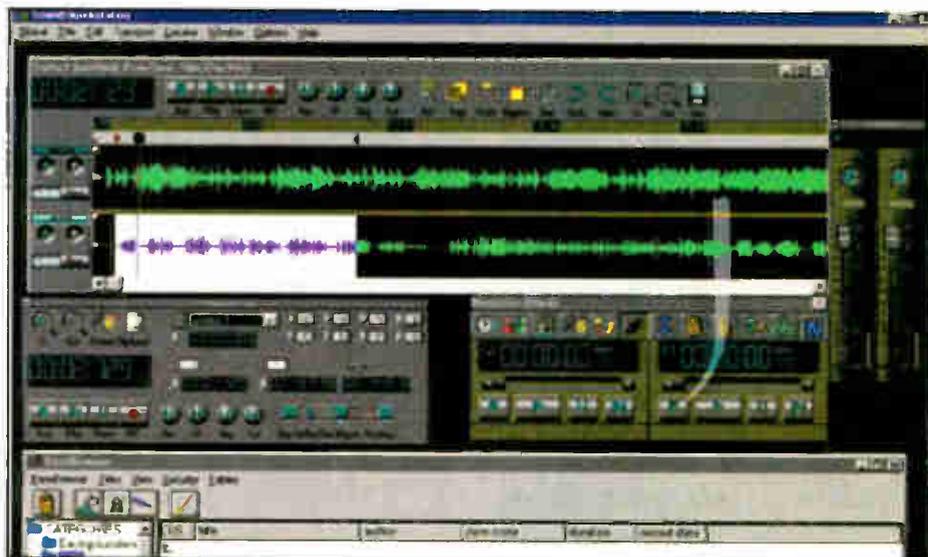
Dalet5 workstations can access the same databases and can be configured to perform various tasks. The system uses an OS-independent platform architecture.

As technologies and platforms change, the system can be reconfigured to work with other operating systems.

The architecture of Dalet5 is scalable and extensible; the company says this allows other broadcast and production sites to be integrated.

Over the past five years, the staff of IBB has worked to build an audio infrastructure that will support uncompressed AES3 digital audio streams for VOA. The technical staff is happy they had installed a sophisticated ATM network earlier.

“We selected ATM as a network transport because it can be configured to be completely non-blocking,” Serafini said.



The IDAPS screen will present multiple functions to users at VOA.



## Sound Advice.

1. Demand **UNCOMPRESSED** 16-bit linear audio in your all-digital air chain. Compression means compromise and we just won't hear of it.
2. Select a digital **STL** that can be configured with **UP TO TWO PAIRS** of linear stereo audio. It's like getting two radios for the price of one.
3. Exercise your **FREEDOM OF CHOICE**. Choose 32, 44.1 or 48kHz audio sampling. It's your broadcast—select the rate that works best for you.
4. Choose a digital **STL** that **CAN ADAPT TO ANY RF ENVIRONMENT** with user-defined 16, 32 or 64 QAM rates. (Flexibility is always a good thing.)
5. Purchase a **950 MHz RF STL**. The channel allocation is free, and the money you save over a T1 STL goes straight to your bottom line.

*Moseley's Starlink SL9003Q is the only 4-channel digital studio transmitter link on the market with all these features. Not just an STL, a sound investment.*

**Moseley**

111 Castilian Drive • Santa Barbara, CA 93117-3093 • Tel: (805) 968-9621 • Fax: (805) 685-9638 • www.moseleysb.com

“At the time we selected the network transport, we were still in the process of defining audio production requirements, and we used ATM to ensure that adequate bandwidth would be available to the desktop regardless of the particular audio production product we subsequently selected.”

Earlier this year, as part of a separate contract, Harris Corp. completed installation of an all-digital Master Control room. It features a massive NVision AES/EBU digital audio routing switcher for on-air switching. Configured for 512-by-512 channels, it can be expanded to 1,024 x 512.

The router control and automation is by Lysis, a Swiss company that specializes in computerized delivery and management of digital media.

VOA plans to use a second router for audio distribution to the desktop of all broadcasters at the Washington facility. Each destination would be controlled by a software application running on each broadcaster's desktop PC.

VOA currently feeds Master Control with an analog signal. Plans for studio renovations include digital consoles, so studio feeds can be routed as AES audio to the Network Control Center. From there, the broadcast signal is routed to satellite uplinks and the VOA transmission system.

The IDAPS project presents special challenges. Unlike facilities that start from scratch, VOA must install IDAPS over an existing infrastructure that cannot be interrupted. The management must take into account its union staffers and rules, and work within the bureaucracy of a U.S. government agency.

Project management is provided by the IBB engineering office. Other members of the project team represent the various departments that will use IDAPS, and the IBB computing services department. The Dalet team is headed by co-founder Stephane Guez.

Dalet staff are never far away, because the company maintains support employees in an office in nearby Virginia.

Training is a major component of the planning. In Task 1 alone, Dalet will train 225 people on more than 55 workstations, according to Joyce Craig of Dalet. Overall, the first three tasks involve training approximately 500 people, she said.

The IDAPS installation is one of Dalet Digital Media Systems' largest in the United States as measured by number of workstations. Earlier this year, the supplier also won a contract to install storage, production, on-air and traffic systems for international satellite broadcaster WorldSpace, as well as a prominent contract for systems at NPR.

If Dalet performs up to VOA's expectations, the company will win change

# More Truth in Advertising



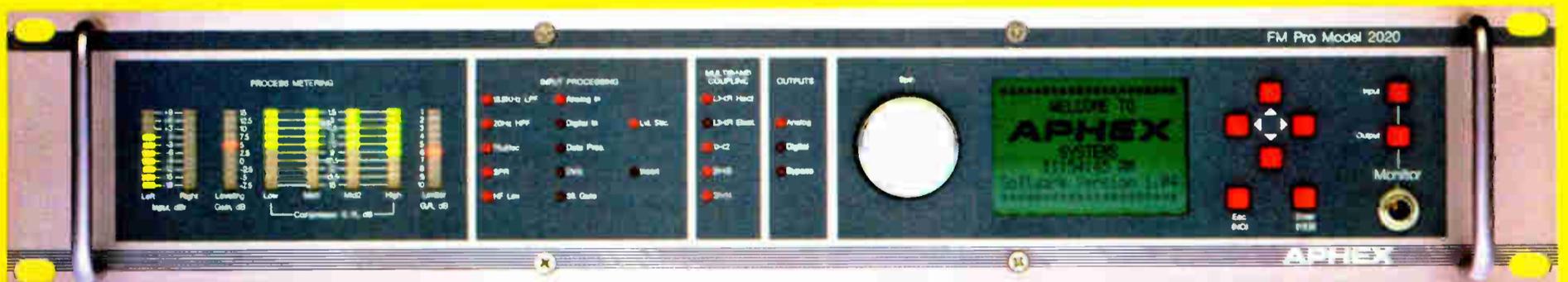
It's no longer a secret, people all over the world are discovering, despite the hype, that digital dynamics processing can't compete with good analog. Even Cutting Edge® claims their Omnia unit sounds almost as good as analog, while both Cutting Edge and Orban® claim each others digital product trashes the signal.

The ApheX 2020 FM Pro offers the purity of an all analog signal path with the power of digital control. Through its use of 11 patented circuits, the 2020

achieves the greatest possible loudness while retaining musicality and naturalness.

No digital grunge, no aliasing, no overshoot. No subcarrier artifacts from composite clipping. Just the loudest, cleanest FM processing with the greatest possible coverage area.

Better sound *and* more listeners - too good to be true? Call ApheX today for a demonstration, and we'll show you there *is* truth in advertising.



## APHEX SYSTEMS

**Improving the way the world sounds<sup>SM</sup>**

11068 Randall Street, Sun Valley, CA 91352 U.S.A  
818-767-2929 Fax: 818-767-2641 <http://www.aphex.com>

Cutting Edge and Omnia are registered trademarks of TLS Corporation. Orban and Optimod are registered trademarks of Harman International.

# Workbench

Radio World, January 19, 2000

## Orban, Burk and GPS Hams

John Bisset

\*\*\*

There was some pre-New Year discussion on *broadcast.net* about Y2K compliance and the Orban DSE-7000 workstation.

Dean Tiernan, Orban's customer service manager, provided RW with info about options available to customers. First, the unit can be made compliant — and upgraded — by converting to the Audicy.

Planning a new studio facility? When your electrician pulls the BX cable for your rack power, label the cable with the electric panel number and the circuit breaker number. If that outlet strip is fed through a UPS, add that information as well.

Figure 1 shows an example. Wrapping white electrical tape around the end of



Figure 1: Mark power strips with panel and circuit designators.

The upgrade cost begins at \$4,800, and depends on the hardware in the DSE. This is field-upgradable, and in most cases includes a free motherboard upgrade.

So just what will a non-upgraded DSE do this year? The DSE will operate normally. All that will be affected is the automatic time stamp.

For folks who don't want to upgrade, roll the date back to 1980 (a leap year, and a nice round number to subtract) to take care of the dating issue.

Want more information? Contact Dean Tiernan at Orban. Dean's number is (510) 351-3500. Online, Dean can be reached at [dtiernan@orban.com](mailto:dtiernan@orban.com)

the BX and identifying it as it is routed from the electric panel to the rack will save time identifying the circuit later.

\*\*\*

Fred Krock at KQED-FM in San Francisco has a Burk ARC-16 with wireline modems. Recently, he experienced a situation where the studio could not Raise or Lower any remote control function.

Fred diagnosed the problem to defective line transient suppressors at the transmitter site. Apparently at a low receive level, the ARC-16 cannot decode the command functions, although metering

still works. After talking to the factory, Fred obtain a couple of numbers you'll want to write in your manual. The output line level should be  $-9$  dBm, and the incoming line must be at least  $-30$  dBm.

It turns out that the transient line suppressor supplied by Burk has four 27-ohm resistors in series with the line. One of these resistors changed value to 5,200, probably due to a transient.

Several months ago, we reported about the Optilator, a fiber optic transmitter and receiver combination that effectively blocked transients using a few feet of fiber optic cable. It was developed by Runnels Electronics in Florida, lightning and transient capital of the world, and you also read about it in the Dec. 22, 1999, issue of RW.

Several remote control makers and broadcast suppliers offer the Optilator, or you can contact Stormin Protection Products in Florida at (888) 471-1038.

\*\*\*

Ham operators are familiar with Automatic Position Reporting Systems. Using a GPS receiver mounted in a vehicle, the vehicle's location and coordinates are broadcast to local computer terminals via packet radio.

The "CGC Communicator" reports that a Canadian ham recently used APRS to track down his stolen van! Apparently some teens used the vehicle to haul stolen items from a number of robberies. When the ham noticed his vehicle missing, he used his computer to track the location.

The Royal Canadian Mounted Police were contacted, and made the arrest, then got a demonstration of APRS and the power of ham radio.

\*\*\*

Planning a new transmitter facility? Include an outlet box such as that pictured in Figure 2. When Gary Morgan, chief at WSOC-FM in Charlotte, N.C., planned his new site, he included a 220VAC outlet.



Figure 2: A spare 220VAC outlet box will speed installation of an emergency low-power transmitter.

The socket permits the quick installation of a low-power transmitter for emergency operation. These 1 kW self-contained exciter/transmitter combinations are frequency agile, and can be shuttled to whichever station has the need. Preinstall the proper AC socket to assure quick installation if the transmitter is ever needed.

John Bisset has worked as a chief engineer and contract engineer for nearly 30 years. He is a district sales manager for Harris Corp. Reach him at (703) 323-8011.

Submissions for this column are encouraged, and qualify for SBE recertification credit. Fax your submission to (703) 323-8044, or send e-mail to [jbisset@harris.com](mailto:jbisset@harris.com)

## Now You're Connected

### Minirator®

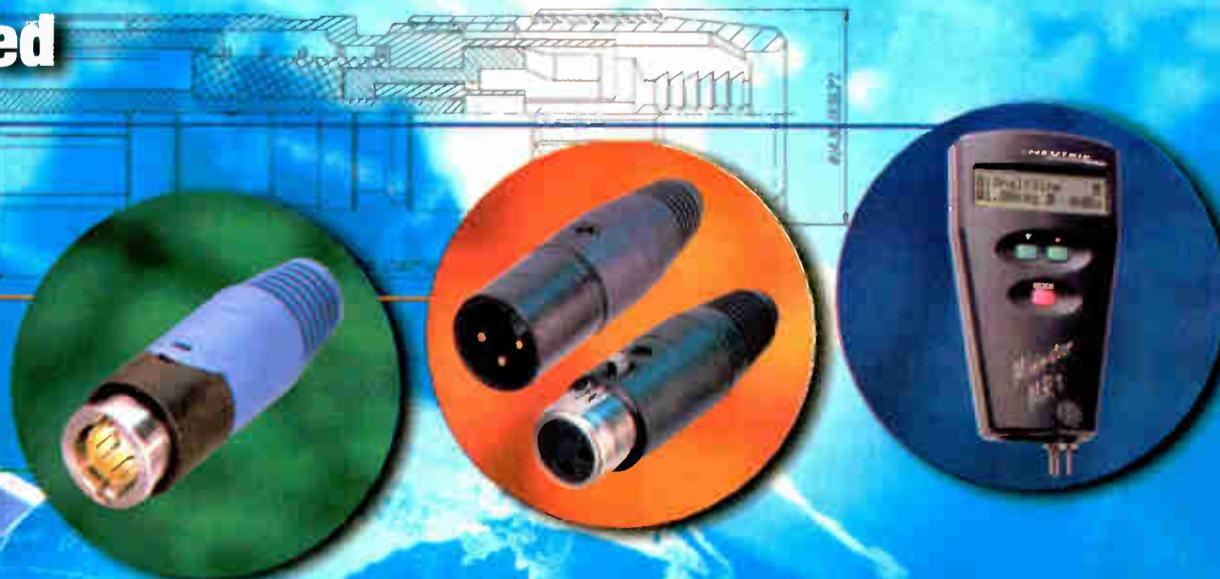
Professional hand held audio tone generator. Pink noise, white noise, sweeps, sine, square wave and polarity tests. Capable of remembering settings when turned off and on. Automatic off helps save battery strength. Balanced XLR and unbalanced RCA inputs.

### Easycon®

Uses gold IDC tuning fork contacts. A solder version will be available in the first quarter of 2000. Made of only 3 pieces—and no set screws—Easycon is the fastest way to terminate a cable with an XLR connector on the market today.

### BNC

NEUTRIK introduces the push pull BNC connector, the first in a series of BNC connectors that will include bayonet and friction fit styles, chassis mount and PCB receptacles. Features include an ergonomic straight push-pull lock/release operation. Ideal for high density applications.





©1999 Harris Corporation

## Some format changes are tough to get used to. Going digital shouldn't be one of them.

Harris helps you make a simple, easy transition to digital with future-proof solutions for the next wave in broadcasting. We're leading the way with tested and proven IBOC-compatible AM and FM transmitters, as well as digital storing, mixing and routing equipment. Our full line of digital consoles have the look and feel of analog consoles, the ability to handle both digital and analog inputs, and can reconfigure from one to another easily. And only Harris provides fully digital studio-to-transmitter links to digitize your entire air chain. Some tactics to keep listeners can be a real drag. But with Harris, it couldn't be any easier.

*next level solutions*

WIRELESS

BROADCAST

GOVERNMENT

NETWORK SUPPORT

1-800-622-0022 ■ [www.harris.com](http://www.harris.com)

**HARRIS**

Circle 150 On Reader Service Card

***In a business devoted to selling time,  
here's a digital console that'll buy you some.***



©1999 Harris Corporation.

With satellite radio and other digital services rapidly approaching, time is of the essence. Moving to a digital audio format is a must. Preserving your current infrastructure investment is the challenge. And the Harris AirWave™ digital console from **Pacific Research & Engineering** is the answer. It accepts both analog and digital inputs and can be reconfigured from analog to digital right in the studio. But that's just the beginning of the time it'll buy you. With the AirWave's three stereo program buses, talent can do three things at once so you get more productivity from your payroll. Its familiar layout flattens the digital learning curve. Plus, you can add optional functionalities, such as one or two telco mix modules or independent B-side logic, as you need, on your own timetable. The AirWave Digital. With time running out, it's a console whose time has come.



The AirWave Digital broadcast console is available in 12 or 20 input models.

***next level solutions***

WIRELESS

BROADCAST

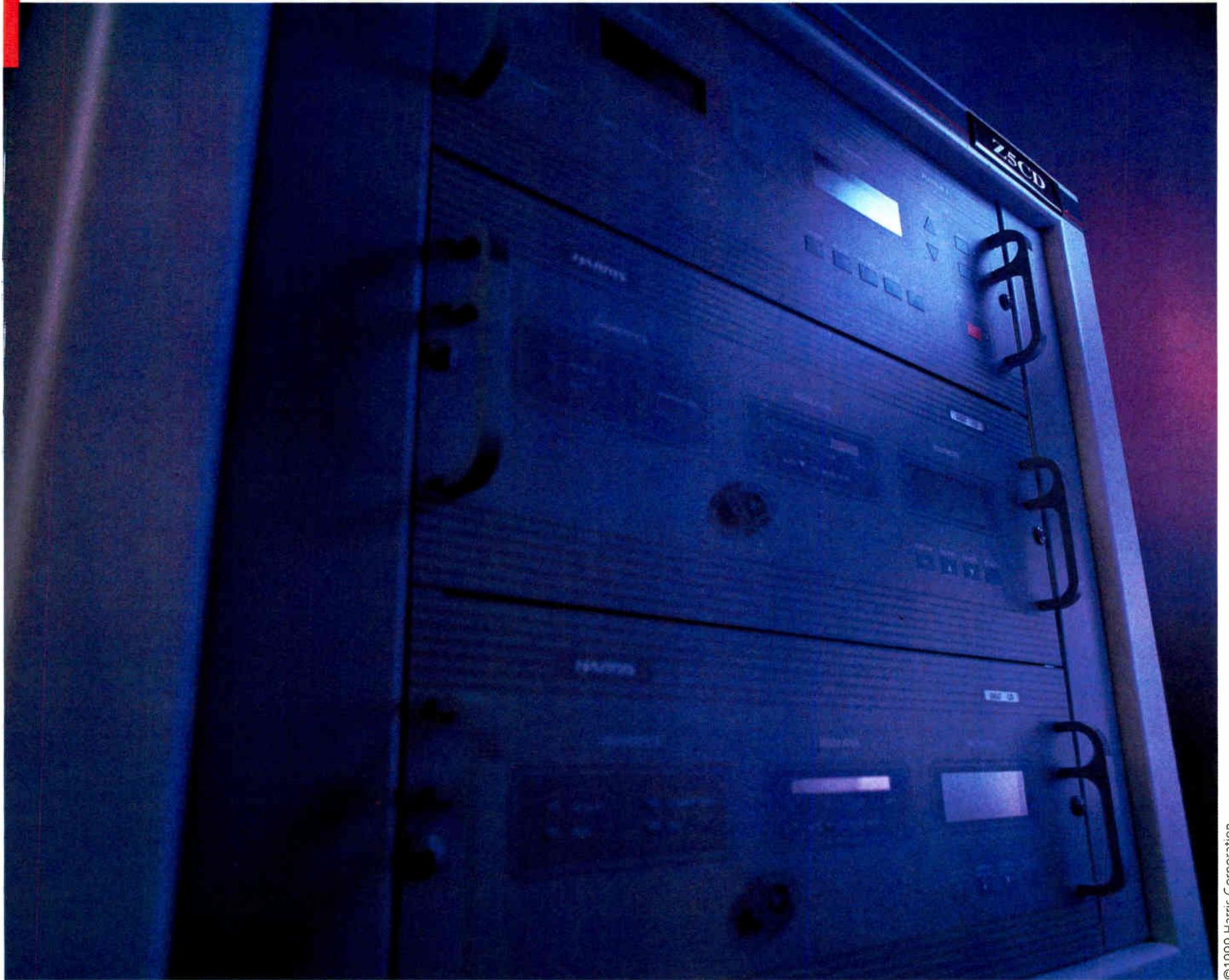
GOVERNMENT

NETWORK SUPPORT

**HARRIS**

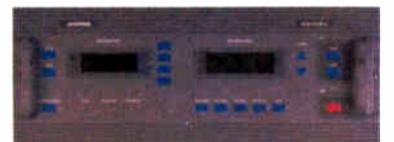
1-800-622-0022 • [www.harris.com](http://www.harris.com)

***Solid-state reliability. Built-in redundancy.  
You'll appreciate why we named them ZZZs.***



©1999 Harris Corporation.

Engineers sleep easier with the Harris Z Series of FM transmitters for lots of reasons. Like their solid-state reliability, redundant IPA systems and power supplies, hot-pluggable RF modules for easy on-air repairs, *and* the option of two exciters with automatic switching built in. Outfitted with our unrivalled DIGIT CD™ FM digital exciter, Zs deliver the trend-setting, CD-quality sound listeners increasingly expect. And now, we're putting your worries about the future to rest as well. We're actively working with DAB system proponents on modifications to Z transmitters for IBOC field testing, so when a new standard is established and you need to start broadcasting IBOC DAB, you won't be caught snoozing with Harris. Or, then again, maybe you will.



Z Series transmitters include an easy-to-read LCD panel for diagnostics plus a main and backup controller.

***next level solutions***

WIRELESS

BROADCAST

GOVERNMENT

NETWORK SUPPORT

**HARRIS**

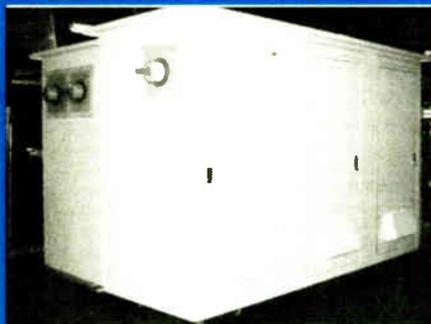
1-800-622-0022 • www.harris.com

Circle (12) On Reader Service Card  
World Radio History

**FOR AM/MEDIUM  
WAVE ANTENNA  
SYSTEMS  
COME TO THE  
CHOICE OF RF  
ENGINEERS  
AROUND THE  
WORLD**

**KINTRONIC  
LABS, INC.**

**FROM CONCEPT  
TO OPERATION  
KINTRONICS OFFERS THE  
STATE-OF-THE-ART DESIGN  
SERVICES AND TOP QUALITY  
PRODUCTS TO PUT YOUR  
STATION ON THE AIR WITH  
THE COVERAGE YOU NEED  
ANYWHERE IN THE WORLD**



**CUSTOM HIGH POWER AM  
DIRECTIONAL ARRAY DIPLEXERS**



**RACK MOUNTABLE MAIN/AUX/DUMMY  
LOAD TRANSFER SWITCHES**



**ALUMINUM CONSTRUCTION, CLIMATE-  
CONTROLLED PRE-FAB ANTENNA  
TUNING HOUSES OR TRANSMITTER  
BUILDINGS**

**KINTRONIC LABORATORIES INC.**  
P.O. BOX 845  
BRISTOL, TENNESSEE 37621-0845  
PHONE: 423-878-3141  
FAX: 423-878-4224  
EMAIL:  
KTL@KINTRONIC.COM  
WEB SITE:  
<http://WWW.KINTRONIC.COM>

Circle (23) On Reader Service Card

**FEED LINE**

# What Do I Do When It Breaks?

**W.C. Alexander**

Engineers who spent their careers building, tuning and nursing AM directional facilities have, in large part, retired, leaving a new generation to try to figure out what's going on. The day that one of these arrays goes out of whack can be a day of dread and stress unless the engineer has a plan for dealing with the problem when, not if, it occurs.

Blame this, at least in part, on consolidation.

In radio, the individual owner is something of a rarity these days. Large group owners are buying up stations even in the smaller markets. On the engineering front, we have had to adapt.

The old "one station, one engineer" way of doing business is long gone, replaced first by the contract engineering trend in the 1980s and now with the economy of scale of the 1990s.

One chief engineer may well be called upon to care for four or more co-owned stations in a cluster or even in adjacent markets.

## A new series

While this makes a lot of sense in many ways, often the station engineer may find himself responsible for one or more AM directional facilities for which he is ill-prepared to deal.

In this series of articles, which will appear in alternating issues of *RW*, it is my aim to give the engineer who finds himself in this unenviable position tools that he can use to diagnose and repair an ailing array.

I hope this information will remove much of the mystery, dread and fear that may accompany directional antenna work by the uninitiated.

We will move in a case-by-case fashion through the likely scenarios. We may not deal specifically with a given problem that you come up against someday, but the rules, procedures and principles will apply. You should be able to reason your way calmly through the problem.

Before we delve in, let me give you the first rule: *Don't panic!*

When a directional array goes out of whack, for whatever reason, the tendency is to grab phasor controls and try to correct the situation immediately. This is the wrong thing to do.

Don't touch anything until you have enough information to make an educated decision of what to do.

## Case 1

Our first case study is in incorrect antenna monitor parameters.

From time to time, the operating parameters as indicated by the antenna monitor may be incorrect. When this occurs, start by making a note of the proper values on a piece of paper with the values as read on the monitor alongside. In this way you can see quickly which parameters are at variance.

If only one or two values are out of whack while all the others are normal, there is a good chance that the problem is with the sampling system or antenna monitor and the array is functioning normally.

As a rule, when something changes in an array due to a component malfunction, all the parameters are affected to some degree. This is because of the mutual

coupling between the array elements.

If you crank the phase of one tower out a couple of degrees and touch nothing else, you will probably see some change in all the other phases, ratios, base currents and common point resistance/reactance as well. When one of our engineers calls saying that something is wrong with his array, I always start by asking him if the common point impedance has changed. If it hasn't, we start with the antenna monitor.

If this is the case with your array, you can check the monitor by swapping inputs to the monitor. A common failure mode in some antenna monitors is a stuck or open relay. The mercury-wetted relays in these units should be trouble-free and long-lived, but they tend to wear out over time. I have replaced scores of them over the years.

When a relay sticks, it may cause all the indications for all the towers but one to be incorrect. To check for this, disconnect all inputs but the reference tower, then connect one of the other tower sample lines to each of the other inputs in turn. You should see the normal indication of phase and ratio for the sample line being used as it is moved from input to input.

When you come to a channel where you do not get the correct readings, that is often the one with the bad relay. If there is a stuck relay, it tends to load the other channels so while the phase readings may be normal during this procedure, the ratio readings will often be low for all but the channel with the defective relay.

## Resistor damage

Occasionally, antenna monitor sample line terminating resistors can become damaged by arcs or lightning strikes. The symptom will be a very high ratio on one of the antenna monitor channels. Check these resistors with an ohmmeter.

The detector diode in your antenna monitor is one of those "future failure components" to watch out for. Usually this diode is a germanium type, prone to damage from lightning.

If this happens, we hope it will open completely. I have seen them become non-linear, however, giving incorrect readings on all towers.

The symptom of this condition will be a significantly changed loop reference setting on the reference tower. If you have to crank that control more than half a turn to get 100 percent on the loop meter, suspect the detector diode.

Another possibility is the faulty sample line. You can check your sample lines by running an open circuit/short circuit impedance test on them. This will give you the characteristic impedance and approximate electrical length of each of the lines.

You can also bridge the sample lines open-circuit at a quarter-wavelength resonant frequency to determine exactly the electrical length. We will discuss both these procedures later in this series when

we deal with transmission lines.

The best way to check sample lines is with a time-domain reflectometer. These devices generally are available for rent, and many tower riggers now have TDRs in their shops.

Sample loops can cause trouble, with welds and insulators breaking. Sometimes high winds can blow loops around so that they are no longer properly oriented. A sample loop should be positioned so that it is perpendicular to the tower face behind it.

A good way to check loop alignment is to stand at the tower base and look up at the loop. If positioned properly, the loop should line up with the guy wire.

Inspect the loops up close, looking for corrosion, loose connections and



The array of WPAT(AM) in Paterson, N.J., is familiar to travelers on the Garden State Parkway.

hardware, etc. Most loops attach to the sample line with an N- or UHF-connector of some sort. Check these connectors for water, corrosion, etc.

There may be a copper strap or braid used to jumper from the connector to the open end of the loop. This strap can break loose easily from the loop. Be sure that it is well-bonded to the metal of the loop.

Toroidal sampling transformers can, from time to time, cause problems. Some are prone to arc internally when their output is unloaded. While sample lines should always be terminated in the load resistors in the antenna monitor, enough voltage could develop at the tower end of a long sample line to allow an arc to occur.

If a transformer is suspect, swap it with one from another tower (any but the reference tower) and see if the problem disappears.

In the next part of this series, we will take a look at the common but troublesome problems of out-of-tolerance monitor point field strengths and out-of-tolerance base currents.

■ ■ ■

*Cris Alexander is director of engineering for Crawford Broadcasting.*

Contact him via e-mail at [cbceng@compuserve.com](mailto:cbceng@compuserve.com)

# GM Journal

Web Watch

See  
Page  
27



Radio World

Resource for Business, Programming & Sales

January 19, 2000

## NRB 2000: Convention Preview

Craig Johnston

The National Religious Broadcasters opens its 57th annual convention and exhibition Feb. 5, riding a wave of growth in religious broadcasting.

According to the NRB, there are 1,731 radio stations in the United States that carry Christian programs, an increase of nearly 10 percent from the previous year and an all-time record.

Exhibition space at the four-day meeting at the Anaheim Convention Center and Marriott Hotel in California sold out by December and there is a waiting list of exhibitors who would like to participate. The NRB will host the live broadcast or tapings of many daily or weekly Christian programs from the 150,000-square-foot exhibition hall.

The NRB convention brings religious station personnel and religious program producers together, combining educational sessions with Christian worship, fellowship and entertainment.

"The big difference between the NRB convention and the mainstream broadcasting meetings is that we're built on a spiritual foundation," said NRB President E. Brandt Gustavson.

### Hot topics

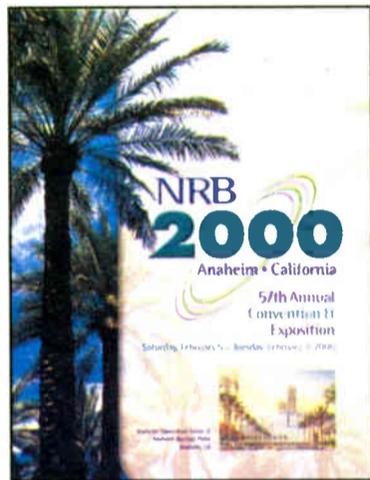
Monday's Public Policy Breakfast session should find a standing-room-only audience at a point/counterpoint discussion of the roles of Religion and Politics. "700 Club" broadcaster and one-time presidential candidate Pat Robertson and syndicated columnist Cal Thomas will go head to head on the subject.

Thomas' recent book "Blinded by Might: Can the Religious Right Save America?" takes the Christian Coalition to task. Robertson is the Christian Coalition founder.

This year's get together will feature a number of Internet sessions, including a

day-long "Internet Boot Camp" on Saturday. Other Internet sessions include "The Care and Feeding of a Web Site," "Using the Internet for Friend-raising/Fundraising," "Integrating E-Commerce Into a Ministry Web Site," and "Internet — Real Now," dealing with streaming telecasts.

The convention also features boot



camps for Radio Sales, Television and Stewardship. There are separate session tracks for International, Internet, Marketing, Executive Management, Media Strategy, Radio, Stewardship and TV/Visual Communications.

At "Don't Pay Commissions — Plus Nine Other Ways to Improve Your Agency Relations," Steve Woodworth and Rich Simons of The Raymond Group will share ways broadcasters can establish better partnerships with their agencies and bring the two parties' interests in line. They promise to show how to save money in the process.

Attendees will have a chance to question FCC officials directly at Monday morning's FCC Update. On the panel will be the commission's Roy Stewart, chief of the Mass Media Bureau, and Linda Blair, division chief of Audio

Services. Two pressing regulatory concerns for the NRB are the low-power FM proposal, which they oppose, and local TV DBS proposal, which they support.

Producers will want a seat at "Can a Christian Show Ever Get a Green Light From the Networks?" Panelists will supply young or established producers and production companies with information on what stations and networks are looking for so that the projects and programs that get developed have the best opportunity to be accepted.

With a wealth of new technologies changing the face of traditional radio broadcasting, two sessions will strive to provide answers to broadcasters.

The "Future of Radio" panel brings experts to discuss the opportunities and challenges, which face broadcasters. And the "Commercial Radio Open Forum: Achieving Balance in Critical Times" session looks at consolidation, digital technology, Internet, professionalism, profitability, spiritual growth, family and self.

Promotional events are important to any radio station. At "You Want to Do What? — Practical Guidelines for Successful Promotional Events," panelists will provide tips, pitfalls and information to help stations maximize the effectiveness of their promotions.

### News business

"The Role of News in Broadcast Ministry" focuses on the growing importance of news in Christian radio and the impact of accurate and up-to-date information on the ministries of the church and on the listeners of Christian radio.

While many sessions at the convention would be familiar to mainstream broadcasters, the NRB also features a stewardship track dealing specifically with Christian broadcast ministry fundraising issues.

At "Seven Deadly Diseases of Ministry Marketing," panelists will focus



E. Brandt Gustavson

on the most-common obstacles to effective fundraising encountered by Christian broadcasting ministries today, and offer solutions.

In his presentation "If God Will Provide, Why Do We Have to Ask for Money?," Rick Dunham of KMA Companies will look to the scriptures for God's views on fundraising and build a biblical framework to guide fundraising activities.

Recent trends in raising and spending money among evangelicals will be covered in "God, Mammon and Evangelicals: A Report From the Institute for the Study of American Evangelicals."

And the "Direct Mail and the Telephone" session will educate attendees on proven strategies integrating direct mail and the telephone to bring dynamic results. The panel will focus on maximizing the lifetime value of donors and attracting and keeping younger donors.

NRB 2000 will include a pair of awards banquets.

Sunday evening's Awards Night/Opening Session will feature an address by Jack Hayford of The Church on the Way, the First Foursquare Church of Van Nuys, Calif. Presentations will follow for Radio and TV Stations of the Year, Radio and TV Program Producers of the Year, Talk Show of the

See NRB, page 37 ▶

## Radio Assist<sup>®</sup>

Complete Radio Automation Systems.

 netia  
DIGITAL AUDIO

Netia Americas Ltd. • tel: (817) 312-6338 • toll free: (877) 699-9151 • fax: (877) 699-9152  
<http://www.netia-broadcast.com>

# Net Radio Is the New Way Now

Bill Mann

The recent three-day Streaming Media West '99 convention in the heart of Silicon Valley billed itself as "The World's Largest Internet Audio and Video Event." It wasn't just hype — this year's big meet at the San Jose Convention Center attracted 6,000 international participants and a record 125 exhibitors — enough to fill the building's exhibition floor.

Last year's convention in the basement of a San Francisco hotel drew 800 attendees and 28 exhibitors.



Rob Glaser

Another indicator of how hot streaming media is these days: The keynote speaker was none other than Microsoft CEO Bill Gates.

"Streaming media will explode as broadband reaches critical mass," Gates said.

One of the convention's lighter pub-

licity events was the introduction of a 26-year-old techie called "DotComGuy." He'll spend the next year restricted to his home, "living on the Net" — the Internet's equivalent to the Biosphere.

DotComGuy did a live Webcast from a completely empty two-bedroom home in Fort Worth, Texas, that will be stocked exclusively through Web sites like online grocers and furniture suppliers.

As they were last year, traditional radio and TV broadcasters were sparsely represented amid dire predictions they'll be left behind technologically.

The explosive growth of so-called "personal broadcasting" on the Web was also obvious in the exhibition hall, where a number of start-ups had first-time booths catering to the technical needs of such seminal radio operations.

There are now some 1,500 Internet-only radio stations in the United States and more than 1,200 overseas, according to Internet-radio consultant and Netcasting author Peggy Miles.

There was plenty of cheerleading here for Netcasting, while its technical drawbacks, many of them possibly temporary, were largely pushed into the background in favor of hyping Webcasting's enormous growth potential.

"Steaming is absolutely the next big thing on the Web," said Michael Casey, founder and CEO of GMV Network, a provider of platform-independent streaming solutions that allow interoperability with RealNetworks, Windows Media player, QuickTime and WinAmp.

"The nearly ten-fold increase in attendance here underscores the explosion of interest in streaming media."

RealAudio, a big streaming company known primarily for audio, is expanding its Netcasting operations to video. Rob Glaser, RealAudio founder and CEO, spoke at the conference. Glaser unveiled



Bill Gates

a "Utopia Project" centered on a video player beta version displayed at SMW that he said will soon make 3-D shopping commonplace on the Web.

Glaser called it a "breakthrough in computer-generated video."

But bandwidth, several speakers conceded, remains the main obstacle to the widespread use of streaming. Most agreed this would change soon with more and more phone-company DSL and cable-modem systems coming online.

And distributed-network (or "edge network") companies here like I-Beam and Sandpiper were well-represented, offering alternative technologies like satellite delivery to solve the bandwidth crunch.

"For the next year or two, effective streaming remains mostly confined to business-to-business applications such as sales training and videoconferencing," said "Upside Today" tech newsletter

See NET RADIO, page 29 ▶

# Brand Your Station Online

One workshop here of special interest to radio was called "Promoting Your Station's Brand Name Online — and Making a Profit." It attempted to answer every manager's basic question about streaming: "Sure, Netcasting sounds good, but can I make any money from it?"

Apparently, yes: One of the panelists, Ashley Farr, CEO of Los Angeles-based Internet-only station SpikeRadio, revealed that his company had just landed a \$1 million account with Toyota. The carmaker's logo appears on Spike's Gen-Y-oriented home page.

George Bundy, who consults both traditional and Internet radio operations and is chairman and CEO of BRS Media, said radio station Web sites can be a gold mine for targeted ads, especially local accounts "like the local furniture store, that might not be able to advertise on your station otherwise. Too many station managers think they can't make money and don't bother to try," he said, "That's a mistake."

Bundy said station sites can be profitable in two ways: "Co-branding partnerships and e-commerce associations."

With e-commerce taking off, Bundy said, "Here's radio stations' chance to co-brand with local businesses, like the furniture store guy who might not be able to pay for his own Web site."

"Traditional stations need to think out-of-the-box," said Bundy. "They're ball-and-chained to their terrestrial signals."

SpikeRadio's Farr stressed that online radio "is very cost-effective. It can make your brand. Plus, at-work listening is a real money-maker."

Mike Elder, program director of Chicago talk giant WLS(AM), agreed.

"Since we began Netcasting, we've overcome some of the physical barriers of broadcasting to a downtown area. People are e-mailing saying, 'We can finally hear you in downtown Chicago.'"

Asked about Netcasting, Elder said, "I take Net broadcasters very seriously. I was working in TV when broadcasters didn't take cable seriously, and look how it's hurt broadcast. It scares a lot of broadcasters because it's new technology," said Elder, warning, "But those who don't take it seriously will be left behind."

Elder said many of the comments "bleeped" on seven-second delay on WLS's air are now left intact in the station's Netcasts to reflect Net radio's freer and less-restrictive climate. But Elder quickly reminded the audience that "traditional radio broadcasting is also a corporate entity," referring to WLS' Disney ownership.

"There are certain ways we have to do things, even online."

When asked what regulatory constraints there are on Net radio content,

See WORKSHOP, page 29 ▶

**DIGITAL RADIO AUTOMATION**

*QuicPix*  
Radio Studio

**\$699\***

(this is not a misprint)

MediaTouch™, America's Digital Automation Original since 1984, shatters the price barrier with QuicPix, the software that makes digital audio and automation truly affordable.

The QuicPix Radio Studio software consists of:

- \* 5 Programs in 1: Audio Player, Cartwall, Audio Production, Voice Tracking, and CD Ripping utility software
- \* Live Assist On Screen Buttons that are mouse and/or touchscreen friendly
- \* 7 Deck Audio player that also provides a 27 button hot play cartwall
- \* Overlapped MPEG-2 broadcast quality stereo audio on any sound card
- \* Wave audio editor, file import and quick audition feature
- \* Windows™ 95 / 98 using peer, NT™ or Novell™ networking
- \* 24/7 support, training and upgrading included
- \* Fully upward-compatible to a MediaTouch OpLOG Enterprise System

Windows 95, 98 and NT are trademarks of Microsoft. Novell is a trademark of Novell Corporation

\* Visit [www.quicpix.com](http://www.quicpix.com) or phone 888-665-0501 for more details and options

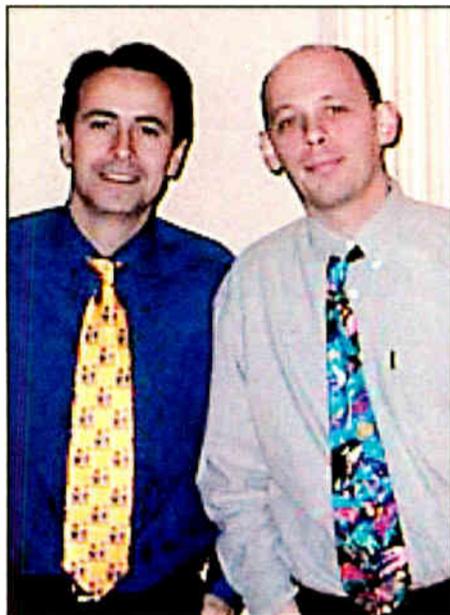


**WEB WATCH**

Web Watch Items are collected and reported by Carl Lindemann.

**Digigram Moves Into Networking**

Digigram has acquired Aztec Radiomedia, a French designer of electronic communications systems for net-



Gérard Santraille, President, Digigram Executive Board and and Gilles Misslin, President, CEO, Aztec

works, telecommunications and radio transmission.

"This acquisition is part of Digigram's strategy to utilize its exper-



tise to move into new professional markets and consolidate its leadership in the radio market," said Gérard Santraille, president of the Digigram executive board.

While Digigram is well-known to radio broadcasters for soundcards and other audio production equipment, Aztec Radiomedia supplies audio and broadcast markets with network and telecommunications technologies and radio broadcasting. Products combining audio and network functions (Internet-intranet) will be introduced in the second quarter.

**Clear Channel, NBCi Launch New Deal**

NBC launched its new company NBC Internet Inc. with a bang when it announced a distribution and promotion deal with Clear Channel Communications.

Under the deal, Clear Channel will promote NBCi services on the media conglomerate's 425-plus radio stations and be integrated with the stations' companion Internet properties. Lowry Mays, Clear Channel chairman and CEO, will serve on the board of directors of NBCi.

NBCi will provide search, e-mail, homepage design, chat and e-commerce services on Clear Channel Communications radio station Web sites. These services will be designed to retain the look and feel of Clear Channel's individual station Web sites and will be promoted on air via in-show mentions and promotional spots.

NBC created the new company by combining several of its Internet properties including the Snap.com Internet portal, XOOM.com, AccessHollywood.com, VideoSeeker and a 10 percent interest in CNBC.com.

NBCi properties rank as the seventh-most-visited Web sites and services on the Internet, according to Media Metrix ratings data cited in an NBCi press release.

The new company began trading on NASDAQ under the ticker symbol NBCI in late November.

Chris Kitze, chief executive officer of NBCi, said, "Through our extensive partnerships with NBC, Clear Channel Communications, ValueVision International and others, NBCi can uniquely market and distribute services to virtually every Internet household in the country."

**Streaming Targeted Audio Ads**

A collaboration between Houston-based Radio InterCast and computer system supplier Scott Studios aims to allow Webcasters to create demographically specific advertisements for Net audio listeners.

The joint venture will provide a digital Internet streaming solution to broadcasters through ADD-in, Radio InterCast's ad insertion software.

The software will be incorporated

into Scott Studios' custom broadcast computers and will allow stations to program, schedule and automatically input advertising over their Internet audio stream, as well as provide video and customized streaming options to the station.

"Customizing advertisements to



Dave Scott

Web visitors was the next big step in Internet broadcasting," said Dave Scott, president of Scott Studios. "Through Radio InterCast's unique software, our customers now have a better way to capture the attention of their online audience."

Aside from helping advertisers reach customers, targeting prospects saves listeners from being hit with unnecessary or inappropriate pitches.

**United States Chooses Webcaster**

BroadcastAMERICA.com, an online entertainment network based in Maine, has signed an exclusive, four-year partnership agreement with United States Radio Networks Inc.

BroadcastAMERICA.com will stream more than 30 of the network's nationally distributed radio programs. Currently, these programs air on more than 2,300 radio stations reaching 87 million listeners weekly.

In addition to the Webcast deal, on-air personality and impresario Dick Clark will serve as a senior advisor to the BroadcastAMERICA.com board of directors.

Clark, co-founder and chairman of USRN, admits he wasn't always a believer in the Internet as an entertain-



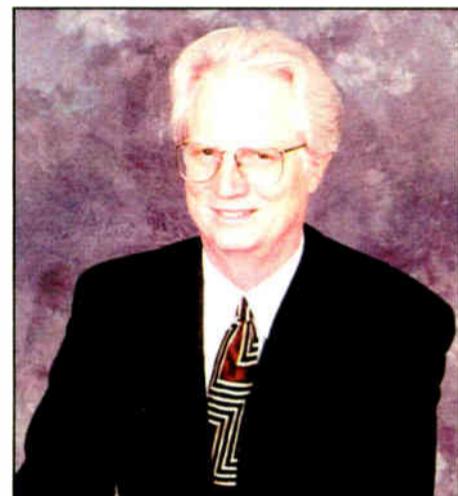
ment platform.

"Two factors have convinced me otherwise. First, people, in exponentially growing numbers, are actually seeking out entertainment on the Internet. Second, there are simply more online programming options available out there, and both the quality and variety have greatly improved," he said.

By keeping up with new media, Clark demonstrates that though he is senior advisor, he still deserves the title of "America's Oldest Teenager."

**Salem Doubles Online Ministry**

Salem Communications Corp., a leading provider of radio, electronic and printed resources targeted to the Christian market, announced in December that its wholly owned subsidiary, One Place Ltd.,

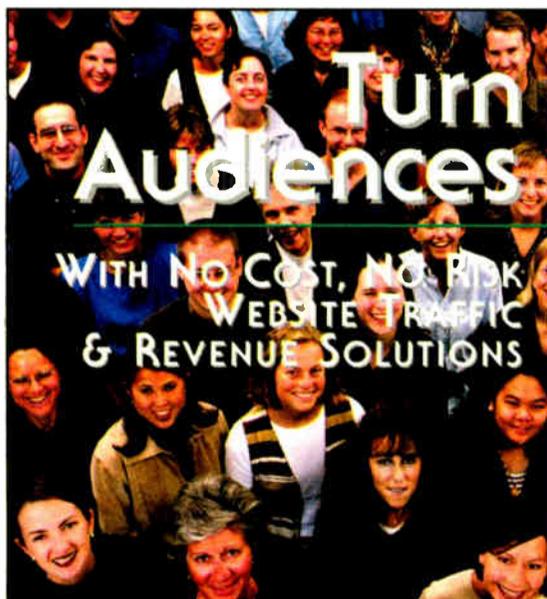


Edward Atsinger

had acquired ICRN.com, a Christian streaming media network.

This acquisition doubles OnePlace's streaming broadcast ministries to 120 from 60 to make them more than twice

See WEB WATCH, page 28 ▶



**Your On-Air Into On-Line Profits**

BuySellBid.com multimedia on-line classifieds, auctions, personals & shopping will drive new & repeat traffic to your website 24 hours a day, 7 days a week producing substantial new non-traditional revenue from both your audiences and your advertisers. You can be a major portal in your market and cash in on the Internet, with BuySellBid no cost content.

Visit [www.buysellbid.com](http://www.buysellbid.com) or call 800-320-7870 Today.



[www.classifind.com](http://www.classifind.com)



[www.buysellbid.com](http://www.buysellbid.com)



[www.datechannel.com](http://www.datechannel.com)



[www.inxsys.com](http://www.inxsys.com)

BUYSELLBID.COM, INC.  
921-14TH AVENUE, LONGVIEW, WA 98632

► **WEB WATCH**, continued from page 27 the size of its nearest competitor.

"(This) is part of our growth strategy to be the leader in the distribution of religious and family issues content across our vertically integrated stations, networks, magazines and Web sites," said Edward Atsinger, chief executive officer of Salem Communications.

**Everyone's a PD ...**

As any program director knows, every on-air personality and listener wants to take over the PD's role. A new service

may make that possible.

MP3.com Inc. announced the creation of what it describes as "fully interactive radio."



"Stations" is a service that enables anyone to create a Web-based music station by ranking and reviewing their personal song picks from MP3.com's data-

base of more than 200,000 songs from some 35,000 artists.

Users accessing "Stations" can view upcoming songs, play, replay, reorder and skip songs at their discretion using their computer's MP3 player.

The chairman of MP3.com called Stations an exciting and free feature.

"This level of control has never been accessible to anyone, anywhere. Station creators can build a quality music destination for fans all over the world who share their interests," said Michael Robertson, chairman and CEO of MP3.com.



Michael Robertson

Nearly 500 station pages were created on the day of "Stations" launch, with no off-line promotion. And by mid-December, 5,000 interactive "radio stations" had been created using Stations software.

**WarpRadio Signs 100+ Stations**

WarpRadio.com, an online audio streaming service, said its station subscriber list reached the milestone of 100 radio stations by Dec. 1, 1999, six months after its launch.

WarpRadio provides stations the technological infrastructure to "simulcast" their signals online on a barter basis.

CEO Denise Sutton said, "WarpRadio.com has the potential to do for the radio broadcasting industry what cable and satellites did for the television industry — provide incremental market penetration with new audiences."

In exchange for continuously streaming a station's programming live over the Internet, WarpRadio.com receives two minutes of prime time advertising per day.

Ease of installation and economy of operation are intended goals of WarpRadio.com.

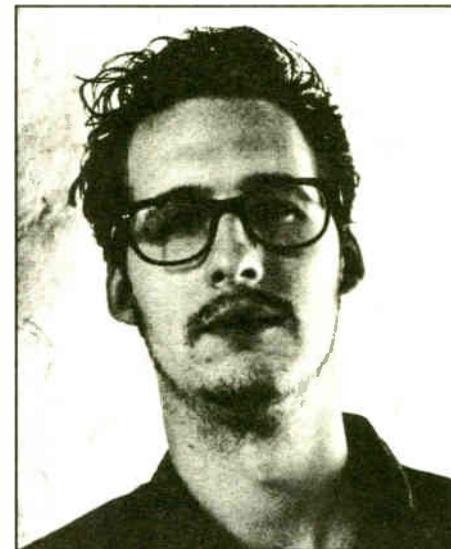
"To set up (a radio station on the Internet) via WarpRadio is very simple. All that it requires is a dedicated computer, a software download, a quality sound card, and a static IP address. A radio station with the necessary equipment, software and connections can be up with WarpRadio.com in as little as an hour," said Sutton. Since the announcement, more than 20 additional stations have signed up.

**Rykodisc Launches Radio Ryko**

Sputnik7.com, the online digital network, and Rykodisc, the independent music label, launched Radio Ryko, a

free-form radio stream residing on sputnik7.com.

Radio Ryko provides music fans with pre-programmed radio shows featuring



George Howard

audio from creative musical artists on labels who fit the mix as well as artists within the Rykodisc family.

"I see Radio Ryko as a rare chance to actually do what so many of us say we would like to do: that is to create programming that people who are passionate about music will not only listen to but will be excited and challenged by," said George Howard, president of Rykodisc.

**National Geographic Has a 'Pulse'**

"Pulse of the Planet," the daily radio feature distributed to more than 400 commercial and public radio stations, announced that an expanded version of



Jim Metzner

the show will debut on the National Geographic Web site this month.

According to Jim Metzner, this will "provide radio listeners the opportunity to explore the subjects of the program in greater depth than is possible given the constraints of a two-minute feature."

In addition to making more audio available, the site will tie into images and links for further research. The expanded coverage of seasonal sounds and events on the National Geographic site will be the primary online venue for the show. However, the program's Web site [www.pulseplanet.com](http://www.pulseplanet.com) will continue, though it will be linked to the National Geographic site.

■■■

Carl Lindemann is a frequent contributor to RW.

**STATION/STUDIO SERVICES**

**LA PALMA BROADCASTING**

- ▶ Consulting services at affordable prices for small markets. Barter is available.
- ▶ Quality Adult Contemporary programming with all AC formats available.
- ▶ Song-by-song music logs.
- ▶ Image production & sweepers.
- ▶ Complete format packages.
- ▶ Background checks on prospective employees.

714/778-6382 [lapalma@pacbell.net](mailto:lapalma@pacbell.net)

**ADVERTISING SPACE IN RADIO WORLD'S**

**STATION/STUDIO SERVICES SECTION IS AVAILABLE!**

Call Simone Mullins at 703-998-7600 ext 154 for more information.

**URBAN NEWS PROGRAMMING**



- AM & PM drive reports
- Targeted latest news
- ISDN delivered
- Customized for your station
- Bartered and market exclusive!

954.735.4070

READER SERVICE 81

**Sound Effects Production Effects Buy-Out Production Music!**

Over 60 products to choose from. Call 612-522-6256 or get full details and hear on-line demos at our web site:

[www.radio-mall.com](http://www.radio-mall.com)

Dave Dworkin's Ghostwriters  
2412 Unity Ave N., Dept RW,  
Minneapolis, MN 55422

READER SERVICE 70

**Retro Radio The Good Stuff**

The pre-programmed solution for your station. A unique music mix from the '60s, '70s, and '80s.

Hear it For Yourself

[www.radioinfo.com/retro.html](http://www.radioinfo.com/retro.html)  
Ph 214-553-8305  
FAX 214-553-4582



9640 Brentgate Drive, Dallas, TX 75238

READER SERVICE 75



**ATTENTION PROVIDERS!**

Promote your services to **Radio World's** 15,000+ readers. Reach Radio Station and Recording Studio owners/managers and engineers with your message. For information on affordable advertising call **Simone** at **1-800-336-3045, extension 154.**

# Radio Turns a Profit Online

► WORKSHOP, continued from page 26

Spike's Farr said, "We may not have to deal with the FCC, but we have our own regulatory body — our advertisers."

Several panelists predicted that new formats will be created on the Net — and then sold back in syndication to traditional broadcast stations. Elder said he's given serious consideration to creating Net-

only talk personalities for WLS Netcasts. "Net radio isn't really about a demo-

about a psychographic. It's about reaching a certain mindset that may be opposed

**Online radio is very cost-effective. It can make your brand. Plus, at-work listening is a real money-maker.**

— Ashley Farr

graphic," Farr said, whose station draws mostly listeners in their 20s. "It's really to traditional radio. I think we've shown this is a valid business strategy."

— Bill Mann

The term "psychographics" kept popping up at seminars here dealing with Net radio.

The moderator asked Elder and Netcaster Farr to critique each other's Web sites.

"Too static," said Farr when seeing WLS's traditional-looking home page featuring a nighttime photo of Chicago's skyline and a listening button below a picture of Rush Limbaugh. Bundy recommended more video on the WLS site. Elder said, "We're always looking at our site and trying to improve it."

Then, looking at a giant monitor displaying SpikeRadio's home page, which is festooned with the names of 20 alternative-rock groups displayed in torn-out newspaper-headline-type print, Elder thought a minute and smiled, "Too cluttered."

## Streaming Show Expands

► NET RADIO, continued from page 26

Editor Dale Buss.

Reps from Yahoo Broadcast, which recently incorporated Broadcast.com, told RW the streaming division's bread and butter right now is streaming everyday business events.

Yahoo Broadcast streamed one Anyway Netcast launching its new Quixtar e-commerce site to more than 100,000 sales agents, reflecting the potential reach of Netcasting.

The most-quoted estimate here is that about a quarter of all U.S. homes will have broadband by 2003.

"Once people get broadband, the demand will really explode," said Jeremy Schwartz, a senior analyst at media tracker Forrester Research. He said penetration of broadband was at about 2 million homes earlier this year. That figure is expected to rise to 6 million in 2000 and 27 million by 2003.

Schwartz said, "The cost of producing content for Netcasting has been pretty high, but it's plummeting. Personal broadcasting is going to take off," he predicted.

Michael Fasman, senior producer of On24, a prominent company with a significant presence here, streams sound-only news stories to investors all day.

"The quality of streaming audio so far is vastly superior to that of video, so Web sites should use their sound component more aggressively," Fasman said, reflecting Net radio broadcasters' edge.

With advertisers placing more emphasis on targeting niche audiences, Netcasting, several speakers said, is being seen by buyers more as a cost-effective way to do it.

Several start-up Web portals specialize in searching for and listing streamed online stations and events. These portals should give increased visibility and accessibility to radio stations that Netcast.

One is Emeryville, Calif.-based *yack.com*, which lists online events and has a prominent radio-station directory in its interface.

Another is Chicago-based *akoo.com*, a streaming-media search engine that not only focuses on broadcast stations, but also allows the user to program the entire day by selecting radio shows from national station listings. Both new companies report cooperation from traditional radio stations eager to have their programs listed and accessed on the Web.

**I heard they're gonna go Prophet...**

**...how do we compete?**

Prophet's AudioWizard™ software has been so singularly instrumental in the industry transition to virtual radio, the trades are reporting us to be the standard.\*

\* June 10, 1999 M Street Journal: "Prophet supplies digital software—and its name is now a catchword (they're gonna go Prophet with it overnights)."

**NexGen**  
DIGITAL  
Broadcast

**NexGen Digital™ Broadcast features:**

- Mix and match compressed and non-compressed audio
- WANcasting™ – Wide Area Network linking
- Voice-track recording concurrent with programming
- Scalability up to 128 stations
- Customized default configuration
- High speed digital audio extraction

The ambitious design of NexGen Digital™ Broadcast expands scalability, flexibility and reliability in radio broadcast digital automation to meet anticipated growth needs and user preferences. For redundancy, connectivity and database fault tolerance, the system is unsurpassed. We are so confident in the capabilities of NexGen Digital, we are offering users of AudioWizard a free software upgrade to NexGen Digital in 2000.

AMFM Radio Networks, Clear Channel/Jacor Communications and over 500 independent stations across the country, Australia and Puerto Rico rely on digital audio from Prophet. Join them and "go Prophet!"

Together, let's make great radio.

**PSi**  
PROPHET SYSTEMS  
INNOVATIONS  
877/774-1010  
www.prophetsys.com

Prophet Systems Innovations

World Radio History Circle (29) On Reader Service Card

# Arbitron Study Rates Web Radio

Carl Lindemann

The Webcasting industry took a major step from new media to the mainstream with the release of Arbitron's first streaming audio ratings in December.

The first InfoStream ratings report revealed that the 240 channels of audio programming observed in October had more than 900,000 listeners.

Who are the big winners in the first report? Small-time broadcasters, according to Joan FitzGerald, director of marketing, Arbitron Internet Information Services.

FitzGerald said the study clearly

indicates that small-market broadcast stations are getting a big boost in audience thanks to streaming their on-air programming.

## Cume

"The leading Internet radio station isn't even in an Arbitron-rated metro, yet its Webcast on Magnitude Networks posted a cumulative audience that exceeds that of many stations in top-rated metropolitan areas," she said.

Jayson Fritz, owner and operator of the No. 1 Net radio station in the ratings, KFAN-FM in Johnson City, Texas, has an explanation for his station's success on the World Wide Web.

"There's Texans scattered all over the world and there's wanna-be Texans scattered all over the world, and about 60 percent of the music we play is either about Texas, or is by Texans, or by transplanted Texans. And that's probably part of what attracts people."

FitzGerald points to the immediate impact online ratings will bring to such stations. Until now, such small-market success online has not translated into increased national advertising revenues.

"Infostream will help them overcome that," she said.

FitzGerald expects that putting the numbers to online listenership quickly



Joan FitzGerald

will dispel what she feels to be a fundamental misperception about Webcasting. She says many radio professionals take the view that going online with their signals is just a game of musical chairs. At best, listeners are simply shifted from airwaves to Internet.

## Radio online

Not so, FitzGerald said.

"There are so many opportunities to tune into the radio online where the listener can't take advantage of it through terrestrial broadcast.

For example, you leave your car, go into the office and you're usually out of range.

"So this is an opportunity to build listening behavior. I really don't believe we'll just see broadcasters cannibalizing their listeners — instead, you'll see an expansion of overall tuning. This is not a zero-sum solution," she said.

According to FitzGerald, the need for InfoStream is obvious and immediate.

"This service is designed to fill in the information gap that's out there right now. There's virtually no information about streaming media consumption. The streamers need that data to sell their advertising time. So there is a very significant demand for this information in the marketplace," she said.

Michelle Bleiberg, spokeswoman for ABC Radio Networks, expressed confidence in the accuracy of the ratings and said the ratings were a welcome addition for ABC.

"The Arbitron Internet ratings are a good indication of Internet usage, and we will use these ratings for Internet advertising sales," Bleiberg said.

Fritz said with just one "book" out, he can only hope that the ratings will help his sales department sell more advertisers to buy on his station.

"I really believe that it's going to take maybe six months of being in the top 25 to really have a story to tell. ... It's totally different than an Arbitron book, there's no average quarter hour share, for example, just cume numbers, so it's hard to say exactly how we will be able to use this right now," said Fritz.

This first study compiled total audience estimates and average time spent listening to Internet audio channels being streamed by both "terrestrial" broadcasters as well as "Internet-only" Webcasters.

Four outlets — ABC Radio Networks, BroadcastAmerica.com,

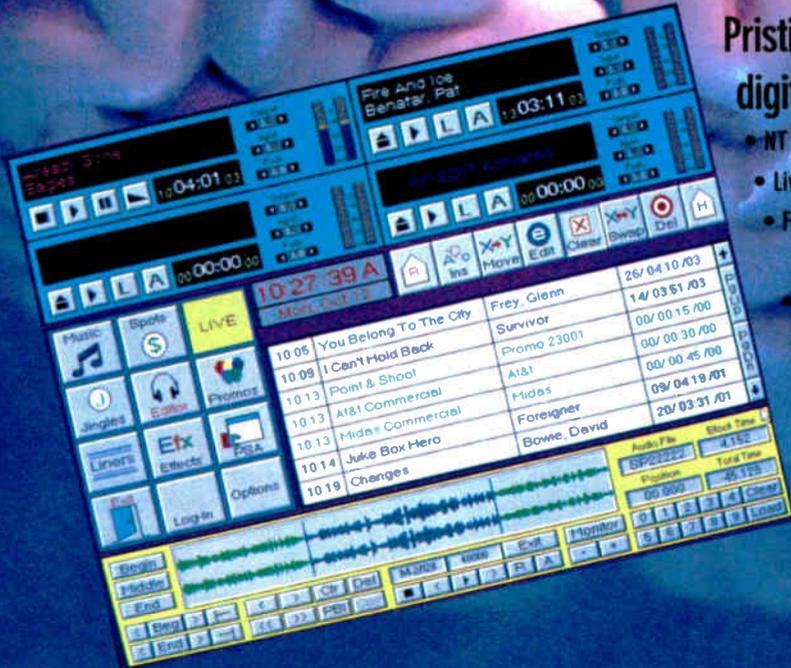
See WEB RADIO, page 34 ▶

# It's not brain surgery.

# We make it simple.

Pristine RapidFire: the all-in-one digital broadcast system.

- NT file server compatible
- Live assist, walkaway and satellite
- Four on-air digital players with volume, fade and segue control
- Easy playlist editing capability
- Access your entire audio library
- RF edit on-air waveform editor
- Instant jock "audio drop box"
- Bulletproof reliability
- Satisfaction guaranteed



Pristine  
Access **RAPIDFIRE**

on the web at [www.pristinesys.com](http://www.pristinesys.com) or call (310) 670-7500

Pristine RapidFire is a product of Pristine Systems, 5841 Uplander Way, Suite A, Culver City, CA 90230



# WEBCASTING MADE SIMPLE

So your station wants to stream audio on the Net, and it's up to you to make it work? You've heard all the horror stories of unfriendly software, undependable PCs, lousy audio cards and the dreaded 3am lock up. Who needs it?



If only there was a reliable, one-box solution for broadcasting.

Say hello to Audioactive. We're the company that pioneered MP3 streaming, and the solution chosen by the world's most demanding webcasters. With the Audioactive real-time hardware encoder, you'll be reaching new listeners with the latest technology in no time at all. Simple. Professional. Reliable.

Make it easy on yourself.



**AUDIOACTIVE.COM**  
2101 SUPERIOR AVENUE CLEVELAND, OH 44114 USA  
TEL: +1 (216) 241-7225 FAX: +1 (216) 241-4103  
E-MAIL: info@audioactive.com  
www.audioactive.com

**AUDIOACTIVE.COM EUROPE**  
JOHANNISSTRASSE 6 D-85354 FREISING GERMANY  
TEL: +49 81 61 42 467 FAX: +49 81 61 42 402  
E-MAIL: europe@audioactive.com  
www.audioactive.com

Audioactive.com and Telos Systems are trademarks of TLS Corporation.

One Word: **Advantage**



One Company:





**Moseley**

*360 Systems*

**arrakis**  
SYSTEMS INC.

**urban**

**COMREX**

**Omnia**  
A Telos Company

*Telos*  
SYSTEMS™

You gain special benefits when you buy **Advantage Partner** products, **ONLY** from BSW.

**Benefits** • Extended Product Warranty • Extensive Product Inventory • Factory Trained and Certified Sales Professionals

For more information Call 1 • 800 • 426 • 8434 or Visit [www.bswusa.com](http://www.bswusa.com)

# Arbitron Launches Internet Radio Ratings

► WEB RADIO, continued from page 30  
LaMusica and Magnitude Network — were measured for the study.

The InfoStream service determined that, for these four streaming content providers, Internet listeners spent more than 1.3 million hours tuned to Internet audio during the month of October. Internet listeners logged 36,000 hours tuned to the channels streamed by LaMusica; 41,000 hours to BroadcastAmerica.com channels; 440,000 hours to the Magnitude Network channels and 816,000 hours to the channels streamed by ABC Radio Networks.

"This covers a relatively small percentage of the total streaming audio listenership — just 15 to 20 percent. Still, these are major outlets doing some very

interesting things," said FitzGerald. And she anticipates rapid growth in coverage for upcoming studies.

"Already, we're getting a lot of cooperation. The Internet industry is willing and eager to embrace this kind of service because they know that this information will help their business grow," she said.

The November results, expected to be released this month, will include two additional Webcasters: OnRadio and NetRadio. Another factor enhancing growth: The price is right.

"Right now, the service is free as we're in these initial sample stages. Ultimately, it will be a subscription service like our terrestrial system," said FitzGerald.

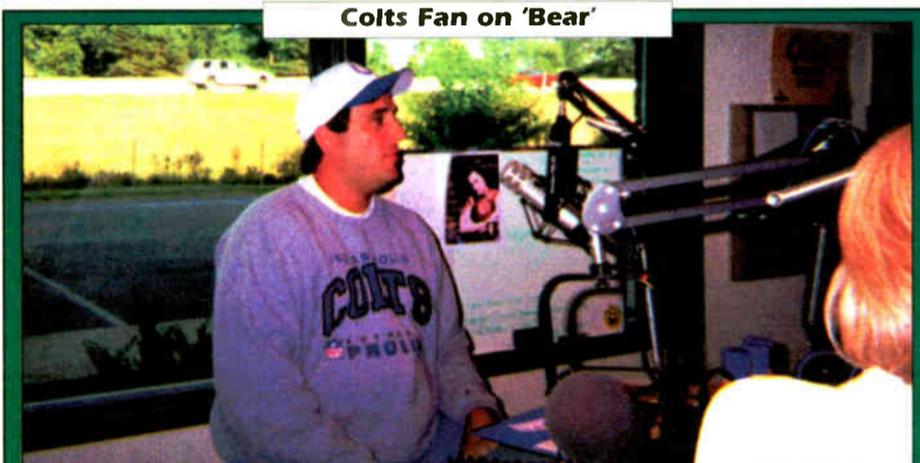
The methodology and implementation of InfoStream are worlds away

## Arbitron InfoStream Report - October 1999 Top 10 Cumulative Audience

URL	Internet Affiliate	City, State Base	Format	Monthly Audience*
www.texasrebelradio.com	Magnitude	Johnston, Texas	Album Adult Alternative	83,900
www.kpig.com	Magnitude	Monterey, Calif.	Album Adult Alternative	70,100
www.cd93.com	Magnitude	Monterey, Calif.	Modern Adult Contemporary	66,400
www.khyi.com	Magnitude	Dallas	Country	56,700
www.klaq.com	Magnitude	El Paso, Texas	Album Oriented Rock	55,600
www.wkpo.com	Magnitude	Madison, Wis.	Urban Adult Contemporary	38,900
www.cd101.com	Magnitude	Columbus, Ohio	Alternative	35,000
www.radiolakeplacid.com	Magnitude	Burlington, Vt.	Album Adult Alternative	34,500
www.93x.com	Magnitude	St. Louis	Alternative	32,400
www.wbap.com	RealBroadcast	Dallas	News/Talk	30,700

\* Total cume audience in the month of October 1999.

These are the top 10 in cumulative Internet radio audience, according to the Arbitron InfoStream Report.



Colts Fan on 'Bear'

Ken White relaxes in the press box at RCA Dome in Indianapolis before his live Indianapolis Colts football wrap-up for 93.9 WGRL(FM) "The Bear" in December. White was the lucky listener selected to add to The Bear's sports coverage during the Colts' season. He provided reports before and after each game, as well as several minutes of live commentary and analysis every Monday morning.

White, 36, a group manager at Raytheon Technical Services, was one of 28 listeners who auditioned for the chance to be the Bear's "Colts cub reporter." This was his first radio experience.

"Ken is exactly the kind of person we had in mind when we put together this promotion," said John Morris, program director at The Bear. "He has funny stories about how the fans heckle opposing players, as well as cheerleader analysis, which is cool."

from the diaries and markets of Arbitron's flagship service.

"The technologies used to stream the audio differ widely. The major hosting companies operate differently and have different equipment. So when we're invited in to begin measurement, that's when the real work begins," said FitzGerald.

Developing an interface to the individual servers is only one of the technical issues.

"The size of the data sets is a challenge. Our October data was some 20 Gigabytes. To compute cume, you have to process all of that data — the processing is a non-trivial event. You need a tremendous technical infrastructure to actually run the numbers," she said.

Other obstacles come from developing techniques to learn more about listeners without intruding on their privacy.

"Looking to the future, one of the important things is to include demographic, qualitative information in the data set. There are a lot of different ways to get that data. We haven't made a decision as to which is the best way to yield the highest-quality results."

Fritz said he has confidence in the InfoStream method.

"This was a computer-measured system, as opposed to someone having to keep track with a diary or responding to a phone call. So I do think it's extremely accurate.

"The thing is, Webcasting is still its infancy, and we're very gratified to be the No. 1 station the first time that Arbitron has measured it, but you still have to take it with a grain of salt."

### STATION SERVICES

## Ski Season Snow Radio Reports

SnoCountry Mountain Reports brings ski and snowboard conditions to a daily audience of 3 million listeners on more than 400 affiliates.

Radio stations subscribe to SCMR from November through April. During that time, the network's broadcasters begin calling stations at 5 a.m. to report on conditions in local ski areas. By noon, most stations have been called twice, once with a morning report and later with an updated report to air for that afternoon.

Most reports are 60 seconds long and contain information about weather, snow totals, trail counts, special events and tips for getting the most from a day on the slopes.

For more information, contact Wendy More or Chuck Devine in New Hampshire at (603) 443-8806, send e-mail to wendym@snocountry.org or circle Reader Service 151.

## Strong links make a strong chain



### The LEX 25 Exciters:

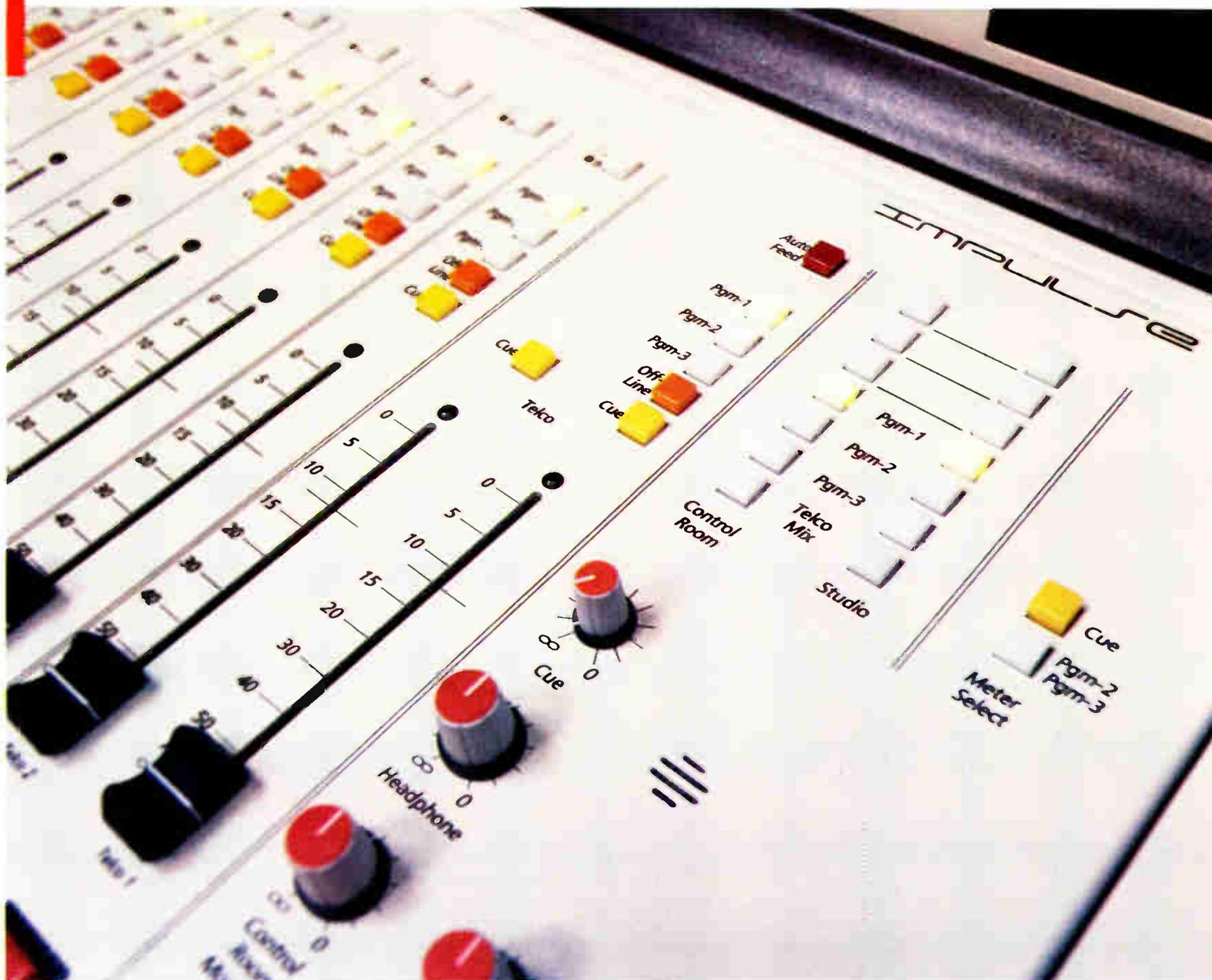
Unsurpassed audio quality in their class, starting at \$1595 - Now available with SPC Stereo Generator and High Definition Sound Processor\*

**BEXT** RF innovations for the broadcast world since 1985

1045 Tenth Ave San Diego CA 92101 • USA • 619-239-8462 FAX: 619-239-8474 • mail@bext.com • www.bext.com

\*Includes user-selectable composite processing controls & fully adjustable sound definition

**Digital technology at an analog price.  
It'll be hard to resist an Impulse purchase.**



©1999 Harris Corporation.

With the need to move to digital on the horizon, it's getting a whole lot harder to justify the purchase of an analog console. Especially when products like the new Harris Impulse Digital Console by Pacific Research & Engineering can accept either analog or digital inputs and reconfigure from analog to digital easily – right in your studio. With the Impulse, you can transition to digital on *your* timetable, while using your current analog sources. And, believe it or not, you can do it for less than the cost of most analog consoles. Plus, you get unique Impulse features like three stereo buses, two mix/minus outputs, comprehensive control room and studio monitoring, opto-isolated control logic inputs and outputs, as well as renowned PR&E quality construction. To find out more, call us today. Or, of course, feel free to act on impulse.



Impulse 12-input frame size  
(also available in 20-input size)

**next level solutions**

WIRELESS

BROADCAST

GOVERNMENT

NETWORK SUPPORT

1-800-622-0022 • www.harris.com



## NEWS MAKER

# Lund Marks 20 Years as Consultant

Robert Rusk

The program director who hired Don Imus in 1970 at KXOA(AM) in Sacramento, Calif. — and also was the I-Man's PD at WGAR(AM) in Cleveland and WNBC(AM) in New York — is about to celebrate his 20th anniversary as a consultant.

John Lund traded career hats in 1980, when he switched to the other side of programming and founded the Lund Consultants to Broadcast Management. Recalling his years with Imus, he now likes to tout the "Three Ms": music, marketing and mornings.

"Obviously, if you are a news-talk station, the first one isn't important," Lund said. "But in terms of marketing and mornings, I'm a great believer in a big morning show. You look at the top-rated stations — such as KKCW(FM) in Portland, which we helped put on the air years ago — they all have big morning shows. It's what blows the station open.

"Oftentimes, the morning show runs on a different format than the rest of the day. Fortunately, I worked for stations that did that. The morning show was different. Certainly my experience with Imus proved that. We didn't have to have a comedian on the air through-

out the day. Having an 'unusual' guy in the morning and 'normal-type' people the rest of the day worked just fine."

Lund again uses Imus to explain his philosophy on marketing.

"I use the word 'marketing' in the same way people use the word 'brand-

ing.'"

lot of my time helping stations reach that kind of level. Research is a very important part of that — to find out how well a market will take to a specific format, and all the other aspects needed for the station to win."

Lund, who works with more than 100

## Recalling his years with Don Imus, Lund likes to tout the three Ms: music, marketing and mornings.

ing," Lund said.

"WFAN(AM), where Imus now anchors mornings, is an extremely well-branded station. It is marketed extremely well. If you say 'W-FAN' in New York, people know it's 'Imus in the Morning' and sports the rest of the day.

"Likewise, in the old days at WNBC — when we were the premier contemporary station in New York — there was 'Imus in the Morning and fun radio all day long."

As a consultant, Lund said, "I spend a

radio stations in the United States and Canada, said, "A consultant is often brought into a station that is having problems. Maybe they don't have enough listeners, or the station is not on the air yet and needs a format. But there are also times when we are hired and the station is actually doing pretty well and sounds pretty good, and ownership wants to continue going along that same stream."

Throughout his career, Lund has put his stamp on some of the biggest stations in the largest markets, but today "loves" consulting in small and medium markets.

"They are more creative, and we can do more as consultants," Lund said. "For example, a client of ours in Baton Rouge, La., wanted a major contest in the fall and had heard about my top-20 list of favorite contests — which was the Dollar Bill Game.

"That afternoon, I searched through promos and liners that I had written for other stations where we had done the contest. That evening I wrote a 16-page style-book for the client. The first three pages told them exactly how it could be done; the following pages included legal contest rules, as well as promos and liners."

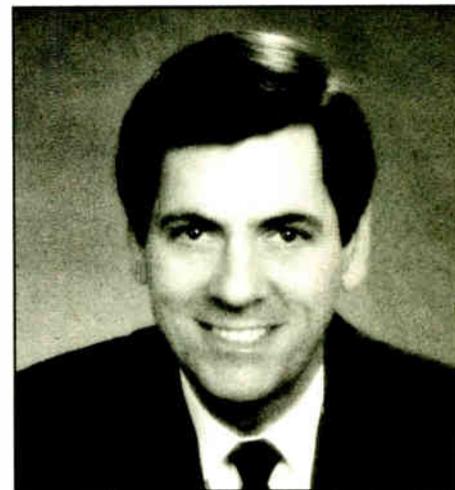
The best example of a station that Lund has helped is perhaps WSOX(FM) in Arbitron-rated market No. 103, York, Pa., the home of major group owner Susquehanna Radio Corp.

Susquehanna's AC station WARM(FM) has long been dominant in the region. On the other hand, WSOX(FM) had been a low-rated, religious-formatted station.

When Brill Media Co. took over in 1998, Lund was called upon to help turn things around — and the results were nothing short of amazing. In the spring '98 Arbitron survey, WSOX had a dismal zero-share. One book later — summer '98 — when the station was launching a live, traditional '60s-based oldies format recommended by Lund, it scored a respectable 2.6 share, 12+.

In its first full book, fall '98, WSOX zoomed all the way up to a 7.7 share — placing it fourth among the 38 rated stations in the market. WSOX moved even higher in winter '99, with a 7.9 share. In spring '99 — just four books since the launch of the new format — WSOX had an 8.4 share, and ranked second behind only Susquehanna's WARM.

Even more impressive, as the station celebrated one year as an oldies outlet, the spring '99 book also showed that WSOX was No. 1 in the key 25-54 demo in both the York and the adjoining Lancaster markets.



John Lund

And WSOX ranked No. 1 in 12+ in the May, June, July 1999 Arbitrends in York — the center of the ninth largest baby-boomer population in the country.

Commenting on Lund's contribution to the station's success, Brill Media Co. Vice President Alan Beck said, "We've never had a failure with him." Lund has a long relationship with the company and has consulted its other stations, including properties in Colorado, Indiana, Kentucky, Minnesota and Missouri.

"We hooked up with John years ago," said Beck. "I talked to a variety of consultants and John seemed extremely knowledgeable and on track. He understood what our company was about. We've had a string of successes with him. John is an experienced researcher. There's really nobody better at doing a format search and sitting down with you to recommend the format and then executing it. Clearly, we needed that at WSOX."

WSOX President and General Manager Tom Thies said, "John, along with myself and the program director, was instrumental in initially setting up the format of the station. The format and the audience available in the market were a perfect match. We were hoping to be one of the top-three radio stations within the first year. Obviously, we have gone far beyond those initial expectations."

### Size doesn't matter

While Lund does work in major markets as well, he stressed that the bulk of his business will continue to be with stations in the smaller towns and cities — assisting with virtually all mainstream formats.

"Markets No. 30 to 200 are the backbone of our business," he said. "And virtually all of our clients in the secondary markets are competing with the big owners. To compete and win against them is somewhere between an obstacle and an opportunity — and I'm proud of the fact that many of our clients do just that."

During an interview with RW, Lund was interrupted by the ringing telephone. It was the PD of a Midwest station checking in.

After he got off the phone, Lund explained that the PD wanted to schedule time on the following day to talk about strategy.

"I told him that I get in at 6:30 in the morning and am here till 6:30 at night," said Lund. "I said to call me and we'd do it."

It looks like Lund, whose enthusiasm for the business is infectious, will be keeping up those 12-hour days for a long time to come.

■ ■ ■

Bob Rusk is a regular contributor to RW. He operates the entertainment Web site [www.CallingHollywood.com](http://www.CallingHollywood.com)

## Affordable Digital Automation

24 HOUR  
FREE  
TECH SUPPORT

NEW



Our new WaveStation 3.0 has all the features of the \$50,000 automation systems, but is priced reasonably like software, not gold-plated broadcast hardware. We often hear, "It can't be true!" More than 1000 satisfied users worldwide prove the contrary. WaveStation includes a powerful digital audio editor and uses standard or compressed audio files, including MP3. On-screen Voice-Track editing, time-shift recording, serial port control. WebCast ready. Full automation, satellite, voice track and live assist. No recurring fees, Free upgrades. Microsoft Windows 95, 98 or NT.

888-BSIUSA1

Only

\$999

Try Before You Buy

Download the Actual Software!

[www.bsiusa.com](http://www.bsiusa.com)

BSI

# NRB 2000 Set for Feb.

► NRB, continued from page 25  
Year, Milestone (for 50 years of broadcasting), News, Distinguished Service, and Chairman's and President's awards. The

Pasadena Tabernacle Band and singer Bob Carlisle will provide musical entertainment for the evening. Tuesday evening NRB will award Hall

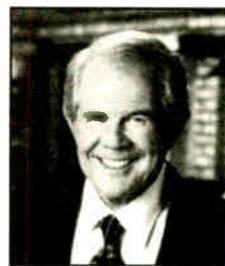
## NRB 2000 Exhibitor List

The following is a selection of companies registered to exhibit at NRB 2000 at press time. Check the on-site listings for late-registering companies.

- |  |  |   |
|--|--|---|
| 2.95 Guys  | DonorDirect.com  | NRB Magazine                                |
| 711.NET  | Duplication Factory  | NSN Network Services                        |
| Acrodyne Industries Inc.                                   | Eastman Curtis Ministries                                  | Oasis Audio LLC                             |
| ADC Telecommunications Inc.,<br>Broadcast Systems Division | Energy-Onix  | Oasis Music                                 |
| ADRA International   | EO International   | OMB America                                 |
| Affiliated Media Group Inc.                                | EWTN   | Omnimusic                                   |
| All American Network                                       | Faith For Today  | Oneplace Ltd.                               |
| American Bible Society                                     | Family Life Ministries Inc.                                | Pacific Garden Mission                      |
| Andrews Tower Inc.   | Family Magazine Talk Show                                  | Phil Driscoll Ministries Inc.               |
| Armstrong Transmitter Corp.                                | Family Research Council                                    | Price Manufacturing &<br>Engineering        |
| Assurance Publishers Inc.                                  | Fellowship for the Performing<br>Arts Inc.                 | Prime Time Christian<br>Broadcasting        |
| B & H Photo-Video / Pro Audio                              | Fellowship of European<br>Broadcasters                     | Professional Tape &<br>Communication Supply |
| Banner Communications Inc.                                 | Fidelipac Corp.  | Propagation Systems Inc.                    |
| Barbour Publishing Inc.                                    | Food For the Poor  | Radio Nueva Vida                            |
| Barco Projection System America                            | Friends of Israel Gospel Ministry                          | Rees Associates Inc.                        |
| Beacon Hill Press of Kansas City                           | Gateways to Better Education                               | Regency Communications                      |
| Bee-Alive Inc.   | Good News Jail & Prison<br>Ministry                        | Regent University                           |
| Bethany House Publishers                                   | Good TV Broadcasting Corp.                                 | Response Unlimited                          |
| Broadcast Electronics Inc.                                 | Gospel Music Association                                   | RISE Intl. Inc.                             |
| Broadcast Store Inc.                                       | Grizzly Adams Productions Inc.                             | RF Specialties of Missouri                  |
| Broadcasters General Store Inc.                            | Harris Broadcast   | RFS Broadcast                               |
| Broadman & Holman Publishing                               | Hartline Marketing   | Royal & Sunalliance                         |
| Bryant Design  | Harvest House Publishers                                   | Royal Nutrition Intl. Inc.                  |
| Campus Crusade for Christ Intl.                            | Information Radio Network                                  | Rutherford Institute                        |
| Capital Dynamics Corp.                                     | InService America Inc.                                     | Sacred Symbols Inc.                         |
| Carpel Video   | INSP — The Inspirational<br>Networks                       | Salvation Army                              |
| CBL Media  | Inspiration Cruises & Tours                                | Satellite Export & Engineering              |
| Custom Business Systems Inc.                               | Inspire Management Group                                   | Scala Electronic Corp.                      |
| CDR Communications Inc.                                    | International Press Association                            | Servant Publications                        |
| Chosen People Ministries Inc.                              | InterVarsity Press   | Shively Labs                                |
| Christ for the Nations                                     | Israel Ministry of Tourism                                 | Shuva Israel                                |
| Christian Blind Mission Intl.                              | It is Written  | SofTrek                                     |
| Christian Care Ministry                                    | JDI Travel   | SpaceCom Systems                            |
| Christian Internet Radio &<br>Television Network (CITV)    | Jeremiah Films Inc.  | Spectrotape/Your Story Hour                 |
| Christian Law Association                                  | Jerusalem Tours Intl.                                      | Sterling Communications Inc.                |
| Christian Lists & Data Services                            | Jesus Film Project   | Strang Communications                       |
| Christian Management Assoc.                                | JMS Marketing & Sales Inc.                                 | Strategic Christian Services                |
| Christian Medical & Dental<br>Society                      | KFSG(FM)   | SWR Inc.                                    |
| Christian Publications Inc.                                | KFUO Radio/Jubilee Network<br>Kingdom Inc.                 | Technology for Communications<br>Intl.      |
| Christian Network Inc.                                     | KKLA Communications Group                                  | Three Angeles Broadcasting<br>Network       |
| Christian Solidarity Intl.                                 | LeSEA Broadcasting Network                                 | Timothy Plan                                |
| Christian Television Network                               | Liberty Broadcasting Network                               | Todd Duncan Group/Dove<br>Publishing        |
| Christian Working Woman                                    | Liberty Counsel  | Toronto Airport Christian<br>Fellowship     |
| Christianity.com/CBN                                       | Life Issues Institute                                      | Total Living Network                        |
| Christians for Israel                                      | Life Messengers Publishers                                 | Trans World Radio                           |
| Christy's Film/Video Supply                                | Lifeline/AmeriVision<br>Communications                     | Tri-Media Marketing Services                |
| Church 2000 Inc.   | LJM Productions L.L.C.                                     | Tri-State Christian TV                      |
| Church on the Rock World<br>Outreach Center                | Living Word Broadcast/The<br>Oasis of Love Churches        | Trinity Broadcasting Network                |
| Church Production<br>Magazine/Div.                         | Lockman Foundation   | Turning Point Ministries                    |
| Production Media Inc.                                      | Lutheran Hour Ministries                                   | TV/Visual Communications<br>Committee       |
| Circuit Research Labs                                      | Mail America Communications<br>Inc.                        | Technologies for Worship<br>Magazine        |
| Computer Prompting &<br>Captioning Co.                     | Master Marketing Intl.                                     | Tyndale House Publishers                    |
| Concordia Publishing House                                 | Mayberry USA — LTI Net Inc.                                | U.S. Mail & Marketing Corp.                 |
| Consistent Computer Bargains                               | Max Greiner Jr. Designs                                    | USA Radio Network                           |
| Cook Communications  | MDS Communications Corp.                                   | Voice of Prophecy                           |
| Cornerstone TeleVision                                     | Media Ministries of the A/G,<br>Michael Cordone Media Ctr. | Walk Thru the Bible Ministries<br>Inc.      |
| Corporate Media Group                                      | MEMSYS (Herlick Data<br>Systems)                           | WaterBrook Press                            |
| Cowboy Stuff Ministries                                    | Messenger  | We Love Country Inc.                        |
| Cross TV   | Micah Media Group  | WGCB  |
| Crosswalk.com/DIDAX Inc.                                   | Miro Records   | WGS-TV 16/Faith Printing                    |
| Crossway Books (Div. of Good<br>News Publishers)           | Moody Press  | Westar Media Group Inc.                     |
| Crown Broadcast  | MSE Media Solutions  | World Missionary Evangelism                 |
| CRT Custom Products Inc.                                   | Multnomah Publishers                                       | World Evangelical Fellowship                |
| CSN International  | National Christian Choir                                   | World Video Group/Keith Austin<br>Edgewise  |
| Curse-Free TV  | National Right to Work                                     | WWCR/WITA/WNQM                              |
| Dalet Digital Media Systems                                | Nelson/Word Ministry Services                              | YWAM Publishing                             |
| Data Check, Division of LSI                                | Network Music Inc.   | Zondervan Publishing House                  |
| DH Satellite   | NRB TV Committee   |   |
| Doug Ross Communications                                   |  |   |
| Domain Communications L.L.C.                               |  |   |
| Domain Group   |  |   |

of Fame status to Aimee Semple McPherson and Dr. Charles Swindoll.

The late McPherson was a Canadian-born American evangelist and early radio preacher. She founded the International Church of the Foursquare Gospel. In 1924 she put L.A.'s third radio station, KFSG(AM) on the air.



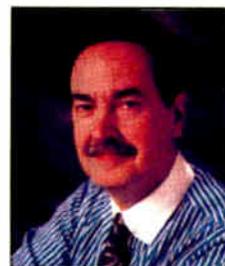
Pat Robertson

Swindoll is the president of Dallas Theological Seminary and is the main speaker for the broadcast "Insight For Living," which is heard on 1,400 stations around the world.

Featured speaker for the evening is Dr. Tony Evans, co-founder and Senior Pastor of the Oak Cliff Bible Fellowship in

Dallas, Texas, with musical entertainment provided by violinist Jaime Jorge and musical group The Martins.

Others performing include Damaris Carbaugh, the Haven Quartet, Big Tent Revival, India Children's Choir, Chris Rice, Kathy Troccoli and Michael W. Smith.



Cal Thomas

Advanced registration figures are not available, but NRB officials expect a large attendance following the record number of attendees at its 1999 meeting.

Craig Johnston is an Internet and multimedia producer in Seattle and a frequent contributor to Radio World.

## The New Standard for Digital Consoles



Numix consoles by Logitek give you all of the flexibility you need

- ◆ True DSP-based digital mixing and routing
- ◆ Combine analog and digital signals as needed
- ◆ Re-configure fader and button assignments "on the fly" - no need to re-wire anything
- ◆ Integrates nicely with digital storage systems- fader displays provide room for song titles, timing information, or other messages
- ◆ Contemporary ergonomic design keeps controls within easy reach
- ◆ "Building-Block" design allows you to specify a console with 6 to 42 fader channels
- ◆ Easy installation, clean wiring – leave all of that extra equipment and cabling in the equipment racks

Call today for more information

5622 Edgemoor  
Houston, TX 77081  
800.231.5870 (North America)  
tel: 713.664.4470  
fax: 713.664.4479

**Logitek**  
Digital With a Better Difference

Visit us at [www.logitekaudio.com](http://www.logitekaudio.com)

### Innovative solutions...



Your new digital transmitting equipment sounds great! There's no arguing about that. But your jocks can't stand the delay they hear in the monitor when they go live. And let's face it, you're getting pretty tired of hearing the complaints. The CAS-1 Con/Air Switcher can solve both of these problems.

Got digital gear? You need a Con/Air Switcher

**Sine Systems, inc.**  
innovative solutions

615 • 228 • 3500 (vox)  
615 • 227 • 2367 (fax)  
615 • 227 • 2393 (f.o.d)  
[www.sinesystems.com](http://www.sinesystems.com)

## Here are three ways Eventide can help:

**C**onsolidation brings market efficiencies, but also big headaches and challenges. It's essential for management to keep track of multiple stations. And keeping a legal record of what was said and when commercials aired is also more important than ever. Several groups have standardized on **Eventide Digital Audio Loggers**. Our economical VR204 records up to 550 hours on a tiny palm-sized cassette. VR204 records up to 4 channels simultaneously so you can keep tabs on the competition's spot loads, play lists and talent while you record your own stations. New!! Now Eventide loggers let you record/play in Hi-Fi for full "broadcast quality." Ideal for show replays, time zone delays, etc.

**E**ventide's **BD500 Broadcast Delay** makes talk shows run smoother and sound better, for less. The BD500's multiple dump feature divides the delay time into several "slices" so you're still safely in delay even right after dumping an offensive remark. It's the hassle-free talk solution... even when air talent is working without a producer. No other delay offers Eventide's high quality patented catch-up technology for clean audio combined with fast catch-up. And it's the only delay with optional digital inputs and outputs for new all-digital studios. Yet the BD500 costs thousands less than our previous model. See how much easier talk shows can be with Eventide's 4th generation BD500 Broadcast Delay.

**W**ant to increase creativity without adding personnel? Add life to drive-time shows? Win new advertisers with better station-produced spots? An **Eventide Ultra-Harmonizer**® brand effects processor really does all that. Designed specifically for radio and production, the new **DSP4000B Ultra-Harmonizer** features radio effects designed by production whiz Jay Rose. Hundreds of comic voices, sound effects, reverbs, pitch changers and more are instantly accessible at the touch of a button. Plus, the DSP4000B has superb **Timesqueeze**® time compression /expansion capability. Shorten a 60 second national spot to allow for a local tag. Squeeze or stretch a music bed to fit the spot. The DSP4000B has optional digital I/O to interface easily with digital editors and consoles. It's the radio effects box designed to bring stations more business and more listeners.

*The bottom line:* Eventide broadcast products are potent tools for today's radio. To learn more, talk to your broadcast distributor, call Eventide direct at 201-641-1200, or see our website, [www.eventide.com](http://www.eventide.com).

**Eventide**  
the next step

One Alsan Way, Little Ferry, NJ 07643  
Tel: 201-641-1200 Fax: 201-641-1640  
Email: [broadcast@eventide.com](mailto:broadcast@eventide.com) Web: [www.eventide.com](http://www.eventide.com)

# BOTTOM



# LINE



# BROADCASTING



**Better  
managed,  
better  
sounding  
radio yields  
better results.**

# Studio Sessions

An Updated Classic

See  
Page  
42



Radio World

Resource for Radio Production and Recording

January 19, 2000

## Win2k: A New Era in Production?

Carl Lindemann

The ongoing debate over the preferred digital audio production platform is set for another twist.

The latest operating system from Microsoft, Windows 2000 — or in the vernacular of geekdom, “Win2k” — is set for release on Feb. 17, after three beta releases and more than a year of delays.

Most pro-audio software developers for Windows have looked at the new platform and made plans accordingly. Some developers are betting considerable resources this is going to be a breakthrough product for users, while others are adopting a wait-and-see approach.

For producers going digital or those considering a change in OS — either an upgrade or changing camps altogether — what lies ahead with Win2k should be a part of the decision.

The Win2k operating system is an upgrade to Windows NT 4.0. In fact, the

product originally was called NT 5.

How significant is this release?

At first, Microsoft was going to use Win2k to merge consumer and profes-

9x. This means you get all the advantages of the NT operating system, such as increased memory protection, security, robustness and multi-processor support.”



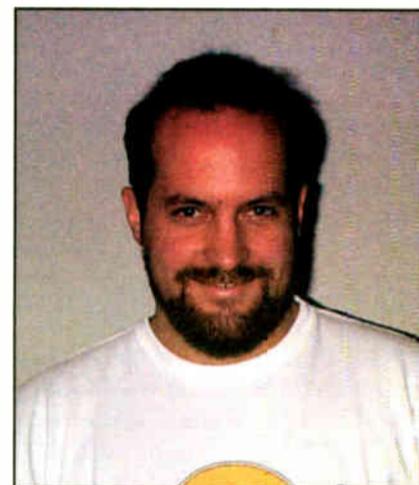
sional products into a single package. This ambitious plan has been shelved for now. Win9x (95 and 98) and Win2k will continue as separate products, though with significant interconnectivity.

Ron Kuper, chief technology officer for Cakewalk, said, “The main advantage of Windows 2000 is that it is a new version of NT, not a variation on Windows

Cakewalk creates software for MIDI music sequencing and PC-based audio recording.

### Going 32 bits

Windows 9x and NT have nearly identical interfaces. The difference is, NT is a “true” 32-bit operating system. Windows 9x retains some of the 16-bit code at the



Mike Guzewicz

heart of DOS and Windows 3x.

It is a bridge to NT's 32-bit architecture. For those still running “legacy” DOS and Windows 3.x 16-bit programs, Windows 9x offers backward compatibility. Keeping one foot in the past keeps the user from making the leap into the 32-bit future.

See WIN2K, page 50 ▶

### PRODUCER PROFILE

## KTCL's Roger Keeler — Production That Rocks

Ken R.

Clear Channel's alternative outlet in Denver, KTCL(FM), is oozing with “in-your-face” attitude. Roger Keeler's job as production director is to maintain that edgy image on the air and on the Internet.

At most stations, the production director spends hours grinding out car dealer spots, placing dozens of

and grungy musical effects.

“Sometimes I'm stumped for an idea,” said Keeler. “I'll throw it out in a meeting and it's guaranteed that someone will come up with something better than what I would have thought of alone. To avoid institutional incest, you need input from lots of people. At KTCL we work as a team.”



Roger Keeler is happy to work at KTCL.

dated tags on jewelry store commercials, and recording the wives of the owners of furniture stores stumbling through scripts for the fall sale.

Keeler doesn't do any of that. His niche is portraying the image of his station through promos, liners, strange noises, artist clips, listener sound bites

Keeler enjoys working at Clear Channel's new, multimillion-dollar, state-of-the-art studio complex in Denver.

“There are eight stations here, and each has its own production studio plus four other commercial areas

See KTCL, page 47 ▶

Perhaps you've heard the buzz around Cool Edit Pro, the complete software multitrack recording studio. Why is it so popular? **It's so easy to use!**

As one user said in Radio World, “When it comes to broadcast production, it is doubtful you will find an easier interface that is as inexpensive yet as powerful as Cool Edit Pro.” — March 17, 1999

See for yourself.  
Download a demonstration version from <http://www.syntrillium.com>, or just give us a call and we'll send you a free demo/tutorial CD. Give Cool Edit Pro a try— you'll be amazed at what you can do!



...good sound stuff!

P.O. Box 62255  
Phoenix, AZ 85082-2255 USA  
cepro@syntrillium.com  
+1-480-941-4327  
1-888-941-7100  
(toll-free sales, USA and Canada)  
Fax: +1-480-941-8170



# Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No.(s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

## The Traffic C.O.P.™ for Windows. 21<sup>st</sup> Century technology at a price you can afford.

- A complete, fully featured, true Windows, traffic and billing system from order entry to log scheduling to A/R
- Run up to 256 stations from a single database, separate databases or any combination of the two
- Total password security
- Unexcelled support
- The intuitiveness of Windows. Training has become obsolete
- Full control over your cart numbers and copy
- Runs on your computer network... Exports to your automation system
- Sales History for up to 5 years

No Obligation! See what The Traffic C.O.P. for Windows can do for you!

Generous Small Market Discounts  
Call NOW for our FREE CD-ROM Demo!  
(800) 275-6204  
www.broadcastdata.com

READER SERVICE NO. 200

## Would you believe that you can visit a dozen markets in an hour without leaving your desk?



If you have the TeleRadio from CircuitWerkes at your stations, you can listen to every radio station in each of your markets.

Old-fashioned air-checks are okay, but they have some real drawbacks. Among them are:

1. You have no control over what is recorded on an air-check. You may be hearing only what someone else wants you to hear.
2. Your own air staffs usually know when they're being recorded and react accordingly.
3. By the time you get an air-check in the mail, it may be too late to respond to the competition.

The TeleRadio beats those problems by letting you listen to both your station *and* the competition in *real-time*. If you have a TeleRadio, you simply dial it up from any phone. As soon as it answers, the internal radio begins playing down the phone line to you. You can control the radio by using the buttons on your phone. It's just like being there!

The TeleRadio even has a DTMF selectable external audio connection so it can be used as a standard telephone coupler too. An optional call progress decoder is available for using the TeleRadio on PBX analog lines and in areas that don't support CPC.

CircuitWerkes - 3716 SW 3<sup>rd</sup> Place, Gainesville, FL 32607  
(352) 335-6555 / fax 380-0230 - www.circuitwerkes.com

READER SERVICE NO. 201

## Composite Distribution Solutions for Every FM and TV Application ...



Use The CDS-200 for switching two composite feeds to up to three different exciter.



Use the CDS-200A when you need only to distribute a composite stereo, SCA, SAP or RBDS signal.

Broadcast Devices, Inc.



5 Crestview Avenue  
Cortlandt Manor, NY 10567  
Tel. (914) 737-5032 Fax. (914) 736-6916  
Website: www.Broadcast-Devices.com

READER SERVICE NO. 202

Buy simplicity,  
reliability and service

## EAS

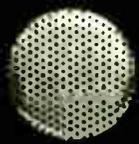
Price \$1750.00

Equipment is in stock for  
immediate delivery!

GORMAN-REDLICH MFG. CO.  
257 W. Union St. Athens, Ohio 45701

Phone 740-593-3150  
FAX 740-592-3898

Now available  
with optional DTMF  
control via a phone line.



- 5 two-way RS-232 inputs/outputs for computer, remote signboard & character generator
- 6 audio inputs on standard models. All audio inputs & outputs are transformer isolated from encoder-decoder board
- Automatic interruption of program audio for unattended operation
- 4 line 40 character LCD display with LED backlighting
- 20 key keypad to program unit, set modulation level, set input levels
- Will handshake with automation equipment
- 2 year warranty
- 2 minutes of digital audio storage
- 25 pin parallel printer port for external printer
- 52 terminals on the rear to interface with other equipment by removable plugs
- BNC fitting with 600ohm balanced audio out for second transmitter

Web Site: [www.gorman-redlich.com](http://www.gorman-redlich.com)

◆ Also available: weather radios, antennas for weather radios, crystal controlled synthesized FM digitally tuned radios, remote signboards, cables for interconnection, character generators.

READER SERVICE NO. 203

## REMEMBER THE CORTANA FOLDED UNIPOLE ANTENNA? WE STILL MAKE IT WITH THE SAME HIGH QUALITY MATERIALS AND WORKMANSHIP. IT FEATURES...

- BROAD BANDWIDTH for better sound,
- GROUNDED ANTENNA for lightning & static electricity,
- ELIMINATES ISOCOUPERS in VHF & UHF antenna lines,
- BEST ANTENNA FOR DIRECTIONAL ARRAYS.

ALSO

DETUNING SYSTEMS FOR ANYTHING THAT DISTORTS YOUR  
AM COVERAGE PATTERN: TOWERS, POWER LINES, TANKS  
OR ANY METAL STRUCTURE.

FOR INFORMATION CALL, FAX OR WRITE:

*nott ltd.*

4001 La Plata Hwy  
Farmington, NM 87401

phone 505-327-5646 fax 505-325-1142

READER SERVICE NO. 204



## Econco REBUILT POWER TUBES



Approximately One Half  
the Cost of New

3,000 Hour Unconditional Guarantee

Call for Our Price List

Econco 1318 Commerce Ave. Woodland, CA 95695  
Phone: 530-662-7553 Fax: 530-666-7760 Telex: 176756  
Toll Free: 800-532-6626 From Canada: 800-848-8841

READER SERVICE NO. 205

## Switcher tools

Designed by broadcast engineers for broadcasters, our audio and digital audio switchers offer excellent sonic quality, removable I/O connections, contact closures and serial remote control capabilities and flexible mounting accessories.



SS 12-4

Active crosspoint switching/routing with 12 stereo inputs and 4 stereo outputs.



10X1

Passive switching/routing with 10 stereo inputs and one stereo output or vice-versa.



SS 8.2

Active crosspoint switching with 8 stereo inputs, 2 stereo plus 2 mono outputs.



8x1 DAS

Routes any one of eight AES/EBU digital inputs to split outputs.



8X2D

Active crosspoint switcher with 8 stereo inputs, 2 stereo and 2 mono outputs



6X1G

Passive switching/routing with 6 stereo inputs and one stereo output, or vice-versa.



3X2B

Active crosspoint switcher with 3 stereo inputs and 2 stereo outputs.



SS 3.1

Passive switching/routing with 3 stereo inputs and one stereo output or vice-versa.



SS 2.1/BNC

Passive switching/routing with 2 composite audio, video, or AES/EBU inputs to 2 composite audio, video, or AES/EBU outputs, or vice-versa.



SS 2.1/TERM

Passive switching/routing with two stereo inputs to one stereo output or vice-versa.

Check out our web site for  
product information, list pricing  
and a list of distributors!

Internet: [www.broadcasttools.com](http://www.broadcasttools.com) E-mail: [bt@broadcasttools.com](mailto:bt@broadcasttools.com)

Voice: 360 . 428 . 6099  
Fax: 360 . 428 . 6719

BROADCAST  
tools inc.

READER SERVICE NO. 206

PRODUCT EVALUATION

# Tiny Texas Console Rides Tall

Alan R. Peterson

My curiosity over the Autogram Mini-Mix 8A began with the company's ad in RW.

I have used Autogram consoles on a few occasions. I remember it for the rotary pot mixers with hefty toggle switches and those big "doorbell" remote start buttons on the front skirt.

Lots of broadcast boards look similar from a distance, but the "doorbells" on the front of older Autogram consoles gave them an identity as distinctive as cowcatchers on steam locomotives.

In the ad, Texas-based Autogram described the Mini-Mix 8A mixer as a broadcast-specific mixer, more useful than musician-style mixers that some stations buy as low-cost alternatives. Given its \$2,499 list price, I had to see what the console had to offer.



DJ Dan Foster at KXEZ(FM) in Farmersville, Texas, with the Mini-Mix 8A

### Big dreams, small bucks

Companies such as Autogram, LPB and ATI fill a niche of cost-effective radio station mixers that sound good.

Not every station can afford or needs a new \$15,000 console or wants to resort to a mini-board with mono inputs. Independent stations and small-market "townie" operations are stuck when the time comes to retire the old Gates Yard or Rockwell-Collins studio console. College

onto the top surface. It is less than 15 inches wide and 5 inches high. No problems here with sight lines between host and guests.

All connections to the 8A are on the back panel, in the form of plug-in, screw-type connectors and RCA jacks. All balanced connections are routed to the A input of each channel and the unbalanced lines feeding the B side, with a black A/B

more confident with inside connections.

Removing four screws under the front edge of the unit allows the console to be tilted open for service. This struck me as awkward, as studio consoles normally are anchored to the tabletop. This means it has to be detached from the tabletop when opening it.

My advice is to lose the screws and anchor the mixer base down to the tabletop anyway. Tilt it open when you need to get in.

The motherboard is attached to the top surface and there is nothing mounted on the bottom plate. At its low price, I

expected a glued-in-for-life soldering job. Surprisingly, all ICs — 5532, TL072 and LF353 op-amps and SSM2122 voltage-controlled amplifiers — are socketed for quick replacement.

All faders are quick-connected Molex plugs, as are several components from the rear panel, making replacement easy.

The 8A boasts a disappointing one-inch cue speaker mounted on the rear panel away from your ears. An output jack also on the rear panel can be used to feed a beefier speaker.

### Doorbell contacts

The classic Autogram "doorbell" buttons are along the front edge of the mixer for remote starts of external equipment. These provide eight or 12 dry contacts to a Sub-D type connector on the back panel. If cart machines or turntables are still used, the jock can have fun with these.

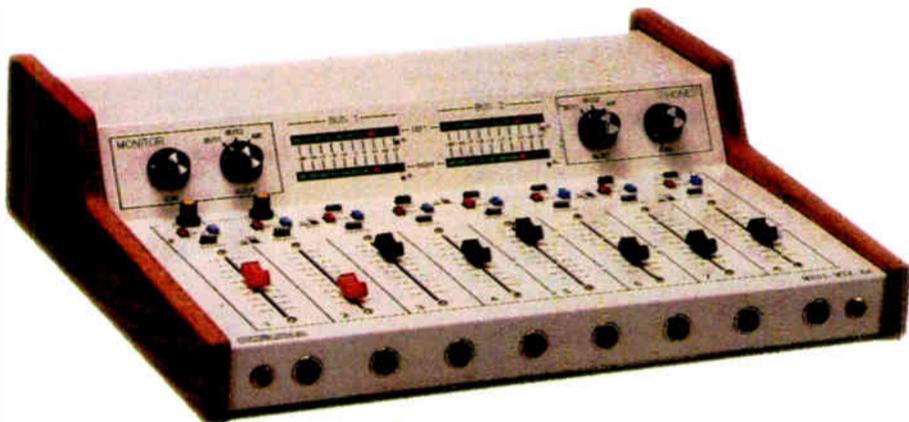
All channels except the ones dedicated for mics make the channel-on buttons double as the cue routers. When the channel is not active, it routes the signal to the cue bus, which may get confusing in practice.

An associate called the buttons "vegetative" buttons, as they are reminiscent of the switch one would see on blenders. These are not high-end Switchcraft models or ITT Schadows and cannot handle hard hits from adrenaline-laced jocks.

Two headphone jacks on the front panel allow for left- and right-handed people to have a choice in where to plug in without getting hung up on headphone cords.

The well-regulated external power supply is too small to rack-mount and lacks the brackets for mounting under the tabletop. Universal rack shelves for

See CONSOLE, page 49 ▶



The Front ...

carrier-current stations often limp along with donated mixers.

The 8A, and its bigger version, the 12A, fit the need for inexpensive broadcast mixers with clean specs and easy installation.

The Mini-Mix 8A is an eight-channel broadcast mixer designed to accommodate both pro-level balanced equipment and unbalanced consumer gear. It is a featherweight 9.5 pounds, running lean

button over each fader for switching.

Purists may claim RCA jacks do not belong on a professional broadcast console, preferring the + and - lines of a balanced input.

Most likely, the stations using the 8A probably have cassette decks and consumer CD players with unbalanced outputs, bought at the local electronics emporium. Also, PC-based digital audio



... and the Back of the Mini-Mix 8A

on features and decoration. It is made for functionality and low-cost operation.

The linear faders have a lightweight feel. Metering is a 10-segment bargraph with LED displays on both program and audition channels, which are called Bus One and Bus Two.

The 8A is finished in a neutral ivory-putty color with control legends screened

coming from a cheap sound card generally is unbalanced.

As long as cable runs are kept short, it is easier to run right into the Autogram 8A with RCA cables than to hook up a twisted-pair line and mess with level trimmers.

The only gripe about the connections on the back panel is that's where all the studio dust, lost CDs and other crud gather. I feel

## Digital Audio Just Got Easier!

12:16:35

On The Air

Time	Cart	Title	Artist	Length	Intro	End	Type
12:13:07	L015	Liner # 2		00:05			LC
12:13:12	M1012	Photograph	Def Leppard	04:54	:22		F MUS
12:18:06	M2174	Friends	Elton John	02:20	:05		C MUS
12:20:26	M1732	Dance The Night	Van Halen	02:47	:13		F MUS
12:23:13	V026	Voice Track 26		00:12			VTK
12:23:25	DALIVE	SPOT SET		03:00			I COM
12:26:25	J011	Jingle / Fast		00:06			Jin
12:26:31	M0713	Listen To Her Heart	Tom Petty	02:48	:11		C MUS
12:29:19	V027	Voice Track 27		00:15			VTK
12:29:34	M2214	Black Friday	Steely Dan	03:40	:12		F MUS
12:33:14	M0015	All Day Music	War	04:04	:19		F MUS
12:37:18	L015	Liner # 15		00:15			LC

00:03:23

# CartWorks

Digital Audio Systems

For information call: 1-800-795-7234 Or visit us on the web: [www.cartworks.com](http://www.cartworks.com)

## PRODUCT EVALUATION

# SM7A: The Changes Are Internal

Paul Kaminski

Dollars vs. bandwidth is the classic question that broadcasters face when upgrading facilities.

This is just one of the test criteria I used when Shure sent its top-of-the-line dynamic announce microphone, the SM7A, for a test at the Motor Sports Radio studios. I wanted to find out if changing microphones would make a significant difference in the studio sound, and if it would help get rid of hum from a

The SM7A is a dynamic microphone, with an integral foam windscreen and air-suspension shock mount. Though the appearance is unchanged from the SM7, the internal workings and specifications are improved.

The frequency response is 50 Hz to 20 kHz, though this only reflects a change in the spec writing. The mic has the same cartridge as the previous model utilizing an alnico magnet.

The output is still -57 dB, which might be a stretch for a less-than-adequate pre-

er cardioid microphones.

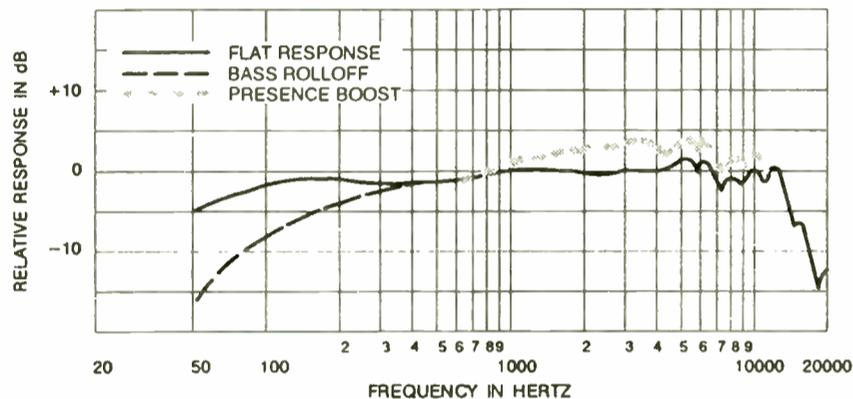
As on the original SM7, the SM7A has two switches on the rear of the mic body to control bass roll-off and presence boost. It has a panel to cover the switches, perhaps to discourage "tinkeritis." After re-setting the EQ on the board, I activated the presence-boost that kicks in around 600 Hz.

The SM7A helped to solve a nagging problem with interference from a computer monitor screen.

In smaller studios, monitor screens may be in close proximity to mics. This increases the likelihood that induced hum will enter the audio chain and be amplified to an objectionable level.

The SM7A has improved humbucking

## Frequency Response 50 to 20,000 Hz



computer monitor. I also wanted to see if it would tip over a mic boom or stand.

My first experience with the original SM7 came when I was news director for the Armed Forces Desert Network in 1991. An omni microphone was mounted in the studio along with a Shure SM7 for recording newscasts.

I made a command decision to replace the announce microphone with the SM7. Even to my relatively untrained ears, I could discern an improvement in voiceovers for our newscast. Given my voice range, from high bass to low baritone, the results were impressive.

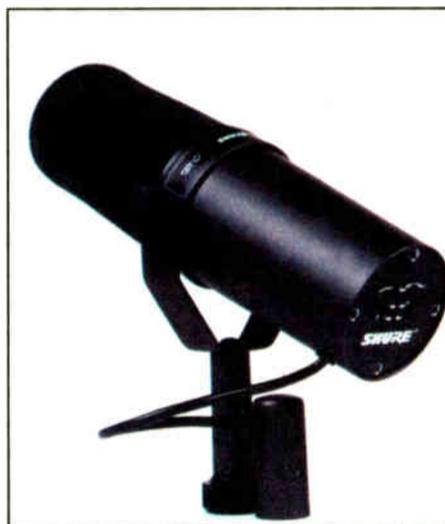
The difference between the 40 Hz to 16 kHz response of the SM7 and the 80 Hz to 13 kHz response of the omni mic was quite noticeable.

amp. I cranked up the preamp on a Mackie 1202 VLZ mixer and, after setting a reference level, got a consistent, solid signal.

Jack Kontney, PR manager at Shure, responded to the low mic output. He said, "I can't recall hearing of a pro broadcast or home recording operation for which the SM7/SM7A did not provide adequate output. On the other hand, there are stories of high-output neodymium mics overdriving boards with limited input range."

Some engineers might assert that only a dog can hear over 16 kHz. Even so, my voice tracks during the testing time with the mic seemed to be brighter and fuller than in the past.

The SM7A seems to have a wide sweet spot. I could work with it somewhat close and it would be less likely to pop than oth-



Though its appearance is unchanged, the internal workings and specifications of the SM7A are improved.

(canceling) coil, reducing the mic's propensity to pick up hum. The mic was tested with a regular mic cable, a USA-2, and the "field" cable, an 1804 Belden star quad. The mic itself made the most difference.

With the regular mic cable, the hum was significantly lower, though still audible. With the star quad cable, the hum was attenuated to the point where it was heard only after a few seconds of silence.

The SM7A weighs 1 lb., 11 oz., but mounting the mic was relatively simple.

### Product Capsule: Shure SM7A



#### Thumbs Up

- ✓ Extended, smooth frequency response
- ✓ Rejects hum from computer monitors
- ✓ Built-in shock mount and windscreen
- ✓ Reasonable price/performance ratio



#### Thumbs Down

- ✓ Low mic output

For more information contact the company in Illinois at (800) 257-4823, visit the Web site at [www.shure.com](http://www.shure.com) or circle **Reader Service 225**.

Larger facilities with mic boom arms should not find problems installing it. With the internal shock mount, elastic band-style shock isolators will not break at inopportune times.

The SM7A, like all Shure products, comes with a multi-lingual specification sheet that is helpful to the facility engineer. The specification I like most is the reduced list price, which is \$584.50.

In my application, a talk-intensive small studio that masters to MD or a PC workstation, the mic performed as advertised.

The literature from Shure suggests choices for certain broadcast applications, with the SM58 series suggested as an entry-level broadcast announce mic, and the SM7 series as the top-of-line in its dynamic announce mic category.

To be fair, I cannot compare the SM7A to an SM58. I would not take an SM7A in the field.

Given the inherent differences between dynamic and condenser mics, the SM7A likely would not have the same tonal quality as a large-diaphragm condenser mic when recording music. That doesn't make the SM7A a bad microphone, because tonal quality is purely subjective. It is still a good vocal announce mic.

When you are comparing dollars vs. bandwidth of a microphone, factored in with simplicity and uniformity of sound, the SM7A makes the short list.

## ALTRONIC RESEARCH INC.

Performance By Design



MANUFACTURER  
OF RF COAXIAL LOAD RESISTORS.

DUMMY LOADS FROM 1 KW TO 1500KW,  
AVAILABLE IN AIR, WATER OR SELF  
CONTAINED HEAT EXCHANGERS.

HIGH POWER NON-REACTIVE CERMET  
RESISTORS FROM 1 OHM TO 20 MEGOHMS.



ALTRONIC RESEARCH INC.

P.O. Box 249 • Yellville, Arkansas 72687 870-449-4093 • Fax: 870-449-6000  
E-mail: [altronic@mtnhome.com](mailto:altronic@mtnhome.com) Web Site: <http://www.altronic.com>



# Stuck in a Time Warp?

Move into the 21st century with a new console from Arrakis



**BSW**  
BROADCAST SUPPLY WORLDWIDE

Advantage Partner

*Let BSW Work To Your Advantage When You Buy Arrakis.*

BSW's extensive Arrakis inventory    BSW's convenient parts fulfillment

BSW's factory-certified sales representatives    BSW's priority factory support

Circle (152) On Reader Service Card

A lot has changed since the '50s (or the '80s).

You've replaced reel-to-reels, turntables and carts with new digital equipment.

With technology improving so dramatically around you, how can you expect your old console to keep up? A new console from Arrakis will improve your station's quality while acting as the control center to handle all your modern studio equipment. With three analog console series and a brand new

digital console line, Arrakis sets the standard worldwide for performance and value. Now is the time to replace your old on-air console.

Call BSW today **1 · 800 · 426 · 8434**

**BSW**  
BROADCAST SUPPLY WORLDWIDE

# ◆ PRODUCT GUIDE ◆

## Products for Radio Production

Mail info and photos to: RW Product Guide, P.O. Box 1214, Falls Church, VA 22041

### ASI4332 Card Includes Mixer

AudioScience Inc. offers the ASI4332 digital audio adapter. This card, which retails for \$1,595, contains a mixing console on-board.

One card can handle three balanced inputs and four playback streams that are mixed to a balanced stereo output. A second balanced out can play one of the four streams. One stereo record stream can be sourced from one of the inputs.

By specifying start and end gain with duration, the card is able to auto-fade volumes. Automation is done in the firmware.

The Channel Mode control allows

a mono input to be configured for stereo or to swap left and right channels.

Analog I/Os are software selectable between -10 and +20 dBu. It has eight MB of RAM. Up to four cards can be installed.

It was designed for radio automation systems to handle live announcers and feeds while handling playing and record-

ing of the streams.

ASI also makes the ASI4334, which has four balanced outs, for \$1,995.

For more information, contact the company in Delaware at (302) 324-5333, visit the Web site at [www.audioscience.com](http://www.audioscience.com), or circle **Readers Service 112**.

Programs can be downloaded at [www.syntrillium.com/cooledit](http://www.syntrillium.com/cooledit). Information is available from the company in Arizona at (888) 941-7100, or by circling **Reader Service 171**.

### Scott Studios Uses Sound Forge

Digital audio software manufacturer Sonic Foundry announced a relationship with Scott Studios, manufacturer of digital air studio systems.

Scott Studios is using Sound Forge 4.5 digital audio editing environment as the editing platform for its digital audio recorder-players.

Scott's technical requirement included an interface capable of incorporating personalized content in on-air programming. Sonic Foundry modified its software to support the *scott.wav* storage format.

According to Jim Latimer, national sales manager for Sonic Foundry, "The adoption of the Scott format within Sound Forge increases Sonic Foundry's presence in the broadcast industry."

Scott Studios also plans to integrate Sonic Foundry's Vegas Pro.

For more information, contact Scott Studios in Texas at (800) SCOTT-77, visit [www.scott-studios.com](http://www.scott-studios.com) or circle **Reader Service 153**.

### Cool Edit 2000 for \$69

Syntrillium Software is out with Cool Edit 2000, which carries a price tag of \$69. It is the next generation of the popular audio recorder, editor and effects processor, for Windows 9X, Windows 2000 and Windows NT.

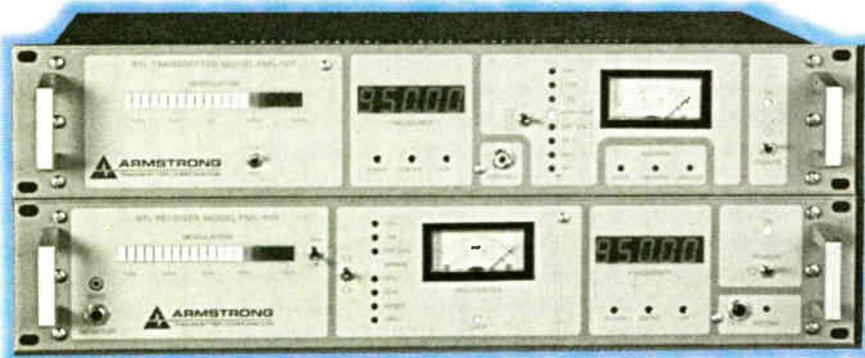
It includes more than 20 DSP effects, MP3 import/export as well as 23 other file formats and 24/96 record/playback capabilities.

For \$49, Audio Cleanup Plug-In adds click and pop elimination feature to CE2k. Included is a clip restoration feature that removes distortion from sound files recorded at too high a level.

The studio plug-in option for \$49 turns CE2k into a four-track mixing studio. It has mixing features like mute/solo/record switching on each track, punch-in with support for multi-takes and more.



## Frequency Agile STL Systems



▲ If you are looking to deliver clean, crisp audio to your transmitter via microwave, Armstrong FML-10 STL system offers unsurpassed audio purity in a rock-solid, feature-packed package.

▲ Built to tough manufacturing standards throughout, FML-10 system features microprocessor controllers, advanced PLL circuitry, ultra linear VCO and front panel frequency programmability with digital frequency readout.

▲ Currently in service at over 300 stations in 21 countries, this field proven design is a "rock-solid" STL choice for any station.

**Complete System Under \$5500.00**  
**Same Day Shipping**  
**30 Day Money Back Guarantee**



**ARMSTRONG**  
 TRANSMITTER CORPORATION

4835 N. Street • Marcellus, NY 13108 • PH: 315/673-1269 • Fax: 315/673-9972  
 E-mail: [info@armstrongtx.com](mailto:info@armstrongtx.com) • [www.armstrongtx.com](http://www.armstrongtx.com)

### Fast Edit Upgrade

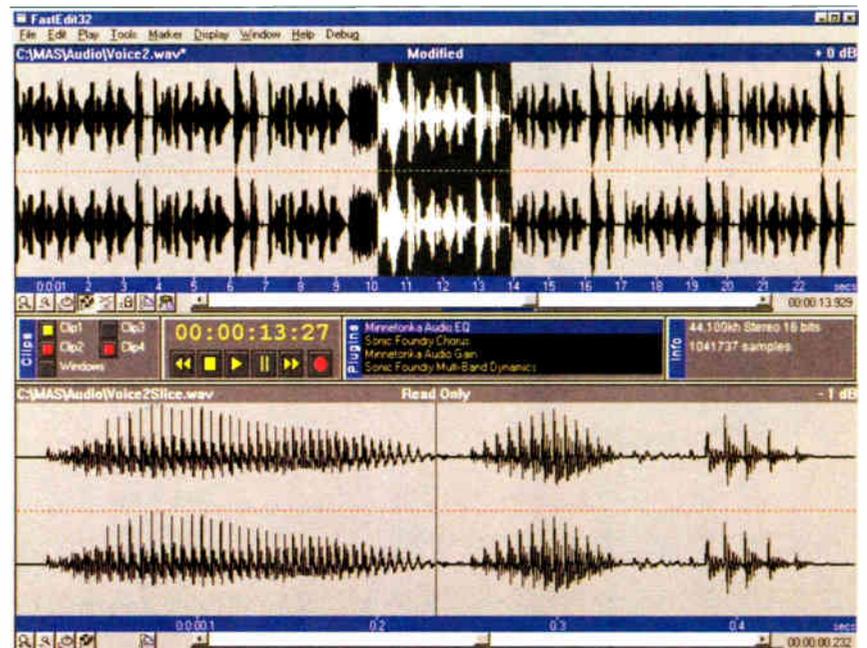
Minnetonka Audio Software has upgraded its Fast Edit to V4.0. It retails for \$199; upgrades for existing users are available for \$99.

The software now is a 32-bit, 96-kHz Windows application that can accept Direct-X plug-ins. It also includes two bonus programs.

The Sound Catalog is an interface for a real-time sound effects library. It allows users to create labeled boxes of soundfiles, so sound can be played by a click of the mouse.

The Playlist Editor builds libraries of sound segments. It can place the segments in a playlist for sequential playing. It has a "play 1" feature to play sound segments one at a time, which is useful for on-air assists. It also has a Region Library and Region Editor to make any edited segment of a soundfile an item on the playlist.

For more information, call the company in Minnesota at (612) 449-6481, visit the Web site at [www.minnetonkaaudio.com](http://www.minnetonkaaudio.com) or circle **Reader Service 93**.



# New Studio Products From Tascam

*Studio Product Supplier Tascam has Made Several Product Announcements Recently*

## Hard-Disk Recorder

The company has rolled out its MX-2424 digital hard-disk audio recorder. It's a 24-track, 24-bit random access recorder, player and editor with a base price of \$3,999.

This unit is the first in a line of products co-developed with TimeLine Vista, branded as "Tascam by TimeLine."

The unit comes with a built-in 9-Gigabyte hard drive and two channels of AES and S/PDIF digital I/O.

The buyer chooses between the 24-channel digital I/O, either Tascam TDIF, ADAT Optical or AES/EBU; or an analog I/O with 24 channels of 24-bit 48/44.1 kHz audio and 12 channels of 24-bit 96 kHz audio.

TimeLine also created ViewNet, a graphical interface that allows editing and setup of parameters. The program was written using Java so it runs on both Mac and PC. An internal drive bay and external SCSI port are provided for backup.

Up to 32 units can be linked.

On-board metering for all channels and editing capabilities is included standard.

The units will start shipping in early March.

## MDM

Tascam also introduced the DA-78HR eight-track recorder/player. It offers 24-bit resolution and has a price of \$3,199.

The ASIC IC allows for backward



Tascam DA-78HR  
High-Resolution DTRS

compatibility with older 16-bit machines.

The unit features a built-in 8 x 2 mixer that adjusts volume and pan. It can be accessed by MIDI or from the front panel of the recorder. Mixes can be routed to two tracks of the tape or S/PDIF interface.

It is compatible with all DA-98, DA-88 and DA-38 models, and up to 16 units can be locked.

## Semi-Pro Product News

Meanwhile, Tascam recently lowered the price on the TM-D1000 eight-channel digital mixer to a retail price of \$499.

Tascam also upgraded some of its semi-pro line, starting with the MD-301MkII rackmount MiniDisc for \$499. It has XLR and RCA I/Os with a digital input on the front, a PS/2 connector for a keyboard, and a wireless remote.

Features include a sampling monitor function, auto track function for instantaneous recording, timer record/play, program and repeat play. It also has divide, combine, erase, move and title editing features.

Tascam has also introduced the CD-A700 CD player and cassette deck for \$649. It has both XLR/RCA I/O with a digital S/PDIF out for the CD player only, as well as a D-sub 15 pin for control. The CD and cassette operate independently of each other.



Tascam CD-A700

The unit features CD-cassette continuous play, and a 12-percent pitch control for both. It also has play tally for professional consoles, as well as a list of other programmable features.

Last, Tascam has just released the CD-302 dual-well CD player with remote control, aimed at the professional DJ market for \$1,350. The two drives operate independently.

The most unique feature is the Tempo/Sync feature that analyzes tempo and downbeats of two different CDs, allowing for flawless cross-fades.

It also has a 10-second RAM buffer in the control module for anti-shock, instant start and looping and sampling of at least eight

seconds.

For more information call Tascam in California at (323) 726-0303, visit the Web site at [www.tascam.com](http://www.tascam.com) or circle Reader Service 250.

**Listen Closely**

Success depends on how well you listen. And how good you sound. For over a decade the designing minds at AudioScience have been responsible for more digital audio adapter innovation than anyone else in the business. So Listen Loud. Listen Clear. And demand digital audio peripherals from AudioScience. Call 302-324-5333 or visit [www.audioscience.com](http://www.audioscience.com).

**AUDIOSCIENCE**  
Sound Engineering  
Sonic Excellence

## PRODUCT EVALUATION

# Compressor Has Unique Sound

Loren Alldrin

One of the newest and least expensive Joemeek units is the C2 stereo compressor, retailing at \$399.

A few years back, no one had heard of Joemeek products. Today, with a line consisting of a dozen models, it seems green-faced processors are turning up everywhere.

The C2 is a half-rack compressor that can be rackmounted with an optional kit. It has the characteristic look and feel of the Joemeek line, right down to the blinding blue compression-on LED.

All controls are located on the front panel. The back panel houses balanced stereo inputs and outputs on 1/4-inch jacks, powered by a wallwart-style transformer.

## Signal flow

Controls include input and output level, compression on/off switch, compression level, attack time and release time. A four-segment LED meter shows gain reduction after

always working, regardless of the switch setting.

The C2 drops system gain when bypassing the compressor, so flipping this switch does not always cause a large shift in level.

Next is the C2's compression level control, which approximates a threshold control, though the actual threshold is hard to define due to the way the photo-optical control element works. Depending on the attack time setting, this knob usually stays



Joemeek's Lean, Green, Compressing Machine

in the top half of its travel to get enough compression with most signals.

Attack and release time controls offer a range of 1 ms to 11 ms and 250 ms to 3

seconds, respectively.

Acoustic guitar and bass sound great through it as well. Though not my first choice for vocals, the C2 put in a good showing on both male and female vocals. Even at moderate compression levels, there was a slight dulling that crept in, along with the added thickness and increased sense of presence.

It adds a touch of attitude to most signals, making them a little chunkier and thicker-sounding. It is a definite improvement for some sounds and a step backward for others.

In most cases, I liked what the C2 added to the sound. It is the stuff for guitars, especially electric. Distorted guitar tones pick up a nice aggressive thickness.

**It adds a touch of attitude to most signals, making them a little chunkier and thicker-sounding.**

compression, with indicators at -2, -4, -8 and -16 dB. An eight-segment meter tracks input level with a peak LED at the top.

The input gain control varies from complete attenuation to 20 dB of gain. This lets the user boost the signal, which may be necessary to get adequate compression with some signals.

According to the manual, the input level control also has some effect on compression ratio, as does program content and level. Compression ratios range from 2:1 to 14:1, though it is simply labeled from 1 to 11.

The compression on/off switch does not function like a true bypass. Instead, the unit's input and output gain controls are

seconds, respectively.

The C2 uses an interesting method to compress the signal, splitting it through a sum/difference matrix before compression. Basically, it applies gain reduction to the mono and stereo or difference elements independently. After compression, the signals are converted back to a normal stereo signal.

It is impossible for the C2 to induce any stereo shift due to uneven gain reduction, hence improving the image stability of the compressed stereo signal. For mono signals, the MS processing offers no benefits.

The C2 delivered a sound similar to that of other Joemeek compressors. Like the other green-faced models, the C2

## Difficult to dial

I found the C2 least adept on full mixes. It was difficult to dial in settings that punched up the energy without audible compression artifacts. To its credit, the C2 did maintain a rock-solid stereo image even during severe compression.

The C2's gain arrangement may take some getting used to. The input gain has to be driven pretty hard to get adequate compression with some signals, and there is not a makeup gain control.

Instead, the output level knob changes the gain regardless of whether the compression is on or off. In spite of the automatic makeup gain circuit, certain control settings cause a pronounced change in levels when the compression-on button is pushed.

Many times, the compressed signal was louder than the uncompressed signal. Using that last knob for makeup gain would have been a better scheme.

Due to its optical control element, the C2 does not offer ultrafast attack times,

## Product Capsule: Joemeek C2 Stereo Compressor

### Thumbs Up

- ✓ Thick, aggressive sound
- ✓ Simple operation
- ✓ Low cost

### Thumbs Down

- ✓ Hit-and-miss makeup gain scheme
- ✓ Input level meter is post-compression
- ✓ One knob (ratio) from perfection.

For more information contact the company in California at (877) 563-6335; check out the Web site at [www.joemeek.com](http://www.joemeek.com) or circle Reader Service 121.

but it still reacts plenty fast to reduce the attack of a strummed guitar or take the edge off a snare drum.

The attack time control shows a range from 1 ms to 11 ms, but my ears hear a slower attack than 11 ms at the top of the control's range. Likewise, the fastest release time sounds considerably faster than the labeled 250 ms.

All this points back to the C2's nonlinear, quirky optical circuitry and its program-dependent nature. Call it sloppy or character — you will like what you hear.

On some signals, the C2's effects are audible long before the first 2 dB gain reduction indicator lights. Though a 1 dB gain reduction indicator would be useless on most compressors, I found myself wishing the C2 had one. With best-guess knob legends, it is a processor that forces you to trust your ears more than your eyes.

The only real glitch I found with it was the level meter. This meter is supposed to read input level, but it changes in response to gain reduction. It's as if the meter is tapping the signal post-compressor instead of the input.

Finally, while I understand leaving a ratio knob off reduces the C2's cost and makes it easier to use, when compressing certain signals, I yearned for independent ratio and threshold controls. I wish there was some way to add that crucial control without raising the cost.

Joemeek's affordable stereo compressor delivers thick, aggressive character, good control and a few quirks of its own. The old-fashioned optical technology used places it in rare company.

Engineers wanting a fat-and-sassy stereo compressor at an appealing low price will definitely want to give the Joemeek C2 a close listen.

■■■

Loren Alldrin is project studio editor for RW's sister publication *Pro Audio Review*, and author of "The Home Studio Guide to Microphones."

**AS-101 Audio Switcher**

10 Stereo In - 1 Stereo Out

- Illuminated and legendable control buttons
- Instant or overlap switching
- Front panel accessible level controls
- Options include: RS-232 interface, remote control, relay-follow-switch outputs
- Network proven quality and reliability

P.O. Box 1342 Bellingham, WA 98227  
1-800-645-1061 FAX (206) 676-4822

**Conex Electro-Systems, Inc.**

**Readers  
Forum  
is now  
found on  
page 62.**

# Keeler Creates KTCL(FM) Sound

► KTCL, continued from page 39 which are all tied together digitally. Our chief engineer is Jack Lambiot," said Keeler.

## KTCL.com

"To get a good idea of what our station is like, go to the Web site KTCL.com," said Keeler. Upon visiting the site, surfers are accosted by blinking, flashing, wiggling, jumping and interactive areas. The Web site, called "Adventure for Your Ears," is another responsibility of Keeler's.

Kathleen Valentine and F Poff help with the page that features special mixes of songs not heard on the station.

"It features B-sides and other songs not heard on KTCL," said Keeler. "It's like having a separate college station."

The visitor also gets new artist profiles, a newsletter, members-only features, freebies, streaming audio, contests and advertiser links.

Five people help Keeler in the programming department. "We all multi-task," said Keeler.

He started at KBPI(FM) in Denver before landing at KTCL six months ago. "Joe Simon handles commercial production for all Clear Channel stations in the area, which was my old job."

The Clear Channel complex uses Orban Audicy digital workstations in the production studios. Each studio can share sound bites from the AM news facility, network news feeds, effects and commercials, and is capable of going on the air.

"We have the capability to voice-track shows and do production for other markets from here, which will be happening soon," said Keeler.

"I also use Cool Edit Pro at home and here. It's Windows-based and quick, and has a million effects. I use the factory presets and create my own settings. I love the stereo phase and built-in EQ features. It also has the

best 'telephone voice' setting I've heard."

Keeler has three computers in his production room. The first is an Audicy

Keeler often will send an intern with scripts for the bands to read, and the bands usually comply.

"You need to have some empathy for

from a song and try to make my voice sound like the artist. I sing the benchmarks and make them part of the music," Keeler said.

Within the alternative format, new music is the core of the station's identity.

"Alternative artists are not trying to be pop stars. They don't come out of a cookie cutter, and they're not Britney Spears, but fans are important to them," Keeler said.

The air personalities talk about it, listener calls respond to it, station events are wrapped around it, and Roger Keeler makes it his mission to use his promos to tie the music and the listeners together.



Clear Channel's Denver Complex

workstation; the second is a Prophet Systems Innovations Audio Wizard system for delivery of audio to the various studios; and the third is used for e-mail, Cool Edit Pro and for downloading sound bites and effects.

## Collecting audio

Keeler tapes many interviews with bands when they come through Denver. This audio ends up on the KTCL Web page and on station imaging promos.

"I go out or sometimes send an intern out, with a portable Sony MiniDisc," said Keeler.

"I have a hundred generic artist promos, but we try to get every band to say '93.3 KTCL' whenever we can. We also try to get them to say our station's benchmarks such as 'Free CD Friday' and 'Music First.'"

them. Even artists who are stressed out are cooperative. You make a joke and get them to laugh. I try to key in on what's important to them and remember to thank them," Keeler said.

He likes to maintain audience involvement by putting as many listeners on the air as possible. Keeler said, "We use lots of listener audio. At concerts or wherever, we put a mic in someone's face and ask them to talk about the music or our station. We try to keep them excited and use the best comments on the air."

He likes quotes about the artists, but it's better when the listener also says how much he or she loves the station.

Keeler uses the KTCL production facilities to create his own song parodies. "My voice sucks, but it's cool! I loop together an instrumental phrase

## KTCL's All-Digital Production Equipment

(10) Orban Audicy digital workstations

Syntrillium Software Cool Edit Pro

Prophet Systems Innovations Audio Wizard system

DGS system for digital audio delivery

Sony MDS-B5 MiniDisc

Klotz VadisDC and Spherion digital consoles

AudioMetrics 2001 CD Players

Various DAT machines

360 Short/cut inside the air studio



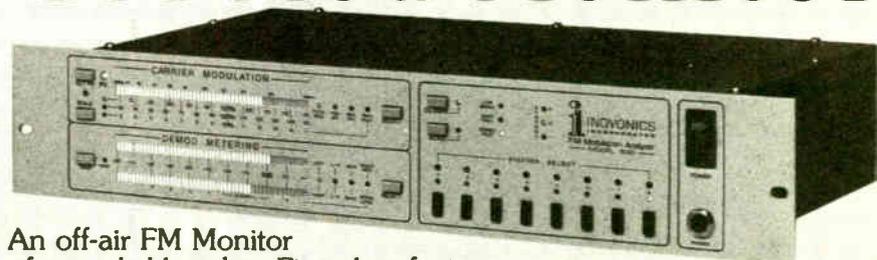
You can measure

with the best monitor and the most accurate test set.

The FMM-2/FMS-2 series monitors provide an even greater degree of precision measurement than ever before... You can measure S/N below 90 dB, You can measure crosstalk below 85 dB, You can measure separations of better than 70 dB, You can measure frequency response to better than 0.25 dB, You can measure distortions to lower than 0.01%, and much more... Our uncluttered panels and autoranging voltmeters make these measurements a dream.

**BELAR** www.belar.com (610) 687-5550  
ELECTRONICS LABORATORY, INC.  
LANCASTER AVENUE AT DORSET, DEVON, PENNSYLVANIA 19333  
Call or write for more information on Belar AM, FM, Stereo, SCA and TV monitors.

## A Best-Value FM Mod-Monitor



An off-air FM Monitor of remarkable value. First-class features and outstanding performance have made the Model 530 a favorite the world over. Check these product highlights:

- Accurate, high-resolution bargraph metering of carrier deviation and demodulated program audio; pilot, subcarrier and residuals. Meter also displays signal strength and multipath distortion to aid antenna alignment.
- Pushbutton tuning with 8 station presets for "comparative market evaluations."
- Rear-panel outputs for composite MPX and balanced program audio; plus remote peak flasher, carrier-loss and program-loss alarms.

MODEL 530 FM MODULATION MONITOR

**Inovonics, Inc.**

1305 Fair Ave., Santa Cruz, CA 95060 USA  
TEL: (408) 458-0552 • FAX: (408) 458-0554

www.inovon.com



# Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No.(s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

## S.C.M.S., Inc. Charlotte, N.C.

Low Prices – Experienced Staff  
New and Re-built R.F. and Audio

### THIS MONTH'S SPECIAL

**\$100 TRADE-IN FOR ANY HYBRID  
TOWARD A GENTNER DH-30.  
SALE PRICED AT \$1,665.00**

- 24 BIT DSP
- 3 BAND EQ
- ANALOG/DIGITAL I/O
- ECHO CANCELLATION
- AUTO MIX-MINUS
- ADJUSTABLE COMPRESSOR/EXPANDER

You Know We Know Radio —  
Toll-Free 800-438-6040  
FAX 704-889-4540

READER SERVICE NO. 214

## PTBK

500W FM POWER AMPLIFIERS

# \$2,950

to end of 1999  
only



- ★ FM500 500W Out, 10w drive Power Amplifier
- ★ 2 year warranty
- ★ Made in USA
- ★ Over 100 currently in use in USA

**CALL 888-411-5174**



1814 SCHOOLDALE DRIVE, SAN JOSE, CA 95124. 408-448-3342 FAX 408-448-5951

READER SERVICE NO. 208

## Excalibur Electronics CDA-1

Composite Distribution Amplifier



This 1 in, 3 out distribution amplifier allows you to distribute stereo composite and/or subcarrier signals as easily as audio.

- ◆ DC-100 kHz frequency response
- ◆ 90 dB signal/noise ratio
- ◆ +6 dB to -20 dB gain range
- ◆ Individual 20-turn output trimmers
- ◆ 1 3/4" rack mount enclosure

EXCALIBUR ELECTRONICS, INC., CHANTILLY, VIRGINIA  
Please circle our bingo number for a data sheet and a dealer list.

READER SERVICE NO. 209

## CABLE X-PERTS, INC

HELIAX® LDF series coaxial cable from

### ANDREW

- Premium electrical performance
- Excellent RF shielding.
- 50 Ohm Impedance.
- Low Loss Foam Dielectric.
- Easy to install connectors.
- Cable cut to your specific length.
- Complete product line stocked.
- Related products too.



800-828-3340 \* Fax 847-520-3444  
<http://www.cablexperts.com>  
416 Diens Drive Wheeling, IL 60090



READER SERVICE NO. 210

## The New Standard in Systems Integration

# RDA Systems

Technical Leadership in  
an Industry of Change

Call: (888) 616-7980 In Missouri: (314) 872-8222  
<http://www.rdasystems.com>

READER SERVICE NO. 211

Time to "re-tube"  
the transmitter?



Order your next rebuilt  
transmitter tube  
from

## Freeland Products, Inc.

"Over half a century of quality rebuilt power tubes  
and U.H.F. - TV Klystrons"

75412 Highway 25 - Covington, LA 70435 - U.S.A.  
800-624-7626 504-893-1243 Fax 504-892-7323  
[www.freeland-inc.com](http://www.freeland-inc.com)  
Email [freeland-inc.com@freeland-inc.com](mailto:freeland-inc.com@freeland-inc.com)

READER SERVICE NO. 212

**OUTSTANDING** Outstanding specifications and pricing on professional quality AF210 FM receivers designed for the most demanding sensitivity, low distortion and signal to noise requirements, such as FM relay (translator) service, SCA monitoring, data and paging services. Stereo, SCA and RDS demodulators are provided in the AF210 design.



AF210 FM Stereo, SCA, RDS \$549.95

The Model AF210 is single channel with internal switch selectable PLL (synthesized) tuning. Features include wide and narrow band AGC, carrier detection relay, LED indicators, composite, SCA, RDS and Stereo outputs.

Designed and Manufactured in the USA

**DAYTON INDUSTRIAL CORPORATION**

2237 Industrial Blvd., Sarasota, FL 34234 Tel. (941) 351-4454  
Email: [SCARadio@aol.com](mailto:SCARadio@aol.com) WebSite: [www.DaytonIndustrial.com](http://www.DaytonIndustrial.com)

READER SERVICE NO. 213

## THE COST EFFECTIVE ALTERNATIVE TO MANUFACTURER SERVICE

**SERVICE, REPAIR &  
CALIBRATION**

- STL's • RPU's • TSL's
- Exciters • Optimods
- AM/FM Monitors
- Remote Control Systems

**SPECIALIZING IN  
EQUIPMENT BY**

- Belar • Marti
- Moseley
- McMartin
- TFT
- And others...

**WE ALSO PROVIDE**

Free, over-the-phone technical assistance  
STL loaner/rentals  
PCL 505 Certification



2198 Hubbard Lane, Grants Pass, OR 97527

**(541) 471-2262**

READER SERVICE NO. 207

# Little 8A: Affordable Solution

► CONSOLE, continued from page 41  
attaching the power supply are available readily. Just remember to keep the power supply within eight feet of the console.

I never know how long the screening on the panel will last, as I discovered on two mixer brands I have used. Within four months, simple thumb friction wore the finish down to the bare metal on several input strips.

I did not have the 8A long enough to rub through the finish, but I do not want to find out how long it might take.

### Ruminations

This is a light-duty console. It is not the mixer the maniacal slam-bang morning jock should use. It would be perfect tied to the live-assist system, as a newsroom mixer or in a backup

**Product Capsule:**  
**Autogram**  
**Mini-Mix 8A Console**

**Thumbs Up**

- ✓ Cost-effective mixer
- ✓ Built-in unbalanced inputs
- ✓ Lean and clean PC board construction

**Thumbs Down**

- ✓ Light overall construction
- ✓ Exposed back-panel connections
- ✓ Don't know where to put the power supply

For more information contact Autogram in Texas at (972) 424-8585, check out the Web site at [www.autogramcorp.com](http://www.autogramcorp.com) or circle **Reader Service 199**

production room.

There are still a number of small, local radio stations broadcasting out of strip malls and old houses that would love one or more of these mixers.

Another possibility is it might be just what is needed for an Internet Webcaster or low-power FM station, should the latter proposal actually go through. The 8A is an alternative to DJ "disco" mixers and musician-styled mini-mixers.

The only changes I'd propose are to make the channel buttons more substantial, rack-mount the power supply and put a protective spray coating over the paint job.

Everything else is good. The cost is right, and, lacking the stout feel of older Autograms, is dependable.

There might be a temptation to spend the same \$2,500 on a used console. For that money, you will not get a factory warranty and will probably inherit somebody else's headaches.

If you don't employ ham-fisted DJs, call Autogram for the brochure on the 8A or 12A mixers.



Alan Peterson is manager of technical systems at Fairfax Public Access Corp. in Fairfax, Va., and a technical adviser to RW. He can be reached at [alanpeterson@earthlink.net](mailto:alanpeterson@earthlink.net)

PRODUCT GUIDE

Copy Tower for CDs

Discmatic introduced its Tigereye series of tower duplicators. With up to 16 8x CD-R drives, the system can copy up to 96 full CDs per hour.

The Tigereye 800 lists for \$2,585-and can support up to eight 8x writers. It is expandable to support one slave unit, holding eight more drives, that lists for \$1,465. The Tigereye 1600 lists for \$3,495 and supports up to 16 8x writers in one unit. CD-R and RW writers are not included, but most are supported.

It is a standalone system without a PC required. Data is stored in a 4 GB hard drive, and it has a space for an input CD-ROM drive.

For more information call Discmatic in New York at (800) 422-6707, visit the Web site at [www.discmatic.com](http://www.discmatic.com), or circle **Reader Service 62**.



**THE FUTURE DOESN'T TAP YOU ON THE SHOULDER,  
IT HITS YOU RIGHT BETWEEN THE EYES.**

Consider this a wake up call from your friends at NAB2000. Because in the electronic media communications industry, by the time you learn of a new way to create or deliver content, someone else is already capitalizing on that technology. And where do those fortunate pioneers go to get their insider information? NAB2000 where you can join them this April and go face-to-face with the future.

Register at [www.nab.org/conventions](http://www.nab.org/conventions), or call 888-740-4622 or +1-301-682-7962.

April 8-13, 2000 • Exhibits April 10-13 • Las Vegas, Nevada USA



# A Platform That's Twice as Wide

► WIN2K, continued from page 39

Such technical superiority comes with a few tradeoffs. For the average user interested more in ease of installation and operation, NT seems more like a step backward than forward.

## For the pros

NT is intended for the professional market and so it lacks some of the amenities consumers expect. It has to be set up manually. The automatic configuration features in Windows 9x are missing. Wandering through the maze of settings, interrupts and drivers can be daunting.

The payoff is a faster and more-stable

system. Once it is up and running, NT seldom crashes.

What Win2k adds to NT are Plug-and-Play (PnP) amenities plus additional enhancements to improve audio performance.

Tilman Herberger, lead developer for Samplitude and part owner of Sek'd,

is a mixed blessing.

"It's hard to determine whether PnP in 2000 will be a benefit or a curse. In Win 95/98, the more devices that are there, the more that PnP cannot handle the configuration successfully. In NT, the users need to know more about the devices, motherboard, system, drivers, etc. But it means

**Win2k moves the audio real-time support into the 'kernel mode' of the driver, which makes processing as quick as the processor.**

said, "It combines the best of both worlds — Win98 and NT."

Jeff Giedt, vice president of sales and support at SADIe, also sees this as a major incentive to adopt Win2k.

He said, "One of the real advantages from SADIe customers' perspective is that it will provide true PnP drivers to ease installation. Our customers have grown used to PnP from our support of Win 98 and it will be good to offer the same facilities on an NT platform."

Chris Wright, technical director for Soundscape Digital Technology, thinks it

that you determine how to configure the computer properly."

How Microsoft manages to work out past inadequacies in Win2k remains to be seen. For users in pro audio, the issue is what happens after the setup and getting to work.

## Out with the latency

Some software developers believe the audio enhancements in Win2k are compelling enough to upgrade or switch to it. In particular, the greatest drawback to the Windows platform is latency. This laten-



Microsoft  
**Windows 2000**  
**Professional**  
with NT Technology  
The Reliable Operating System for Business

cy sometimes is the result of having inadequate hardware, perhaps a slow CPU or insufficient RAM.

Ideally, a digital audio workstation should operate in real time. When a button is pushed or a slider is moved on a virtual mixer, the software response should be instantaneous.

Latency can be inherent to an OS. Windows is designed to be a general purpose OS. To adequately cover all the bases in a wide range of applications means sacrificing real-time capabilities. The fastest hardware for Windows systems runs up against such inherent latency.

Stefan Scheffler, project manager at Steinberg, sees a definite improvement in his tests of Win2k. He said, "Though we cannot give specific numbers right now, the latency might vary between different audio devices. Because some audio devices have a high-latency by design, Windows 2000 won't be able to cure the problem for all cards."

Mike Guzewicz, manager of software development in the E-mu/Creative Tech Center, said, "The new OS is fundamentally better. Windows 2000, unlike the situation for Win 9x, moves all of the audio real-time support into the 'kernel mode' of the driver. This is the 'privileged' mode of the processor making it so that all of the real-time stuff, at least theoretically, as quick as a processor doing it."

Like NT, Win2k offers multiprocessor support. Guzewicz said, "I've played with dual processor machines and they're just a whole lot faster." These changes promise to make Win2k a landmark product for audio production.

Guzewicz said, "It's more than just moving the driver to the kernel, they're actually implementing an entire string model allowing for insert algorithms in-line with different streams. They're providing tools like kernel level audio mixing so to avoid worries about different applications doing the mixing. They're moving MIDI-sequencing into the kernel as well, so that different applications are not doing the sequencing."

In an upcoming article, we will look at how changes in the Win2k driver are designed to make integration with existing Win 98 computers seamless.

In the meantime, contact the distributor or manufacturer of your favorite audio software to find out if it will be providing a Win2k-compatible product.

■ ■ ■

Carl Lindemann is a frequent contributor to RW.

Save Your Issues  
of Radio World in  
**Style**



Now there's an easy way to organize and protect your copies of Radio World, the industry's best read newspaper, keeping issues readily available for future reference.

Designed exclusively for Radio World, these custom-made titled cases provide the luxury look that makes them attractive additions to your bookshelf. Each case is sized to hold a year's issues (may vary with issue sizes), and is made of reinforced board covered with durable leather-like material in blue, with the title hot-stamped in gold. Cases are V-notched for easy access and free personalization foil is included for indexing the year.

Cases  
1-\$8.95 3-\$24.95 6-\$45.95

Call Toll Free  
7 days, 24 hours  
1-800-825-6690

Charge Orders (Minimum \$15):  
AmEx, Visa, MC, DC accepted.

Jesse Jones Industries,  
Dept. 95RW  
499 East Erie Ave.  
Philadelphia, PA 19134

Allow 4 to 6 weeks for delivery  
**SATISFACTION GUARANTEED**

Add \$1.50 per case for postage & handling.  
Outside U.S. (Including AK & HI) \$3.50 per case  
(U.S. funds only).  
PA residents add 7% sales tax

**Visit Radio World  
on the Web!**



**The Industry's Online Resource**

Read weekly updates in the Newsroom!

Find trade shows and meetings in the  
Calendar of Industry Events

Look up associations and regulatory groups in the  
Broadcast Organization Directory

Find the equipment you need in the searchable  
Vendor & Product Directory!

Plus,

Guy Wire's exclusive column,  
Reader Subscription Services  
and more!

**<http://www.rwonline.com>**

For advertising information, contact  
Richard Farrell at 703-998-7600 x115 or rfarrell@imaspub.com

# Buyer's Guide

Tech Updates



Radio World

Radio Business Software, Traffic & Billing

January 19, 2000

USER REPORT

## DeltaFlex Keeps Accounts Payable

by Donald W. Kirkish  
Chief Financial Officer  
Silverado Broadcasting Company

**STOCKTON, Calif.** I have been in the "business end" of the radio industry since 1985, including more than five years as controller for a 13-station group with properties across the country.

During my career, I have been a user of several traffic and billing systems. The new DeltaFlex III from Custom Business Systems Inc. is a complete renovation of its accounts-receivable system. It contains, among other numerous enhancements, answers to many questions relating to the industry's increasing need for more-flexible customer billing of "non-traditional revenue" and flexible internal reporting.

Some of the highlights of DeltaFlex III include the ability to retain up to 10 years of history including spot times, charges and payments, which allows effortless re-printing of prior period invoices; the ability to store a series of

A/R report formats for the effortless printing of month-end reports; and a Windows Report viewer, which allows



viewed reports to be saved to disk and transferred electronically to management or to a corporate office.

### Tricks 'n' trade

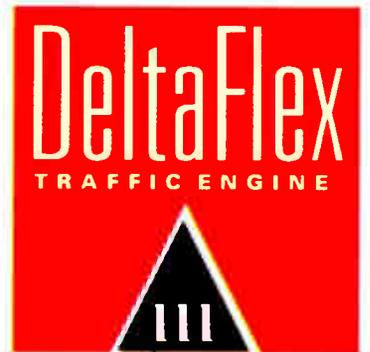
The most exciting enhancement, in my opinion, is the ability to combine client contracts, from one or more stations in a cluster, into one master invoice while keeping them separate for internal accounting purposes.

Due to consolidation, the ever-increasing effort to include non-tradi-

tional revenue, such as event sponsorships and Web advertising within a company's sales plan, has brought some burdensome additional responsibilities for business and traffic managers. These take the form of client requests for single or consolidated billing and difficult internal reporting of various sources of revenue.

In some cases, billing personnel or sales assistants are required to obtain copies of all invoices for a specific client before they are mailed, only to retype them in a consolidated format for all of the stations in the cluster. Meanwhile, business managers are maintaining spreadsheets in order to track properly the various revenue sources for internal accounting and historical data purposes.

In addition to the billing issues that come along with non-traditional revenue, some others come to mind: talent fees,



promotional fees and hard-cost recoveries. It has always been a challenge to include these types of charges within a client's invoices yet easily separate and account for them on internal reports.

CBSI's DeltaFlex III has provided us with various options, at the order entry level, relating to consolidated billing combined with flexible internal reporting.

For example, a group of stations may be promoting a listener concert (or concert series) and selling sponsorship packages for that concert. The sponsorship package may include a

See CBSI, page 56 ▶

USER REPORT

## Traffic C.O.P. Software Moves Sales Invoices

by John Godfrey  
Owner  
KBEK(FM)

**MORA, Minn.** As the owner of a high-quality, but small, radio station, I know that the biggest is not necessarily the best.

When I needed traffic and billing software, I searched the Internet to find out about lesser-known traffic software choices. I found The Traffic C.O.P. for Windows from Broadcast Data Consultants.

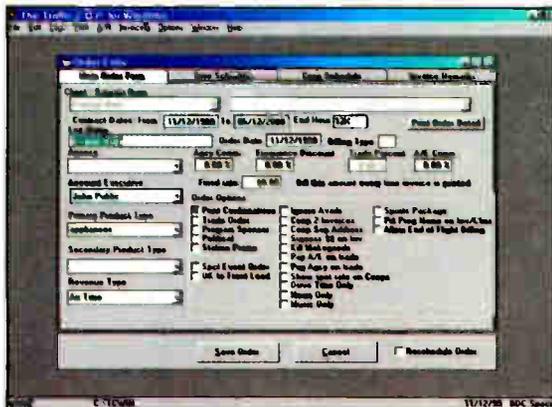
The top factor on my list of reasons for choosing The Traffic C.O.P. was the simple fact that it is a Windows program. The system's Windows-based architecture gives me a modern, easy-to-use user interface, access to the Windows clipboard for cutting and pasting text, and the ability to switch instantly to another program.

The pricing structure also attracted me. The substantial small-market discount brings the price down to a reasonable investment. Options like multiple stations or multiple users are reasonably priced. I really like the

fact that I own, not lease, the software, so I won't keep paying forever.

And the purchase price is broken into quarterly interest-free payments. Support after the first year is optional and is available at various levels.

Also important is the experience of the software company. While The Traffic C.O.P. is a young product, Broadcast Data Consultants has been in

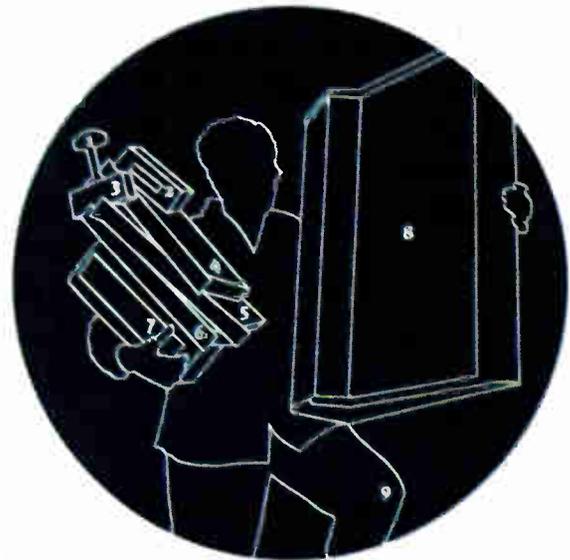


The Traffic C.O.P. Order Entry, Main Order Form Page

business for years.

Their original product was music-scheduling software for classical music stations and many well-known stations are on their client roster.

See BROADCAST DATA, page 54 ▶



radio SYSTEMS

radio systems millenium products

- 1 CT-6 satellite receiver
- 2 CT-6 desktop clock / timer
- 3 CT-6 thin clock / timer
- 4 DI-1000 telephone hybrid
- 5 DI-2000 telephone hybrid
- 6 DA-4X4a distribution amplifier
- 7 CT-6 large clock / timer
- 8 RS-12a millenium console
- 9 MRS BRAVERMAN, company spokesmodel



601 Heron Drive, Bridgeport, New Jersey 08014, (609) 467-8000 voice, (609) 467-3044 fax, www.radiosystems.com

USER REPORT

# CJDS Unifies Stations, NBA Team

by **Bill Ashenden**  
**General Sales Manager**  
**KXL(AM), KXJM(FM)**

**PORTLAND, Ore.** At KXL(AM) and KXJM(FM), we were satisfied users of the Columbine automated traffic system for a good 20 years. But recently a new owner, Paul Allen, who brought us into the same corporate family as the Seattle Seahawks and the Portland Trail Blazers, purchased our stations.

The Blazers have their own traffic and sales department that generates revenue for all their broadcasts, but they were

using a different automation system. It seemed like a good opportunity to see if anything better had come on the market since we'd started using the Columbine system in the 1980s.

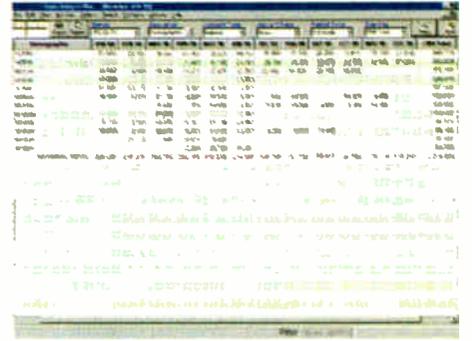


It turns out that something better was available — the latest version of

Columbine software, from Columbine JDS Systems Inc.

Columbine has a large number of features that simplify the work of our traffic department — features for general contract management, spot placement, inventory and availability management, reporting, billing, accounts receivable and so forth.

According to our traffic manager, Gina Shoepe, one of the most-useful new features is a doubling of the number of lines available for contracts. This is especially useful for yearlong contracts for national accounts, where a shorter line length would mean having to write up two contracts and



CJDS Sales Analysis Plus Demographic Entry Page

behind last year's spending.

We can bring up a three-year spending trend by month for our top accounts, and we can find out with just a few clicks of the mouse the percentage that key product categories are contributing to our bot-

## Arrakis Studio Furniture systems are #1 with over 1,000 sold!

The Master Control Studio, shown right, is one of seven Arrakis studios in Sony's Manhattan network origination center for SW Networks.



### Arrakis furniture is #1 ...

- Off the shelf -or- Custom
- Easy to design & assemble
- Very fast delivery !!!

call today to find out why Arrakis studio furniture is the choice of broadcasters worldwide... from Moscow, to Tokyo, to Manhattan...

**(970) 224-2248**

1995 Arrakis Systems inc. 2619 Midpoint Drive, Fort Collins, CO. 80525

### Sales Analysis Plus gives us a summary by sales person sorted in descending order based on the percent of budget attained for the month.

the advertiser getting two invoices.

Gina uses Columbine Sales and Traffic about six hours a day, so she knows the product better than anyone at the station. She said that it's easy to read and user-friendly, featuring easy-to-remember commands to move from screen to screen.

The new Columbine JDS module with which I work daily is Sales Analysis Plus. It's a great vehicle for sales managers to evaluate a variety of traffic and inventory issues with their sales people. Sales Analysis Plus provides us with a great level of detail about rep performance, tracking and pacing issues, and helps us to measure performance and set goals with individual accounts. Furthermore, it gives us a snapshot of station inventory at any given moment.

For example, Sales Analysis Plus gives us a summary by sales person sorted in descending order based on the percent of budget attained for the month, with the ability to "drill down" to the account level and see which advertisers are pacing

tom line, and how this is changing from year to year.

Another benefit of Sales Analysis Plus is that it's in a user-friendly Windows format, so even I was able to learn how to use it in just a short time.

In the process of re-evaluating our needs for sales and traffic software, we looked at many options. We were open to the idea of bringing in a new system, but we are glad circumstances did not require it.

CJDS provided us with a complete package that also includes the Portland Trail Blazers traffic and sales department, and the most-significant change we had to make was an upgrade to our AS400. Now KXL(AM), KXJM(FM) and the Blazers are all using the latest software from Columbine — connecting us all into one big happy family.

For more information contact Columbine JDS in Colorado at (303) 237-4000, fax (303) 237-0085, visit [www.cjds.com](http://www.cjds.com) or circle Reader Service 33.

TECH UPDATE

#### Netia Broadens Radio-Assist

Radio-Assist is Netia's family of digital audio products covering a range of functions from editing to broadcast. Radio-Assist products are client-server solutions for broadcasters in all market sizes.

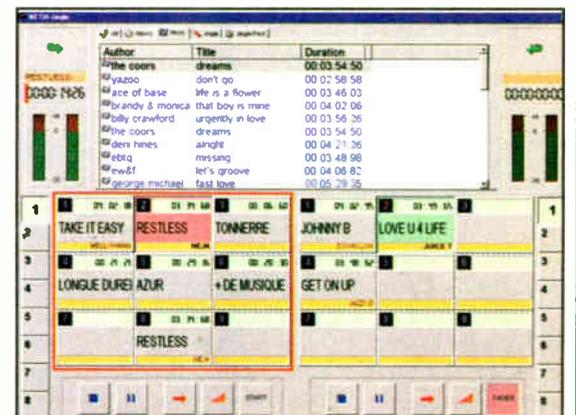
Netia's new module in the Radio-Assist line is the Insider. This module is used to access a station's database from any Internet browser. The database contains both the sound library and the audio transfer commands for each site.

Users have real-time access to the information in the audio library and are able to listen to their latest reports, without degradation in broadcast quality.

Insider uses streaming

audio technology to provide instant playback and continuous audio flow. Easy on-screen controls include play, stop, fast rewind and volume.

For more information contact Netia North America in Texas at (877) 699-9151, fax (877) 699-9152, visit the Web site at [www.netia.net](http://www.netia.net) or circle Reader Service 50.



Netia Insider Jingle, Music Page

**TECH UPDATES**

**SpotTaxi.com**

SpotTaxi.com from Central Media Inc. (CMI) was created in response to what the company saw as a lack of high-quality, cost-efficient radio distribution methods.

SpotTaxi.com's integrated software package incorporates the specific needs of an advertising agency, the production facility and radio station in order to deliver radio



advertising using the Internet. By utilizing the Net as a means of distribution, SpotTaxi.com allows users to access radio spots for approval and distribution from any computer with Internet capabilities.

In addition, SpotTaxi.com offers several features designed to streamline the distribution process, such as providing integrated traffic instructions, billing services and customer support. This is achieved through a three-step process.

First, when the spot is completed, the production facility names and uploads the spot. Second, the ad agency automatically gets an e-mail notification of the upload, logs in and selects the destinations for the spot. Third, the radio station receives e-mail notification that a spot is ready for them. They log in and download the spot. The user automatically receives a delivery confirmation.

Other services from SpotTaxi.com include Approval Audio. This allows anyone with authorization to the server the ability to hear an approval-quality version of the spot via streaming audio from any computer in the world. Then the user can e-mail a Web link to the spot to the person the spot needs to reach for approval.

Integrated Traffic ensures that traffic instructions are included with the order. Spot Archival has comprehensive search features enabling the cataloging of every spot sent via SpotTaxi.

All SpotTaxi.com files are sent in MPEG2 format. System requirements for radio stations include a sound card that supports 16-bit, 44.1 kHz sampled audio, and free SpotTaxi.com download-decoding software.

SpotTaxi.com is scheduled to launch this month.

For more information contact CMI in Washington State at (206) 903-3400, fax (206) 903-6400, visit [www.spottaxi.com](http://www.spottaxi.com) or circle Reader Service 40.

**Smarts — The Second Generation**

Smarts — The Second Generation (SecGen) is a Windows-based offshoot of the Smarts Billing Accounting and Traffic System that has been serving radio stations across the country for almost 20 years. It is made by Smarts Broadcasting.

While retaining the many scheduling categories ranging from run-of-station to fixed-position and package-plan schedules, SecGen allows for point-and-click entry on a graphic calendar. With numerous combinations of master files and spot break configurations available, users can make a program log look the way

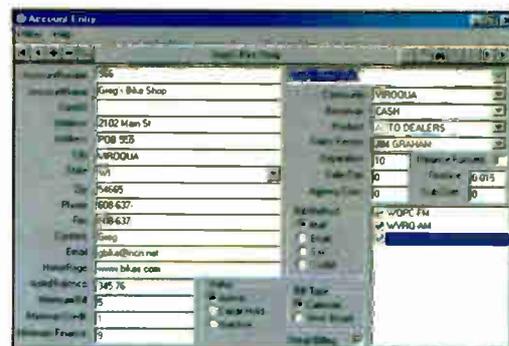
they want it.

SecGen is amiable to both large and small group operations. A time order can be entered for a single station, or any number of stations in the group, without repeating the order entry.

Financial information is available on multiple levels. Users can see the big picture for the entire operation or pinpoint problems down to the individual sales representative's level.

SecGen is designed to work with the Internet and with the other Smarts products including the Smartcaster digital audio system and the Digital Program Director music selection system.

For more information contact Smarts Broadcast Systems in Iowa at (800) 747-6278, fax (712) 852-5031, visit the Web site at [www.smartsbroadcast.com](http://www.smartsbroadcast.com) or circle Reader Service 60.



Second Generation Account Entry Page



**We've got you covered**

Crown Broadcast transmitters are designed and carefully engineered to the same reliable high performance standards known worldwide as the hallmarks of Crown products.

Enjoy on-air confidence with compact stand-alone transmitter designs that integrate audio processing, stereo generation and RF amplification. Or choose from custom configurations for versatile solutions to meet your unique broadcast needs. And be confident in your choice, with a three-year warranty backed with service from some of the finest talent in the industry. *Ask us, we can help!*

Call us, visit our web site, or send us e-mail for more information about the versatile transmitters from Crown Broadcast. Crown International, 1718 W. Mishawaka Road, PO Box 1000, Elkhart, Indiana. U.S.A. 46515-1000  
Phone: 800-294-8050 or 219-294-8050; Fax: 219-294-8222 Email: [broadcast@crowintl.com](mailto:broadcast@crowintl.com)  
[www.crownbroadcast.com](http://www.crownbroadcast.com)

**Crown Broadcast...  
making a world of difference**

Visit Radio World  
on the Web at  
[www.rwonline.com](http://www.rwonline.com)

# Broadcast Data Directs Traffic

► BROADCAST DATA, continued from page 51 They had already gained experience in Windows and database programming before tackling a complex traffic and billing system.

To install The Traffic C.O.P. for Windows, simply run the install program and enter some basic information. When the installation is complete, you enter your station's unique data.

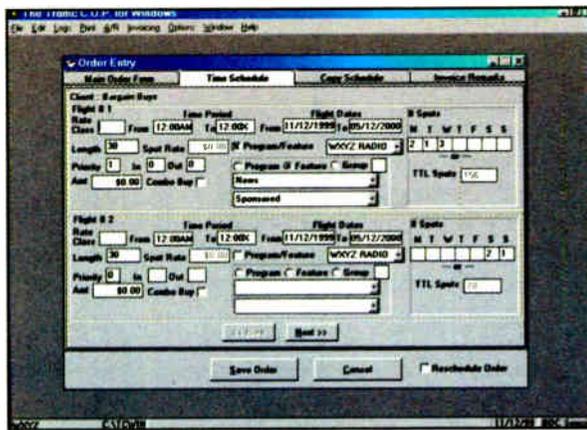
Clients, ad agencies and sales reps must all be entered. You define programs, features (like news, sports and weather), and stop sets, and combine them into hour clocks. Then orders are entered, and finally logs can be run.

In my case, I received the software on

started May 31. During that time, I ran that May 31 log over and over to see the effect of my entries on the finished log. This really helped me figure out the best way to set up my orders, stop sets and hour clocks.

Once you are up and running, the basic day-to-day tasks are entering new orders, running daily logs and debriefing logs. Then, as often as you choose, you print invoices. I've found each of these to be easy to accomplish.

The order entry screen is



The Traffic C.O.P. Order Entry, Time Schedule Page

right copy in the right place, whether it changes by day of week, time of day or expiration date. When you enter flights, you prioritize them. In this way you can be sure the spots that absolutely must run get on the log first.

To run logs, the program schedules the log and then you manually adjust it. Sometimes some spots won't schedule because of product conflicts or filled avails. To schedule these bumped spots, you just click on the bumped spot, then click on the line on the log where you want to place it.

Similarly, you can move spots or change copy. When you are satisfied, you print the log. The Traffic C.O.P. can also create schedule files for several automation systems. Running logs is so easy that once, when I extended an out-of-town stay, I phoned our evening announcer and talked him through the process. He had the log printing in about 15 minutes.

### Clearing congestion

Debriefing logs is done after the spots have aired. This tells The Traffic C.O.P. about any late orders that were



written on the log by hand, spots that didn't run for some reason, or copy that was changed. Manual debriefing only takes a couple of minutes each day, and The Traffic C.O.P. can automatically import this information from Arrakis DigiLink systems.

When invoicing, you can create a lot of invoices in a short time. You choose whether to bill completed orders, certain clients or clients with a user-defined billing cycle. Then The Traffic C.O.P. prints out invoices, complete with times spots ran and affidavits when needed.

After verifying the invoices are correct, you close all of the correct invoices and mail them, and go back and correct any mistakes you found.

Broadcast Data Consultants has impressed me most in an area where I am hard to impress — customer support. Someone who is ready to give advice on how to enter an unusual order or handle a problem answers the toll-free number.

For tougher problems, I've e-mailed a copy of my database for the company to check. When I've reported bugs, updat-

ed software has been posted on the Web site within a day. And home phone numbers and a pager number are provided in case of a night or weekend problem.

An excellent example of this support involves the KBK(FM) sports booster package. The package includes a rotating sponsorship of sportscasts about once a week. The Traffic C.O.P. wasn't designed to handle such an infrequent rotation. Within just a day or two of calling the company about this, I downloaded a free update that rotates these perfectly.

In short, I've found The Traffic C.O.P. for Windows to be affordable, reliable, and easy to use. It has made traffic and billing at KBK much more efficient. And the support provided by Broadcast Data Consultants has been outstanding.

*John Godfrey built KBK, which went on the air in 1995. Prior to that, he was chief engineer of KFAI(FM) in Minneapolis and an electronics technician at the University of Minnesota.*

For more information contact Broadcast Data in Florida at (800) 275-6204 or (727) 442-5566, visit the Web site at [www.broadcastdata.com](http://www.broadcastdata.com) or circle Reader Service 59.

**I really like the fact that I own, not lease, the software, so I won't keep paying forever.**

May 15 and was up and running in time for the June broadcast month, which flexible, and besides scheduling the spots, the program handles getting the

### TECH UPDATE

#### Datacount D32

Datacount, traffic and billing supplier for more than 3,500 stations, is in the early stages of delivering a new Windows/Open Database Compliant (ODBC) traffic and billing system.

Datacount 32 (D32) is a traffic system designed to target many levels of use including corporate, group and station. Information is gathered using ODBC as the standard for communicating with any reporting program.

The company says D32 uses existing technologies including the thin-client/fat-server approach to reporting, and the three-tier client/server model for user interaction. Designed as an "open system," all D32 files will be ODBC compliant.

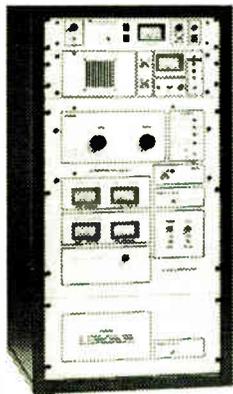
File specifications and data structures will be open and available to end users. This allows all data to be exported to a multitude of software tools. With data structures readily available to end users, customized reports are generated through Excel and other tools.

For more information contact Datacount Inc. in Alabama at (334) 749-5641, fax (334) 749-5666, visit the Web site at [www.datacount.com](http://www.datacount.com) or circle Reader Service 58.

## Superior Broadcast Products

Quality Transmitters and Antennas at Reasonable Prices

### FM Transmitters



High Performance Solid State Exciter  
Solid State IPA Amplifier  
One Year Limited Warranty  
Factory Service  
On site check out by factory  
personal available

- 1,000 watt ..... \$5,990.00
- 2,500 watt ..... \$11,990.00
- 5,000 watt ..... \$18,990.00
- 10,000 watt ..... \$24,990.00
- 15,000 watt ..... \$34,990.00
- 20,000 watt ..... \$37,990.00

#### 20 Watt Solid State Exciter - \$995.00

#### Solid State FM Transmitters with Digital Exciter

- |                             |                              |
|-----------------------------|------------------------------|
| 120 watt ..... \$2,800.00   | 2,000 watt ..... \$12,900.00 |
| 300 watt ..... \$3,500.00   | 3,000 watt ..... \$19,990.00 |
| 1,000 watt ..... \$7,990.00 | 5,000 watt ..... \$29,990.00 |

FM AMPLIFIERS	
100 watt.....	\$995.00
300 watt.....	\$1,790.00
500 watt.....	\$2,990.00

FM STL Both Transmitter and Receiver	
	\$3,500.00

### FM Antennas

All Power Levels 500 watts to 20,000 watts per bay

As low as.....\$395.00 per bay

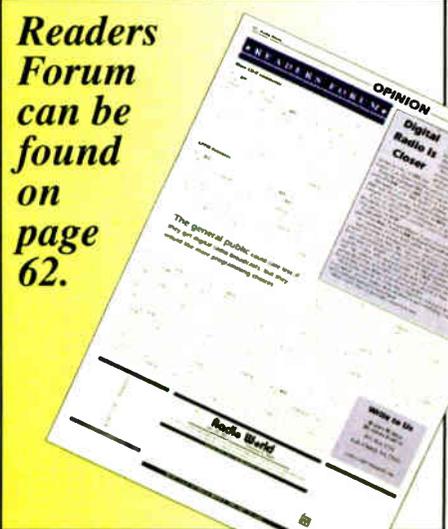


FREQUENCY AGILE FM TRANSLATOR \$2,500.00
--

* RF Coaxial Patch Panels *FM Combiners
--

## Superior Broadcast Products

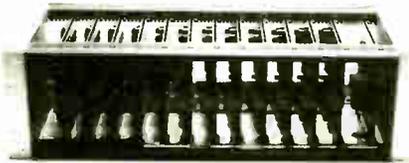
Contact **Jimmie Joynt** 17194 Preston Road, Suite 123-297 • Dallas, Texas 75248  
Ph: 972/473-2577 • 800/279-3326 • Fax 972/473-2578 • 800/644-5958  
Email: [sbp@pulse.net](mailto:sbp@pulse.net) web site: [www.sbpjj.com](http://www.sbpjj.com)



# Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No.(s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

## The CircuitWerkes AC-12 Telephone Autocoupler Bay



Get up to 12 couplers in a neat, compact chassis

- Auto answer & disconnect.
- 2 audio busses for mass feeds.
- Individually card selectable buss or auxilliary audio I/O.
- LED indicators for ring, clipping, power & online.
- Ring counter answers on user set ring number.
- Momentary or latching dry contact outputs at pickup.
- Remove & install cards without affecting the rest.
- The aux. audio jack is ideal for multiple IFB feeds, etc.
- Check out our www site for more info and tech manuals.

The AC-12 rack-mounted coupler bay is the best way to eliminate a wall or cabinet full of yesterday's couplers. Our unique dual audio busses eliminate the tedious and messy wiring associated with networks and other mass feeds. Each card can also individually either send or receive telco audio. Best of all, a fully loaded AC-12 lists for under \$175 per coupler.

### CircuitWerkes

3716 SW 3<sup>rd</sup> Place  
Gainesville, Florida 32607  
(352) 335-6555 / fax 380-0230  
<http://www.circuitwerkes.com>

READER SERVICE NO. 215

## Don't let their size fool you.

### STEREO HEADPHONE AMPLIFIERS



#### HD-1000 MASTER

- Drives Four Independent Headsets
- High Output for 8 to 600 ohm Headsets
- Stereo Balanced Line Inputs
- Padded Microphone Input for Announcements
- Stereo or Left Only-Mono Output
- Balanced Line Out to HD-100
- Half Rack or Desk Mount

#### HD-100

- Drives Single Headset
- High Output for 8 to 600 ohm Headsets
- Stereo Balanced Line Inputs
- Low-imp Inputs Feed Multiple Positions
- AC Powered, Compact
- Ideal for Offices and Study Carrels

CALL OR WRITE NOW FOR FREE DETAILED BROCHURE.

**ATI** AUDIO TECHNOLOGIES INCORPORATED

328 Maple Ave. Horsham, PA 19044, USA

(215) 443-0330 FAX: (215) 443-0330

READER SERVICE NO. 216

**SIX MILLION THUNDERSTORMS HIT PLANET EARTH EVERY YEAR! IT TAKES ONLY ONE TO PUT YOU OFF THE AIR!**



The STATI-CAT LIGHTNING PREVENTION SYSTEM provides a continuous, low-resistance discharge path for the static electric charge on tall structures. Dissipation points are 1/8" stainless steel rods.

This affordable and rugged system has proven itself in the field for over 15 years.

**Cortana**  
Corporation Inc.

Write or call for a free brochure and design  
P.O. Box 2548, Farmington, N.H. 87499-2548  
Toll Free Ph: 888-325-5336 • Fax: 505-326-2337

READER SERVICE NO. 217



### FM BROADCAST ANTENNA

#### FMR Series



- Circular polarization
- Series fed
- Internal feed
- Brass/Copper construction
- Excellent bandwidth

### PROPAGATION SYSTEMS, INC.

719 Pensacola Road  
Ebensburg, PA 15931 USA  
814-472-5540 Fax 814-472-5676  
E-mail: [psiba@surfshop.net](mailto:psiba@surfshop.net)

READER SERVICE NO. 218



**Silicon Valley POWER**

AMPLIFIERS

The RF People

### FM Broadcast Power Amplifiers

Designed for reliability, durability, & efficiency.



Models from 165 watts to 2.4 KW

- Solid state.
- VSWR foldback.
- Remote operation.
- Full documentation.
- Frequency agile.
- Digital display.
- Easy installation.
- Modular construction.

**1-800-986-9700**

[www.svpa.com](http://www.svpa.com) e-mail: [sales@svpa.com](mailto:sales@svpa.com) Fax 1-408-986-1438

READER SERVICE NO. 219

## Shively Labs

Reach for Ratings!

Shively Antennas Deliver Coverage!



- Superior Engineering
- Multistation Solutions
- Filters & Combiners
- Translators
- Reliable Pattern Studies

FM & TV Antennas and Related RF Equipment

because ... it pays to be heard!

P.O. Box 389, Bridgton, ME 04009 USA  
Tel.: (207) 647-3327 FAX: (207) 647-8273  
1-888-SHIVELY e-mail: [sales@shively.com](mailto:sales@shively.com)  
Web: [www.shively.com](http://www.shively.com)  
An Employee-Owned Company

READER SERVICE NO. 220

## Affordable Custom Broadcast Furniture



32 Pennsylvania Avenue, Malvern, PA 19355

Delivered and installed by

**STUDIO TECHNOLOGY**

TEL: 610-640-1229

FAX: 610-296-3402

email: [sales@studlotechnology.com](mailto:sales@studlotechnology.com)

web: [www.studlotechnology.com](http://www.studlotechnology.com)

READER SERVICE NO. 221

# CBSI Counters Consolidation Concerns

► CBSI, continued from page 51  
spot schedule on all stations within the cluster, signage at the event(s), point-of-sale entry to win tickets to the show (which includes appearances by station talent) and a banner ad on the station's Web site.

To complicate things a bit further, the station management wants to reduce the gross revenue enough to

client and internal tracking for accounting purposes. In my experience with various systems, CBSI included, it would have been virtually impossible to allow for all of these goals to be achieved by the system at the point of order entry.

With CBSI's DeltaFlex III, I have the technology. Each piece of this sponsorship package can be entered as a separate

preparation. No more cumbersome spreadsheets.

Finally, I have options for combining all of the contracts for this sponsorship into one master invoice, from all stations, or billing the spot revenue separately and combining all other charges on one invoice or billing each piece by itself.

In my opinion, CBSI's DeltaFlex III is the answer to many of the challenges that have been presented to me during the last few years of radio consolidation.

If I were asked what additional improvements I would like to see in the system, I would have to address the need for an "automatic credit warning" at the point of log preparation, based on invoice aging with a user set tolerance level.

So many times, client's book orders months in advance. At the time the order is approved and entered, the clients credit standing is in great shape. However, at the point the order is scheduled to run, the client has other invoices approaching an age that

deserves some attention and a "forced decision."

I feel that an automatic warning in this scenario could help tremendously the turnover of our accounts receivable and keep small-time accounts from getting away from us.

I find CBSI's customer service and

**I must consider three major goals — accurate revenue projections, consolidated billing for the client and internal tracking for accounting purposes.**

cover the hard costs incurred for production of client-specific signs and entry boxes that are provided with the sponsorship. Thus a business manager must ensure that the projections do not reflect these charges as station revenue.

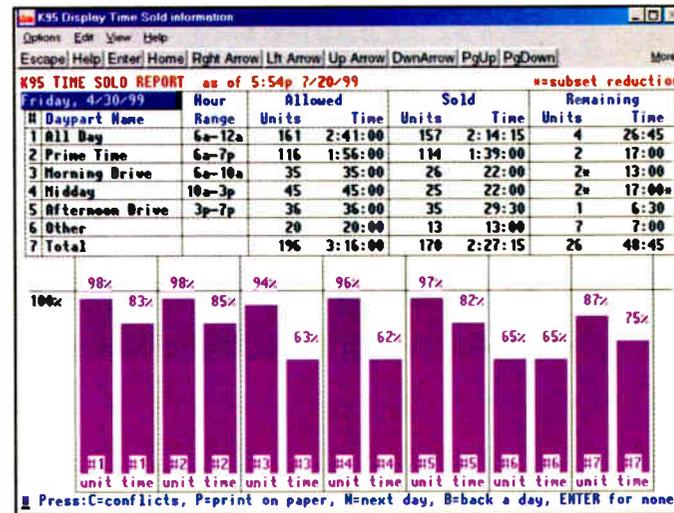
Finally, the last request is that the client is demanding one, all-inclusive invoice for the sponsorship package.

In this scenario, I must consider three major goals — accurate revenue projections, consolidated billing for the

contract, with separate income accounts.

Revenue projections can be limited to include only certain income accounts, thereby excluding such items as talent fees and hard-cost recoveries, while still separating the spot revenue. Web site advertising and non-spot sponsorship revenue into appropriate categories within your report.

Month-end reports can be printed showing all categories and providing appropriate detail for easy journal entry



The Time Sold Display for CBSI's DeltaFlex III

management team to be a friendly, helpful group of "outside-the-box" thinkers who obviously have their fingers on the pulse of our industry and its ever-changing demands. DeltaFlex III shows that they have been listening and continue to be prepared to respond with innovative, intelligent solutions.

For more information contact CBSI in Oregon at (800) 547-3930, fax (541) 271-5721, visit the Web site at www.cbsi.org or circle Reader Service 90.

**THE INDUSTRY'S #1 PUBLISHER**  
IMAS Publishing Group is proud to bring you

**THE ONLY Official Daily Newspaper of the INDUSTRY'S #1 TRADE SHOW...**

For the fifth year from the publisher of Radio World, TV Technology, Pro Audio Review & Pro Video Review

**NAB 2000 DAILY NEWS**  
The Convergence Marketplace

The NAB2000 Daily News  
Monday-Wednesday  
April 10-12, 2000

**Look for it every MORNING for news, maps and exhibitor listings.**

**Look for it every AFTERNOON for late-breaking news & updates.**

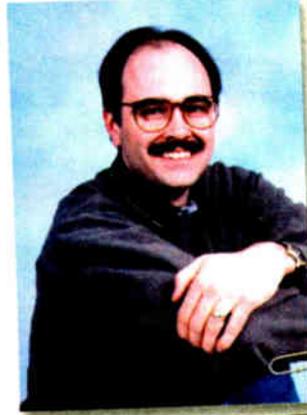
Limited Advertising Opportunities Available.  
Call 703-998-7600 x151  
or visit <http://www.imaspub.com/nabdaily.html>  
for Rates & Information.

**Radio's Most Wanted**

**PROFILE: Jeff Littlejohn**  
Vice President of Engineering, Chancellor Media Corporation  
Cincinnati, Ohio  
Radio World reader for 15 years

Hometown: Gary, Indiana  
School: ITT Technical Institute (Bachelor's Degree)  
Favorite radio format: Chancellor's Jammin' Oldies  
Favorite place to listen to the radio: In the car  
Favorite color: Green  
Favorite piece of equipment: Neutrik A2 test set  
Hobbies: Spending time with my wife, Tina; my dogs, and flyfishing  
Coffee: Black  
Proudest moment: Any time a major studio or transmitter project goes "on-the-air."

Favorite Section in Radio World: Workbench  
Best thing about your job: Working with the best engineers in the world!  
Reads RW because: Radio World is the ONLY publication that focuses on the things I need to know about radio.



Here at Radio World, we strive to deliver the information that helps you, our readers, deliver the goods that make you the most wanted people in the industry. We salute you, and thank you for reading Radio World.

**Tell us why YOU read Radio World!**  
Send your answers to the above questions and anything else you'd like to share to: [hharris@imaspub.com](mailto:hharris@imaspub.com), or fax us at 703-998-2966 attn: H. Harris. Include your contact information, and we'll get back to you.

# Radio World Broadcast Equipment Exchange

"Broadcast Equipment Exchange" accepts no responsibility for the condition of the equipment listed or for the specifics of transactions made between buyers and sellers.

## ACOUSTICS

### WANT TO SELL

**AcousticsFirst™**  
Tel. 888-765-2900  
Full product line for sound control & noise elimination.  
[www.acousticsfirst.com](http://www.acousticsfirst.com)

## AMPLIFIERS

### WANT TO SELL

Crown DC-150, \$250; Crown stereo power line one amp, \$295. J Price, 214-321-6576.

Custom built Altec-Lansing A323B monaural, pwr amp, push-pull 6L6 output tubes, BO, transformers worth over \$350. M Crosby, 408-363-1646.

### WANT TO BUY

Vintage bdct audio equip, RCA, WE, Altec, Harris, etc. E Davison, 561-287-8832.

## ANTENNAS/TOWERS/CABLES

### WANT TO SELL

**S.W.R. FM Antennas**  
Great Antenna Great Price!  
**HE HALL Electronics** (804) 984-4255

Collins Type 37 circ pol FM antenna w/de-icers, 97.0 MHz, working when removed, buyer transports from Central Indiana, \$1000. B Tennant, 765-642-2750.

Shively 6810 3 bay FM antenna tuned to 90.7, new in 1991, BO. E Brenner, 425-742-4541.

**ON-SITE REQUIREMENTS**  
FCC antenna structure registration signs.  
Guy wire warning devices.  
RF-EMF compliance signs.  
Custom CAUTION signs.  
FCC ASR gate entrance signs.  
**610-458-8418**  
antennas@hall.com

Coax patch panel 3-1/8"-7 pole. Mike, 800-588-7411.

Dielectric 3-1/8" coaxial relay, Mike, 800-588-7411.

## AUDIO PRODUCTION

### WANT TO SELL

Audiometrics voice-over booth on wheels w/XLR/phono inputs, 60x42x30, \$1275 +shpg. J Baltar, 207-623-1941.

Ramsa WZDE40 digital multi EQ, 20 bit stereo, 31 band graphic, feedback search, notch filter, compressor, spectrum analyzer & delay, \$2000. M Hughes, 301-962-6823.

Sidekick subcarrier modulator, \$800/BO. G Cassidy, 507-433-9650.

## CASSETTES • CARTS • REELS

### J & I AUDIO/VIDEO

A wholesaler in the Radio and Television market. Now running SPECIALS on audio and video:

BASF CASSETTES-AMPEX R-Rs  
AUDIOPAK, FIDELIPAC & ITC CARTS  
DAT & THE NEW R-CD

For more information call Kris Elliot at 1-800-942-1711 or write to: J&I Audio/Video 20899 Kelvin Pl. Woodland Hills, CA 91367

Circle (241) On Reader Service Card

Spencer-Kennedy 308A vintage tube filter, rack-mount dual elect audio filter, 16 tubes, mil-spec built, vintage 2 band tube filter, gd cond, \$350/trade. M Hughes, 301-962-6823.

ANTEX AUDIO CARDS, will not be undersold. A.S.C. (619) 523-1575.

Urei 565 Little Dipper EQ, \$700; ADC Propatch 1/4" punchblock patchbays, new, \$600 (many); 1.4" TRS patch cords like new, \$15; ADC TT 144 point patch bays, record, \$149-229. W Gunn, 760-320-0728.

### WANT TO BUY

Yamaha BP-2 bass pedals, need electronics only, but will be happy with schematic and/or owner's manual. B Meuse, 650-969-2433.

## AUTOMATION EQUIPMENT

### WANT TO SELL

Scott Studio Systems (4), new, never used, still in boxes, call for prices. S Fuchs, 573-686-3700.

Arrakis Digilink DL-DNA-2 automation system, complete, w/DL-CD-8SC CD controller w/8 Pioneer PD-TM3 18 disc players, \$3500. M Gollub, 410-535-2201.

Arrakis Digilink III, extra SCSI drive for addtl 24 hrs record time, gd clean cond, \$2750/BO. P Wolf, 941-458-3777.

Smartcaster automation systems (3), one in service, two w/switchers & one w/o, all units used in satellite automation, \$4000/all. B Geyer, 304-523-8401.

Sparta remote control w/cable hookup & Sparta cart automation systems, BO. W Dougherty Jr, 573-998-2681.

## BUSINESS OPPORTUNITIES

### WANT TO SELL

SYNDICATE YOURSELF 1-100 MARKETS, US and Caribbean via satellite, airtime available now, call Mr. Ferguson 954-735-4070, [www.ibnradio.com](http://www.ibnradio.com).

### WANT TO ADVERTISE?

CALL SIMONE MULLINS @ 703.998.7600, EXT. 154

## CART MACHINES

### WANT TO SELL

BE Series 3000 (2) Pb mono in gd cond, \$50 ea; (1) Series 300 R/Pb mono w/spares, gd cond, \$75 +shpg. M Zurbrick, 214-293-7420.

Various stereo/mono, BO. J Lalino, 315-891-3110.

BE 2100 Series stereo cart PB (3), BO; BE 2100 Series stereo R/P cart machine, BO. C Smith, 501-524-7194.

## COMPLETE FACILITIES

**Picture This:**  
Your Y2K Complete Equipment Dealer  
\* Experienced Professionals  
\* RF and Studio Packages  
\* Personal Service \*  
New Stations and Modernization  
*Atlantic Media Broadcast*  
\* Toll Free \*  
**888-744-6635**  
email - rick@cstone.net

**NEW OR USED COMPLETE PACKAGES**  
STUDIO/STL/TRANSMITTER/ANTENNA OR ANY COMBINATION OF ABOVE.  
-LEASE OPTIONS-  
-EMERGENCY RENTALS-  
-REMOTE BROADCAST RENTALS-  
**SCMS, Inc. (800) 438-6040**  
"You Know We Know Radio"

## CONSOLES

### WANT TO SELL

Ampeg AM10 6x2 mixer, excel cond, \$295; Altec 1599A 6 chnl mixer, \$295. J Price, 214-321-6576.

Fairchild FICM vintage discrete console strips includes mike pre-amp, line amp, 2 band EQ, compressor, VU meter, fader, 1+ space rackmount, \$1200 ea. M Hughes, 301-962-6823.

RCA BC 30 85-23 stereo, missing lever switch & input card for Ch1 position, very clean w/manual, 1981 vintage, working when removed from service, BO. A Fromm, 918-335-5093.

Auditronics 200 Series on-air console w/4 mic inputs, 14 stereo line inputs, CRM, CSM, Tel, 2 stereo line outputs, mono line output, PEQ, LS8, 2 PS-60 pwr supplies, \$2000/BO. J Clark, 208-356-2906.

Neotek Elite console strips, mic pres & other parts, includes great mic pre, EQ, etc, \$850 ea; Neve JPEG avail & other Elite parts avail, will consider trades, M Hughes, 301-962-6823.

Webster Electric vint mic pres (4) tube w/2 band EQ, rackmount 2 space, pwr supply included, lo z & line ins, tubes nuvitors & a couple 12ax7 size tubes, 30+ yrs old, no rust or pit marks, very nice cond, \$750 ea. M Hughes, 301-962-6823.

Logitek 12 stereo mixer. Mike, 800-588-7411.

Soundcraft 600, 24x8, \$3900; JL Cooper 16 trk automation, \$1200. W Gunn, 760-320-0728.

## LIMITERS

### WANT TO SELL

AKG C-3000, dual pattern condenser mic, never used, \$250. D Meyer, 805-962-8273.

Optimod 8100A/1 & 8100A/XT2, 6/99 factory refurbished, \$4250. D Brown, 910-455-9200.

CBS Volumax, \$400/ea; mint Urei 1176LNs, black, \$2300; 1176LN silver, \$1800; 1176 original blue/silver transformer l/o, \$2300. W Gunn, 760-320-0728.

### WANT TO BUY

Urei, dbx, Collins, RCA, Gates, Universal Audio. T Coffman, 619-571-5031.

Symetrix 528-E mic processor, must be in very good condition. D Meyer, 805-962-8273.

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

## MICROPHONES

### WANT TO SELL

Atlas heavy duty boom mic stand for 44BX or other, \$250; RCA 44BX ribbon mic, \$2500. E Reilly, 206-282-6914.

Telex WT-50 xmtr & mic, \$125; Telex WT-200 xmtr & mic, \$125; EV 636, \$65; EV 654, \$85. J Price, 214-321-6576.

Shure 565 gold mics (3), unisphere unidirectional, dual impedance, collector item, in original boxes, never used, \$150 ea. Frank, 401-274-1999.

EV 635L mics, \$95; Altec salt shaker mics, \$295/ea. W Gunn, 760-320-0728.

### WANT TO BUY

RCA 4A-1 sq box style mic (brown), used in late 20s, will pay top dollar in any condition. L Drago, 203-230-5255.

Ribbons, condensers, dynamics, tube 1950-90. T Coffman, 619-571-5031.

Sennheiser MKH 416. H Hogan, 317-740-0022.

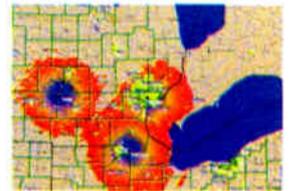
RCA 77-DX, 44-BX, KU-3A's, WE-639's, On-Air & recording lights wanted. 615-352-3456, FAX: 615-352-1922.

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

RCA ribbon mics. W Gunn, 760-320-0728.

## BROADCAST ENGINEERING CONSULTING SOFTWARE

Professional software packages for preparing FCC applications and plotting coverage. For Windows and NT.



- ✓ Create "real-world" coverage maps with Longley-Rice, TIREM, PTP & other models using polygon map features.
- ✓ Prepare concise FCC model coverage maps and allocation studies using USGS geographic map databases. Census calculations, tower and airport databases.
- ✓ Search for AM, FM, TV, DTV & LPTV channels with graphics oriented programs and FCC databases.
- ✓ Plot STL paths in 3-D using NGDC terrain databases... and more!

**VSoft Communications**  
800-743-3684  
[www.v-soft.com](http://www.v-soft.com)

## MISCELLANEOUS

### WANT TO SELL

**ROTOR BLOWERS AND PLATE BLOCKERS**  
new & rebuilt for Elcom, Harris, CCA, CSI, McMartin, Goodrich Ent. 11435 Manderson St. Omaha, NE 68164 402 493 1886 FAX 402 493 6821

UTC transformers "ouncers", variety of P/S Byer TR/BV35508, \$25 ea; Ampex Sel-Sync, \$295; Ampex transformers & pre-amps, call for price. J Price, 214-321-6576.

60 slot cart racks (2), 4 shelves ea, solid wood, \$25/both +shpg. 203-840-5167.

**RF Warning Signs**  
9" x 12" \$13.95  
10" x 19" \$19.95  
**HE HALL Electronics** (804) 984-4255

Jennings HV vacuum capacitors, MLC1000 30 KV, CSVF500 12-500PF 15 KV. M Jones, 423-573-8670.

Motorola T1099A, KC peak deviation meter, a 7.5KC & 15KC switch, off/limiter, current/freq set, sero/dev, ant & osc jacks, missing power cable, \$35; Motorola TA142, \$30. W Dougherty Jr, 573-998-2681.

Spectra Sonics 601 compressor, MONO, complete w/outboard controls & VU meter, schematic, brand new, \$200; Allen & Heath "Mini-Limiter/Pro-Limiter" \$50/BO. M Crosby, 408-363-1646.

### WANT TO BUY

Conax, Stancor PCO/PSO 150. R Robinson, 203-949-0871.

Tower beacon, need both incondasant & Xenon type. A Weiner, 207-985-7547.

Broadcasting Yearbook, 1 yr old. E Davison, 561-287-8832.

Jazz record collections, 10" LP/12" LP be-bop, swing, dixie, highest prices paid. B Rose, Program Recdgs, 228 East 10th, NNYN 10003. 212-674-3060.

**HE HALL Electronics**  
706 Rose Hill Dr. Charlottesville Va. 22901  
804-984-4255 (Voice) 804-984-3299 (Fax)

This Month's Special !!  
**BSI**  
Broadcast Software International  
Broadcast Automation Software  
JUST \$999 List  
Turnkey Systems Starting at \$2995

Call or visit our web site for your discount price  
[sales@halls.com](mailto:sales@halls.com) [www.halls.com](http://www.halls.com) [tech@halls.com](mailto:tech@halls.com)

Circle (242) On Reader Service Card

## MONITORS

### WANT TO SELL

Belar stereo FM, FM monitor, \$500/both/BO. J Lalino, 315-891-3110.

JBL speaker drivers, call for price. J Price, 214-321-6576.

Used Mod Monitors, McMartin & Belar. Many to choose from, tuned & calibrated on your frequency, full guaranteed. Goodrich Ent. 402-493-1886.

Yamaha NS10Ms, \$295. W Gunn, 760-320-0728.

## RECEIVERS & TRANSCEIVERS

### WANT TO SELL

CDQ 1000 audio codec ISO/MPEG layer 2, gently used. \$2000 +shpg. M Tait, 202-488-3905.

Dayton Industrial SCA AF-61 rcvrs (24), \$50 ea/BO for all. G Cassidy, 507-433-9650.

McKay Dymek MK AM5 long distance high fidelity AM tuner, Solid State w/owners manual, top cover missing, in box, gd cosmetics, \$325/BO; Heathkit BC-1A Am tube radio tuner, \$35; Heathkit AJ-31 high fidelity FM tuner, \$60/BO. W Dougherty Jr, 573-998-2681.

## RECORDERS

### WANT TO SELL

Ampex 354-2 stereo tube recorder, excel cond in console, \$695; Ampex 351 transports decks, BO; Ampex 440 stereo, excel cond in console w/Ampex 6 chnl mixer, \$750; Ampex 440C in console, 3.75-30 ips, excel cond, \$995; MCI JH110 stereo in console, excel cond, \$495; MCI JH110B stereo in console, \$750; set of new Ampex 8 trk 1" heads, \$750; new Ampex 16 trk 2" heads, \$350 ea; MCI electronics stereo set B-C, \$150; Otari CB-109 auto locator, CB-11 new, call for price. J Price, 214-321-6576.

Ampex 440B 15 & 30 ips w/remote, \$1000/BO; Studer A80 24 trk, lw hrs, wide body, \$20K/BO. A Pollhemus, 212-302-9010.

## DAT Machine Service

Fast, expert repairs on all DAT recorder brands & models including ADAT and DA-88. Warranty Service on Most Brands. Over 3000 Machines Serviced!

New/Refurbished DATs Available. Compare Our Rates!

**Pro Digital Inc.**  
DAT Recorder Service Specialists  
(610) 353-2400

Magnefax reel duplicators (2), gd cond, one mono, one stereo, 5 slaves ea, BO; Otari ARS 1000, gd cond, PB only, \$400. Jim, 615-321-3612.

Otari MX 5050 BII-2 (4), great cond, 2 speed, 2 trk, 2 chnl, 1/4" tape. \$1100. D Watson, 508-752-0700 or drew@wicn.org.

## STUDER REVOX PARTS/SERVICE

Cassette-CD-Open reel Capstan resurfacing. ALL BRANDS. **JM TECHNICAL ARTS**  
1515 Elm Hill Pike #203  
Nashville, TN 37210 (615) 365-9030

Otari MX-5050A; Revox A-77; Magnacord 1021 3 in rack; Teac A4300; Telex 7 cassette duplicating system, all in gd cond, BO. D Hedrick, 912-268-1550.

Parting out Scully 2 trk, 8 trk, all parts avail. M Hughes, 301-962-6823.

Marantz PMD-200 pro portable cassette deck, w/built in limiter, variable speed control, 2 speed motor, mic in, speaker out, battery check & more....works, but may want to replace belts, \$35. W Dougherty Jr, 573-998-2681.

Otari ARS1000 (2) in gd cond, \$125 ea. R Jacobson, 712-362-2644.

Otari ARS1000 in gd clean cond, \$150/BO; Tascam 32 in gd clean cond, \$750/BO. P Wolf, 941-458-3777.

Sony MDS-B2P/B4P PB MD (4), maintained by Sony, BO. C Smith, 501-524-7194.

Tapecaster 700P, BO; Tapecaster 700-RP (2), BO; Tapecaster X-700-RP, BO. Frank, 401-274-1999.

Akai M7 Cross-Field head recorder, \$100; Roberts portable recorder, mono, tube-type, take-off on Ampex 600 Series, \$100; (3) Ampex 440/450 tube type PB electr w/o tubes, \$200 ea; Ampex early recording monitor amp w/S-31A output xfmr & 5" Utah speaker, tube type, rack mount, \$150/BO; AMPEX RESTORATION FREAKS!! - VIF tube replacements & adapters, VIG 1006-JFET replacement for 12SJ7, 12AX7 or 6F5 tubes, spec sheet avail, \$16 ea. M Crosby, 408-363-1646.

ALL NEW!! Spotmaster TP1B tape timers, \$175; CLOSEOUT Spotmaster TP1B cart winders, w/o pressure roller & timer, \$25 +shpg; STL alignment carts C0031-FI (IEC), CO234-2-FI (stereo IEC), X1235-1-FI (3150 Hz Flutter), \$25 ea. M Crosby, 408-363-1646.

New MCI 110C-2s, \$1800; Scully 8 trk, \$1500; new short MRL test tapes, \$229 for 2", \$79 for 1/4", all formats avail; Otari MX5050 Mk III-8, \$3k; Otari CB110 remote, \$300; CB116 locator, \$550 (all for \$3.5k); Tascam 85-16 w/locator, remote, dbx, \$1800; MCI JH110B 8 trk w/locator, \$2900; Akai ADAM new, digital 12 trk, \$3500; Ampex ATR102 rebuilt 1/4", \$4900, 1/2", \$6400; Technics RS1500 isoloop recorders, \$695; Otari 5050 2 trk, \$695. W Gunn, 760-320-0728.

**LONG-LIFE HEADS**  
call  
**SEQUOIA ELECTRONICS**  
1-(408) 363-1646  
FAX 1-(408) 363-0957  
SEQUOIA@AOL.COM

Scully 280B-2 w/servo motor in Russ Lang roll-around console, new record & PB heads & idler, \$1100 +shpg; Ampex 622 speaker/amp in portable case, \$200; portable case for Ampex 622 speaker/amp, case only, \$75; Inovonics solid-state R/P electr for Ampex upgrade, 2 chnl, \$100 ea. M Crosby, 408-363-1646.

### WANT TO BUY

Soundworkshop 40, all or parts. A Pollhemus, 212-302-9010.

Ampex ATR100 taperecorders for parts. Circuit cards, heads, motors, machine parts, or electronic parts. Call 818-907-5161.

## REMOTE & MICROWAVE

### WANT TO SELL

Comrex 2XP, 2 line Incoder, \$450. Tom, 1-800-860-9771.

## RENTALS

TELOS-Zephyr  
COMREX-Hotline, Vector  
MUSICAM-Prima  
COMPLETE AUDIO PACKAGES  
Silver Lake Audio  
(516) 763-1776  
internet: silverlakeaudio.com

## WE RENT FOR LESS

Hotlines	FM Exciters
Zephyrs	STL's
Nemus	FM Power Amps
Audio	Test Equipment

If we don't have it, we will get it!  
**SCMS, INC.** (800) 438-6040  
"You Know We Know Radio"

Comrex 2XP Incoder, \$450. Tom, 1-800-860-9771.

Marti RMC 2AXS & RMC 2AXT remote control systems. W Dougherty Jr, 573-998-2681.

## SATELLITE EQUIPMENT

### WANT TO SELL

Microdyne 1100-PCDR (5) analog SCPC rcvr, works great, requires 70 MHz down converter, \$400. L Seizle, 970-356-1310 x204.

## SOFTWARE/ DATABASES

### WANT TO SELL

INEXPENSIVE PC SOFTWARE  
for Radio Broadcasters  
Traffic, Billing, Accounting  
& Music Scheduling  
(941) 643-3689  
www.aba-software.com  
email:  
demo@aba-software.com

## STATIONS

### WANT TO SELL

Radio stations for lease in Virginia Beach VA. Looking for reliable broadcaster to lease one or both of our radio stations (1000W/1450, & 5000W/1550). Top market (over 1,600,000 people), with lots of income potential for right party. No tire kickers please. Ron, 757-496-6556.

Radio stations for sale (2)/Virginia Beach VA. (1) 5000(1550) W daytimer (nd) with plenty of upgrade potential; (1) 1000(1450), top 40 market, biggest city in the state, one consolidated well located transmitter site. Serious inquiries only. Ron, 757-496-6556.

## RECEIVERS - ALL TYPES WE BUILD RECEIVERS

FM, FM/SCA, WEATHER, RDS, PUBLIC SERVICE, MONITORS, FM/SCA Ethnic, SPECIAL, CUSTOM

WWW.DAYTONINDUSTRIAL.COM

Dayton Industrial Corp  
2237 Industrial Blvd, Sarasota, FL 34234  
TEL: 941-351-4454 FAX: 351-6081

# CONSULTANTS

## EVANS ASSOCIATES

Consulting Communications Engineers

FCC Applications • Design • Field Engineering • Tower Detuning Upgrade & Relocation Studies • AM Directional Array Tuning & Proof

EXPERTS IN:

TV • DTV Transition • FM • Directional Antennas • RF Exposure

210 S. Main St., Thiensville, WI 53092. (262) 242-6000, FAX (262) 242-6045  
http://www.evansassoc.com Member AFCCE

## Consulting Communications Engineers EMC Test Lab

- FCC Applications and Field Engineering
- Frequency Searches and Coordination
- AM-FM-CATV-ITFS-LPTV
- EMC Test Lab-FCC and European (IEC)

**OWL ENGINEERING, INC.**  
1-800-797-1338 Fax (612) 785-4631  
E-mail: info@owleng.com  
8899 Hastings St NE, Minneapolis, MN 55449 (612)785-4115 Member AFCCE

## T. Z. Sawyer Technical Consultants

AM-FM-TV-LPTV

- FCC Applications & Exhibits
- Experimental Authorizations
- AM Directional Antennas
- High Power Antenna Arrays
- Frequency Studies
- Class Upgrades
- STL Applications
- Station Inspections

1-301-913-9287

FAX: (301) 913-5799 • 5272 River Rd. #460 • Bethesda, MD 20816

## PC - SOFTWARE

AM FM TV Search Programs  
Signal Mapping—STL Paths  
RFHAZ—US Census PopCount  
FAA Tower—Draw Tower

Doug Vernier  
Engineering Consultant  
1600 Picturesque Drive  
Cedar Falls IA 50613

800-743-DOUG

System One Communications  
Broadcast Constructors & Consultants  
Houston, Texas  
888-625-5649

- AM-FM Site Construction Specialists
- Complete Tower Service
- Antenna & Transmission Line Diagnostics
- Custom Studio Designs & Furniture

## MUNN-REESE, INC.

Broadcast Engineering Consultants

AM - FM - TV

Box 220, 100 Airport Rd.  
Coldwater, MI 49036  
517-278-7339 or Fax 517-278-6973

wayne@munn-reece.com

## GRAHAM BROCK, INC.

BROADCAST TECHNICAL CONSULTANTS  
Full Service From Allocation to Operation AM/FM/TV/AT X Services.  
Field Work, Antenna and Facilities Design  
Over 35 years engineering and consulting experience  
912-638-8028  
202-393-5133  
www.grahambrock.com

## MULLANEY ENGINEERING, INC.

Consulting Engineers  
•Design & Optimization of AM Directional Arrays  
•Analysis for New Allocation, Site Relocation, And Upgrades  
AM-FM TV LPTV  
Wireless Cable  
(MDS/MMDS/ITFS/OFS)  
•Environmental Radiation Analysis  
•Field Work  
•Expert Testimony  
9049 Shady Grove Court  
Gaithersburg, MD 20877  
Phone: (301) 921-0115  
Fax: (301) 590-9757  
email: mulleng@aol.com

Q: Looking for quality radio programming?  
A: **DASrock.com**



Market Analysis  
Engineering Software  
Ethnic/Demographic Data  
Custom Full-color Mapping  
Sales Marketing Packages

www.dataworld.com  
800-368-5754

info@dataworld.com  
fax: 301-656-5341

Advertise in Radio World and reach the broadcast professionals.

Call Simone TODAY!  
703-998-7600, Ext. 154



**REBUILT  
POWER TUBES  
APPROXIMATELY  
1/2 THE  
COST OF NEW!**

# ECONCO

TEL: 800-532-6626  
INTL: +1-530-662-7553  
FAX: +1-530-666-7760  
(SE HABLE ESPAÑOL)



**WANT TO BUY**

AM or FM station located in RI, MA or CT area, non-comm or comm., no station to small, will consider partnership. M Carcillo, 401-942-8341.

**TAPES/CARTS/  
REELS/CD'S**

**WANT TO SELL**

Tanner Goldmine Series. 200 oldies tapes, mono in boxes, excel cond, few hrs use, complete library, BO. D Hedrick, 912-268-1550.

Various carts, \$.60 ea. J Lafino, 315-891-3110.

Audiocdisc 10 - 10", 20 - 12", 3 - 16" in master shipping case, BO. M Crosby, 408-363-1646.

**TEST EQUIPMENT**

**WANT TO SELL**

Prime Image HR6001M TBC, \$950 +shpg. J Baltar, 207-623-1941.

Tektronix DM501A digital multimeter, \$150; Tektronix DM502A digital multimeter, \$150; Eico 150 solid state signal tracer, \$100; HP 353A 100DB attenuator, \$65; BK precision Dyna-Jet 707 tube tester, \$200. J Price, 214-321-6576.

Delta TCA 20 ext, 20 amp Tortol antenna meter, \$600. M Jones, 423-573-8670.

Rutherford Electronics B7B Mod 2 pulse gen; model 36-616 CRT tester & rejuvenator, full color & B7W w/instruction booklet & case, \$20; NRI Model 12 vacuum tube voltmeter, \$30; Allen Dumont Labs made for WE type 2577-KS15586 oscilloscope, \$45. W Dougherty Jr, 573-998-2681.

**WANT TO BUY**

Teac/Tascam MU4 or MU6 meter bridge, a rack mount, lighted 4 VU meter bridge. C Marion, 215-543-9873 or email at cj949@hotmail.com.

**TRANSMITTERS**

**WANT TO SELL**

Gates 1G 1 kW AM 1400 kHz 833 tubes, gd for parts or ham radio use, BO. A Fromm, 918-335-5093.

**USED: FM/AM Transmitters, RPU's, STL's, FM Antennas, Consoles, Processing, etc.**

**CONTINENTAL COMMUNICATIONS**  
3300 Chippewa, St. Louis MO 63118  
1-800-664-4497  
FAX 1-800-700-9427  
contcomm@fiastl.net

## TRANSCOM CORP.

*Serving the Broadcast Industry Since 1978*

Fine Used AM & FM Transmitters and Also New Equipment  
For the best deals on Celwave products, Andrew cable and Shively antennas.

100 W FM 1985 Harris FM100K	1 KW AM 1979 Harris MW1A
1 KW FM 1981 Harris FM 1K	1 KW AM 1993 Continental 314T Solid State
2.0 KW FM 1996 BE FM 2C Solid State	1 KW AM 1995 Naute ND-1
2.5 KW FM 1976 Collins 831D	10 KW AM 1982 Harris MW10A
2.5 KW FM 1974 Harris FM 2.5H3	50 KW AM 1978 Continental 317C-1
2.5 KW FM 1984 Continental 814R1	50 KW AM 1978 Harris MW-50B
3 KW FM 1975 CSI FM3000E	
5 KW FM 1989 Harris HT-5	
5 KW FM 1976 RCA BTF 5E1	
5 KW FM 1967 Collins 830E	
6 KW FM 1994 Henry 600D	
20 KW FM 1984 Continental 816R2A	
25 KW FM 1974 CCA 25,000D	
25 KW FM 1981 Harris FM 25K	
30 KW FM 1986 BE FM 30A	
30 KW FM 1984 BE FM 30	

2655 Philmont Ave #200, Huntingdon Valley, PA 19006  
800-441-8454 • 215-938-7304 • FAX No. 215-938-7361  
FOR INFORMATION AND THE LATEST PRICES, VISIT OUR INTERNET SITE: WWW.TRCORP.COM  
SEND YOUR E-MAIL REQUESTS TO TRANSCOM@TRCORP.COM

**TURNTABLES**

**WANT TO SELL**

Technics Quarts 2-speed direct drive TT (2), SP-25 w/arms & carts, BO. Frank, 401-274-1999.

**WANT TO BUY**

Tone arm for Gates 12B TT. E Davison, 561-287-8832.

**DON'T GAMBLE WITH YOUR ADVERTISING DOLLARS!**

Advertise in Radio World and reach the broadcast professionals. Call Simone TODAY!

703-998-7600, Ext. 154

## Portable Audio Generator

The RX-11 ToneJack is a battery operated, precision audio generator

SLP \$229.00

- RS-232
- LOG SWEEP
- 10ms BURST (1MS TO 29,999 SECONDS)
- SINE & SQUARE WAVE (1 Hz - 29,999 Hz)
- STEP THROUGH USER LIST OF 10 FREQUENCIES

**CONEX ELECTRO SYSTEMS**  
1602 Carolina Street, Bellingham, WA 98226  
(360) 734-4323 FAX (360) 876-4822

FOR MORE INFORMATION  
**800-645-1061**  
www.conex-electro.com

Allen Dumont Labe Type 303-AR cathode ray oscillograph; Tektronix Type S61A oscilloscope, vertical type 3S76 sampling dual trace/hor Type 3T77 sampling sweep; Beta Scope 8519 non destructive thickness guage, mfg for Twin City Testing Corp by Lionel Electr Labs.; Sylvania Electric 29 tube tester & box of tubes, \$400/BO. W Dougherty Jr, 573-998-2681.

Harris FM10H 10K, gd for rebuilding or parts, exciter not included, \$2000. D Coffman, 941-334-1393.

Harris MW1-A, was used as extra, in working cond, just off air, need space, must sell, spare parts w/manuals, \$3500/BO +shpg. D Kasey, 904-253-0000.

Delta OIB-3 operating impedance bridge, as new w/cables & manual, \$3500/BO; General Radio 1606A RF bridge, as new w/cables & manual, BO; General Radio GR821A Twin T impedance measuring circuit, as new w/cable & manual, BO. J Nashmy, 201-384-0500.

**OFF THE AIR? Emergency Back-up Rentals**

FM Exciters - STL's -  
FM Pwr Amps - Antennas -  
Studio & Test Equipment

**SCMS Inc (800) 438-6040**  
"You Know We Know Radio"

**SERVICES**

## SIMPLE CONNECTION

Prewired Racks & Console Harnesses

Connect to the Turnkey Distributor...

**BROADCAST RICHMOND**

E-mail broadcast@infocom.com

Tel 765-966-6468 Fax 765-966-5505

www.broadcast-richmond.com

BE FM-1B 1 kW single tube FM xmtr, 8 yrs old in very gd cond, needs some minor repair. E Bremer, 425-742-4541.

Continental 314-R 1 kW, gd cond, needs minor repair, 11 yrs old, w/manuals, \$4500/BO. R Thompson, 606-785-3129.

Gates BC16 AM 1000W, complete but not running, buyer transports from Central Indiana, \$500. B Tennant, 765-642-2750.

Harris BC10H 10 kW AM, 1090 KHz, \$500/BO; RCA BTA-5U 5 kW AM in excel cond on 810 KHz, \$3000/BO; Continental 831-D-2 2.5 kW FM in excel cond, no exciter, \$5000. T Toenjes, 785-437-6549.

Harris MW1A AM, working when removed from service, \$2500. M Jones, 423-573-8670.

McMartin 25M, 25 kW FM in gd cond w/spares, \$18K. D Denver, 402-734-5521.

Harris FM-25-K xmtr. Mike, 800-588-7411.

McMartin BF-10K 10 kW FM, factory rebuilt, in perfect, like new cond, includes new tubes, tested & tuned on your freq. Guaranteed. Adjustable from 5.5 kW to 15 kW, FCC type accepted. Goodrich Ent, 402-493-1886.

McMartin BF-5K 5 kW FM, factory rebuilt in perfect, like new cond, includes new tubes, tested & tuned on your freq, guaranteed, fully adjustable from 0 to 5.5 kW. Goodrich Ent, 402-493-1886.

**WANT TO BUY**

C-Quam AM stereo system in gd shape. D Hedrick, 912-268-1550.

McMartin AM/FM xmtr, any model, exciter or stereo modules. Goodrich Ent., 11435 Manderson, Omaha NE 68164. 402-493-1886.

**TUBES**

**WANT TO SELL**

AMPEREX, EIMAC, SVETLANA 3CX400A7/8877, 3CX3000A7, 3-500ZG, 4CX250B, 4-400, 4CX400A, 807, 833C, ETC. Westgate 800-213-4563.

**D & C Electronics Co.**

**NEW TUBES**

We have the alternatives for all your needs, at the lowest prices, direct from OUR STOCK!!!

EIMAC, SVETLANA, PROTEK®, EEV and many others.  
(352) 688-2374  
PH: (800) 881-2374  
FAX: (530) 683-9595

SE HABI A ESPAÑOL WE EXPORT  
VISA/MASTERCARD ACCEPTED

TUBES, Eimac, Svetlana, 800-430-6683, ams@hard-to-find.net Fax: 905-844-6263 www.hard-to-find.net

**FOR THE BEST PRICE** & 24 Hr service on transmitting tubes & sockets/parts, new & rebuilt call Goodrich Ent. at 402-493-1886 day or night, FAX 402-493-6821.

## RF POWER

*The Best of Two Worlds!*

Immediate Shipment from Stock!

Broadcast & Communications  
Tubes • Transistors • RF Fets  
HV Rectifiers & Bridges

**Eimac** **Svetlana**

Tel: 760-744-0700 800-737-2787 Fax: 760-744-1943  
E-mail: rfp@rfparts.com Web: www.rfparts.com  
435 So. Pacific Street, San Marcos, CA 92069

**RF PARTS COMPANY**  
FROM MILLIWATTS TO KILOWATTS™

Se Habla Español We Export

Circle (244) On Reader Service Card

*The World's Best Power Tubes Sold By The World's Best Distributors*

QUALITY • RELIABILITY • SERVICE

**POWER TUBES**  
www.svetlana.com

**Svetlana ELECTRON DEVICES**

HQ: 8200 S. Memorial Parkway Huntsville, AL 35801 Phone: 256-882-1344 Fax: 256-880-8077  
Mktg & Eng.: 3000 Alpine Road Portola Valley, CA 94028 Phone: 650-233-0429 Fax: 650-233-0439

Circle (245) On Reader Service Card

## EMPLOYMENT

## HELP WANTED

**Marketing Manager:**

IMAS Publishing, leading publisher of professional broadcast, video and audio publications worldwide, seeks an experienced marketing manager. Experience within the broadcast market and familiarity with industry trade publications highly desirable. Ideal candidate will possess a strong creative background, from concept and strategy to circulation planning and database marketing, to competitive market analysis and e-commerce. Superior organizational and communication skills required. For immediate consideration, send resume & salary requirements to: Dept. SU-TVT, PO Box 1214, Falls Church, VA 22041, Fax: (703) 820-3310, email: [SUNANGST@IMASPUB.COM](mailto:SUNANGST@IMASPUB.COM).

**BROADCAST ENGINEER**

**WHTZ-FM in New York City** has an immediate opening for a Broadcast Engineer to join our engineering team in our brand new digital facility. The successful candidate will have a solid understanding of digital equipment, studio repair & maintenance in the digital (AES/EBU) domain, remote broadcasts & troubleshooting digital & analog systems. RF & LAN/Netware5/NT workstation knowledge a plus, but not required. You must possess a "What can I do to help?" attitude & be friendly & personable. Respond via email: [hadden@whtz.com](mailto:hadden@whtz.com) or Josh Hadden, Chief Engineer, WHTZ-FM, 101 Hudson St, 36<sup>th</sup> FL, Jersey City NJ 07302. WHTZ-FM is an Equal Opportunity Employer.

**THERE IS AN IMMEDIATE OPENING** for a Chief Engineer in the southeast coastal area of the United States. The position requires experience in AM, high power FM, computer audio storage systems & studio maintenance. A Lifetime FCC general radiotelephone license or SBE certification is desired. Please send resumes to: Radio World, POB 1214, Falls Church VA 22041. Attn: Box 00-19-1-RW.

**EMPLOYMENT SERVICE****WE PLACE ENGINEERS**

*Employer Paid Fees.  
20 Years personalized  
& confidential service.  
All USA States & Canada*

MAIL &amp; FAX:

**KEYSTONE INT'L, INC.**

49 S. Main St., Pittston, PA 18640 USA

Tel: (570) 655-7143

Fax: (570) 654-5765

web: [keystoneint.com](http://keystoneint.com)

Employee &amp; Employer Service

Alan Cornish / Mark Kelly 999

**POSITIONS WANTED**

**Hello Colorado!** Slade Parker is ready to get started! Mature, professional, rookie-grad w/specialized training in radio broadcasting looking to head back west. Call Connie. 405-375-6843.

**Middays, afternoon** drive or nights. Any of those need filling? 9 yr vet relocating to work for you. Andy. 330-633-5323.

**Personality Radio!** Ratings, phones, concepts! PD MD exper. A.C. oldies, country, classic rock, no liners! Mornings or other. Mike. 707-421-1502.

**Program Directors**, are you looking for a very knowledgeable R&B DJ to host a very unique show & boost your bottom line? Then call me at 718-528-9758 for a free demo tape.

**Veteran broadcaster**, retired from Voice of America could do part-time gig as news anchor or in production. Alex Kuhn. 864-595-7092.

**15 yr radio veteran**, relocating to PA, MD DC area in early 2000, primarily news-oriented, seeking FT or PT leading to FT. T/R available: Tory, 207-882-4865.

**Experienced CE seeks FT, PT**, contract, seasonal work NE. Friendly, outgoing, works in the NE. Radio, Am, Fm, TV work, FCC licensed, CET, amateur radio operator, exper in carrier current AM & MDS also. M Rakoff, 718-969-5224 or email at [RadioMitch@Webtv.net](mailto:RadioMitch@Webtv.net).

RUN YOUR  
EMPLOYMENT  
AD ON OUR  
WEB SITE  
FOR TWO  
WEEKS FOR  
ONLY \$2.00  
PER WORD!

Call Simone at  
1-800-336-3045  
ext. 154  
or email at:  
[smullins@imaspub.com](mailto:smullins@imaspub.com)

**Attention Advertisers!**

RADIO WORLD's Product Showcase provides a perfect medium for test marketing your products and services. It's an efficient, effective and affordable advertising option!

For more information, including rates and deadlines, contact your sales representative or Simone Mullins at

fax: 703-671-7409

tel: 703-998-7600 ext. 154

**ACTION-GRAM**

**EQUIPMENT LISTINGS**

Radio World's Broadcast Equipment Exchange provides a FREE listing service for radio stations and recording studios only. All other end users will be charged. This FREE service does not apply to Employment Help Wanted ads or Stations For Sale ads. These are published on a paid basis only. Send your listings to us by filling out the form below. Please be aware that it takes one month for listings to appear. The listings run for two consecutive issues and must be resubmitted in order to run again. Thank you.

Please print and include all information:  Yes  No  
 Are you currently a subscriber to Radio World?  
 Yes  No  
 Signature \_\_\_\_\_ Date \_\_\_\_\_

Contact Name \_\_\_\_\_  
 Title \_\_\_\_\_  
 Company/Station \_\_\_\_\_  
 Address \_\_\_\_\_  
 City/State \_\_\_\_\_  
 Zip Code \_\_\_\_\_  
 Telephone \_\_\_\_\_

Brokers, dealers, manufacturers and other organizations who are not legitimate end users can participate in the Broadcast Equipment Exchange on a paid basis. Line ad listings & display advertising are available on a per word or per inch basis.

WTS  WTB  Category: \_\_\_\_\_  
 Make: \_\_\_\_\_ Model: \_\_\_\_\_  
 Brief Description: \_\_\_\_\_  
 Price: \_\_\_\_\_

WTS  WTB  Category: \_\_\_\_\_  
 Make: \_\_\_\_\_ Model: \_\_\_\_\_  
 Brief Description: \_\_\_\_\_  
 Price: \_\_\_\_\_

WTS  WTB  Category: \_\_\_\_\_  
 Make: \_\_\_\_\_ Model: \_\_\_\_\_  
 Brief Description: \_\_\_\_\_  
 Price: \_\_\_\_\_

\*Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.  
**Broadcast Equipment Exchange**  
 PO BOX 1214, Falls Church, VA 22041 • Tel: 800-336-3045 • Fax: 703-998-2966

**ADVERTISER INDEX**

This listing is provided for the convenience of our readers. Radio World assumes no liability for inaccuracy.

PAGE	ADVERTISER	WEBSITE URL	READER SERVICE
15	AETA Audio Corp	www.aetausa.com	72
42	Altronic Research	www.altronic.com	42
19	Aphex	www.aphex.com	21
44	Armstrong Transmitters	www.armstrongtx.com	161
43	Arrakis	sales@arrakis-systems.com	152
52	Arrakis	sales@arrakis-systems.com	52
55	ATI	www.atiguys.com	216
6	Audio Precision	www.audioprecision.com	6
31	Audioactive	www.audioactive.com	31
2	Audioarts Engineering	sales@wheatstone.com	2
45	AudioScience	www.audioscience.com	130
47	Belar	www.belar.com	47
34	Bext	www.bext.com	34
40	Broadcast Data	www.broadcastdata.com	200
40	Broadcast Devices, Inc.	www.broadcast-devices.com	202
17	Broadcast Electronics	www.bdcast.com	17
59	Broadcast Richmond	www.broadcast-richmond.com	-
36	Broadcast Software Int'l (BSI)	www.bsiusa.com	100
40	Broadcast Tools	www.broadcasttools.com	206
11	BSW	www.bswusa.com	11
32,33	BSW	www.bswusa.com	32
4	Burk Technology	www.burk.com	4
27	BuySellBid.com Inc.	www.buysellbid.com	27
48	Cable X-perts	www.cablexperts.com	210
41	Cartworks/DBM	www.cartworks.com	41
14	CBSI	www.cbsi.org	14
40	Circuit Werkes	www.circuitwerkes.com	201
55	Circuit Werkes	www.circuitwerkes.com	215
3	Clark Communications	NOT AVAILABLE	3
7	Comrex	www.comrex.com	7
46	Conex Electro-Systems	www.conex-eletr.com	46
1	Continental Electronics	www.contelec.com	1
55	Cortana	cortana@cyberport.com	217
53	Crown Broadcast	www.crownbroadcast.com	53
13	Cutting Edge	www.nogrunge.com	13
48	Dayton Industrial	NOT AVAILABLE	213
5	Digigram	www.digigram.com	5
40	Econco	www.econco.com	205
38	Eventide	www.eventide.com	80
48	Excalibur Electronics	Not Available	209
48	Freeland Products, Inc.	www.freeland-inc.com	212
28	Ghostwriters	www.radio-mall.com	70
40	Gorman-Redlich Mfg. Co.	www.gorman-redlich.com	203
57	Hall Electronics	www.halls.com	242
21	Harris	www.harris.com	150
22	Harris	www.harris.com	22
23	Harris	www.harris.com	12
35	Harris/PR&E	www.harris.com	35
28	IBN Radio	www.ibnradio.com	81
47	Inovonics	www.inovon.com	48
48	J Squared Technical Service	jsquared@cdsnet.net	207
57	J&I Audio/Video	NOT AVAILABLE	241
24	Kintronic Labs	www.kintronic.com	23
28	La Palma Broadcasting	lapalma@pacbell.net	28
37	Logitek	www.logitekaudio.com	38
12	Lucent Technologies	www.lucent.com/ldr	12
18	Moseley Associates	www.moseleysb.com	18
25	Netia	www.netia-broadcast.com	25
20	Neutrik USA	www.neutrikusa.com	20
40	Nott Ltd.	www.tjantenna.com	204
16	Prime Image	www.primeimageinc.com	15
30	Pristine Systems	www.pristinesys.com	30
55	Propagation Systems	psiba@surfshop.net	218
29	Prophet Systems Innovations	www.prophetsys.com	29
48	PTEK	ptekpower.com	208
26	QuicPix	www.quicpix.com	26
51	Radio Systems	www.radiosystems.com	51
48	RDA Systems	www.rdasystems.com	211
8	Register Data Systems	www.registerdata.com	8
59	RF Parts	www.rfparts.com	244
28	RR Productions	www.radioinfo.com	75
48	S.C.M.S., Inc.	www.scmsinc.com	214
10	Scott Studios	www.scottstudios.com	10
55	Shively Labs	www.shively.com	220
55	Silicon Valley Power	www.svpa.com	219
37	Sine Systems	www.sinesystems.com	37
55	Studio Technology	www.studiotechology.com	221
54	Superior Broadcast Products	www.sbpj.com	54
59	Svetlana Electron Devices	www.svetlana.com	245
39	Syntrillium Software	www.syntrillium.com	39
9	Telos Systems	www.telos-systems.com	9
59	Transcom Corp.	transcom@trcorp.com	243
63	Wheatstone	sales@wheatstone.com	190
64	Wheatstone	sales@wheatstone.com	180

**Reach your internet-savvy clients with RW Online!**



**The Industry's Online Resource**

Newsroom ■ Vendor & Product Directory  
 Calendar of Industry Events ■ Broadcast Organization Directory  
 Guy Wire's exclusive column ■ Reader Subscription Services

Highlight your listing in the searchable  
 Vendor & Product Directory  
 or sponsor a section!

**http://www.rwonline.com**

For advertising information, contact  
 Richard Farrell at 703-998-7600 x115 or  
 rfarrell@imaspub.com

## ◆ READERS FORUM ◆

## I agree with DAT

Dear RW,

This letter is regarding "Why I Hate My DAT Machines" by Ken R. in the Dec. 8, 1999 RW.

When DAT became popular, it was the only digital game in town. Inexpensive decent-quality sound cards (like the Sound Blaster Live!) didn't exist. Internal

DAT offered the opportunity to archive audio in a small amount of space with digital quality; however, as time marched on I experienced the same headaches Ken R. mentions in the article.

Given today's options of CD-R, MD and hard-drive storage, DAT becomes clunky and expensive. Recently, I was in an equipment boneyard at a radio and television station and the station manager

## Given today's options of CD-R, MiniDisc and hard-drive storage, DAT becomes clunky and expensive.

— Trevor Stern

CDR/W drives for \$300 didn't exist, and MD was a failed consumer format.

Radio stations (and recording studios) had embedded investments in analog tape. Digital multitrack existed, but was too expensive. DAT was a digital format at a relatively reasonable price. That's why it was adopted.

MD has just taken off in the last few years. I had the need for a cart machine and got the MD as a substitute. I'm not disappointed at all — CD quality (or damn close to it), instant start, random access, built-in timer and inexpensive blank media. Seems I was ahead of my time. MD is the way to go for cart replacement, even at stations with hard-drive based systems.

I disagree with the review in RW on the Sound Blaster Live! (RW, Dec. 8, 1999). I've found it to be quite acceptable, especially in the digital I/O mode. I use the dbx processor's digital I/O and a Midiman routing switcher to go totally digital to/from hard drive, CD, DAT and MD. Works fine for the stuff I do.

The analog I/O is OK, but the output could use a little more gain. I don't find the card to be noisy.

Ben Bass  
Owner  
Bass Electronics  
Buffalo, N.Y.

Dear RW,

I read the article about the DAT format and couldn't agree more.

Originally, I was wowed by the fact that

pointed out a shelf stacked high with old, burned-out DAT machines ... any brand, take your pick. They felt that major repairs weren't worth it and pitched them ... many because the head assemblies either failed or wore out.

My pick for field recording for radio is MD. The machines have fewer moving parts, the discs are reusable and both are inexpensive. One of the people I work with switched from mini DAT to MD in the field because he would rather suffer the loss (damage or theft) of a \$200 MD player as opposed to his \$800 mini DAT.

Funny Ken mentions frequent repairs — mine has a service trip in its future. For DAT the vultures are circling overhead.

Trevor Stern  
Sales Assistant  
Broadcast Electronics  
Quincy, Ill.

## Incorrect account

Dear RW,

Ken R. was incorrect on his account of the Bing Crosby/David Bowie rendition of "The Little Drummer Boy" (RW, Dec. 9, 1999).

If my memory serves me, Bowie appeared on a Crosby Christmas TV special that was taped a few months before Crosby's death in August of 1977.

This segment has been aired as a music video. I have seen it numerous times over the years.

The song was not recreated in the studio

## A Radio Century

Among the many top 10 lists at the end of 1999 was one that caught our eye. The Washington Post's radio column listed what it considers the most significant radio developments of the century.

Because the century *actually* ends later this year, it's not too late to consider this question.

The Post listed these national radio highlights, in order of increasing importance:

The rise of FM; the Hindenburg disaster and Herb Morrison's report; Alan Shepard in space ("perhaps the last moment when most of America follows a big event primarily on the radio"); Russ Hodges' call of Bobby Thompson's home run to win the 1951 pennant for the Giants over the Dodgers; the pioneering black air staff of WDIA in Memphis in the 1940s; FDR's Fireside Chats; and radio industry consolidation.

The Post's top three: old-time radio drama (worthy of a top 100 list of its own); "The War of the Worlds"; and World War II ("the world's most savage time is radio's finest hour").

Nice picks. The paper also named local Washington radio highlights, including Arthur Godfrey's morning radio show in the 1930s, the rise of Cathy Hughes and Radio One, the D.C. careers of shock jocks Howard Stern and Doug "Greaseman" Tracht, the influence of soul station WOL in the '60s and the founding of NPR, VOA and Radio Free Europe.

That list is proof that local radio can have national impact.

But what about behind the scenes? Developments important to the listener may be different from what's important to the radio engineer, manager and owner.

What were the most important developments in radio technology and management of the past 100 years? What people, products or services changed the way we looked at radio?

Tell us at [radioworld@imaspub.com](mailto:radioworld@imaspub.com) or write to the address below, and we'll pass along your comments in an upcoming issue.

— RW

by Bowie in 1982. Bing and Bowie had actually met face-to-face and performed it together on camera!

Michael Porter  
Producer  
WYPL(FM)  
Memphis, Tenn.

tioned songs, *together!* This was a deliberate production by both these fine artists in the studio to do something unique and different with these songs.

Ed Lacinski  
President  
Natural Sound Studios  
Patchogue, N.Y.

Dear RW,

In the Dec. 8, 1999 issue, Ken R states that the pairing of "Little Drummer Boy/Peace On Earth" was the result of some Bing-posthumous studio fooling around by Bowie.

Nothing could be farther from the truth. All one has to do is to tune in to VH-1 and see the video for these songs which was taped for a Bing Crosby special sometime in the '70s and understand.

There is Der Bingle and Bowie talking, discussing and singing the above men-

## —EDITORIAL STAFF—

Paul J. McLane	ext. 117	Editor
Sharon Rae Pettigrew	ext. 126	Managing Editor
Leslie Stimson	ext. 129	News Editor/Wash. Bureau Chief
Laura Dely	ext. 198	Business Editor/GM Journal
Paul Cogan	ext. 146	Associate Editor/Studio Sessions
Bernie Cox	ext. 183	Buyer's Guide Editor
Thomas R. McGinley	—	Technical Adviser
Alan Peterson	—	Technical Adviser
Marlene Lane	ext. 128	Editorial Director/Assistant COO
T. Carter Ross	ext. 120	Editor-In-Chief (International)
Marguerite Clark	—	Editor (International), Milan
Christine Joaquin	ext. 138	Managing Editor (International)
Rogelio Ocampo	ext. 121	Latin America Managing Editor
Karina Gerardi	ext. 137	Latin America Assistant Editor
Renata Beck	ext. 196	Latin America Assistant Editor
Peter Finch	—	Editorial Assistant, Milan

## —EDITORIAL CONTRIBUTORS—

W.C. Alexander, Harry Cole, Troy Conner, Ty Ford, Harold Hallikainen, Mario Hieb, Paul Kaminski, Peter King, Mel Lambert, Mark Lapidus, Carl Lindemann, Bill Mann, Dee McVicker, Lynn Meadows, John Montone, Rich Rarey, Bob Rusk, Randy Stine, Barry Umansky, Tom Vernon.

## Radio World

Vol. 24, No. 2 January 19, 2000

Telephone: (703) 998-7600 • Business Fax: (703) 998-2966 • Editorial Fax: (703) 820-3245  
E-mail: [radioworld@imaspub.com](mailto:radioworld@imaspub.com) • Web site: [www.rwonline.com](http://www.rwonline.com)

## —ADVERTISING SALES REPRESENTATIVES—

Sales Mgr., US Southeast & Mid-Atlantic: John Casey	330-342-8361	Fax: 330-342-8362	email: <a href="mailto:jdcasey@compuserve.com">jdcasey@compuserve.com</a>
US Northeast & Central: Sandra Harvey	765-966-0669	Fax: 765-966-3289	email: <a href="mailto:ads4sales@aol.com">ads4sales@aol.com</a>
US West: Dale Tucker	916-721-3410	Fax: 916-729-0810	email: <a href="mailto:dtucker@ms.net">dtucker@ms.net</a>
Classified Ads: Simone Mullins	703-998-7600 x154	Fax: 703-671-7409	email: <a href="mailto:smullins@imaspub.com">smullins@imaspub.com</a>
Germany, Austria: Dagmar Hänle	+39-02-7030-0310	Fax: +39-02-7030-0211	email: <a href="mailto:ghanle@imaspub.com">ghanle@imaspub.com</a>
France: Silvia Di Stefano	+33-1-45-48-42-17	Fax: +33-1-45-48-42-19	email: <a href="mailto:sdsimas@aol.com">sdsimas@aol.com</a>
European Sales Mgr., Africa, Middle East: Raffaella Calabrese	+39-02-7030-0310	Fax: +39-02-7030-0211	email: <a href="mailto:rcalabrese@imaspub.com">rcalabrese@imaspub.com</a>
Japan: Eiji Yoshikawa	+81-3-3327-2688	Fax: +81-3-3327-3010	email: <a href="mailto:callem@msn.com">callem@msn.com</a>
Asia/Pacific: Wengong Wang	+852-2787-4727	Fax: +852-2787-4041	email: <a href="mailto:imashk@ctimail.com">imashk@ctimail.com</a>
Latin America: J.O. Lima e Castro	+55-11-3873-1211	Fax: +55-11-3873-1211	email: <a href="mailto:Limcas@uol.com.br">Limcas@uol.com.br</a>
Australia: Samatha Marks	+61-2-9918-0547	Fax: +61-2-9918-9584	email: <a href="mailto:gmmid@ozemail.com.au">gmmid@ozemail.com.au</a>

## NEXT ISSUE OF RADIO WORLD FEBRUARY 2, 2000

For address changes, send current and new address to RW a month in advance at P.O. Box 1214, Falls Church, VA 22041. Unsolicited manuscripts are welcomed for review: send to the attention of the appropriate editor.

## —ADMINISTRATION &amp; PRODUCTION—

Stevan B. Dana	President/CEO
Carmel King	VPI/Group Publisher
Chuck Inderrieden	CFO
Eric Trabb	Sales & Marketing Director
Lisa McIntosh	Production Director
Jeff Fisher	Production Manager/Publication Manager
Kathy Jackson	Ad Traffic Manager
Christopher Duerk	Senior Graphic Designer
Alex Frosini	Graphic Artist
Heather Harris	Marketing Manager
Sheryl Unangst	Circulation Director
Robert Green	Circulation Manager
Steve Berto	Accounts Receivable

Radio World (ISSN: 0274-8541) is published bi-weekly by IMAS Publishing (USA), Inc., P.O. Box 1214, Falls Church, VA 22041. Phone: (703) 998-7600, Fax: (703) 998-2966. Periodicals postage rates are paid at Falls Church VA 22046 and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 1214, Falls Church VA 22041. REPRINTS: Reprints of all articles in this issue are available. Call or write Michael Crossett, P.O. Box 1214, Falls Church, VA 22041; (703) 998-7600, Fax: (703) 998-2966. Copyright 2000 by IMAS Publishing (USA), Inc. All rights reserved.

—Printed in the USA—

# Everyone Wants to Own a Convertible!

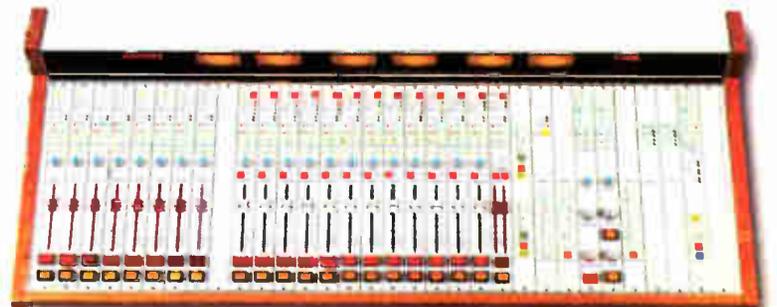


It doesn't matter what's under the hood...

## So... How About a Convertible Radio Console?

**Our New WHEATSTONE A-5000** gives you the **best** of both worlds. Order it from the factory now as a topnotch ANALOG on-air console. Then later, when you're ready, switch it out to DIGITAL! That's right, this new design accepts modules from our top-of-the-line D-500 and D-600 consoles, allowing it to be converted from analog to digital in the field!

**Think of it:** no new studio furniture, *no rewiring*—all your existing studio connections simply replug. And while we're at it, no re-training your staff either. A painless switchover on your own timetable, right in your own facility! If you need a new radio console *now* but aren't quite ready for the Big Switch, then check out our new A-5000—you'll like what's under the hood!



 Wheatstone Corporation

600 Industrial Drive, New Bern, North Carolina 28562 (tel 252-638-7000/fax 252-637-1285/email: sales@wheatstone.com)



# The Leading **EDGE**

## **WHEATSTONE'S D-600 is the DIGITAL CONSOLE with the features you NEED!**

It can control our digital AES routing switcher and display source information right above each fader. It can receive serial commands from your station's automation system, displaying track and cut IDs; it can even store and recall channel setups directly from its control surface—all without the use of an external PC.

Each individual channel can have multiple parametric equalization, limiting, ducking and digital gain settings—complete with preset recall—a great feature for your production suite or demanding on-air talent.



Its LED metering system provides dual readouts showing full scale digital peak *and* calibrated VU or PPM ballistics, so you can derive maximum benefit from its 24-bit architecture. You can even have in-line channel VU and gain reduction metering!

**The D-600** allows you to smoothly transition into digital technology without upsetting your entire organization and retraining your whole staff. **THIS IS A TRULY EXCITING CONSOLE!**

**ADVANCED TECHNOLOGY, SYSTEM INTEGRATION and HIGH RELIABILITY—WHEATSTONE has the LEADING EDGE!**

tel 252-638-7000/fax 252-635-4857  
email: sales@wheatstone.com

 **Wheatstone Corporation**  
600 Industrial Drive, New Bern, North Carolina, USA. 28562

Circle (180) On Reader Service Card  
World Radio History