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Page 12

Page 26

# Radio World



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The Newspaper for Radio Managers and Engineers

January 15, 2003

## INSIDE

### NEWS

▼ Ownership concentration; the latest on CCA; and on-demand audio via digital radio.

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### IT'S A MATCH

▼ We send the new version of the Henry Matchbox to a Utah reporter.



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### GUEST COMMENTARY

## Is Narrow AM IBOC Bandwidth Bad?

*Andy Laird Argues That Changing AM Bandwidth From 10 to 5 kHz for Digital Won't Impair Audio*

by Andy Laird

Will narrowing a station's bandwidth for AM IBOC adversely affect the audio quality?

The AM IBOC system FCC-approved for U.S. operation requires using the broadcast station to reduce analog audio bandwidth from 10 kHz to 5 kHz.

Broadcasters are hearing from some — mostly broadcast engineers — who think this is the death of a wonderful-sounding, linear medium that under certain conditions has very high fidelity.

There was a time when I would have agreed. I have fought on the purist side of this battle from the start of my radio

See AM IBOC, page 6 ▶

**WE CODE BECAUSE WE CAN**

Page 10

## Allen Brings Hill Skills To PPW

by Randy J. Stine

**WASHINGTON** With its first executive director in place and funding from the Federal Emergency Management Agency, the Partnership for Public Warning is poised to move ahead with its plan to improve the collection and delivery of emergency warning information.

Kenneth Allen has been named executive director of the public-private partnership, made up of leaders from emergency management, government, broadcast engineering and private business and based in Washington.

Peter Ward, chair of the board of trustees for Partnership for Public Warning, said Allen has the Capitol Hill experience the organization was looking for in a leader. Allen most recently served as executive vice president and CEO of the National Newspaper Association in Washington. Before that, he was president of the Information Industry Association, a group representing 800 high-tech information companies.

"My first job will be to get the organization up and running. The shell is here.

See PPW, page 7 ▶

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# ◆ NEWSWATCH ◆

## XM Sees \$450 Million In Refinancing

**WASHINGTON** XM Satellite Radio could close its new financing package with creditors by the end of February.

The satcaster reached agreements on a financing agreement worth \$450 million in late December. The deals consist of \$200 million in new funds from strategic and financial investors and \$250 million in payment deferrals and related credit facilities from General Motors.

"With this financing package, we believe we have achieved full funding through cash flow breakeven," said XM President/CEO

Hugh Panero. "The financing also removes a major roadblock to our company being valued based on its marketplace progress, business plan execution and future economic potential."

When the deal closes, GM, together with its affiliates Hughes and DirecTV, will own nearly 20 percent of the satcaster, a nearly 5 percent increase. Honda's ownership stake will rise from just over 2 percent to slightly more than 8 percent.

The \$200 million in new funding is in the form of 10 percent Senior Secured Discount Convertible Notes due in 2009 and a small concurrent common stock sale. Purchasers of the notes include

American Honda Motor Co. Inc., Hughes Electronics Corp., The Hearst Corp., Columbia Capital LLC, AEA Investors Inc., Eastbourne Capital Management LLC, BayStar Capital II L.P., and other parties. The notes are convertible into common stock at a price of \$3.18 per share.

In the other major element of the financing package, General Motors has agreed to defer or finance up to \$250 million of payments through 2006.

Based on sales-to-date and projections through the end of the year, XM expected to have more than 350,000 radios sold and ready for activation by Dec. 31. The satcaster predicted the year-end activated subscriber total would be 340,000 to 350,000.

## Hicks, Elliott to XM Board

**WASHINGTON** When its refinancing deal closes, XM Satellite Radio expects to add two members to its board of directors: long-time radio executive Steven Hicks and Honda executive Thomas Elliott. The additions would bring its board count to 11 members.

Hicks has 33 years of radio experience, including stints as an owner/operator, president/CEO of SFX Broadcasting and Capstar Broadcasting, which merged with Chancellor Media and became known as AMFM Inc., and merged with Clear Channel Communications. Hicks is chairman of Click Radio and a non-managing member of BayStar Capital.

As executive vice president, automobile operations of American Honda Motor Co. Inc., Elliot is responsible for product planning, advertising, marketing, public relations and distribution for Honda and Acura cars. He started his career at Honda in 1970 and progressed to positions in sales and management. He was appointed to the Honda North America board in 1992, when he also became president of Honda Performance Development Inc., a subsidiary of American Honda, established to manage the Honda Championship Auto Racing Team racing and race engine development programs.

## Clear Channel, AFTRA at Odds In New York

**NEW YORK** Clear Channel Radio Senior Vice President Rob Williams asked the American Federation of Television and Radio Artists last month to present the company's last contract offer to its membership at FM stations WLTW and WKTU in New York for a secret ballot. He said another round of failed negotiations at the bargaining table prompted him to bring the year-and-a-half process to a close.

"We clearly have fundamental differences on certain material issues with the union leadership, primarily the issue of voice tracking," said Williams. "It is time

See NEWSWATCH, page 3 ▶

# THE AMAZING LITTLE MIXER

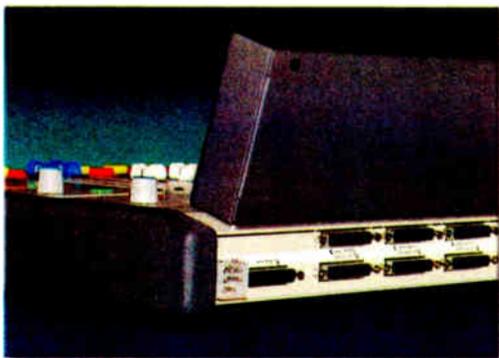


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### OPINION

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# FCC: How Crucial Is Station Count?

*Commission Studies Radio Groups, Ad Rates and Other Media Ownership Issues*

**WASHINGTON** How many stations can or should a company own? How does the answer affect competing stations and radio ad rates in a market?

These questions are at the heart of the FCC's pending media ownership proceeding.

In 1996, the two largest U.S. radio groups each owned fewer than 65 stations. By 2002, the largest owned about 1,200 and the second-largest had 250. However, such concentration does not appear to drive increases in ad rates.

Those are among the conclusions of 12 media ownership studies conducted by FCC staff, a first step in evaluating the agency's media ownership rules and policies.

The commission is reviewing public comments on the studies. Chairman Michael Powell has set an April deadline for the revision.

## No. 1 gets 47%

The largest station owner in a market received an average of 35.6 percent of radio ad revenue for the market in 1996, but in 2002 that figure rose to about 47 percent, according to the authors. The increase in the revenue share of each owner gradually has leveled off.

The studies developed by an internal agency ownership working group compiled information on how the radio industry has changed since passage of the 1996 Telecommunications Act, to how the Internet has affected consumers' use of radio, TV and newspapers.

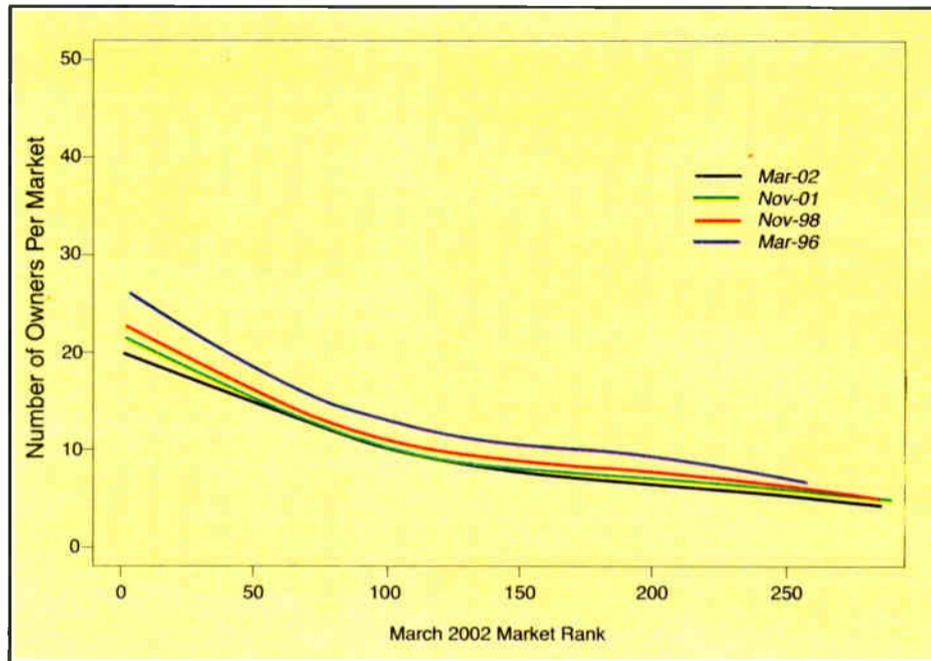
A document devoted to how ownership consolidation has affected advertising prices found that economics has been the major force driving ad growth since 1996.

According to "Consolidation and Advertising Prices in Local Radio

Markets," by FCC Media Bureau staffers Keith Brown and George Williams, increased ownership concentration in local radio markets between

in Ownership, Format and Finance." This study, by Williams and Scott Roberts, found that between 1996 and 2002, the average number of station owners in a market dropped from 13.5 to 9.9, "primarily due to mergers between existing owners."

In 1996, the two largest radio group



In March 2002, the average number of owners across Arbitron Radio Metro markets was 9.9. In March 1996, the average number of owners in a radio Metro was about 13.5.

1996 and 2001 accounts for 3 to 4 percent of the 68 percent increase in advertising rates during that period. The authors credited general economic growth for the bulk of the increase.

The study maintains that national concentration does not appear to drive increases in ad rates. It concludes that a greater presence of large national owners in a local market appears to decrease the rates paid by national and regional ad agencies.

Consolidation is putting advertising money in fewer outlets, according to "Radio Industry Review 2002: Trends

owners each owned fewer than 65 radio stations. By 2002, the largest group, Clear Channel Communications, owned

about 1,200 stations and Cumulus Broadcasting, the second-largest owner, had approximately 250 stations.

The largest station owner in a market received an average of 35.6 percent of radio ad revenue for the market in 1996, but in 2002 that figure rose to about 47 percent, according to the authors. The increase in the revenue share of each owner gradually has leveled off.

The average number of formats available in a market has held steady at 10 since 1996, according to the authors.

And consumers, for the most part, aren't substituting other media for radio, according to a study by Joel Waldfogel of The Wharton School at the University of Pennsylvania. While there is clear evidence of substitution between the Internet and broadcast TV among consumers for overall consumption and news consumption, there is little substitution between radio and the Internet.

Critics, such as consumer groups, have said in published reports the studies are biased in favor of deregulation. The coordinator of the studies as head of the commission's ownership task force, Paul Gallant, has stated that those who feel the data is inaccurate should file public comments, and supply the commission with better analyses.

To see all of the studies, go to: [www.fcc.gov/ownership](http://www.fcc.gov/ownership).

The deadline for submitting public comments on the ownership studies was extended to Feb. 3 for reply comments (MB Docket 02-27, MM Docket #s 01-235, 01-317, 00-244).

— Leslie Stimson

## NEWSWATCH

► NEWSWATCH, continued from page 2  
our employees are given an opportunity to vote on the package and decide for themselves if the proposal is acceptable."

Clear Channel says voice tracking generally is limited to overnights and weekends, and it uses non-live talent for certain air shifts. That talent often is from within the market, but may originate elsewhere, giving other talent more exposure, according to the company.

AFTRA opposes the use of voice tracking.

### Duncan Trades Research For Programming

**CINCINNATI** Jim Duncan said he's calling it quits on publication of his American Radio and Duncan's Radio Market Guide books after 28 years.

"I do this with sadness and regret. Obviously I have devoted a great amount of my life's work to these books and it is difficult to walk away

from a career," he said in a letter distributed to media outlets in December.

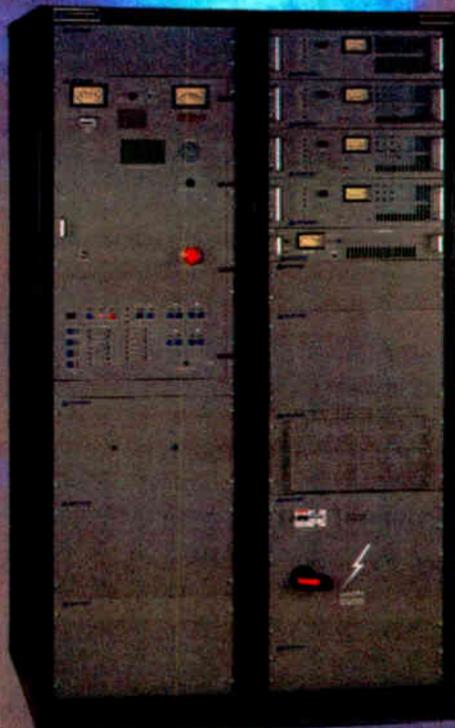
He said demand for the products has been declining since the industry consolidated. Also he plans to begin programming a new station in Santa Fe, N.M., this month. Duncan still intends to produce a statistical history of the past quarter-century in radio this year.

### FCC Cancels Antenna Fine

**WASHINGTON** In June, the FCC fined Seggi Broadcasting of Florida \$24,000 for failure to have identification information on two antenna structures, install obstruction lighting and clean or repaint the structures.

Seggi told the commission the inspection occurred after WIPC(AM), Lake Wales, Fla., and its two towers used as a directional antenna system were sold to Siber Media Group, and Siber should pay the penalties. The agency confirmed the sale and cancelled the penalty against Seggi.

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# N.J. and Radio, Perfect Together

Exit 11. Woodbridge Mall. Westfield High School.

Yea, I'm from Jersey. What about it?

My Garden State roots are on my mind today after chatting with Carl Van Orden. If he and his colleagues have their way, they will debut the New Jersey Radio Museum this summer in downtown Dover, about an hour west of New York. The group has space in a historic house and is seeking money, volunteers, equipment — even photo frames.

"The New Jersey Radio Museum is dedicated to presenting to the public a general 'when radio was radio' version of radio, showing the difference between what it was up to the '70s vs. what it is today," said Van Orden, the project manager. "As such, it will also appeal to people interested in radio outside New Jersey."

## Like-minded enthusiasts

The idea has its beginnings with George Laurie, a trustee of the Dover Area Historical Society, the parent of the museum, which holds the lease on the four-story house owned by the Dover Presbyterian Church.

Like Van Orden, Laurie is a former employee of WRAN(AM), a 10 kW station that operated in Dover until the late

1980s. They and Lew White, now with WRNJ(AM) and WGHT(AM), started brewing the idea and began contacting as many WRAN alumni as they could. Things grew from there.

"We actually got together in a Dover diner where we could meet face to face. For some of us, it had been way over a decade since we had seen each other."

**My biggest fear is to not get the support of our local N.J. radio stations.**

— Carl Van Orden

Of course. All great ideas in New Jersey involve a diner.

At first the nonprofit group planned a small display of WRAN memorabilia. Then they expanded the scope to include the former WDHA(FM), then all of radio in North Jersey.

Eventually the planned museum

adopted a statewide mission.

Thus a group of like-minded Garden State folks who have worked in radio or are deeply interested in it have gotten together to create the organization.

"We have program directors, music directors, engineers, Webmasters, all a part of the NJRM executive committee," Van Orden told me.

Lease and maintenance details are being worked out; the historical society is taking care of much of that work. Meantime, plans are developing for the museum infrastructure and its special events.

Museum listening booths will enable visitors to choose from different stations and formats. Program directors have agreed to speak. A reunion dinner for N.J. radio people is contemplated. The museum hopes to raise money by selling a CD of airchecks, most of which have been donated.

## Live from Dover

Dick Taylor, vice president of South Jersey operations for the museum and the GM of WOND(AM), WUSS(AM) and WTKU(FM), called it "the only place in New Jersey that anyone can visit to remember the kind of radio they grew up listening to, and to let those not so fortunate to grow up in those days a glimpse at how things used to be."

Most ambitiously, they plan a low-power radio signal, and also have applied to the FCC for an AM license.

"The original Dover stations, WRAN 1510, now dark and gone, and WDHA 105.5 FM, are no longer in Dover," Van

## From the Editor



**Paul J. McLane**

Orden said. "We would like to serve Dover as its local station. ... We have plans to put on the air a '70s-type format, complete with local news. The area is heavy in Spanish-speaking people, and there is a need there as well."

A soundproof studio room is planned in a minaret on the top of the historic Silas Condict House. The studio would be a showpiece for the museum and a spectacular statement for N.J. radio, Van Orden feels.

He says the group needs financial support. It also needs equipment — cart machines, tape and CD decks, mics, booms, you name it, for its exhibits and its studio. And why photo frames? Because thousands of pages of documentation need collating, filing and mounting.

Unfortunately, radio stations themselves seem reluctant to take part.

"I do not know if it is because of day-to-day business; but of the stations I have contacted, many seem very distant. In fact, it would be to their benefit to join with us; it is free advertising for them," Van Orden said.

"Imagine having your banners posted all over the walls of a radio museum. However, the owners and operators of N.J. radio stations have been difficult for me to get involved."

I hate to say this, but Van Orden's problem doesn't surprise me. Many radio managers have little appreciation for radio history and lore; indeed they seem obsessively worried that anything associated with "old" is "bad." For every

See MUSEUM, page 5 ▶

With this issue we launch Radio World's 2003 New Technology Sweepstakes.

That means it's time to visit our Web site and sign up, even if you've entered our past sweepstakes; we're starting fresh. Just click on the icon in the right corner of the Web site for a chance to win one of 26 super prizes this year.

Earnest Brinkerhoff of Backcountry Utah wins one of Henry Engineering's new rack-mountable Matchboxes.

The prize, valued at \$225, is the first in a series of rack-mountable items from Henry. It occupies 1/3 of a rack width; up to three can be mounted on an optional shelf.

All of the new versions — including the Superelay, TwinMatch, USDA and MicroMixer — will be the same size, so products can be mixed and matched. The new Matchbox, like the original, includes an AC power supply; no "wall wart" supply is needed.



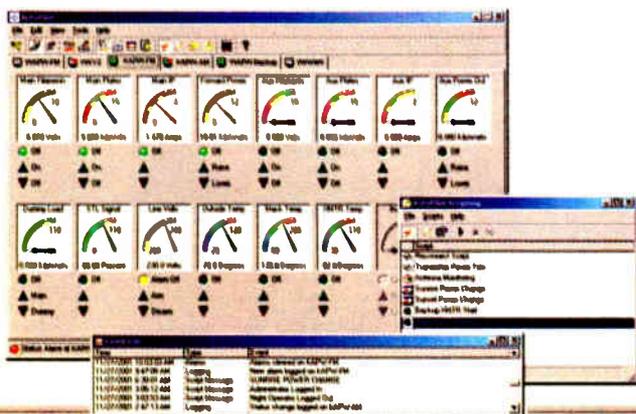
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Jeff Kuhne, Engineer, WRPI-FM

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# Museum

► Continued from page 4  
heritage station that celebrates its history, a dozen want nothing to do with even last year's formats.

Among stations that have supported the effort, however, are WDHA, WMTR(AM), WHTG(AM-FM) and WOND. Local papers have been helpful, as has Scott Fybush through his regional newsletter.

For the time being, the collections are being built. John Yanagi, museum vice president for airchecks via the Web, said there is a wealth of old radio audio online, and his job is to track it down. He is an avid aircheck collector and trader.

"I'd like to ask all your readers, professionals and amateurs alike, if they have any airchecks of N.J. licensed stations to please consider donating a copy to the museum," he said. "Any aircheck, large or small, unscoped or scoped, new or old, even clips and jingles are welcome." Donators will have permanent recognition of their gifts, which are tax-deductible.

The most significant donation so far: Mike Ferriola, chief engineer of WMTR/WDHA and Greater Media, gave three working broadcast boards — one each from each station plus a heritage WDHA broadcast board used at the original studio on Route 10 in Randolph.

## 'Better radio'

Rich Phoenix was program director of WRAN for almost 10 years. He describes himself as one of the crankier vice presidents of the organization.

He said all participants are volunteers, and that there have been headaches along the way. For instance, plans for an earlier museum space in a shopping center fell through when the prospective benefactor found a paying tenant.

"This created the necessity for our various members to store equipment, files and recordings in their own digs and on their own computers, much to the chagrin of their spouses," Phoenix said.

"We have hopes of preserving in our museum the evidence of what made local radio broadcasting great in the 20th-century, pre-deregulation days of the profession," Phoenix said.

"The evidence will present itself as airchecks, photographs, press clippings, videos, functioning 1970s-vintage studio equipment, a low-power broadcasting station and live performances by local personalities who made radio great in New Jersey despite all the competition that Philly and NYC could dish out."

Phoenix has little good to say about recent trends in radio management and regulation. Localism, he laments, is all but forgotten in radio. He thinks the museum's mission includes this message.

"We hope to persuade and convince interested radio listeners of all ages that they can demand and get better radio from their local broadcasters."

Van Orden called on the local radio community to help.

"My biggest fear is to not get the support of our local N.J. radio stations. We need WVNJ, WGHT, WRNJ, WJRZ, WOBM and all the great N.J. stations we want to showcase. We will showcase them, but we need their help," Van Orden said.

Anyone interested in helping with this project can contact Carl Van Orden via e-mail to [carlvanden@webtv.net](mailto:carlvanden@webtv.net) or call (570) 253-0848. ●

# Stations Crippled by CCA Woes

by Randy J. Stine

**FAIRBURN, Ga.** Six radio stations that paid a total of approximately \$220,000 for transmitters were still waiting for delivery in December.

The units were to come from Commercial Communication Associates Inc. before it ceased operations in November and filed for Chapter 7 of the United States Bankruptcy Code.

According to court documents, the purchase price on four transmitters had been fully paid. The amount on the remaining two transmitters had been partially paid.

A federally appointed bankruptcy trustee has proposed a settlement in which the six broadcasters would each pay a \$2,500 fee to get their partially completed transmitters. Attempts to reach the trustee for an explanation of the fee were unsuccessful.

A bankruptcy judge in Atlanta was expected to rule this month on a motion by the bankruptcy trustee to sell "certain partially completed pre-paid transmitters by private sale and to sell certain personal property by public auction" as a means to satisfy creditors. (Radio World is among the unsecured creditors listed as owed money by the company.)

transmitters are a fairly simple design. In fact, that was one of the selling points — easy maintenance," Richardson said.

Richardson said the attorney representing the radio station expected the judge to approve the trustee's motion at the meeting on Jan. 7. "That means we could have our transmitter by mid-January," he said.

Chris Myers, chief engineer for WGNX(FM) in Vero Beach, Fla., said the station paid CCA \$20,000 in June for a rebuilt Broadcast Electronics FM30-T transmitter that was never delivered.

transmitter is from being finished," Myers said.

## Half down

WIFO(FM) in Jessup, Ga., paid CCA \$34,000 in June as down payment for a \$68,000 15 kW transmitter and antenna package. Station owner Charles Hubbard said the agreement included an antenna from Jampro Antennas/RF Systems Inc.

"We were waiting to pay the final amount when the transmitter was finished. (CCA's) filing was a complete sur-

Station	Item	Purchase Price	Prepaid amount
KSMD(FM) Pangburn, Ark.	Transmitter	\$58,096	\$58,096
KLGN(AM) Logan, Utah	Transmitter	\$19,000	\$12,350
KZDX(FM) Burley, Idaho	Transmitter	\$35,713	\$35,713
WGNX(FM) Vero Beach, Fla.	Transmitter	\$20,000	\$20,000
WIFO(FM) Jessup, Ga.	Transmitter	\$68,000	\$34,000
WJCR(FM) Upton, Ky.	Transmitter	\$59,495	\$59,495

"I feel we were misled. I spoke to CCA the week before they filed bankruptcy and they said the transmitter was done and would be shipped to us the next week. That was the week they closed," Myers said.

Myers said the station has been preparing to upgrade from 25 to 50 kW. "This mess has brought the project to a halt. I'm not even sure now how far the

prise to us. They had called on Nov. 8 and said the transmitter was almost complete," Hubbard said.

Hubbard said his situation is complicated by the fact that his station still owes CCA half of the package price.

"Our lawyers are reviewing matters at this time. This has been one big headache. I'm just hoping we can settle it

See CCA, page 6 ►

**We are told  
our transmitter is  
about 80 percent  
finished and is sitting  
in the warehouse  
in Fairburn.**

— Gary Richardson

Court documents show the bankruptcy trustee recommends CCA's leftover parts inventory, supplies, manuals and testing equipment be made available for public auction. The trustee asked the court to schedule the public auction at the earliest possible date.

## Asset liquidation

Chapter 7 bankruptcies call for the immediate liquidation of assets to settle liabilities.

"We're very disappointed, but (paying the money) is the only thing we can do at this point," said Gary Richardson, general manager for WJCR(FM) in Upton, Ky. The non-commercial Christian radio station paid \$59,494 to CCA in late August of last year for a 35 kW FM transmitter.

Richardson said the station's transmitter was scheduled to be delivered on Nov. 11, but CCA officials informed him that delivery would be delayed because of a shortage of parts. CCA filed for Chapter 7 on Nov. 13.

"We are told by the court our transmitter is about 80 percent finished and is sitting in the warehouse in Fairburn. We think we can finish it ourselves or with the help of a transmitter engineer. CCA

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# AM IBOC

► Continued from page 1

broadcast engineering career in 1967, always focused on what could make a better-sounding transmitting plant, and then complaining that the receiver manufacturers didn't build a product that could receive it.

## System approach

About 12 years ago, I adjusted my view by acknowledging that the receivers out there are part of the system. To serve our industry best, we must design and adjust with the whole system in mind, as it exists.

How do we define what is AM sound today? If it's not hi-fi, what can we call it? Are we degrading AM sound by narrowing the transmitted audio bandwidth to 5 kHz? In the future, what should we focus on for best results?

In the past, several schools of thought and industry actions worked to degrade the quality of "hi-fi" AM sound:

- The record producer school of thought: "OK, everyone, out to the cars to adjust our test master."
- Station equalization. The Program director says: "Plug that EQ into the program line and I will tweak it."
- Positive modulation. Chief engineer: "Let's see, if I off-set modulator bias — look, more positives!"
- Multiband processors. PD/CE: "If I can just push up the high-end density more ..."
- Multiband processors II. PD/CE: "Louder!"

Politicians and station owners who wanted the bandwidth to accommodate more stations pressured the FCC, and the result was reduced interference protection. Consultants, in turn, enabled more stations, by saying things like, "With 12 towers we can drop this in."

The following are examples of how "hi-fi" sound did or does not exist, plus forces working at cross purposes to hi-fi.

These two transmitters noted with specific measured information sounded awful from a hi-fi viewpoint. Transmitters with 18 percent intermodulation distortion @ 3 percent harmonic, such as the RCA Ampliphase (50 kW, first gen) are mostly gone from

this country.

Transmitters with -18 dB incidental quadrature modulation, such as the Gates MW1 (wide bandwidth noise with heavy distortion in envelop detectors) are another example of units that sounded poor from a hi-fi viewpoint. Some of these transmitters are *still* in use.

For NRSC curves, band-pass limits and AM stereo, a CE would say, "Now the receiver manufacturers will build wideband radios." These are examples of my own misguided beliefs that the receiver community would give wider-bandwidth radios one more try.

So we have the activities of others trying to compensate the system with mastering, EQ and processing. We have raising noise levels due to pressure to add more stations along with other electrical noise. We have bad-sounding transmitters.

And we have the personal hopes of people (like the NRSC and myself) that we know what people want, receiver manufacturers will make the stuff and "the people" will buy it. Wrong!

## As noise levels have increased over the last 50 years, AM receiver frequency response has narrowed.

As time has passed, new transmitters, audio processing and production focused away from AM's "issues" have greatly improved AM's transmitted audio quality. Protection is improving with rules changes and will improve when the extended-band stations shut down their old channels. But other electrical noise is increasing. What is really being delivered to listeners?

Much of what consumers hear is governed by their radios. A receiver manufacturer will only mass-produce radios that the public will buy. Manufacturers have focused on reducing impulse noise, electrical static blasts, adjacent station "spits" and other noise.

An inexpensive way to reduce noise and interference is to narrow up the audio response. As noise levels have increased over the last 50 years, AM receiver fre-

quency response has narrowed.

So how "bad" is it? For the NRSC DAB Subcommittee's evaluation process of the AM IBOC system, a sub-group of the Test Procedures Working Group was formed early into the test-procedure writing process, around late 1999. To understand the impact of adding AM and FM IBOC, the committees needed to establish a performance baseline for existing receivers.

## Little wide-band listening

The sub-group was tasked to find representative radios for the testing process and to characterize their performance. The Consumer Electronics Association gathered general historical sales data to help. (*See end of article for information about how to find the report.*)

The sub-group chose four radios as representative of the huge number of AM radios in use. Among the findings: The vast majority of the AM radios in use today are very narrow-band. Few have any significant audio output at 4 kHz and no practical output at 8 kHz.

There is almost no wide-band listening to AM. Although the GE Super Radios and C. Crane radios being marketed have wide-band switches that provide response beyond 5 kHz, CEA considers the quantity in use to be insignificant. Up until recently, the C. Crane radios were very narrow-band. The company supplied me with a sample during the test procedures process.

So the term "high-fidelity audio" cannot be used to describe the total AM system. In hanging around the receiver manufacturer representatives participating in the DAB Subcommittee, I hear them use terms like "receiving experience" and "listening experience." Good terms, the sum of all the parts.

The DAB Subcommittee's receiver characterization study indicates that narrowing the analog transmission bandwidth should not be audible to the existing system. In the fall of 2000, as a participant in the IBOC evaluation process and to help satisfy my curiosity, I took on a purely subjective, reality-check task. I volunteered to try narrowed audio bandwidth transmission on some of my stations.

Reducing audio bandwidth did not degrade the "listening experience." Only the operations manager and I at the first station knew about the experiment. We received one negative comment from a listener who noticed. No one else, including any station or company personnel, noticed the bandwidth change.

However, we received some audio quality compliments from the staff through this period.

"The station is sounding great. Are you working on audio processing?"

"Yes, little tweaks here, a cleanup there."

I ran this experiment in two other markets, with no negative observations from listeners or staff.

I'm not saying that the reduced band-

width is not audible, just that it manifests itself in ways you may not expect and that, when done carefully, it does not negatively affect the existing system.

## Narrower bandwidth

For the future, IBOC stations will need to reduce audio bandwidth. We as broadcasters should think about how the narrower bandwidth would manifest itself audibly. Here are some suggestions:

Work will be needed to design a low-pass filter system that controls audible "ringing." Filter ring sounds are affected by the curve shape and by how much energy is being cut out. Also, where the filter(s) are placed in the audio chain will affect the subjective results. Should filtering be done in multiple stages or a single stage? Should it be placed before and/or after multiband processing? This is work most easily done by the audio processor manufacturers.

The broadcast system already "suffers" from the wide variety of filter designs in receivers and from the audio processing techniques practiced in stations. Some of the harsh sounds we hear from AM radios can result from the amount of audio energy we as broadcasters try to shove through them.

When we transmit strong amounts of audio energy outside of a receiver's band-pass, the receiver's band-pass filter rings. The ringing is heard back into the fundamental audio. Reducing the out-of-band-pass energy seems to smooth the sound. You may hear this as a reduction of highs; rather, it's a reduction of ringing components. The ringing artifacts are not harmonically complimentary; they're discordant and harsh.

Narrow-band audio through audio processors that are not designed to work specifically in the narrow-band world will sound dull, soft. They will not always modulate the transmitter fully.

Digital bit-rate reduction schemes are "unmasked" when audio is processed heavily and then transmitted through a bandwidth-limited system. Reduce the number of times an audio file is encoded and decoded and/or transcoded by using linear digital systems whenever possible. Once these artifacts exist, nothing later in the audio chain can mask them.

I believe that the chances of analog AM radio ever being hi-fi are long gone. There is perhaps 50 years of momentum away from hi-fi that would need to be overcome.

The rising electrical noise floor continues to reduce the usability of wide-band radios in dense urban areas and weaker signaled suburban areas. They are never useable at distance.

So is the listening experience negatively affected by reducing the transmitter analog bandwidth to accommodate AM-IBOC? I believe that the impact is minimal. The listening experience on the vast majority of radios in use may even be improved over today's wider-bandwidth transmission practices when the challenges outlined are worked through carefully.

*The author is vice president of radio engineering for Journal Broadcast Group, a member of the DAB subcommittee of the NRSC, chairperson of the Test Procedures Working Group and a member of the Evaluation Working Group.*

*To see the NRSC report on audio quality, go to [www.NAB.org/scitech](http://www.NAB.org/scitech). Under Standards Setting Committee, click on NRSC, then on AM IBOC Evaluation Report. Review section 3.4, page 22 of the main report. Also review Appendix D.*

# CCA

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and get our transmitter," Hubbard said.

Meanwhile, a criminal investigation continues into possible fraudulent activity by CCA in its final weeks of operation. Fairburn, Ga. police are reviewing a complaint by an Arkansas broadcaster, one of the six stations that paid in advance for transmitters, alleging CCA executives sold the station a unit while preparing to file for bankruptcy and then failed to deliver the transmitter.

According to court documents, Caldwell Broadcasting paid CCA \$58,096 for a transmitter for KSMD(FM), a startup station in Pangburn, Ark. KSMD officials told Radio World they made final payment in late October, just weeks before CCA's filing (RW, Dec. 18, page 1).

Fairburn, Ga. Police Sergeant J.K.

Metcalf said police continue to interview CCA personnel about the order of events leading up to the sale agreement.

"It is still an active investigation. However, the bankruptcy filing and the outcome for the radio station involved will likely be a consideration when we wrap things up," Metcalf said.

Gary Brown, the attorney representing CCA in bankruptcy proceedings, declined comment.

The bankruptcy court has ordered CCA's inventory be sold at public auction on Jan. 25 at 10 a.m. at CCA's Fairburn manufacturing facility. Interested parties will be able to preview available items the day prior.

"We have 42 pages of inventory with lots of transmitter parts and testing equipment on the list for auction," said Jackie Camp, president of Elrod Auction Service Inc.

For information on the auction call Elrod Auction Company in Atlanta at (770) 949-9046. ●

# PPW

► Continued from page 1

now we just need some flesh on the bones. Secondly, I'll work to generate funding for the organization and raise its visibility," Allen said.

PPW was formed after the 2001 terrorist attacks and debate over whether the Emergency Alert System should have been activated in New York and Washington.

Local officials elected not to issue Emergency Alert System warnings the day of the Sept. 11 attacks. Some within the emergency alert community argue a warning could have helped those trapped in the north World Trade Center tower, which collapsed 39 minutes after the first tower fell.

The 52-year-old Allen said he would use his experience as director of several trade associations to open dialogue between government agencies, civil defense planners and private parties to discuss ways to make warnings more efficient.

"We have a multitude of systems, many of which are not interoperable and do not reach the people at risk all of the time. Our goal is to create a national capability that assures that we can reach people when they are at risk," Allen said.

"Right now there are about a dozen

federal agencies involved with public warning, but no one has taken the lead."

For that reason, Allen said PPW is urging Congress and the Bush administration to designate the Department of Homeland Security as the agency to coordinate federal activities in the area of public warning information.

"That doesn't mean EAS will be taken away from the FCC. We just need one agency at the top to coordinate a public warning system," Allen said.

Defense contractor Mitre Corp. gave the organization \$500,000 as start-up money in late 2001. Mitre is a not-for-profit firm that provides information technology support to the government.

Allen said FEMA has awarded PPW \$200,000 as seed money to continue the process of assessing EAS and developing new technologies to deliver

warning information.

"The primary purpose of the FEMA contract is to fund the drafting of a strategy for building an effective national public warning capability," Allen said. "We hope to begin circulating a strategic plan in January to help open up discussion and then have a final plan in place by May of this year," Allen said.

"We continue to work on Capitol Hill and with federal agencies to explore the possibility of additional funding. We are also a membership organization, so we'll look at ways to build membership with private groups," said Allen. Both Allen and Ward said Allen's new salary is confidential.

Annual dues for for-profit companies to join PPW range from \$125 to \$5,000 and are based on revenue. The group has approximately 50 dues-paying members, Allen said.



Kenneth Allen

Allen said any improved emergency warning system would include federal, state and local agencies, with broadcasters continuing to play an important role.

NEWS WATCH

## FCC Hears From SBE On Aux Spectrum

**WASHINGTON** The Society of Broadcast Engineers presented a "Broadcast News and Sports Tutorial" to approximately 100 staff of the FCC in December. The purpose of the program was to inform attendees about broadcasters' use of auxiliary spectrum regulated under 47 CFR Part 74.

The program included presentations by SBE, CBS Sports, the National Football League, Broadcast Sports, Media Alert and the Southern California Frequency Coordination Committee. SBE said the importance of spectrum availability and coordination of its use was described using real-life examples of breaking news and sports programming.

Video clips of breaking news coverage of wildfires, marine disasters and severe weather depicted how broadcasters rely on auxiliary spectrum and wireless communications. The use of wireless devices in sporting events was depicted using PGA Golf tournaments, auto races and NFL football games as examples. The role of SBE regional and event frequency coordinators was explained.

"This was an excellent educational program and offered the opportunity to establish a working dialogue between the FCC and broadcast engineers responsible for their station's BAS services," said SBE Vice President Ray Benedict of Viacom.

Moderating the program was SBE Frequency Coordination Director David Otey. Presenters included Ken Aagaard and Larry Barbatsoulis of CBS Sports, Ralph Beaver of Media Alert, Howard Fine of the Southern California Frequency Coordination Committee and Jay Gerber and Karl Voss of the NFL.

Also making presentations were SBE General Counsel Chris Imlay of Booth, Freret, Imlay & Tepper, P.C., Peter Larsson of Broadcast Sports and Louis Libin of Broad-Comm. Bruce Franca, deputy chief of the FCC Office of Engineering and Technology, Benedict and SBE Executive Director John Poray also took part.

## Meet Ed McMahon's Loyal Sidekick.

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IBOC Q&amp;A

## On-Demand Audio Not Far Off

This is one in a series in which Ibiquty Digital Corp. answers questions about how to implement HD Radio, the newly-trademarked name for its in-band, on-channel digital audio broadcasting technology. Director of Wireless Data Joe D'Angelo answers here. Past answers are posted at [www.rwonline.com](http://www.rwonline.com) under the tab "IBOC DAB."

**Q:** Ibiquty has talked about additional benefits of digital broadcasting, one being on-demand audio. What will my listeners get from this service?

**A:** As the first generation of HD Radio receivers prepared for launch at the 2003 Consumer Electronics Show, both broadcaster and receiver manufacturers are beginning to anticipate the enhanced services that second-generation receivers will enable. Improved audio quality and performance as well as program-associated information will be the hallmark of the early HD Radio receivers, with future generations promising to unlock the full potential of the digital AM and FM channels.

One of the most anticipated capabilities has been broadly embodied in the phrase "on-demand audio." While this may mean many things to different people, the impact on radio listeners will be profound, creating new opportunities for radio stations.

For example, radio listeners will gain more control over the content they listen to and when they listen to it. Additional information services and programming will be delivered and stored on a receiver without interruption to the main broadcast programming.



We anticipate that many of the features that drive the popular personal video recorders in the TV space will find their way over time to the digital radio space. Listeners will be able to

select information they want, when they want it. This could offer many new opportunities for the delivery of news, traffic and, potentially, complete entertainment programs.

Just imagine your listeners never missing their favorite drive time programs on your station, regardless of when they choose to tune in. This capability represents radio's response to the many emerging personal audio and entertainment devices being introduced into vehicles. Developments are underway that will help make that a reality.

While these capabilities will not appear overnight, they are not far off. The fundamental capabilities are being deployed today in stations as they convert to an HD Radio system, and soon the applications and receiver technologies will converge to deliver new and exciting capabilities to digital radio listeners. Stay tuned.

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**dorrrough**

Many of the features that drive personal video recorders will find their way to digital radio.

Ibiquty is planning to host a wireless data forum at NAB 2003. The forum is open to all current and potential broadcasting, manufacturing and content providers. Details are to come, but interested parties should contact Ibiquty Marketing Communications Manager Laura Taylor at [taylor@ibiquty.com](mailto:taylor@ibiquty.com) for information closer to the show.

Send your IBOC questions to [radioworld@imaspub.com](mailto:radioworld@imaspub.com). *Radio World* welcomes other points of view.

MARKET PLACE

## RBC Offers Portable and Home SCA Radios

RBC Radio, a provider of SCA programming, has become involved in the development and distribution of a new receiver for the SCA broadcast industry. The company claims significantly improved signal reception and sensitivity.

Car and home-installation models are available for use by reading services, ethnic and other specialty listeners.

RBC is a South Asian-Indian radio network broadcasting via SCA in New York, New Jersey, Washington, Maryland, Virginia, Chicago, Los Angeles, San Francisco and the Bay areas, and on the Internet. Overseas it broadcasts via WorldSpace.

For information on SCA receivers and RBC programming, call the company in New York at (212) 244-1140 or visit [www.rbcradio.com](http://www.rbcradio.com).

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o m n i a a u d i o . c o m

# How Lossy Compression Changes the Broadcast World

by Dave Moulton

We all know what codecs are, right? Chunks of software that encode digital data for transmission and/or storage and then decode it for use. It's an encode/decode cycle. We call it codec (for Code/Decode), in an oddly poetic compression of language.

But *why* do we encode and decode? Why don't we just hit the transmit or record button? You know the answer to this one too, right?

That answer is, of course: we've got more data than we can transmit! So we gotta throw some away. And this is what the codec does. The code/decode cycle contains an algorithm that deletes data that the codec's programmers believe won't be important to our enjoyment of the transmitted signal. Sort of like Readers' Digest Condensed Books.

The reality is that, for audio signals, the conversion from analog to digital requires a *lot* of digital data. The standard stereo CD signal uses 1.41 MB of data every second, which is, ah, huge. Takes a lot of bandwidth for transmitting. Bandwidth that we don't have. Similar constraints exist for video signals as well.

So, the codec encodes the signal, reducing its bandwidth by throwing away a great deal of the signal (hopefully all of it consisting of irrelevant details) prior to transmission. After transmission has been accomplished, the reduced signal is reconstituted into a reduced-data approximation of the original, during the decode portion of the cycle. Naturally, the devil is in the details.

In fact, the devil permeates a fair amount of this. Back in the late 1970s, we went to considerable trouble to define and establish a viable digital signal standard (the Red Book CD specification for digital audio is 44,100 16-bit voltage samples per second per channel), and now, ironically, we're busy working on trying to whittle away at that estimable standard in order to be able to transmit this signal via radio (and television) in its digital format, even as we also develop higher resolution formats. Sounds a little like a deal with the devil to me!

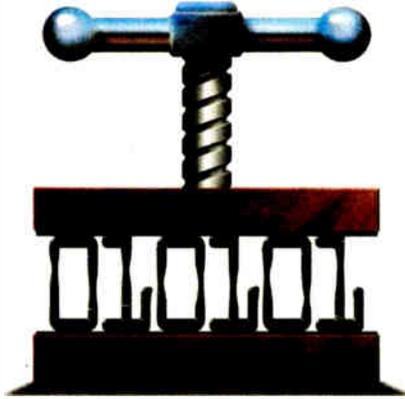
## Why it matters

The general adoption of such data compression is worth thinking about, because it is shaping both the present and the future of audio and video. At present, Internet transmission of audio and video and all satellite transmission of digital audio and video are compressed by codecs. Further, as digital FM comes on line over the next few years (it is already available via satellite and terrestrial IBOC transmission is beginning now), it is all compressed by codecs. We are profoundly committed to this technology and broadcast media. By 2010 it is going to be *everywhere*!

Taken just by itself as a concept, this sort of lossy data compression is not a bad idea at all. However, concern arises because we've managed to paint ourselves into a bit of a corner with it, due to some really enthusiastic general optimism (Oh, the channels we'll

have! The pictures we'll see!!).

*Because we can compress, we do.* More to the point, we compress as much as we can, for better or for worse. We have now committed ourselves to transmitting a volume of data (er, number of channels) that requires quite massive compression. We didn't stop at the quite conservative point where we felt that quality *might* begin to fall off, but rather we've kept going to the point where we *know* that it has begun to fall off, but still hope nobody will mind too much.



We've been trying to fit more and more channels into a fixed bandwidth, simply to maintain, in each of our various competing corporate business plans, a competitive offering to the public.

Why did we do this? For survival in a free market, that's why! We could not and cannot afford not to!

**At 96 kbps, we are actually deleting 93 percent of the data, and the result is a signal that even expert listeners find to be generally acceptable, whose defects are often inaudible. Remarkable!**

Meanwhile, there are some verities that need to be kept in mind. First, data compression is *not* like audio compression. We aren't compressing amplitude here, knowing that we can expand it later, with no significant loss of resolution. Data compression might, more accurately, be called "data-stripping." We are deleting data, and it cannot reasonably be recovered or restored later. It's gone for good, for better and for worse.

Second, we are stripping *a lot* of data away, usually more than 90 percent of it. This is not a trivial act of compression akin to a 1.3:1 compression above +10 dBu in audio. This is massive.

Finally, once we've "decoded" the stripped data, we may encounter some significant problems if we try to encode it again for more storage or transmission. Interesting, eh?

Now the argument is, of course, that the stuff we're stripping out is inaudible, or at least insignificant. And, in fact, there is a lot of truth to that argument. This sort of lossy compression can really work well, and in fact it yields quite massive benefits for both

the broadcasters and the consumers.

But it is essential that we keep in mind that we've created a fairly fragile low-resolution signal. We've done this as a function of our effort to fit more channels into a given bandwidth. We need to be realistic about what that low-resolution signal is, how it behaves and how it will be perceived by our beloved listeners and viewers.

## Kvetching and high praise

And here's where we maybe got a little too chummy with the devil. We've made some, ah, claims about our codecs. We've said things like, "Well, you know, it's *nearly* CD quality. You can't really hear the difference." And we've used such claims to justify our adoption of codecs. Unfortunately, we've institutionalized such claims.

Meanwhile, we've tended to downplay just exactly how much data we're throwing out, as well as how much progress we're really making with improving codecs, because to do so implies that maybe they weren't so hot to begin with, while we were busy claiming that they were, well, ah, *nearly* like CDs.

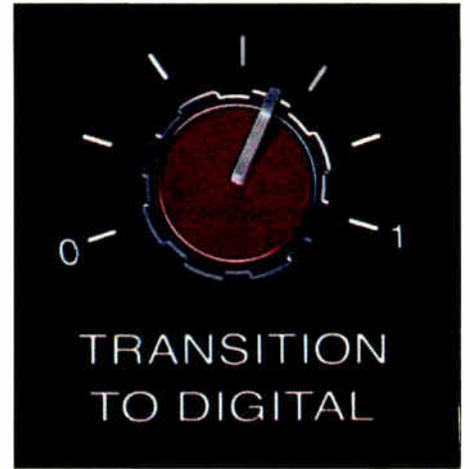
I've got some history here. Off and on, I've been hired by a codec developer to conduct formal and informal listening tests and demonstrations of codec audio performance. Right now, I'm doing work for Ibiqity Digital Corp., which in turn is providing the codecs used by both Sirius Satellite Radio and the IBOC terrestrial digital

broadcasting system.

Some years back, I measured some stereo codecs running at 128 and 96 kbps that performed quite well, in addition to some other codecs whose performance ranged from fair to good. By "well," I mean that in blind trials expert listeners scored them somewhere between "inaudible" and "audible but not annoying" and naïve listeners generally scored them higher than that.

At that time, I also took an informal listen to codecs running at lower bit rates, such as 64 and 36 kilobits per second. At that time, I opined that such rates were "too slow to be musically viable, though speech intelligibility is certainly adequate." That was a polite way of saying that codecs at that speed really didn't sound very good at all, certainly not for music.

Recently, Ibiqity asked me to have a listen to its current Perceptual Audio Coder Version 4, running at 96, 64, 48 and 36 kbps. At the faster end of that range the performance is really remarkably good, generally better than the best codecs I studied five years ago. At the slower end of things,



where things used to be impossible from a musical standpoint, the performance is now musically viable, even if the artifacts are audible.

Now, it needs to be noted that most listeners will detect some artifacts and some listeners will almost certainly find those artifacts to be annoying, and there is no sense in trying to gloss over those truths. In fact, it is the previous attempts to do just such glossing that has gotten us into trouble.

But at the same time there is a quite positive truth to be noted as well. At 96 kbps, we are actually deleting 93 percent of the data, and the result is a signal that even expert listeners find to be generally acceptable, whose defects are often inaudible. Remarkable! There's high praise due here for a remarkable improvement and technical accomplishment.

But what's even better, to my mind, is what has been accomplished at the lower bit rates.

At 36 kbps, we have deleted 97.5 percent (!) of the data (and of course we can hear the effects of that compression). But, just as significantly, the signal has remained musically viable, which is to say that the elements of timbre, dynamics, stereo image and intelligibility remain viable and generally enjoyable.

This means that, according to my lofty standards, such compressed signals are pleasant and satisfying for the kind of general-purpose background listening that is the basis for most listening to broadcast music, the kind of listening that occurs in a car, for instance. To me, that's a tremendous achievement, and a huge improvement over where we were back in 1997. Back then, I doubted that we could ever get down to these bit rates successfully.

## Richness of diversity

The upshot of all of this is that we are entering yet another iteration of the brave new world, a world in which low-resolution signals are everywhere and their signature artifacts are audible. But we can and will learn to live with them. And in return, we will get a richness of diversity in our broadcast programming that hasn't been available for quite a while now, if ever.

Meanwhile, this is another step along the path toward on-demand broadcast programming, where we can call up anything we want anytime we want anywhere we want, all for a reasonable cost. That's where this is all really heading.

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## FIRST PERSON

# Saga of the Cold War's MB-50

by David L. Hollyer

During the Cold War, Radio Free Europe, with transmitters in Germany and Portugal, concentrated its broadcasts on the populations of Poland, Hungary, Czechoslovakia, Bulgaria and Romania. Radio Liberty broadcast to the Soviet Union in Russian and its many languages.

Although many listeners in those countries had radios with shortwave capability, others owned less-expensive sets that received only medium waves, what we call AM in the United States.

Therein lay a problem. Ideal short-wave transmitter sites were sufficiently far from their targets that signals could be bounced off the ionosphere. Medium-wave transmissions, particularly during daylight hours, rely on ground waves, so their coverage distance is limited. If you want to reach a population of medium-wave listeners, the transmitters should be closer to the target and as powerful as possible.

One of RFE's most important targets, Czechoslovakia, was next door to Germany. So why was its main medium-wave transmitter, broadcasting in the Czech language, placed in Holzkirchen near Munich, some 200 miles from Prague, the Czech capital city?

The Czech desk was proud of its facility, located against a backdrop of the Bavarian Alps, with the four towers of its directional antenna array tall and proud against the sky — lovely to look at, a great place to take visitors, so easy to reach from Munich.

But its signals did not reach the target well, as RFE engineers found when they took field-strength readings on the German-Czech border. Jamming was so intense that the signals were barely audible.

Something had to be done to fix that.

## Portable radio

In the early 1950s, I was engineer-in-charge of the RFE Receiving and Monitoring station, built on an old fighter airbase in the town of Schleissheim, near Munich.

One day, a group of seven 40-foot trailers arrived and parked on the abandoned runway. The trailers comprised a cooling blower van, a studio van, a high-frequency receiver van, a shop van, a power supply van, a diesel tanker and an RCA 50 kW medium-wave transmitter. The MB-50 contained a complete station in those trailers; it lacked only an antenna.

We were told only that this was to be known as the MB-50, for Medium-Wave Broadcast, 50 kW; that it had been

ordered by some unmentioned U.S. government agency for a lot of money; and that it had been built by engineer Ben Adler of Mamaroneck, N.Y.

We were told that it would stay there until further notice, ready to go, watched over by our guards. "Ours not to question why." We kept it guarded and dusted, and we waited for something to happen.

The MB-50 sat for more than a year. Then we learned that it was to be moved up to the little Bavarian town of Cham, about six miles from the Czech border.

We visited the location. The site had been cleared; a two-tower parasitic antenna array, designed by the chief projects engineer, the late Ken Owen, had been erected.

Close to the border? Indeed. With

binoculars I could see border towers, with a guard staring back at me through his binoculars.

The MB-50 vans were hauled up to the town of Cham, positioned on the site and checked out. A good operating frequency was selected in the middle of the broadcast band and the transmitter was fired up. Everything worked fine. The German telephone company Deutsche Post was contacted, and a program line and "order wire" were established connecting the Czech studios at RFE in Munich to the transmitter site.

## Short service

After the MB-50 went on the air, our mail pull from Czechoslovakia increased dramatically, proving that the site was delivering a good signal despite jamming.

Operation at Cham became routine for several months, until orders came to close down the site and prepare the MB-50 for travel to the port of

See MB-50, page 14 ►

## THE BIG PICTURE

# Will HD Radio Be a Royal(ty) Pain?

by Skip Pizzi

If and when HD Radio becomes established, radio broadcasters may find themselves pitched into another battle with record companies over payment of royalties.

The music industry's legal forces, fresh from their recent victory over payment of performance royalties by Internet radio Webcasters, may soon turn their sights on the next soft target for their argument: digital over-the-air music broadcasting. The digital audio quality of HD Radio, which Ibiqity long has touted as the system's primary (and so far, its only) advantage, may turn into a liability in this context from its potential for allowing "perfect" copying of music by the consumer, via the incorporation of IBOC tuners into PCs, PVRs, handheld devices or any other home media systems with digital recording capability.

## New ground

Consider the background: Over the last two decades, the record industry has taken every opportunity of new technology's introduction to attempt establishment of new regulation and/or fees. While most of these attempts were largely unsuccessful, the Internet radio decision broke new ground, finally providing the record industry, represented by its trade association, the RIAA, with a significant win.

Although the judgment called for far smaller royalties than the RIAA had requested initially, it set a precedent in requiring Webcasters, including radio stations streaming their air signals online, to pay performance royalties to record companies for the right to play their records online.

Note that while broadcasters have always paid *composer* royalties to songwriters (through ASCAP and BMI), stations have been uniquely exempt from *performance* royalty payments to record companies for the right to broadcast

recordings of those songs. The traditional rationale for this exemption is that record companies sell more product due to exposure via radio airplay, so an adequate quid pro quo is provided without royalty payments from radio stations.

More recently, however, the celebrated losses that the record industry claims to be suffering as the result of online music downloading have only served to redouble the RIAA's efforts on the industry's behalf in aggressively challenging any new technology that might threaten future revenues. So it is to be expected that digital radio's ability (at least theoretically) to freely deliver music with digital quality equal to or better than MP3 will soon be on the RIAA's hit list for restriction, either through new fees or new regulation.

Relevant examples of both of these approaches are in evidence across the industry. A pay-per-play licensing model is used in the recently approved Webcasting fees, still under refinement by Congress. Meanwhile, a regulatory mandate is being attempted in the so-called "Broadcast Flag" process under development in the DTV world (officially known as the Redistribution Control Descriptor of the ATSC A/65A Standard, Amendment 3). One or both of these processes could soon be proposed for IBOC radio.

## Timing is everything

It is unlikely that these developments will occur until it appears that broadcasters have accepted and invested in the technology, however. Then the RIAA will know that the broadcasters are committed to the transmission format, and that soon consumers will have access to receivers that offer a new form of access to the record industry's content, so new licensing arrangements will then be required. Once broadcasters have crossed the IBOC Rubicon, the RIAA will be in a strong

See HD RADIO, page 14 ►

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# MB-50

► continued from page 12  
Bremerhaven.

Another case of "ours not to question why." I was given a Jeep and put in charge of leading the MB-50 convoy up to the port of Bremerhaven, about a 400-mile trip.

Everything went well until we reached the edge of the city of Bremen. I had instructed the drivers to assemble and wait for me to lead them through the town. How I was going to do this, I didn't know; I had never been to Bremen.

When I arrived at the rendezvous point, only two of the vans were present. Where were the others? A friendly German policeman drove up in his

big BMW and asked in excellent English, "Got a problem?" After listening to my explanation he said, "Don't move. I'll round up the rest of the convoy and bring it here. Then you all follow me through the town and I'll put you on the road to Bremerhaven."

So with the help of the local police, the U.S. government's latest Cold War weapon arrived at the port. We contacted the RFE shipping agent and parked the MB-50 in a designated spot, to be used for purposes unknown. The drivers spent the night and returned to Munich by train.

I drove on to the town of Höchst, near Frankfurt, to the headquarters of the Armed Forces Network; I was to borrow its puny 5 kW mobile transmitter to replace the MB-50 in Cham. Not too fair a swap for the powerful MB-50

— unlikely to make much of a dent in the jamming.

## Fate of the MB-50

Months passed and we heard nothing about the MB-50 until we received a report that vandals had broken into it at the port and stolen the transformers for the copper. Eventually it was repaired and shipped out to "somewhere."

Not until a few years later did I learn that "somewhere" was Swan Island, a tiny, uninhabited piece of real estate in the Caribbean. The CIA used the MB-50 to broadcast to Cuba during the Bay of Pigs fiasco.

It stayed there for a while, transmitting programs despite intense jamming.

The ultimate fate of the MB-50 remained unclear to me until I met an engineer who had worked with it in the

Caribbean. I asked him what became of the equipment. He claimed that they had "deep-sixed" it — shoved it off the end of the dock.

This is an ignoble fate for a great transmitter that performed yeoman service broadcasting programs, first in the Czech language, and then in Spanish, to counter Communist propaganda.

Now, its tasks accomplished, it rests in a watery grave beneath the serene Caribbean, with nothing to mark its final resting place.

*David Hollyer began in broadcasting in 1938. During World War II he served with the Signal Corps in North Africa and Italy. He worked for VOA, RFE, RL, Page Communication Engineers and MITRE Corp.* 🌐

# HD Radio

► continued from page 12  
bargaining position.

The eventual impact on broadcasters could be significant. Beyond the levying of new flat annual fees, like those now paid for composer royalties, the more contemporary approach of a sliding, audience-based fee schedule might be applied to any IBOC levies, such as those now used in Webcasting. Although this will be a harder to argue in the broadcast world, where audience figures are estimated, than it is in the online world where listener numbers are precisely known, it still may be attempted.

On the other hand, a regulatory ("broadcast flag") approach to a solution will add cost and complexity to IBOC hardware, in both the broadcast and consumer environments. This could slow the development and sales of consumer receivers, as well as add reliability and/or user-friendliness issues to the IBOC radio experience. There could also be additional liabilities for the broadcaster if the rules of such a system were broken, which they could likely be soon after any such format's introduction. (Like DTV, the process would attempt to protect content without encrypting the broadcast signal, which many experts believe to be an impossible requirement.)

The irony in this process is that new digital services, both on-air and online, have the ability to provide full metadata accompanying any music transmissions, which could contain complete artist, title and album information, thereby stimulating record sales. In analog broadcasting, the only way to provide this is via announcer back-announcing, something that most radio stations inexplicably have eliminated from their continuity in recent years. In addition to reducing public service value, this obviously purposeful directive by broadcast managers away from identifying the music they broadcast seems to be simply asking for trouble from the record industry.

The resolution of this might be the use of potential interactivity in digital broadcasting/Webcasting, which would allow users to purchase content they hear over the air with a single mouse-click or the push of a "buy button" on next-gen radios. Without this, or some other reasonable accommodation, IBOC may become another venue for the revenge of the record companies.

*Skip Pizzi is contributing editor of Radio World. RW welcomes other points of view.* 🌐

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Radio World, January 15, 2003

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# Learning From Our Mistakes

by John Bisset

A few months ago, engineers visiting Dave Biondi's radio-tech list serve on broadcast.net discussed self-inflicted problems. Without naming names, a couple of interesting stories were shared.

The first was a Marti STL-10 that was going intermittent. It was a new installation, and the engineer couldn't understand why the STL-10 was cutting power.



Fig. 1: The Commercial Radio Network in South Africa uses these custom configurable keypads. Any keystroke or combination of strokes can be assigned to a key.

The problem? A very short half-inch piece of 36 gauge wire shorting the drive to the PA. Where did the wire come from? The engineer stripping a stranded shielded pair above the STL-10's well-ventilated enclosure. A lesson learned a little too well!

★ ★ ★

Combating the problem of "lost parts" can be as simple as using a piece of bubble wrap to cover the top cover vents in equipment. In addition to keeping strands

of wire from finding their way inside, any screw, nut or washer dropped will get caught in the bubbles and will not bounce or roll.

The pink static-proof kind of bubble wrap also makes circuit boards happy. You can make your life easier by laying this bubble wrap in the bottom of your equipment rack, or even on the floor of your transmitter to "grab" fallen parts.

★ ★ ★

Alastair Gray works with the Commercial Radio Network in Midrand, South Africa. He read, with interest, our suggestion for using pre-fab keyboards for custom applications in studios.

CRN has come up with its own elegant solution, seen in Fig. 1. These are custom configurable keypads, so any keystroke or combination of keystrokes can be assigned to a key. The keyboard pads are extremely durable and easy to use. Gray says many of the network's presenters (jocks) relate to the older technology look — big buttons, easily identified. The clear layout helps a lot.

The network uses the keypads as part of its Radiohost PC system; more information is available at [www.radiohost.com](http://www.radiohost.com). The F-keys are used as hotkeys to fire off regularly used audio clips or sound effects.

★ ★ ★

Remember the Boy Scout motto "Be Prepared"? Here are a couple of steps you can take now that will make you a hero later. They are offered by engineering consultant Tom Osenkowsky.

First make sure you have a spare muffin fan for your exciter. A little advance

preparation will save you some money. These fans can be purchased from discount electronic suppliers.

While you're checking part numbers, jot down the part number for the transmitter blower motor. Again, blower motors can be purchased from suppliers like W.W. Grainger at considerable savings.

## Remember the Boy Scout motto 'Be Prepared'? Here are a couple of steps you can take now that will make you a hero later.

Early in my career, an engineer showed me how he'd broken the blower wiring and installed male/female Molex-type, three-terminal quick-connect plugs in each of his transmitters. A mating plug was installed on the wiring of the spare blower motor. If a failure occurred, the down time was reduced considerably. By pre-wiring the spare blower, phase/rotation issues also were eliminated.

Remember, screaming bearings won't heal themselves. Bearings can be replaced at a fraction of a new blower motor. Again, the secret is to plan.

If the blower doesn't work, try spinning it manually to get it started. The blower motor may be fine; the start-up capacitor may be bad. If the motor spins freely, try replacing the capacitor. It's an easy part to replace, and again, saves a lot of money over a replacement motor.

Is your transmitter in a dirty environment? Tube-change time is a good time to see how efficient your blower assembly is.

Fan blades or fins clogged with dirt — common in dirty transmitter environments — mean air flow is reduced. There may be enough cooling to keep the air interlock switch closed (check to see that this switch is working, too) but the air volume is reduced, cooking the tube.

As you remove the tube from the socket, look at the underneath. If you see discolored ceramic or contacts,

check the tube socket finger stock and the fan volume.

After cleaning a tube socket, and before inserting a new tube, I've traditionally turned the filaments on — with the exciter off, of course — to allow the blower to force out any dust or debris dislodged by cleaning.

A word of caution: keep your face away from the output cavity so you don't get a mouthful of dirt.

★ ★ ★

Scott Todd, who works with KKMS in Richfield, Minn., had some fun with our "Where are they now" word puzzle. Scott adds that we forgot a manufacturer, REL, although Scott did find its initials at the bottom of the center column.

See WORKBENCH, page 16 ▶

## Digitally Diverse Omega\_FM - \$5880

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# Workbench

► Continued from page 15

★★★

Telos/Omnia and Orban both have announced software upgrades for their processors.

Orban has released version 3.0 software for its flagship FM audio processor, the Optimod 8400. New Optimods are shipped with the software, which also is available as a free download. Visit [www.orban.com](http://www.orban.com); click on Downloads.

more compact. It is rack-mountable and provides both unbalanced/balanced ins-and-outs and independent output-level adjustments for both the balanced and unbalanced outputs.

★★★

Many of us cut our transmitter teeth on the RCA BTF-20 series. A great FM transmitter — unless you needed to neutralize it. Ask anyone with experience on this rig. It's been nick-named "the fire-box."

I recently spoke about this transmitter to an engineer who was looking to retire his BTF. As we ended the conversation,



Fig. 2: Hank's latest.

Omnia-6 users can call or e-mail Customer Support for details on Version 6.1.5. Visit [www.omniaaudio.com/about.htm](http://www.omniaaudio.com/about.htm) for information. Omnia-6 FM owners also can get a free video tutorial from Frank Foti on setting up your Omnia-6. Browse [www.omniaaudio.com/techinfo/default.htm](http://www.omniaaudio.com/techinfo/default.htm) for a modem-friendly video stream.

★★★

Just when you thought things couldn't get better, Hank Landsberg has announced a new Matchbox.

Seen in Fig. 2, the new Matchbox is

he asked me if I knew that a fire extinguisher was a required piece of equipment to perform the neutralization on any BTF FM series properly! I never knew a fire extinguisher could be used as a neutralization tool.

*John Bisset has worked as a chief engineer and contract engineer for more than 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 [jbis-set@harris.com](mailto:jbis-set@harris.com).*

WIRED FOR SOUND

## Brunel's Ship Made Cable History

by Steve Lampen

We left our last installment (Nov. 20) talking about Isambard Kingdom Brunel, the obsessed mad genius.

His obsession started following a conversation in which Brunel learned that ships float not because they are made of wood but because of displacement. As long as the water displaced by the ship weighs more than the vessel, it will float. Being a trained civil engineer, Brunel instantly understood that this meant you could build a ship out of anything, as long as it displaced more water than it weighed. So he designed and built the largest iron-hulled ship up to that time, the Great Eastern.

This ship wasn't just a copy of a "normal" ship made of iron instead of wood. No, this was the largest floating object yet. It weighed more than 18,000 tons and was almost 700 feet long and 85 feet wide. In 1858, it cost more than \$250,000, many hundreds of times that value in today's dollars.

sink. Brunel's greatest triumph became his undoing. In 1859, barely a year after its launching, he died of exhaustion at 53.

Thus the greatest ship built to that time sat in a salvage dock until it was noticed by an engineer working for Glass Elliott of Greenwich, England, one of the firms working on the transatlantic cable. Here, in the Great Eastern, was the obvious solution to one of their most pressing problems. They paid \$25,000 for the ship — 10 cents on the dollar — and refitted it. For what? Why, to carry the wire!

### Miles and miles

The ship could now handle three gigantic reels of wire, each over 1,000 miles long. And they could feed off the back of the ship. The size and weight of the ship helped solve the problems of rough seas or bad weather. And its ability to turn tightly was a godsend when soundings indicated obstructions below.

Only the Great Eastern could have carried the largest roll of wire made to that point (2,700 miles). In July of 1866, the

**The Great Eastern could handle three gigantic reels of wire, each over 1,000 miles long. And they could all feed off the back of the ship.**

The Great Eastern carried sails but was outfitted with a steam-powered paddlewheel system amidships. It had not one but two paddlewheels, one on each side. This allowed the ship to turn on a dime. Just turn one paddlewheel one way, and the other the other way, and it could turn a circle in its own length.

Brunel, near bankruptcy as the ship was completed, thought he would make a killing speeding passengers from London to New York. Unfortunately, it wasn't as speedy as other regular steam-powered propeller-driven vessels. And many passengers were too scared to travel on an iron ship because they thought it would

Great Eastern successfully ran a cable across the Atlantic. One previous cable had worked only sporadically for two weeks before it failed.

This new cable was manufactured by Telcon, an amazingly modern name for a Victorian company. Its cable design was lighter and stronger than previous cables and consisted of seven strands of copper under three layers of gutta percha and one layer of hemp. The entire construction was covered with 18 strands of iron wire.

Not only that, but the Great Eastern then turned around and found a broken cable from a previous attempt, 680 miles

See LAMPEN, page 20 ►

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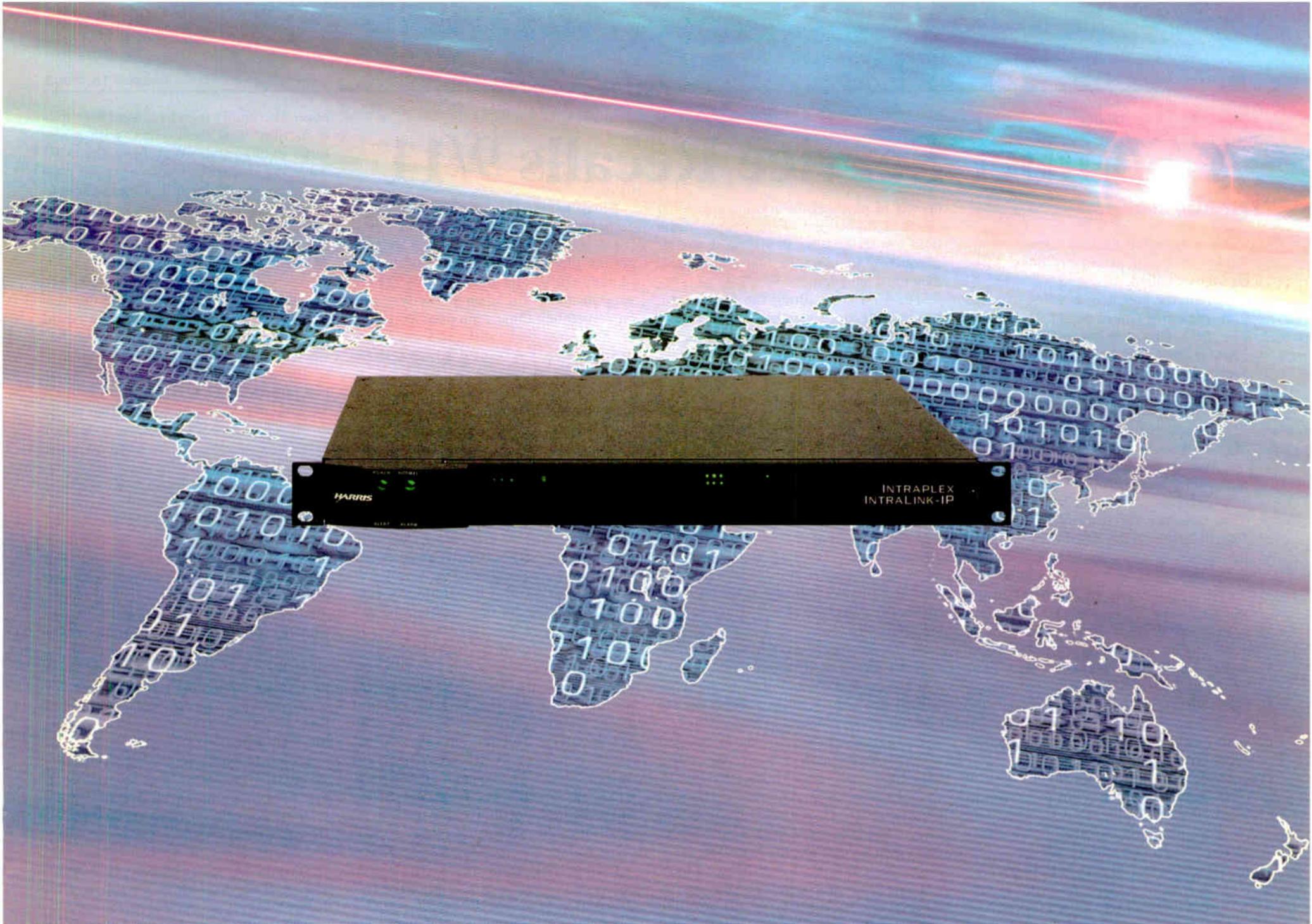
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FIRST PERSON

# A Somber Service Recalls 9/11

by Brian Clark

I was home in Los Angeles with my family at 7 a.m. when my boss, Mike Callaghan, called.

"Brian, the president is going to speak from the crash site of Flight 93 on Sept. 11, 2002. Can you go to Shanksville, Pennsylvania, and uplink his speech via satellite using your M4 World Communicator?"

I replied, "It would be my honor."

## Site visit

I had never heard of Shanksville, and I can imagine most Americans hadn't, either.

One factor on my side was that Clear Channel has stations WJZZ(FM) in Pittsburgh and WMTZ(FM) in Johnstown. It is wonderful to have people in the local area who can help in accepting shipments and provide technical expertise.

In Shanksville it would be my job to uplink audio from a memorial ceremony to the 1,200 Clear Channel radio stations via my M4. The M4 or World Communicator is a small laptop-sized satellite system that emulates ISDN. This small dish connects directly to an ISDN audio codec's "S" interface.

Once my audio was downlinked at NSN, my distribution point in Denver, it would be re-uplinked on C-Band and received on StarGuide satellite receivers all over the United States.

After landing in Pittsburgh around 4 p.m. on Sept. 9, I made the two-hour drive to Johnstown in the hopes of catching my bearings. Not being acclimated to the area, I called the Johnstown station and spoke with the man of a thousand hats, morning-show producer Roger McCoy.

He agreed to meet me the following morning so that we could convoy to the crash site, where a temporary memorial had sprung up.

We arrived at the perimeter of the site at 10 a.m. As I checked in at the white popup canopy for my press credentials, a C-130 cargo plane roared overhead at low altitude, rehearsing for the following day's events. That woke all of us up.

We boarded a yellow school bus with other media people and drove to the site area along a two-mile dirt road.

Many thoughts ran through my head. Since Sept. 11 of 2001, I have tried to put

myself in place of the passengers of the hijacked flights and of the people at the twin towers and the Pentagon. I cannot adequately imagine the fear and despair they must have felt.

The first sight along the road was a blue, single-story weather-beaten family home. Posted on the porch of the house was a sign, "Official Flight 93 Souvenirs." I felt depression setting in.

## Mound of dirt

We approached a small crest overlooking the strip-mine area where Flight 93 fell. Past the top of the hill, we came upon a large grouping of satellite dishes for TV uplinks. To the right and across the road was the temporary memorial, consisting of a 25-foot section of chain-link fence erected overlooking the crash site. Affixed to the fence were many handwritten notes of love and encouragement, along with personal effects such as FDNY baseball caps, left behind by visitors.

In the distance we could see a mound — the filled-in land where Flight 93 had come to earth. Within 50 feet or so of the mound was a lush forest that seemed to encompass the entire strip mine area.

It was remarkable that the plane had struck where it did. A half-mile in any direction were scattered homes and farms.

Our group piled out and approached the memorial. Things were quiet except for the sound of wind, which blew seemingly endlessly across the flat plain.

It was eerie to stand here, where events had mesmerized so many Americans including myself. I came upon a black granite plaque.

## Angels of Freedom

*Few can begin to understand what drives men to such acts of desperation. But the World must now know the resolve of this great nation is both unshakeable and unstoppable.*

*This day ordinary Americans took extraordinary steps to help their fellow Americans and by doing so gave the greatest sacrifice.*

*And so these Angels of Freedom stand not as a memorial to those who died. But rather as a celebration of their lives for which we will forever be in their debt.*

Small wooden angels resembling gingerbread cookies were placed in a uniform line facing forward behind the granite plaque. Each angel was painted in red, white and blue stripes. There was an angel for each passenger and crew member aboard the doomed jetliner. Someone had fabricated miniature orange life vests and placed them around each crew angel.

The reality of the event was sinking in. I became further upset by all the media activity around me, but I realized that these people were here to cover the story just as I was.

## Anniversary

The Secret Service told us to leave the area so they could conduct a four-hour sweep. We returned that evening to set and test our gear for the service the next day.

With the aid of a small Honda generator supplied by the local engineers, I powered up and tested my satellite gear for an end-to-end test with Premiere Networks and NSN, my satellite distributors. This was a very remote location; ISDN and normal phone facilities were problematic. My M4 satellite and low-delay Zephyr Extreme using AAC-LD Mono 64 seemed the only way out of the area. Eventually NPR secured two ISDN lines through Verizon, and one of its reporters allowed me access as a welcome backup.

On the anniversary of 9/11, we met at our hotel lobby at 2:30 a.m. and convoyed to the site. We began our setup on the five-foot-high stage platform about 500 feet west of the crash site. Winds were fierce.

Niki Wild and Bill Cody began their tribute show for the Johnstown radio station, emanating from the wood stage. I took an audio feed from a local engineer and began to uplink the show audio to NSN as a pool feed for Clear Channel stations.

Things were looking good technically but the weather was getting more severe by the minute. A 20-foot platform wall blew over, narrowly missing a group of onlookers; then the platform we were working from began to sway.

A crowd of about 500 surviving family members and friends and some 800 media people were in attendance. Seeing all of these people was a moving experi-

ence. The family members were very quiet as they took their seats, with many hugs exchanged. Watching them all made me realize how many people each of us touches during a lifetime. I came to Shanksville to cover a story, and left feeling like I was part of it.

## More checks

At about 7:20 a.m., about an hour before the event, the Secret Service again instructed us to vacate the stage so they could check the gear for explosives. They finished only 10 minutes before the service.

The wind was stronger than ever. I was concerned about my M4 satellite dish blowing over and noticed a section of the antenna folding back into itself. I decided to hold the antenna for the duration of the memorial.

Still photographers and videographers appeared and wanted to converge on the platform to get "The Shot." This was disturbing to those of us who had been in place since 3 a.m., enduring strong winds, just to have pushy media encroach at the last minute. The professional media on the platform let it be known that the photographers would not be allowed to get in the way.

At 8:30 a.m. the memorial began. A gong was rung and a name read for every passenger of Flight 93. The C-130 flew over, joined by F-14s in the missing-man formation.

I tried to immerse myself in the service, but with severe weather building, my main thoughts during the ceremony were to keep my equipment and myself from blowing away. There were many speeches by such dignitaries as Homeland Security Director Tom Ridge and Sandy Dahl, wife of Flight 93 pilot James Dahl.

The service came to an end after about 45 minutes with the release of white doves. We would not see the president, however. We were told that he would not make a speech after all; instead he would meet with the surviving family members of Flight 93 privately.

Plans called for me to engineer Michael Reagan's syndicated show from the site that evening, but the weather simply wasn't going to allow it. Michael, his producer and I ultimately decided to move the show to our station in Pittsburgh.

The memorial ended, a somber reminder of how short and precious life is. It was time to head home.

*The author is chief engineer of KHHT(FM) in Los Angeles.*



This view is from the temporary memorial. The crash site is about a mile to the north, against the distant tree line.

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## FEED LINE

# Finding Suitable Transmission Line

This is one in a series of articles on the fundamentals of FM transmission systems. Earlier articles appear under the Feed Line tab at [www.rwonline.com](http://www.rwonline.com).

A broadcast engineer designing an FM transmission system has a number of choices for transmission line size and type.

The factors that enter into this decision are transmitter power, line length and antenna gain. All three factors are somewhat variable.

mind that in combined systems, the power in the line is the sum of the power of each station.

Next, go to the manufacturer's catalog and find a line that exceeds the calculated line output power by a good margin, keeping in mind that the input power (which is the maximum power the line will have to carry) will be somewhat higher.

While any of a number of transmission lines may have an adequate power rating, there will be few choices that offer both

ing the antenna input power from the transmitter power output. Divide the antenna input power by the TPO and multiply by 100 to calculate the efficiency of the line in percent.

Table 1 shows an example of a system calculation. The system specifies an ERP of 50 kW, a four-bay antenna and 500 feet of line at 100 MHz.

Rounding in accordance with 47 C.F.R. §73.212, the operating TPO becomes 27.5 kW.

## Headroom

The next question becomes one of headroom. Is a 3-inch line with a 42 kW power rating adequate?

To find the answer, we must derate the line for VSWR. To do this, simply divide

input power?

The answer to that question is determined by estimating the risk of the VSWR ever getting to that point. Are the protective circuits in the transmitter reliable? Are there deicers or radomes on the antenna, and are they effective and reliable? In most cases, you can count on your protective and deicing systems to do the job.

It is not wise, however, to put your eggs all in one basket. An outboard VSWR or reflected power monitoring device is a good investment to protect your expensive transmission line.

The trip point of the device should be set below the level that would exceed the rated average power of the line with full transmitter power output. In our example, the line is rated at 42 kW. Divide that by the TPO of 27.5 kW to find the maximum VSWR that will derate the transmission line to the TPO. In our example, this VSWR is 1.53:1. The idea is to make sure that in the worst case — with the transmitter running at full power

**Table 1: Sample System**

ERP	50.00 kW	16.99 dBk
Antenna Gain	2.133	3.290 dB
Antenna Input Power	23.44 kW	13.70 dBk
Line Loss	0.851	0.700 dB
Transmitter Power Output	27.54 kW	13.40 dBk

It is not uncommon for a given ERP and antenna gain to have the transmitter power level determined by the transmission line size and type. Changing to a larger or lower-loss line may permit the use of a smaller transmitter, somewhat offsetting the added cost of the better line. The other side of that coin is that the larger line may require a beefier tower to support it, adding cost to the project.

Usually, however, the choice is more clear.

## Starting point

The first step in finding a suitable transmission line for a system is to determine the approximate power the line will have to carry. This is calculated by dividing the effective radiated power (ERP) in kW by the antenna power gain, or by subtracting the antenna gain in dB from the ERP in dBk and converting back to kilowatts.

This calculation will yield the antenna input power, or the transmitter power output less the line loss, which is as yet unknown. While the antenna input power does not represent the total power in the line, it is a good starting point. Keep in

acceptable performance and economy. A good rule to follow when selecting a transmission line is to use the smallest line possible consistent with the required power handling capability. There are certainly exceptions, such as in the case of a very long transmission line, where it may be more important to keep losses (and thus long-term operating costs) down than the initial investment. As a rule, however, the goal should be to ensure adequate performance while minimizing cost.

With a likely candidate selected, find the loss of the line at the operating frequency and line length. Manufacturers typically provide this information in dB per 100 feet or 100 meters. Divide the line length in feet or meters by 100 and multiply by the per unit loss to get the total line loss in dB.

To find the transmission line input power (or transmitter power output, TPO), add the line loss in dB to the antenna input power in dBk. Convert back to kilowatts by dividing by 10 and taking the antilog. The loss of the line in kilowatts can be determined by subtract-

## As a rule, the goal should be to ensure adequate performance while minimizing cost.

the power rating of the line by the worst-case VSWR.

A good number to use to account for possible icing of the antenna is 2:1. In our example, the derated average power capability of the line for 2:1 VSWR is 21 kW. Is this reasonable for a 27.5 kW

into some sort of antenna problem — the line will be protected.

In the next installment, we will deal with transmission line installation, pressurization, maintenance and repairs.

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

# Lampen

► Continued from page 16

from shore, and completed that. In the space of a few weeks, Cyrus Fields (1819-1892) and the Anglo-American Telegraph Company had two operating cables.

The new chief engineer, Professor William Thomson (1824-1907), later named Lord Kelvin, had a brilliant idea, e.g. publicity stunt. He assembled engineers, scientists and reporters in the transmission building on the Irish coast and sent a message to the Newfoundland station asking them to attach the two cables at their end. This gave him a 3,200-mile cable that began and ended in the same room.

He then made a simple battery, using a silver ladies thimble, a steel pin and a few drops of lemon juice. With his key and this battery, he sent a clearly discernible message down 3,200 miles of cable to the astonished multitude. This was also made possible by his invention of the "mirror galvanometer," which could move a light beam on a wall with the most microscopic change in current on the cable. It inspired this poem by James Clerk Maxwell:

*The lamp-light falls on blackened walls*

*And streams through narrow perforations*

*The long beam trails o'er pasteboard scales*

*With slow-decaying oscillations.*

*Flow, current, flow! Set the quick light-spot flying.*

*Flow, current, answer light-spot, flashing, quivering, dying...*

There was no question that the transat-

lantic cable worked. It was hailed as the engineering marvel of its day. It is even more amazing to consider that one of these gutta-percha cables, laid in 1873, was in continuous use until 1953.

## Copper head

Let's take a little side-trip at this point.

While most telegraph wires were iron, those transatlantic cables, and most of the cables we use today, are copper.

Copper has been known from ancient times (see the first part of this series). In fact, the word copper goes back through Old English and Latin to the Greek word Kuprios, from Kupros, or Cyprus, which had extensive copper mining.

Copper was mined both in the Old World and the New. There are copper beads from Iraq dating back 11,000 years. And major copper mines dug by natives around Lake Superior in Michigan date to 7,000 years ago.

Did you know that the symbol, ♀, is the ancient alchemist's symbol for copper? It is also the ancient Egyptian hieroglyph for *ankh*, symbolizing eternal life.

Did you know the best preserved of the Dead Sea Scrolls is written on copper? Did you know that the plumbing system in the Pyramid of Cheops (Khufu) in Egypt was all-copper pipe and in perfect working order when discovered in the 20th century? Did you know that Columbus' ships were covered in copper below the waterline? (Prevents barnacles.)

But of course we're only interested in copper wire and cable. We'll continue our never-ending story next time.

Previous articles in this series are available at [www.rwonline.com](http://www.rwonline.com). Steve Lampen's book, "The Audio-Video Cable Installers Pocket Guide" is published by McGraw-Hill. Reach him at [shlampen@aol.com](mailto:shlampen@aol.com).

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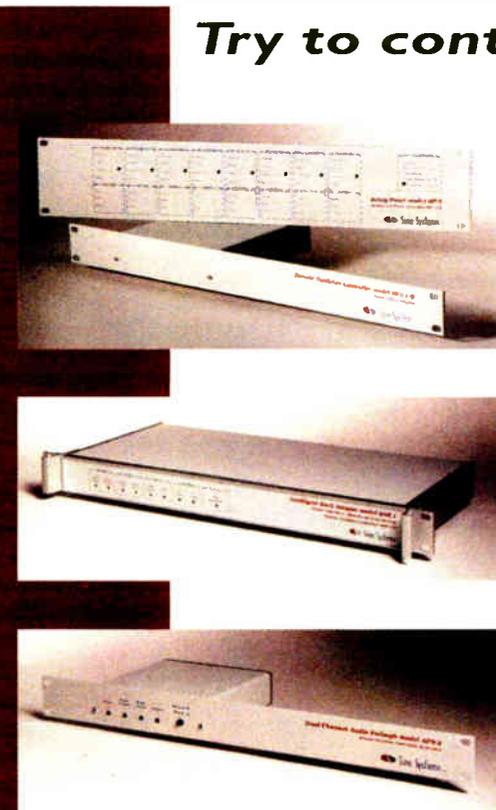
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World Radio History

GUEST COMMENTARY

# Predictions on Satellite Radio

by Guy Wire

*Guy Wire is the pseudonym for a veteran radio engineer who appears regularly at [www.rwonline.com](http://www.rwonline.com). This is excerpted from a recent column.*

In spite of a slow start, the XM and Sirius satellite radio services say that if 10 percent of the existing population using radio signs up and remains loyal, they will achieve their goals of profitability and success.

Subscription growth is slower than originally projected and now totals only about 1 percent of that goal. Annual contract renewals from the early XM buyers were just coming in as 2002 drew to a close. If at least half of present subscribers don't convert to renewals, XM and Sirius will have big trouble surviving as they now exist.

## A steep climb

The growth rate of new satellite radio users should level off as the percentage of those most likely to adopt nears critical mass. It might even start declining if renewal rates drop off.

After those who really want this service buy it, the only sure way XM and Sirius can grow sales to reach profitability is to hope that factory or dealer-installed satellite radios in new cars become attractive enough for car buyers to swallow the buried costs in their car payment. One percent down, 99 to go.

The vast majority of radio users seems happy enough with free and local stations and will most certainly remain so. The satellite boys were banking heavily on getting a big head start on terrestrial services in deploying the advantages of digital. As HD Radio ramps up in 2003, many of those technical advantages will be leveled.

Stay tuned for lots of confusion in the showrooms as sales folk tell consumers they can have all the advantages of digital radio without having to pay any monthly fee and

still listen to all their favorite local stations.

A ton of expensive infrastructure is needed to make SDARS work well everywhere. It doesn't take a math genius to figure out the cost per listener is simply breathtaking. The subscriber acquisition costs for XM alone are about \$120 per person.

## Business 101

Both companies are publicly traded, each with several major stockholders holding the trump cards. Late last year, both were trading near their all-time-low share prices. How long will the banks and investors stay patient?

**Stay tuned for lots of confusion in the showrooms as sales folk tell consumers they can have all the advantages of digital radio without having to pay any monthly fee and still listen to all their favorite local stations.**

In separate press releases, both XM and Sirius recently announced they now have enough financing and cash on hand to keep running into mid-2004. XM just cut 80 positions at its palatial Washington operations center. Other cost-cutting measures are undoubtedly in the offing. Both have executed additional refinancing and stock sales on several occasions to stay alive and buy more time with Wall Street. This most recent restructuring could be the last time their creditors are willing to prop up these ventures and dilute existing share holders.

After the disappointment of Iridium's cell phone service, ventures involving a satellite-based subscription model have become a bit suspect. At some point, the business plan must deliver a profit to the investors.

Both XM and Sirius have major investment backing from big automobile compa-

nies. General Motors is in fact the largest single stockholder of XM, now at about 20 percent. Honda America has just increased its holdings to 8 percent. Clear Channel Communication's stake is in single digits but it is also a key owner. Ford and Daimler/Chrysler have lined up behind Sirius. The presence of these players gives the satellite services more options if their present models don't pan out as scripted.

It seems likely that if Sirius subscriptions do not increase dramatically over the next year, its major creditors will insist it do something very compelling or throw in the towel. Before its present program offer-

ings and business model goes away, there will no doubt be more major cost-cutting, more commercials and perhaps higher subscription fees in a last-ditch attempt to rescue this very sick puppy dog.

Potential bankruptcy filings would take several years to play out, with a court overseeing who gets what, but don't look for any deals that might merge XM with Sirius as a quick solution. The FCC rules specifically mandated two separate services for SDARS using the S-band channels to ensure a competitive playing field.

Economic forces could compel the FCC to change the rules of course, especially if re-auctioning the spectrum would bring in new revenue.

## Mel and Lowry watching

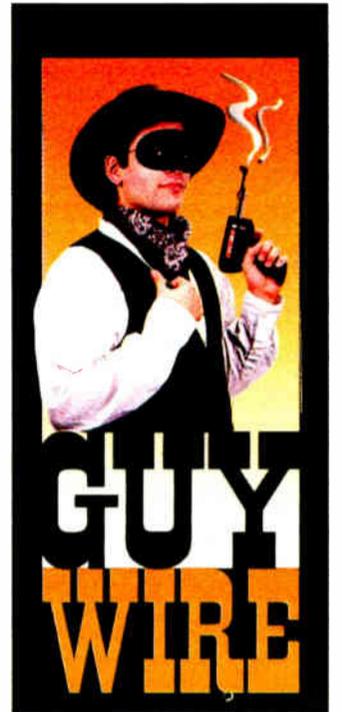
It's possible that if Sirius is forced to liquidate, at say 10 or 20 cents on the dollar, a company like Viacom could step up and become a new controlling interest. With Westwood One and the Infinity stable of successful major stations, adding a nationwide direct satellite distribution network might be valuable for future diversification of their radio holdings. Maybe Mel Karmazin has figured out a business model for this technology within Viacom that might work.

If XM eventually runs this same course, Lowry Mays and Clear Channel could become the controlling interest, perhaps in partnership with GM and Honda to extend their Premiere Network and other O&O programming resources via the existing infrastructure. The program offerings under such a regime will most certainly include more commercial content.

I have always believed that given the high costs required to launch and maintain two separate satellite radio services, only one ultimately would survive. Different modulation and bit rate compression formats make the job of reaching critical mass for receiver penetration more difficult for the receiver manufacturers.

A common satellite platform that integrates well with HD Radio would jumpstart new "multi-mode" digital radio sales much more rapidly. Designs for such radios are already in the works.

There is a silver lining for satellite radio. If it can hang on long enough for



such radios to become standard in most new cars, it will have a much better chance of surviving long-term.

Some have suggested that if satellite receiver penetration grows significantly by the time Sirius or XM gets absorbed by an existing major group owner, or even a consortium of owners, the new model may simply run more commercials and dispense with subscription fees. Then satellite radio simply becomes more channels and program choices on the dial with business as usual.

Given how expensive running this service already is, I doubt it would happen anytime soon.

## Beyond radio on S band

If Sirius does go bankrupt first, what could also happen is that one or more of the major investors will pick up what's left and forge an entirely new business that makes better use of the resources.

If radio listening won't pay for maintaining satellite communications to the car, it's possible that Ford and/or Daimler/Chrysler could use them to support their version of GM's On-Star service and other interactive features that will make driving more convenient, reliable and secure. The 2 GHz S band is a valuable chunk of spectrum that will likely support many new technologies that will find their way into the motor vehicles of the future. Now is the time to nail down control.

That would leave the job of providing satellite radio service up to XM or its successors without a competitor, assuming the S band rules were changed. Maybe one service could survive with unchallenged higher fees, if the programming content attracted enough people who were still willing to pay extra for it. If not, then the car companies just might wind up owning and controlling all of these channels to serve their own inventions. But I'm betting satellite radio in some form is here to stay. It just needs to find a way to make itself profitable.

I'll crawl out on the wire and predict that after its current refinancing deal runs out in 2004, Sirius will not be doing business using its present model or name. It will morph into something else or be absorbed by its major stockholders or a major media group. XM will still be running but with more commercials and higher fees. Clear Channel will have more control of the content, with most of their syndicated shows available on the bird. We could also have audio feeds of the most successful cable and network TV talk shows on the menu.

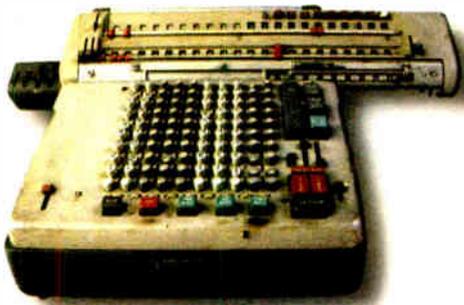
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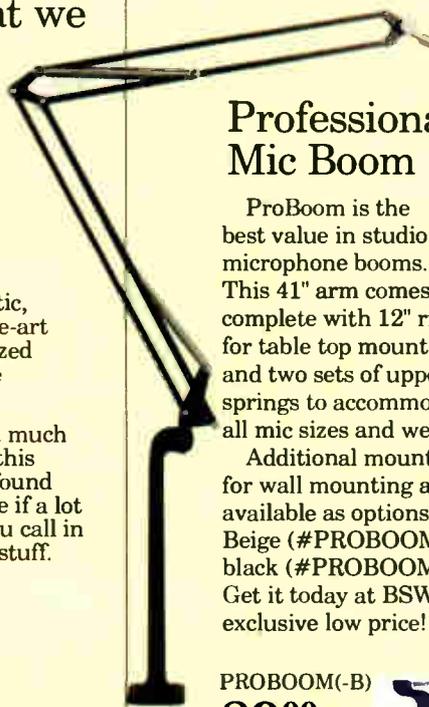
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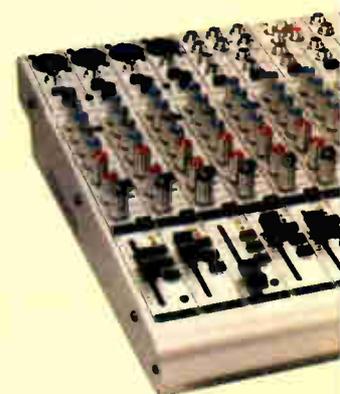


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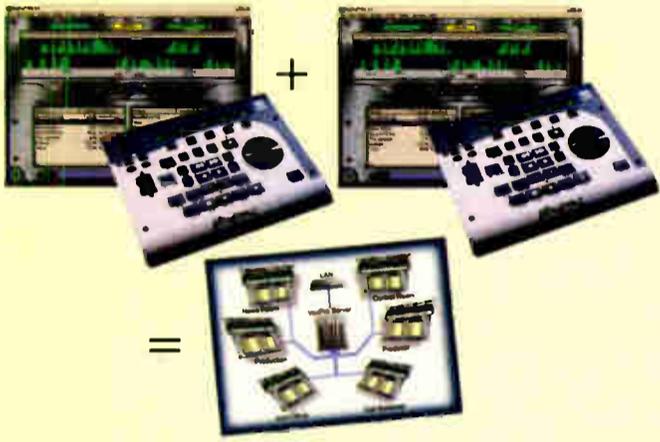


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# ht that we decided to tone down

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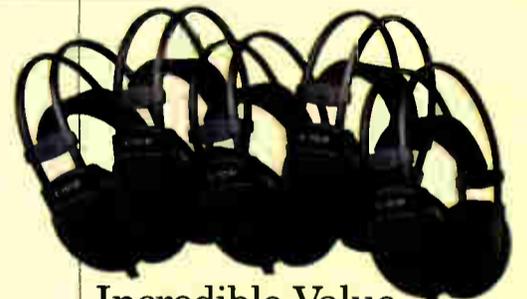
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plexiglass "ON-AIR" window is a long life lamp available in 120V AC (also available are 24V and 12V AC/DC). The whole unit can be easily installed on a standard 2 gang j-box. Also available in "APPLAUSE", "RECORD" and "STANDBY". Dimensions: 14-1/4" L x 2-5/8" W x 4" H.

ONAIR list 295<sup>00</sup>  
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Over the past two years, Radio World and dozens of industry suppliers have joined forces to award more than \$115,000 worth of radio and pro audio gear — from microphones, master clocks and sound cards, to audio processors, routers, CD mastering machines and shopping sprees.

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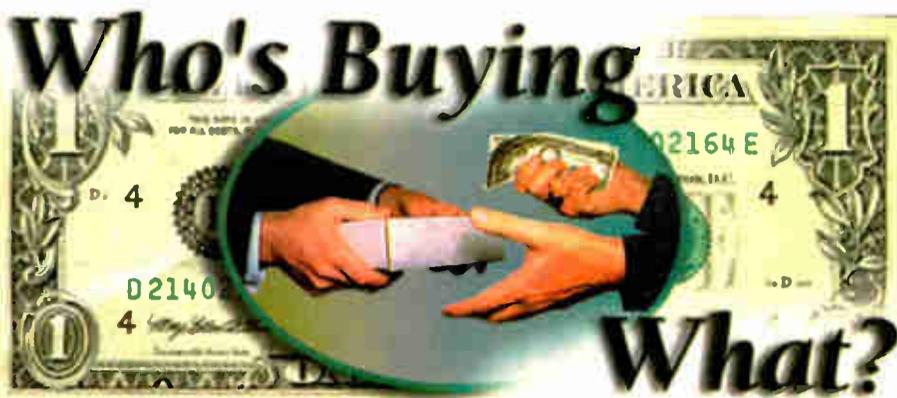
To enter the sweepstakes you must complete these 3 easy steps:

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So what are you waiting for? Don't miss out in '03. Enter to win New Technology products from these fine Radio World supporters:



Contest Rules: To enter the drawing, simply register online at [www.rwonline.com](http://www.rwonline.com). Weeks 26 drawings will be held throughout the year. Contest registration expires Dec. 3, 2003. Final contest prize announcement on Jan. 1, 2004. One prize per winner. All contestants MUST reside in the United States and have a valid mailing address. Prizes should be received within 30 days of notification, however, actual delivery time may vary and is not guaranteed by IMAS Publishing. Federal, state and local tax/tariffs may apply to prizes and are the sole responsibility of the winner. Employees and affiliates of IMAS Publishing are not eligible.



A \$7 million on-air and production facility has been built by **Wisdom Media** in Bluefield, W.Va.

**Wheatstone Corp.** said it provided two D-4000 digital consoles, a Bridge router, three rooms of furniture and Wiremax wiring interface modules for the project. Wisdom provides health and wellness information for radio, television and the Internet. Jeff Horne is chief engineer for its radio and TV divisions. ...

Salem station KCBQ acquired an **Auditronics ALM-12D** digital radio console intending it for production, but eventually it was put in place for the show "Mark Larson with Larry Marino." Craig Caston is chief engineer. ...

Audion also set up a sales contract with systems integrator **Ram Broadcast Systems**. American and Canadian VoxPro PC and VoxPro PC Network customers can use Ram to buy those products. ...

Colorado Rockies baseball fans now have the option to hear game commentary via **Listen Technologies** wireless audio receivers. **Coors Field** gave fans a way to hear play-by-play and color commentary in the stadium. A Listen LT-800 Stationary Transmitter with its broadcast audio system let fans monitor action. ...

**Murray Co.** was the construction firm that completed a 25,000-square-foot interior buildout for **Bonneville Broadcasting** in St. Louis. The project merged



The Sheffield Remote Productions 48-foot remote truck uses an SSL Axiom-MT Digital Console and has 10-foot ceilings, lead-lined walls, sand-filled floors and an elevated client lounge and vocal booth.

**Syntrillium Software** said **Clear Channel Radio** has standardized on Cool Edit Pro for its digital audio editing, recording and mixing. The supplier says Clear Channel has made "two major rounds of purchases" of software licenses for distribution to Clear Channel stations. Steve Davis is senior VP for capital management for the radio group. Bob Ellison is president of Syntrillium.

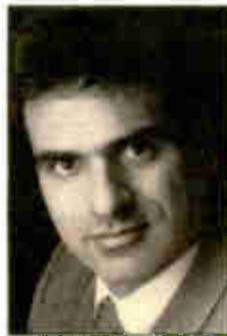
Syntrillium said the software's primary application at Clear Channel is for creating promotional and commercial spots. The group owns about 1,300 stations. ...

**OMT Technologies** said it inked a deal with **Music Choice** to supply and install a new multichannel digital audio broadcast system. The system includes iMediaTouch broadcast automation software, using Dolby AC/3 audio technology.

The contract is worth approximately \$1 million Canadian, or \$640,000 U.S. at recent exchange rates, and will be implemented over several months. OMT President/CEO Scott Farr and Music Choice VP of Information Technology Stu Farber made the announcement. Music Choice provides cable and satellite customers with music in a variety of genres. ...

**WIL(FM)**, **WSSM(FM)**, **WVRV(FM)** and **WRTH(AM)** into the second floor of a building at CityPlace, a retail-office complex in the suburb of Creve Coeur. The construction contract was \$1.75 million. The architectural firm was TR,i. ...

Voice talent **Duke Morgan** in Las Vegas is using a Soundelux E47 variable pattern microphone for his voice work and commercials. "This is a big vocal mic," he said. "Once you dial in the right EQ, it's amazing how this thing cuts through the air." ...



Duke Morgan

**Global Radio S.A.**, a developer of satellite digital radio for Europe, is using **Dalet a.n.n.** to design a digital audio infrastructure for its broadcasting facility in Luxembourg, to be operational by 2005. Dalet developed a similar system for XM Satellite Radio. ...

**Blaupunkt** used the oscilloscope function of **DK-Audio's** MSD 100 meter to check the signal received by its in-car radio

► Continued from page 26 systems during R&D. Design Engineer Mike Stosich installed the meter in his car to report to the design team while testing new receivers. ...

**Sheffield Remote Productions** mixed a recent Bruce Springsteen concert in Asbury, N.J., and a related appearance on "The Today Show." Radio station **WPLJ** also used the audio for its morning show. The event involved radio, television and house feeds. ...

**Jones Radio Networks** announced agreement with **Sound Source Networks** allowing the syndicator to distribute "Delilah" in Canada and sell airtime on the Canadian network. Jones will continue to provide clearances for Canadian stations. ...

**Rocket Network Inc.** reached agreement with **APT - Audio Processing Technology** to integrate apt-X digital audio data compression with **RocketDelivery**, a product for secure file delivery.

Separately, **GWR Group** Leicester Sound radio studios chose **WorldNet Rio** audio codecs by **APT** for a new STL network. The codecs use the Enhanced apt-X algorithm and were purchased by Leicester Sound's service provider **NTL**.

Elsewhere, Swedish radio station **MIX Radio**, part of the **Bonnier Radio** group, purchased apt-X **WorldNet Rio** codecs for use in STL connections using data services from **Teracom**. The Rios replace 2 Mbit E1 J.41 circuits. And **APT** sold three **WorldNet Milano ISDN** transponders to **Circa Music**, an audio postproduction studio, for facilities in New York and Los Angeles. ...

**Telos Systems** said **KCRW(FM)** in Los Angeles purchased a Series 2101 Talkshow System. **Birach Broadcasting's** **WGOP(AM)** in Washington ordered a **Zephyr Xstream ISDN** unit for new studios for **Doug Tracht**, the **Greaseman**. **Sony Pictures' Playboy Studios** purchased a Series 2101. **Living Media's Radio Today** in India purchased **TWOx12** Talkshow Systems. **KASU(FM)** at **Arkansas State University** bought two **Zephyr Xstreams** to broadcast concerts from venues on campus. ...

Radio One Detroit station **WDMK(FM)** turned on its **DAB** service using an **Omnia-6dab** digital audio processor. **Crawford Broadcasting's** **KBRT(AM)** in L.A. put an **Omnia-3am** on the air. Japan's **Shizuoka's K-MIX** chose an **Omnia-6fm**. And **EMF Broadcasting's** **K-LOVE** and **Air 1 Christian** music networks ordered 70 **Omnia-6fm** audio processors, sold through **Broadcast Supply Worldwide**. ...

**Comm-Struction and Services** in Baltimore has been certified on **Klotz Vadis** digital audio systems. **Ed Bukont** said his company can work with clients on design, integration and programming projects involving the **Vadis**. The firm also completed construction of eight studios for **Satellite One**, a division of **Radio One**, and participated in the final testing of **XM Satellite Radio's** headquarters, where **Comm-Struction** tested the 40 largest studios using the **Klotz** router-based digital audio platform. ...

**MediaSpan's** Radio Division said **Infinity's KYXY/San Diego** selected its **Event Auction** program for its **Make-A-Wish** Foundation promotion. The station raised \$140,000 the prior year with "Shop For a Cause." ...

**Turkish Radio Television** purchased a **Netia Radio-Assist 7** system for the renovation of **TRT Ankara Radios**. It has four radio stations in **Ankara**, three of which

will be involved in automation in this first phase of the project. ...

**Advantage Audio Post Production** in Burbank, Calif., installed two **Studer Vista 7** digital mixing consoles. They are the first **Vista 7s** in the United States. Recent buyers include **Algeria's Radiodiffusion Algérienne ENRS** for radio drama production and **Germany's RTL** for radio post-production. ...

The **Orban Opticodec 7000** portable audio recorder and codec was on hand for last fall's **World Series**. **Orban/CRL's** **Dean Tiernan** covered post-game news conferences and interviews for on-demand listening in the Internet sports editions of **The Los Angeles Times** and **The Orange County Register**. He also sent the audio via **ISDN** to the producers of "The **Diamond Gems Baseball Show**," a syndicated radio program. ...

**WOR(AM)** in New York is using **Orban 9200**, **8200ST** and **6200 Optimod** processors. **Tom Ray** is corporate director of engineering for **Buckley Broadcasting** and **WOR**. The **9200** is used on the analog signal, the **8200ST** is in front of its **STLs**; the **6200** processes the new **HD Radio** channel.

**BSI** said its **Stinger** audio player was featured on a November episode of "Touched by an Angel" on **CBS**. The touchscreen-compatible software was used in a story based around a radio personality. ...

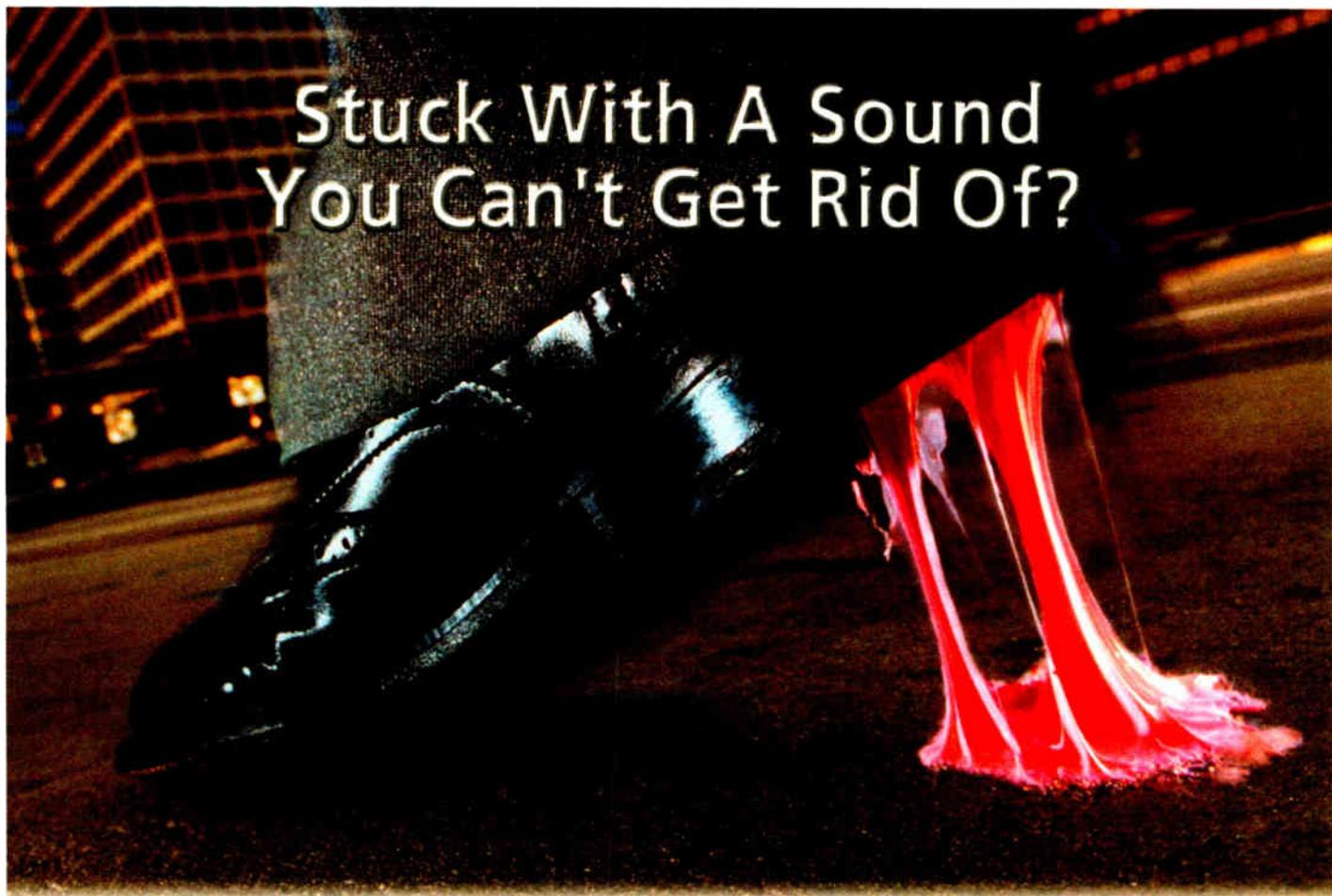
**V-Soft Communications** said **Salem Broadcasting** bought two sets of its **AM-Pro** allocation software program. **Salem** also was a beta tester. Other early purchasers include consultants **Cavell Mertz Davis**, **Don Markley**, **Bromo Communications**, **Graham Brock** and **Smith & Fisher**. ...

**Now Disc**, a **CD-R** duplicator, doubled its manufacturing capacity with the acquisition of an **Otari CDP-64** Large-Scale **CD-R** Duplication system. The installation was at **Now Disc** in **Boise, Idaho**. ...

**Sennheiser** said the **Arizona Cardinals** of the **NFL** placed an **Evolution Series EW 500** wireless mic on a player during a game and isolated that player with a dedicated digital video camera. The microphone was harnessed to the player's shoulder pads and positioned about his sternum.

"Who's Buying What" is printed for readers who are interested in how their peers choose equipment and services. Information is provided by suppliers.

Companies with news of unusual or prominent sales should e-mail information and photos to [radioworld@imaspub.com](mailto:radioworld@imaspub.com).



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## RAB Heads to the Big Easy

by Lyssa Graham

Radio professionals love to network. Add in the lure of Bourbon Street and the Radio Advertising Bureau's 2003 convention becomes an attractive destination.

The event is scheduled for Jan. 30 to Feb. 2 at the Hyatt Regency in New Orleans. Exhibitors like Arbitron, SalesReady and VMS/Voice Trak will be on hand on the Hyatt. Approximately 20 exhibitors have planned booths to date.

Participants will find networking lounges inside the Exhibit Hall along with Internet kiosks to help attendees keep in touch with the office.

According to George Hyde, RAB executive vice president of training, the convention offers participants learning opportunities. "There are more panels than ever, more seminars than ever, close to 100 workshops and forums," Hyde said.

Workshops run through the wee hours of Saturday, Feb. 1. They are led by Irwin Pollack of the Irwin Pollack Company, Frank Kulbertis of RadioActive Sales Development Services and others.

### Keynote address

The keynote addresses are to be given by Rick Sirvaitis, president and COO of General Motors Mediaworks, Eileen McDargh and Dr. Gene Stanaland of GSE Inc.

"I am really excited about all of the presenters," Hyde said. He said Sirvaitis should offer a unique perspective to participants.

"I think the opportunity for our people to hear from someone who is responsible for one of the biggest media budgets in the world is very exciting. He has a unique perspective from both sides of the streets."

Sirvaitis has a 30-year media history, having worked for Fox Family, Turner Broadcasting Sales Inc., NBC Television Network Sales, Blair Television and

Campbell-Ewald Advertising. He joined GM Mediaworks two years ago, leaving his place as president/COO of Phase2media.



Sirvaitis said he will touch on the basics of how he operates in the media business and "how I recommend that anybody operate." He said he tries to apply everything he has learned in his career to the way he does business. Having worked both as a buyer and a seller, he is qualified to teach both sides of the industry.

"It is about hitting the same points from the reverse angle," he said. Sirvaitis' approach is what he calls "back to basics. There are steps that I remind people they need to return to."

Sirvaitis is scheduled to speak at the Saturday breakfast.

Eileen McDargh will share her insights on the importance of resiliency in today's ever-changing marketplace. McDargh, scheduled to speak at Friday's luncheon, will help participants understand how to work with changing economic and competitive situations within the industry. She has been rated a Certified Speaking Professional by the National Speakers Association and has earned the Council of Peers Award for Excellence.

Dr. Gene Stanaland will keynote the Saturday luncheon. According to Hyde, Stanaland has a "unique ability to understand what is going on in the economy in general but to translate that into street English."

Stanaland taught economics at the Auburn University School of Business for 20 years, serving as the head of the economics department from 1972 to 1980. He left the university world to launch a consulting firm, GSE Inc., whose past clients include DuPont, GE, Nissan and Sony.

"Very few radio sales people or sales managers really understood the economic data that they were seeing," Hyde said, "As a result, we as an industry, kind of

got caught up in believing that the economic conditions were worse than they really were."

Hyde said Stanaland will help participants learn to recognize signs that they may have missed earlier, enabling them to do a better job in the future. "Stanaland has an amazing ability to do that," Hyde said.

### Registrations

Participants can expect to see compatriots at RAB 2003. Hyde said the bureau has seen a "tremendous upsurge in registrations this year," running about 50 percent ahead of the average for this time over the last two years.

The RAB2002 convention in Orlando, Fla., saw 1,400 attendees. The 2001 conference in Dallas gathered 2,200 people and about 60 exhibitors. At the current rate of registration, RAB2003 may pull about 2,000 attendees.

"I think that it is been a better year and people are coming to grips with considerable high expectations for 2003, and they want to make sure they get there," Hyde said.

In addition, he said, Susquehanna Broadcasting, Journal Broadcast Group and Clear Channel are holding sales managers meetings in conjunction with RAB 2003.

A new feature is the establishment of a networking lounge within the Hyatt Regency. Hyde said the area will provide the participants with a chance to unwind and bounce ideas and experiences of others in the industry.

"A lot of what goes on here is the networking experience," Hyde said, "A

See RAB, page 30 ▶

### BOOK REVIEW

## Priestman Reviews Web Radio Issues

by Craig Johnston

Those involved in Internet radio certainly are in the fast lane, with seemingly daily changes in rules, costs and business models. That makes the book "Web Radio: Radio Production for Internet Streaming" an ambitious project.

Focal Press is known for books on motion picture, television and radio production. A subject like studio lighting is a well-established craft, with tried and tested techniques and equipment.

### Evolving medium

Internet radio is a new, rapidly evolving medium, as author Chris Priestman frequently reminds the reader. In fact, the book offers a Web site with technical updates, case studies, news, copyright and regulations updates and postings on Web radio trends.

Despite submitting his final draft for the printed book in July of 2001, Priestman is remarkably prescient on a number of topics. In the chapter "Copyright on Web Radio," he nails a dead-on prediction of the morass the U.S. Copyright Office has reached on copyright fees.

In fact, he gives the best description I've read on copyright owners' pursuit of fees from Internet radio while their true nemesis is the group of file-sharing sites: "Web radio is being pinned down in the crossfire between the major record companies and the file sharers."

If Internet radio is rapidly evolving, terrestrial radio offers a stable target by contrast. Priestman makes comparisons throughout the book between Web and terrestrial radio, even titling his final chapter "So How Is Web Radio Different? A Checklist." Among the differences: the relative ease of entry and Internet radio's worldwide reach.

### Give them what they want

Similarities between Web and terrestrial radio are many, he points out. "For all the differences I have put forward in this book, Web radio is still a continuation of the 80 years or so of radio tradition that preceded it," states the author. "Many fundamental techniques, tricks and shortcuts have been learned about what works in sound for the listener."

I found particularly interesting two chapters late in the book, "Redefining Radio Content" and "Scheduling for Redefined Content." They deal with figuring out what listeners want and giving them what they want. The broadness of

See WEB, page 30 ▶



What: RAB 2003

Where: Hyatt Regency New Orleans

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6-7:30 p.m.

Closing Reception: Saturday 5:30 to  
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# Web

► Continued from page 29

Internet radio is apparent here, as not only music and news/talk are considered, but also drama and what are termed experiments.

"Web Radio" places a range of decisions in front of the prospective Internet radio operator. Whether to offer the listener a terrestrial radio station's over-the-air program on the Web, or a different side-channel? (Or both?) Whether to stream the signal live or continuously, or to offer the listener archived programs to choose from?

## 'Web Radio' places a range of decisions in front of the prospective Internet radio operator.

Case studies are presented detailing how existing Internet radio stations have done it. These are divided into two chapters: one for established radio broadcasters' Internet stations, the other for Internet-only stations. True to the international flavor of the book, the seven examples are taken from five continents.

In preparing the reader for the array of station models presented in the case studies, "Web Radio" looks back into terrestrial radio's history to explain the differences between the early European, centrally funded radio model (spawning the BBC, among others), and the American, commercially funded model.

A third category, termed "alternative," encompasses student, hospital and pirate radio and other such small slices of the historical radio model pie.

Perhaps the attempt to survey such a range of station types from around the world has caused Priestman to have left

out some techniques terrestrial radio stations are using to leverage their over-the-air popularity and branding to the online world.

The first is terrestrial radio's concerted marketing campaign during morning drive, steering the soon-to-be-at-work listener to the station's Web stream once he reaches his desk. The book acknowledges the large listening group accessing Internet radio at their desks over their company's broadband connections, but does not talk about the on-air promotion during morning drive (nor the afternoon spots on the Web station promoting evening-drive listening in the car).

A second trend missing is the use of customized, so-called "skinable" media

players for individual radio stations. Most current media players can be decorated with the station's look, a process that can be done by the Webcaster or a third party.

And if one purchased the book based on its subtitle ("Radio Production for Internet Streaming"), he might have assumed it contained instructions detailed enough to enable him to be able to physically produce and serve an Internet radio stream. The reader will have to turn to additional material to get enough of a nuts and bolts view to actually go online with a stream.

With all of that, as noted earlier, Internet radio is a vast and evolving new medium. I learned a great deal from "Web Radio," and it has changed certain assumptions I had made about Internet radio.

"Web Radio" reminds me of one of those 101 classes titled "Survey of ..." I

Saturday night and Sunday day should offer participants enough time to explore and visit local attractions.

"It's going to be very exciting," Hyde said, "and it's a fun place to go." 🌐

# RAB

► Continued from page 29

lot of the really significant idea exchange takes place after the seminars are over."

"(RAB 2003) is a remarkable opportunity



Eileen  
McDargh

Gene  
Stanaland

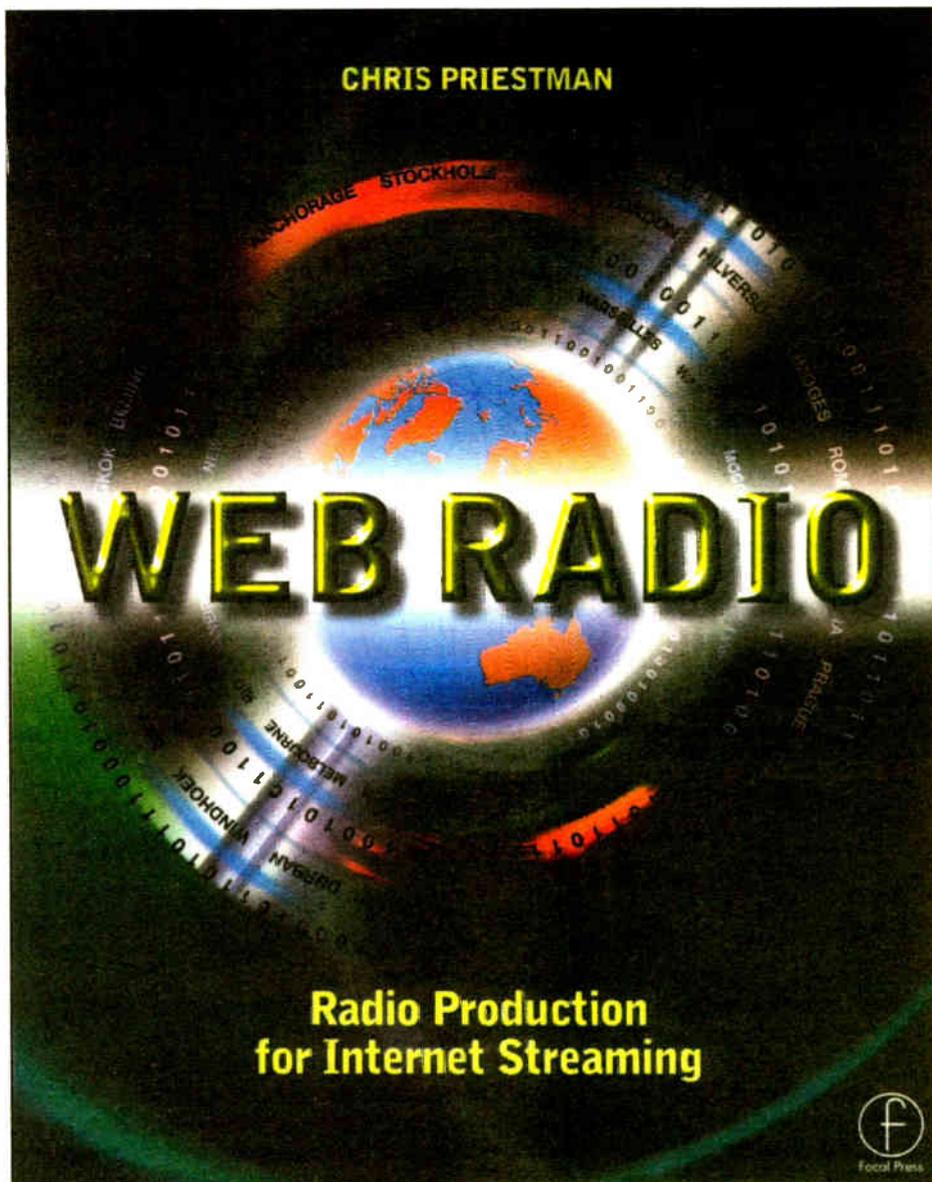
nity for somebody to be exposed to some of the best minds in the business," Hyde said. "It is a lot of bang for the buck when you come right down to the educational experience."

And then there is the location. New Orleans has a well-deserved reputation as a fun place to visit and participants will have the opportunity to take advantage of the fabled party town's sights and scenes.

### Exhibitors

For an updated list of exhibitors, visit [www.rab.com](http://www.rab.com).

American Media  
Arbitron  
Army National Guard  
BRg MusicWorks  
Click-N-Print Tickets  
Integrated Radio Systems  
Marketron  
Media Audit  
Miller, Kaplan & Arase  
Nassau Media Partners  
RCS  
Research Director  
SCA Promotions  
SalesReady  
Smoke & Mirrors  
Sun Media Systems  
TOMA Research  
VMS/VoiceTrak  
Wicks Broadcast Solutions



took in college. After reading it, I don't know enough to go out and start an Internet radio station, but I do know that there's a lot to know.

"Web Radio: Radio Production for Internet Streaming" is published by Focal

Press and is available for \$29.99 through the NAB store.

Craig Johnston is a Seattle-based Internet and multimedia developer. Reach him via e-mail to [craig@craigjohnston.com](mailto:craig@craigjohnston.com). 🌐

## Scheduling for Redefined Audiences

The following is an excerpt from Chapter 11 of "Web Radio: Radio Production for Internet Streaming" by Chris Priestman.

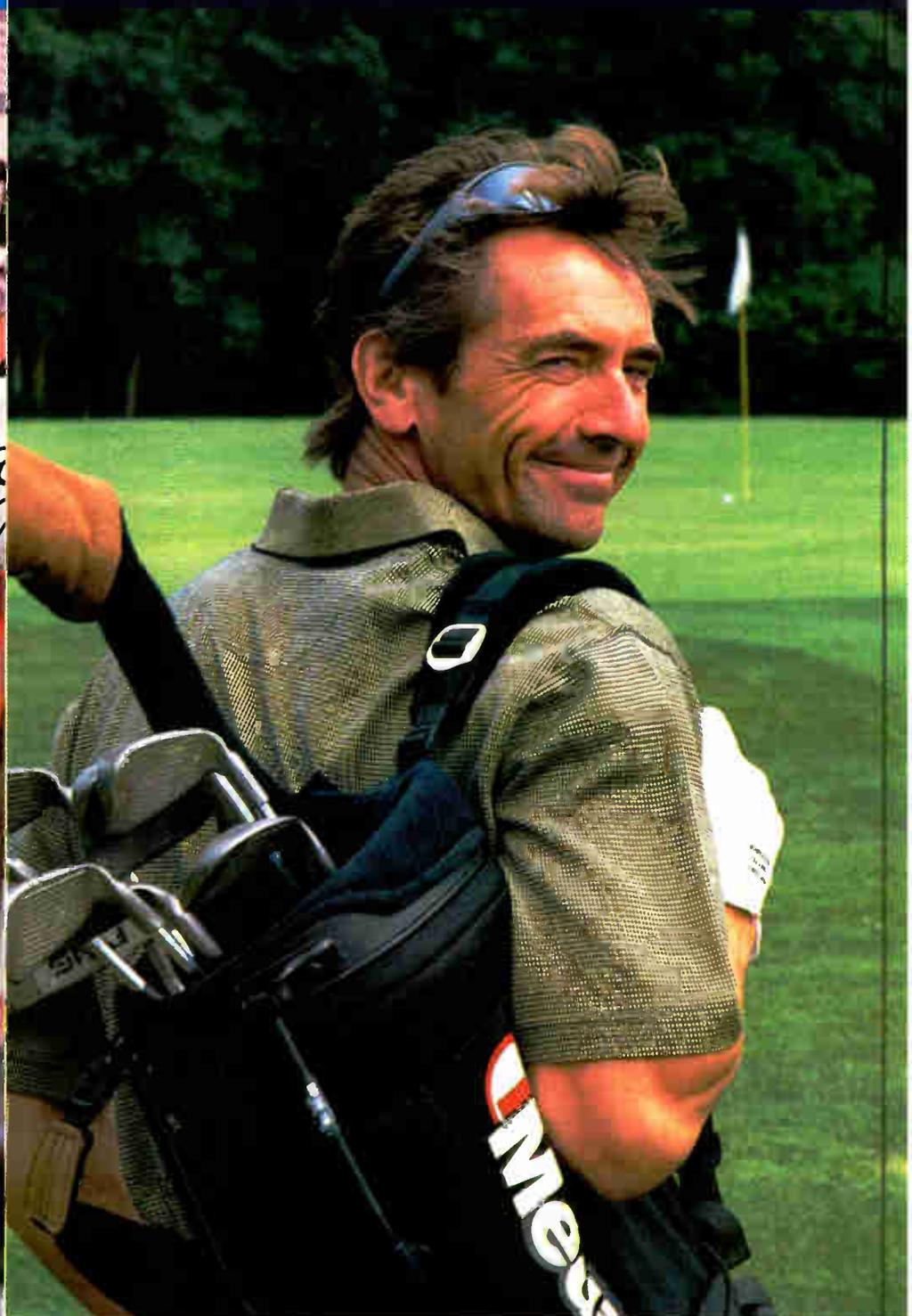
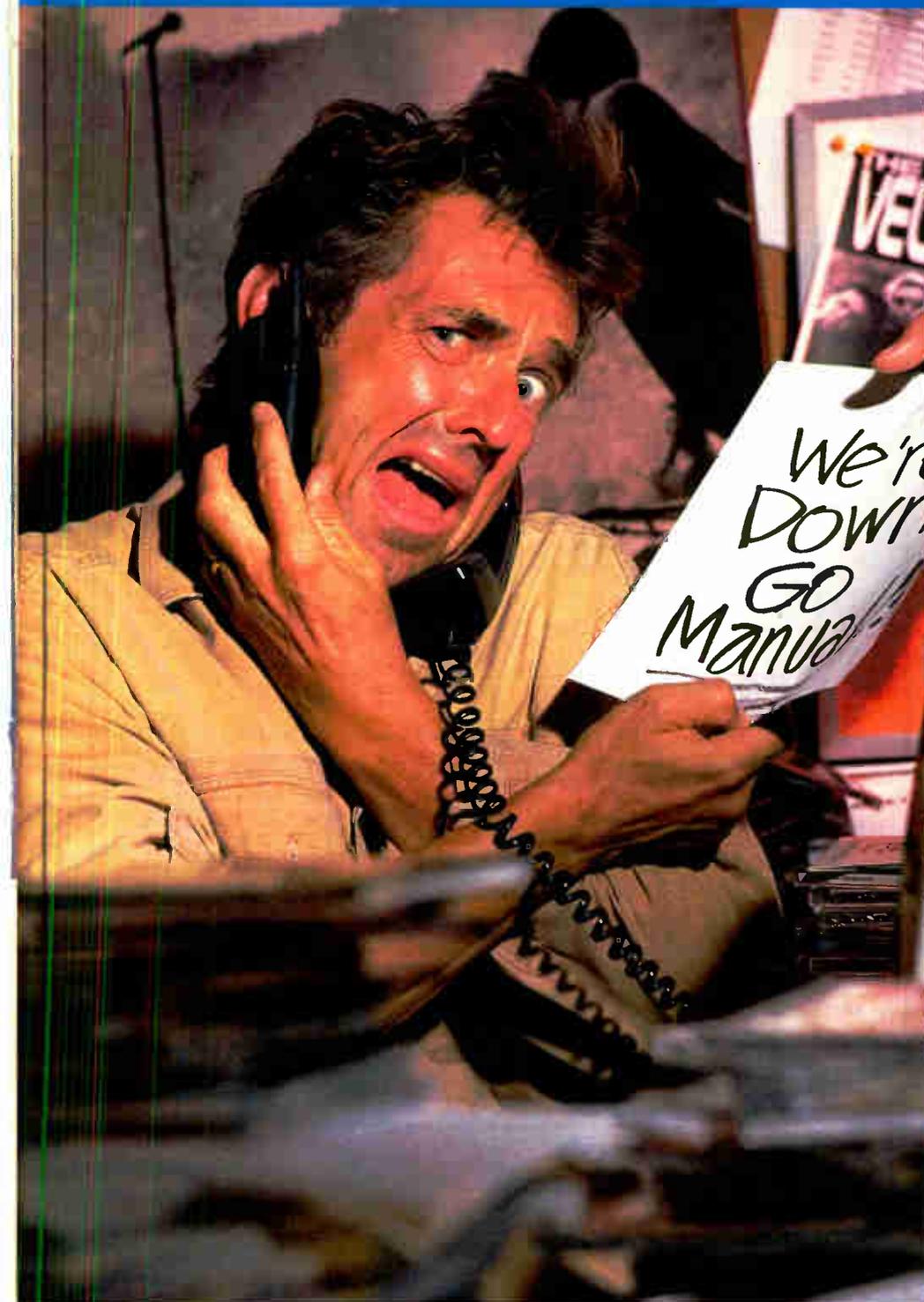
"At first glance, the obvious divide on Web radio is between the programming carried on a live stream and the programmes on an archive stream. But, as suggested in chapter 10, the permutations are a little more complicated. A live stream may be carrying a repeating rotation of a single pre-recorded programme or a short sequence of programmes, or it may be carrying a live output from a radio studio. An archive stream may conceivably carry the same pre-recorded sequence but without the automatic rotation. So the question we need to ask here is, irrespective of our definitions of live and archive streams, 'How does the listener encounter the options they are presented with?'"

"Here again, the ideas of the push and pull sides of Web radio are helpful. Programming is at the heart of a push medium: How do we, the station, keep delivering the content that will keep the audience with us while they have the radio on and give the fewest of them reason to tune into another competitor? In the niche medium of Web radio, we have less reason to keep such a broad range of listeners interested or satisfied — and we certainly wouldn't stake our financial prospects on that broadcast scale of audience within one territory. Nevertheless, the aim is still to keep individual listeners with you because they like your programming and away from opting to try your nearest similar competitor.

"The pull side is diametrically opposite. Here you fully expect listening habits to be promiscuous, that audiences will probably not be tuning to your programming on a daily basis: they'll come and visit your site when you have a programme they want to listen to. They'll find that programme through the online grapevine (e-mail, search engines or well-placed hyperlinks), maybe through offline promotion, or else they'll learn it's in a regular slot — say once a week. And what's more, they are very likely to tune out as soon as it's finished or indeed as soon as they lose interest. The more these visits are part of listeners' routines, the more like conventional radio they become; the more occasional they are, the less any notion of programme matters and the less the station has its singular identity."

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download a FREE trial version at [www.omt.net](http://www.omt.net)



### On the RADAR

ABC's Daytime Direction Network sat atop the latest RADAR network ratings in December. Arbitron ranks the audiences to radio commercials aired on 33 networks operated by ABC, American Urban Radio Network, Premiere and Westwood One. The company is phasing in diaries to the listening base; by the next report in March, RADAR will be based on an annual sample of 50,000 radio diaries.

The report also includes updated statistics useful for radio salespeople.

"Radio retained its position as a mainstay medium over the past year, reaching all demographics in all locations, both in and out of home," Arbitron states. The findings "indicate that over the course of a typical week, radio reached 96 percent of adults 18+ who live in a household with an income of \$75,000 or more. Over the course of a week, 96 percent of college grads and 92 percent of people who did not go to college listened to radio."

It also said that over the course of a week, radio reaches approximately 223 million people, or 94 percent of persons 12 and older. Some 182 million people, or 77 percent of those 12+, tune to radio on weekends.

RADAR-Rated Network	Audience (000)	AQH Rating
ABC Daytime Direction xb	8993	3.8
Westwood CNN Max	7256	3.1
ABC Morning News xb	5594	2.4
ABC Young Adult xb	5215	2.2
Premiere Morn Drv AM xb	5109	2.2
Premiere Focus xb	4478	1.9
Premiere Pulse	4410	1.9
Premiere Diamond xb	4371	1.8
Premiere Morn Drv FM xb	3972	1.7
ABC Prime Reach	3826	1.6
Westwood Source Max	3678	1.6
American Urban Pinnacle xb	3594	1.5
Premiere Action	3244	1.4
Premiere Ruby xb	3123	1.3
Westwood Blaise Radio xb	3092	1.3
ABC Urban Advantage	3009	1.3
ABC News/Talk Radio xb	2643	1.1
Premiere Pearl	2638	1.1
Westwood Navigator xb	2638	1.1
Premiere Emerald	2554	1.1
ABC Advantage	2475	1.0
Premiere Sapphire	2443	1.0
ABC Hot FM xb	2299	1.0
American Urban Renaissance	2254	1.0
Premiere Axis xb	2171	0.9
Westwood CBS Radio	1896	0.8
ABC FM Connection	1838	0.8
Westwood NBC Radio	1821	0.8
Westwood Edge xb	1788	0.8
ABC Info & Entertainment	1769	0.7
Westwood NeXt	1548	0.7
Westwood WONE	1035	0.4
ABC Music Radio	669	0.3

See program listings for programs included in and excluded from dayparts; xb indicates no broadcasts in one or more component dayparts. For a detailed description of each of the RADAR networks, see [www.arbitron.com/national\\_radio/radar\\_networks.htm](http://www.arbitron.com/national_radio/radar_networks.htm).

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### CLEAR CHANNEL, MUSICMATCH ARE NOVEMBER WINNERS

Arbitron said Clear Channel Worldwide was the top network in its MeasureCast Ratings for November, with 5.8 million hours of Total Time Spent Listening (TTSL) or Aggregate Tuning Hours (ATH) for the month of November. MusicMatch was second, StreamAudio third.

MusicMatch's Artist Match was the top Web channel with 1.25 million hours of TTSL. JazzFM was second, Virgin Radio third.

### Top 10 Internet Radio Networks (November 2002)

Rank	Company	TTSL	CUME
1	Clear Channel Worldwide	5,848,346	836,559
2	MusicMatch	4,990,647	1,239,405
3	StreamAudio	3,930,618	375,419
4	Radio Free Virgin	3,762,058	503,831
5	Warp Radio	2,573,816	288,032
6	Internet Radio, Inc.	2,438,542	644,155
7	Virgin Radio	1,726,328	255,937
8	SurferNETWORK	1,647,644	96,345
9	ABC Radio Network	1,522,967	251,870
10	StreamGuys	1,350,049	268,882

### Arbitron's MeasureCast Top 20

Rank	Station	Format	Owner/Network	TTSL (ATH) <sup>1</sup> (in hours)	Cume Persons <sup>2</sup>
1	MUSICMATCH ArtistMatch (Internet-only)	Miscellaneous	MUSICMATCH	1,250,514	381,603
2	JazzFM/102.2 FM & 100.4 FM (London)	Jazz	Guardian Media Group	1,202,148	248,267
3	Virgin Radio/1215 AM & 105.8 FM (London, UK)	Hot Adult Contemporary	Virgin Radio New Media	1,174,334	176,362
4	RADIOIO (Internet-only)	Adult Alternative	RADIOIO/ioMediaPartners,inc. / LimeLight Networks	1,803,431	180,106
5	WQXR-FM/96.3 (New York)	Classical	New York Times	848,693	109,213
6	ESPN Radio (Bristol, CT)	Sports Talk	The Walt Disney Internet Group	765,964	110,629
7	MUSICMATCH Top Hits (Internet-only)	CHR / Top 40	MUSICMATCH	723,551	328,055
8	K-LOVE Radio (Sacramento)	Contemporary Christian Music	Educational Media Foundation	671,955	64,723
9	WBLS-FM/107.5 (New York)	Hip Hop	Inner City Broadcasting / BroadcastURBAN.com	574,548	37,655
10	Beethoven.com (Internet-only)	Classical	Beethoven.com	556,208	62,415
11	KING-FM/98.1 (Seattle)	Classical	Classic Radio Inc. Real Broadcast Networks	407,474	48,463
12	BlueGrass Country (Internet-only)	Country	American University / Warp Radio	356,819	68,533
13	3WK Undergroundradio (Internet-only)	Alternative Rock	3WK	313,509	84,210
14	WFXZ-FM/93.7 (Wilmington, NC)	Classic Rock	Sea-Comm Media / Warp Radio	310,791	19,194
15	MUSICMATCH Soft Hits (Internet-only)	Soft Hits	MUSICMATCH	302,495	66,774
16	WXPB-FM/88.5 (Philadelphia)	Adult Album Alternative	University of Pennsylvania / StreamGuys	276,719	17,449
17	KNAC.COM (Internet-only)	Pure Rock	KNAC.COM	262,717	52,127
18	ChoiceRadio New Age (Internet-only)	New Age	Internet Radio, Inc.	257,445	60,608
19	MUSICMATCH Country Hits (Internet-only)	Country	MUSICMATCH	255,583	77,285
20	ChoiceRadio Country (Internet-only)	Country	Internet Radio, Inc.	247,459	67,180

#### Notes:

1. TTSL (Total Time Spent Listening), sometimes referred to as Aggregate Tuning Hours (ATH), is the total number of hours streamed by the broadcaster in the reported time period.

2. Cume Persons is an estimate of the total number of unique listeners who had one or more listening sessions lasting five minutes or longer during the reported time period. This estimate is derived using an algorithm that takes into account unique media player GUIDs, unique IP addresses, and other variables during the reported time period.

#### Background and Methodology Statement from Arbitron:

The rankings included in the November 2002 Arbitron's MeasureCast Ratings are based on those stations and channels that have provided Arbitron with access to their server data. The ratings may not reflect all tuning for the measured stations or channels since Arbitron may have received incomplete or unusable server data.

Arbitron Webcast Ratings debuted with October 1999 data as the world's first streaming media ratings service. In November 2002, Arbitron acquired a license to MeasureCast's streaming measurement technology and related assets. Some channels that had previously been measured by Arbitron may not appear in the November 2002 ratings. Many of these stations should be included in future ratings as the two services are integrated.

Arbitron's MeasureCast Ratings provides ratings for streamed media because Webcasters need objective, third-party audience measurement to demonstrate the value of their audiences to agencies and advertisers. Arbitron's MeasureCast Ratings is a server-side measurement, which captures tuning to participating streamed media channels by compiling a near census of Internet tuning sessions.



# Station 'Logos' All Over the Map

by Ken R.

This may be hard to imagine, but the roots of most of those catchy little call-letter melodies from your favorite jingles go back to 1925.

One of the most popular purveyors of musical station identifications in the 1960s and '70s was PAMS, based in Dallas.

When PAMS was first trying to sell jingles to WABC(AM) in New York in 1960, the company borrowed a few notes from a popular TV series, "77 Sunset Strip." The ABC detective series lasted from 1958 through 1964, but the "77" melody was never used on the radio. In fact, that package of jingles, "Living Radio," was purchased by cross-town rival WMGM(AM), with a different tune for the call letters.

When WABC finally bought jingles from PAMS a couple of years later, the "77-WABC" melody was adapted from a song called "Manhattan," with music by Richard Rodgers and words by Lorenz Hart. The song was first heard on the stage in 1925's hit musical "Garrick Gaieties."

The "77" tune came from the line "We'll turn Manhattan" (or earlier in the song, "I'll take Manhattan"), and the "WABC" was derived from "into an isle of joy." WABC paid the estates of Rodgers and Hart yearly for this privilege.

## My home town

This got me to thinking about where other call-letter melodies, "logos" or "signatures" came from.

WGR(AM) used a little bit of "Shuffle Off to Buffalo." KFJZ(AM) in Ft. Worth copped the refrain from "Deep in the Heart of Texas," as did KLIF(AM) in Dallas for a while in 1967.

Midwest giant WLS(AM) appropriated the "Chicago" from the Frank Sinatra hit of that name.

KOMA(AM) in Oklahoma City would have been foolish not to grab part of "Oklahoma," and KABL(AM) and KNEW(AM) each used half of the theme line of "I Left My Heart in San Francisco" — KABL used "I left my heart" and KNEW used "in San Francisco."

In 1972, KNBR(AM) in the same city appropriated the same song with jingles by, yes, the same company: PAMS.

WMCA(AM) didn't consider the song

"Manhattan," because it was so closely identified with WABC. Instead WMCA chose "New York, New York" from the 1946 musical "On the Town." Tom Merriman did a great job of adapting the melody line from the original by Leonard Bernstein and Jerome Robbins.

Sound Studios (later known as Pepper Tanner) and by PAMS used Johnny Mercer's "I'm an Old Cowhand" for the logo. Another inspirational country tune was "My Dog Has Fleas," which translated nicely into a signature for KLAC(AM) in Los Angeles, among others.

## You name the song, and PAMS or one of the other jingle companies of the day used it to tie a set of call letters into a geographical area.

In a 1974 audition tape in our collection, Merriman explained to his client that by rearranging the notes of the title song very slightly, the message would still come through without incurring copyright problems.

You name the song, and PAMS or one of the other jingle companies of the day used it to tie a set of call letters into a geographical area.

KDWB(AM) in St. Paul, Minn., used "Red River Valley." KOY(AM) in Albuquerque stole a few notes from Mark Lindsay's hit "Arizona." WGH(AM) in Norfolk claimed "Carry Me Back to Old Virginny," the official state song written by James Bland. And "I Wish I Was In Dixie" turned into "WPXY in Dixie" for a popular AM in Greenville, N.C.

Other songs providing inspiration included "Kansas City," used for the singing of the city name in WHB(AM)'s grid package in 1969, exactly 10 years after the song was popular.

WEPP(AM)'s PAMS Series 22 used an obscure but locally popular melody from a song called "Pittsburgh, Pennsylvania" in the logo.

## Did that trombone talk?

The jingle companies of that era tried almost any audio trick that would cause their product to catch the ears of the listeners. One such device goes back to the early 1940s: the Sonovox.

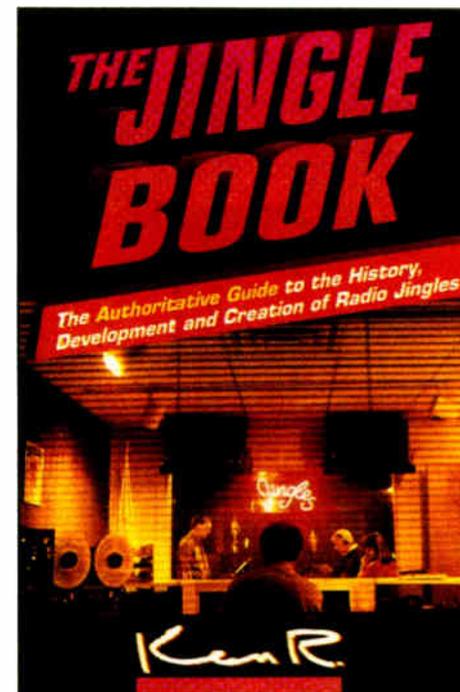
In simple terms, an instrument was played through an amplifier into two small speakers that could be held up to the "singer's" throat. The modulating tone could be a flute, an organ or any other instrument. The "singer" articulated the words with his or her mouth, but didn't use the vocal chords. The effect was the sound of an instrument with human diction.

PAMS was the first studio to popularize this technique in a 1961 jingle package called "Sonosational" for KFVB(AM), Los Angeles and WIBG(AM), Philadelphia.

In the 1940s, WSPD(AM), in our proud city of Toledo, created a homemade pre-PAMS Sonovox version of "We're Strong for Toledo," a corny tune originally penned by Joe Murphy. It must have been difficult to shoehorn in the lyrics "WSPD, Toledo" where one would normally sing "We're Strong for Toledo," but they did it.

City songs weren't the only inspiration for call-letter melodies.

In the late 1960s and early '70s, country was a new radio format; stations weren't as afraid of acquiring a "twangy" image as they are today. Many jingles by Pepper



This story is adapted from *The Jingle Book: The Authoritative Guide to the History, Development and Creation of Radio Jingles.* Visit [www.kenr.com](http://www.kenr.com) for information.

Down" in their jingles. ("Radio One is wonderful ... B ... B ... C.")

"The Sailor's Hornpipe" was used for several cuts over the years. Probably the best was PAMS' "WOCN-1-4-5-0" beaming out of Miami.

A more subtle use of a pretty melody was born when TM created "Warm and Wonderful" for WPEN(AM) in Philadelphia. The first four notes of "Lara's Theme" from "Dr. Zhivago" were altered just slightly for the call letters.

Pepper's "The Station That's All Heart" used both "Down at Poppa Joe's" by the Dixiebells for the call-letter logo as well as "You Gotta Have Heart" from the musical "Damn Yankees" in the lyrics.

There are many more examples, but the point is that one should listen for these little "tributes" in jingle packages. Now that you know how it was done, you can probably spot a lot that we missed. 🌐

## How to Submit Letters

Radio World welcomes your point of view on any topic related to the U.S. radio broadcast industry.

Letters should be 100 to 300 words long; the shorter the letter, the better chance it will be published in full. We reserve the right to edit material for space. Longer commentaries are welcome but may not reach print as quickly.

Include your name, address and contact information, as well as your job title and company if appropriate.

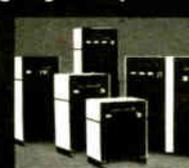
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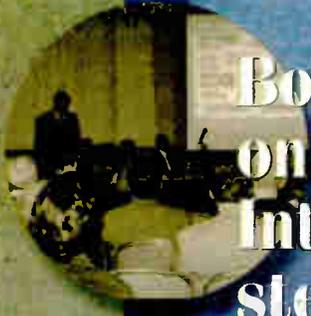
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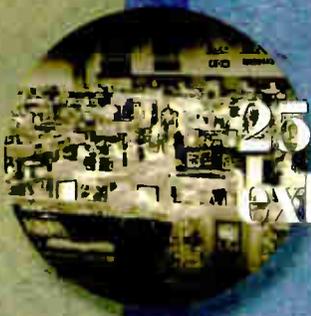
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ROOTS OF RADIO

# Press vs. Radio in the 1930s

by David Richardson

The occasional legal troubles of radio stations using news out of the local newspaper recall the epic press/radio feud of the 1930s, when newspapers and news agencies challenged radio's right to air any news at all.

This was during the Great Depression, when a great many stations were shoestring operations. It was common practice for broadcasters to just buy a paper and read their occasional "news-casts" from it verbatim. Naturally this raised the ire of publishers, who had little use for their new, upstart competition in any case.

Matters were brought to a head by the actions of one Rogan Jones, who owned KVOS out in Bellingham, Wash. Jones had been in the insurance and real estate businesses when the stock market crash came along. Obligated to take back a building he'd sold, Jones suddenly found himself owner of the radio station on its top floor.

Intrigued by the challenge of finding out whether money could be made, he went on to acquire a couple of other all-but-defunct stations, including KVOS. (Originally a Seattle station — the call letters stood for "Voice of Seattle" — it had later been moved some 90 miles north to Bellingham.)

**Chill**

Jones believed in programming aggressively. By 1933 he was airing not one but three full-length news broadcasts a day, on which announcers openly read the leading stories from the latest editions of area papers. He called his shows the "Newspaper of the Air" and hinted strongly that because of this "service" there was no need for listeners to buy newspapers any more!

Jones, a strong Democrat, had long been feuding with the Bellingham Herald's Republican editor anyway. Their respective media soon were filled with mutual deprecations and name-calling over this unpaid "lifting" of what journalists worked so hard to produce.

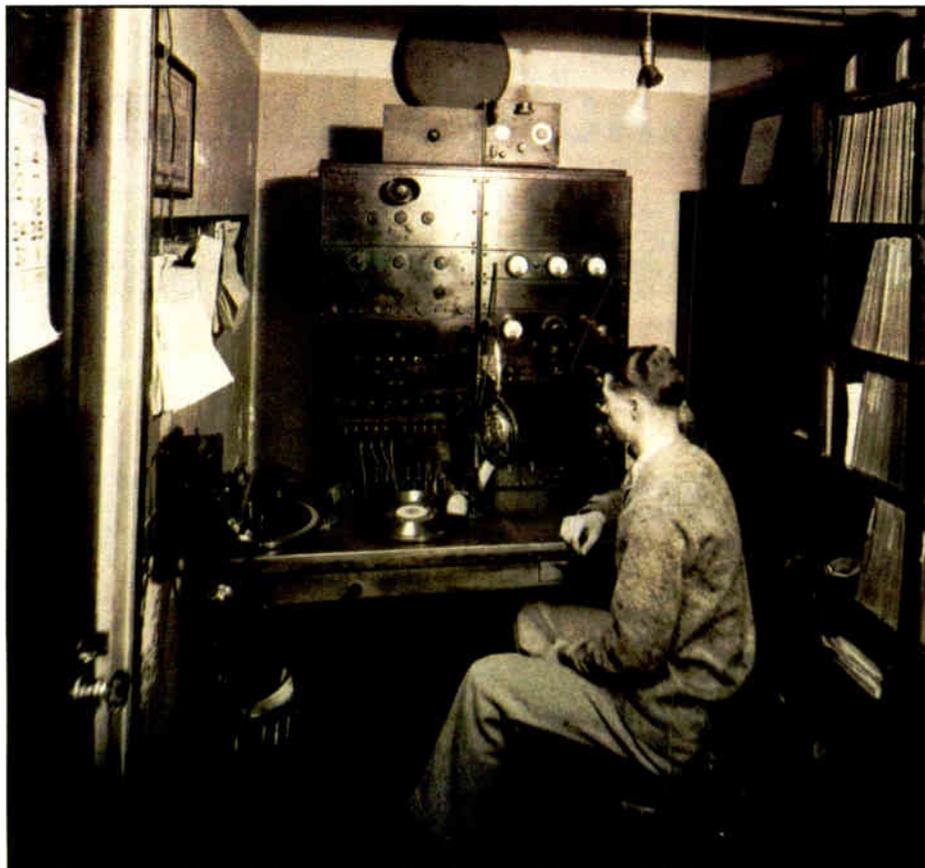
At one point the Herald applied for its own broadcasting license, whereupon Jones argued that it only wanted the station so it could run his out of business. He presented a sheaf of the

Herald's own clippings as proof. The application was denied.

Lawsuits were threatened but in the end it was the Associated Press that brought suit against KVOS, charging unfair competition.

"Who owns the news?" asked the Literary Digest, reflecting a hardening attitude of the print media generally.

Meanwhile newspapers all around the United States were refusing to print radio program schedules any longer, except as



Engineer H. Ben Murphy sits at the controls of KVOS in Bellingham, Wash., in the 1930s. The station's use of news 'lifted' from local papers led to the decade's press/radio feud.

KVOS hired as its lawyer none other than U.S. Senator Clarence Dill, who just happened to be the author of the 1927 Radio Act, then in process of being rewritten as the Communications Act of 1934. A staunch New Deal Democrat, close to FDR, Dill argued that by broadcasting the news, KVOS merely was carrying out its obligation under that very Act to serve the public interest.

The court not only found for KVOS, but issued the startling opinion that by definition, once news was "published," that made it "public" for anyone to use!

The national news media were aghast. News-Week promised a "fight to the last adjective."

paid advertising; and even stations that wanted to pay for a proper news service, such as AP, were turned down. For a time, many stations limited themselves to airing brief summaries of the news, with the placating disclaimer: "For further information, read your daily newspaper."

**Thaw**

At length the U.S. Supreme Court ruled in KVOS' favor on a technicality, essentially confirming the right of broadcasters to air news. By then the big networks had established large, well-organized newsgathering departments of their own. Radio news clearly was here to stay.

Gradually the Associated Press and

other news agencies also softened their attitude toward local stations, allowing them to join up and get their news legally via teletype, for a fee, even including a copy specifically scripted for radio that busy announcers could "rip 'n read," as-is, without further editing.

(The fact that these scripts were all too often read over the air "cold" without first scanning them for garbles and typos would lead to many interesting consequences, but that's another story.)

**Jones' announcers openly read the leading stories from the newspapers. He hinted there was no need for listeners to buy papers any more.**

Copyright laws did not come into play at the time because of the way those statutes had been written well before any such things as radio was conceived of. Today it's another matter, and apart from the question of professional ethics — not to mention ordinary fairness — the legal proprietary rights of an author or agency to the actual words and phrases they produce are entitled to be taken seriously.

As to "repurposing" the substance of someone else's news reporting, attribution is not only a basic courtesy to the story's source, but also a service to listeners, so they can judge the reliability of what they hear.

Rogan Jones went on to pioneer television, FM and cable TV in northwestern Washington, and radio programming automation nationally through his International Good Music Corp, or IGM. As for KVOS, having long ago made its peace with the Herald, it is today, as KGMI, still the dominant Bellingham voice, with an all-talk format that is heavy on the news.

David Richardson is a retired broadcaster and author of "Puget Sounds," an illustrated history of radio and TV in the Pacific Northwest.

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# Buyer's Guide



Radio World

Power Conditioning, UPS & Backup

January 15, 2003

SPECIAL REPORT

## Spike Block in Radio's Future?

by John Pecore  
President  
Stormin Protection Products

**TAMPA, Fla.** Experts in power quality have searched for years for a device that could eliminate ground transient problems. Spike Block seeks to address this problem and comes with UL recognition.

Our company already offers the Optilator, a fiber-optic device that isolates phone lines from Gentner and Burk modems at tower sites, eliminating a ground loop between the building grounds and telephone box grounds.

A similarly important product is the new Spike Block.

At every tower site and multiple building site, physical and electrical grounding for equipment is present. In multiple building applications using RS-485 or 10BaseT, there exists a serious ground loop problem. To eliminate that, the industry has suggested ground isolation transformers. This approach will do the trick electrically; but many cabinets that house electronics are grounded.

Such case ground can be a major problem and create an internal ground loop or feedback loop of electromagnetic impulse or EMI. Noise problems sometimes distort the quality of the FM or AM signal.

### Background

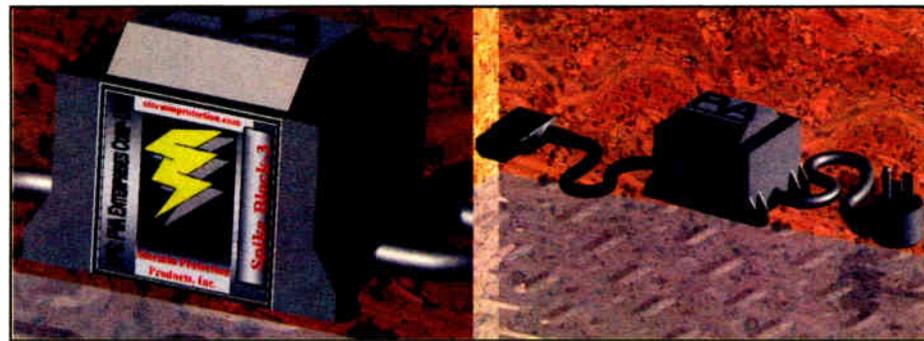
The Spike Block tries to prevent this kind of NEC problem by eliminating feedback loop, noise and ground strikes from case ground or electrical grounds. It is installed on all ground wire or plugged into UPS and has a compact mechanical package. One Spike Block is required for each electronic device for maximum efficiency. Spike Block technology is expensive, but not as expensive as replacing hardware and costly down time.

Electronic systems have advanced in speed and reduced in physical size. Electronic circuit or "chip" manufacturers integrate more surface-mount technology on more and more circuits or in a single chip, enabling software manufacturers to increase the density and complexity of programming. The result: higher operating speeds and lower tolerance to damaging electrical interference.

At the same time, the delivery of electrical power from an electric utility as alternating current can become unstable, surge or vary, beyond the design limitations of the overall system. This may be due in part to changes in the utility's transmission demand, in part to insensitive electrical system structural design, in part to the conversion of AC to DC power, used to drive the common computer, network

communication systems, security systems and naturally in part due to lightning damage.

All technology is vulnerable to electric impulses. Many computer users are aware of the destructive force of a local lightning strike and the electrical impulses induced into building electrical distribution.



Stormin Protection says the Spike Block could be the next generation of UPS for radio.

These impulses go directly into the electronic system via the power supply or case ground. High-energy transients also come from many other sources such as inductive or capacitive loads, including motors switching on/off, heat pumps, elevators controls, laser printers, computer disk drives, irrigation system solenoids cycling and even the

common telephone line.

The design focus of today's power supplies, with AC power converters supplying DC power, is high efficiency and the smallest possible size. Impulse immunity is not a prominent design constraint.

Generally, a computer power supply will use the building electrical ground as a reference (ground connection) for

all the voltages that are supplied to a CPU, memory, hard disk, modem cards and security systems. The ground is tied directly to system components for UL safety and internal and external communication.

Herein lies a growing and significant dilemma based on NEC Code for grounding and UL requirements for life safety.

The ground connection has become a control path for irregular impulses that result in system failure and in many circumstances intolerable downtime.

UPS (standby, on-line, true online and double conversion) surge strips, electrical-panel surge suppression and power conditioners are designed to protect the line and neutral wires of a three-wire circuit where the third wire is a common ground. Whether it is a single-phase or three-phase circuit, there can still be a serious voltage surge problem from erratic voltage transients coming up the ground wire and back into sensitive electronics and security systems.

The power conditioning products mentioned here provide only normal mode protection (line to neutral) even though some state that they provide common mode protection (neutral to ground). Their claims of common mode protection only allow shunting a high-voltage transient to ground.

Unfortunately, the transient energy then becomes bi-directional along the ground line. Not all the transient energy goes to ground; a large part can flow up the ground wire and across the switch mode power supply, case ground or telecommunication devices (without an Optilator), back into the Gentner or Burk system, computer, electronic device or security system.

The Total Electrical Transient Eliminator, or Spike Block, is a patented technology that effectively controls the

See STORMIN, page 39 ▶

TECH UPDATE

### Equi=Tech Products Balance Power

Equi=Tech's balanced AC power products strive to keep static and background noise to a minimum. Increased sonic resolution and detail and tighter, defined bass response are benefits that Equi=Tech touts.

The Wall Cabinet Balanced Power System has an increased capacity and 24/96-transformer technology, separating it from its predecessors.

24/96 series balanced power transformers are designed to extend the bandwidth of common mode noise attenuation into the 100s of megahertz. A reduction in digital jitter and other timing errors has occurred in digitally-based video systems powered with these devices.

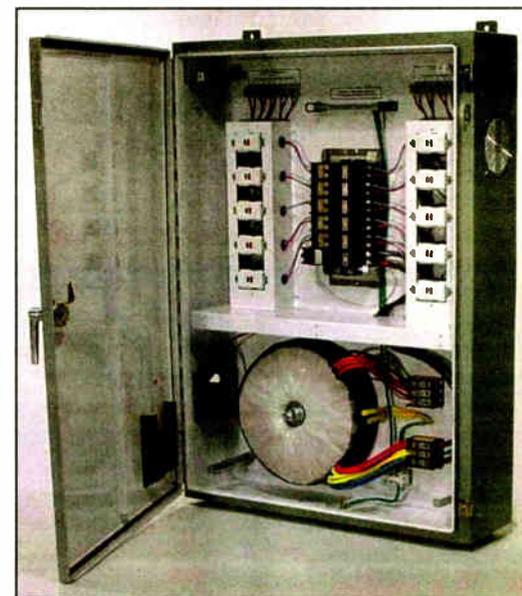
Equi=tech says these transformers provide a more accurate balanced output than products before them, using a proprietary winding method and materials, which enables a virtual mirror image impedance across the output of the transformer.

High-frequency harmonics in AC systems can cause problems in digital signal-processing operations. Newer digital formats rely largely on compressed data and high-frequency clocking operations. Equi=Tech transformers try to extend the effectiveness of balanced AC as a means of cleaning up high-frequency harmonics beyond the bandwidth limitations of earlier systems.

Its Q transformer adds depth and clarity to the low end. Inrush current is reduced and occasional acoustical hum is eliminated almost completely.

The company said tests have demonstrated a reduction of digital jitter in 16-bit audio recordings when the equipment tested was running on balanced AC power. The range of jitter in the equipment tested showed a reduction of 67 percent (18 ns down to 6). At the same time, the average jitter was halved (6 ns down to 3 ns).

Balanced AC eliminates a very wide bandwidth of electrical interference. The tests prove that there is direct correlation between this fact and the performance of digital-based signal processing equipment running on balanced AC. For more information, including pricing, contact the company in Oregon at (541) 597-4448 or visit [www.equitech.com](http://www.equitech.com).



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Equipped with 16 opto-isolated and CMOS/TTL compatible inputs and 16-Relay (Form C) outputs that may be controlled from a host computer or a pair of units can be used in a stand-alone configuration (relay extension cord).

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The SRC-8 provides a means of adding 8 channels of remote control to RF, wireline, and fiber type STL systems and may also be used with dedicated modems (full and half duplex models).

**AVR-8 Alarm Voice Response**  
Used as a voice response and remote control system, the AVR-8 automatically reports changes detected on any of its eight digital inputs to a remote telephone and/or pager.

**BOS, ROS & PBB-24 Switch Panels**  
The BOS offers 12 N.O. dry contact switches with status LEDs in a desktop panel. The ROS is similar, but is a single-space rack unit. The PBB-24 provides 24 momentary buttons that can be programmed to output ASCII or hex character strings.

**SSM Smart Silence Monitor**  
Monitors any stereo or two independent monaural sources and generates alarms indicating loss of carrier when white noise and/or silence is detected.

**PSC Programmable Schedule Controller**  
Stores and controls up to 160 events with Hour/Minutes/Seconds, Day/Month/Year, or Day of Week with Daylight Savings Time correction. 20 SPST relays and/or 32 serial custom commands provided.

**MC-16 Telephone Hybrid/Coupler**  
Full-featured telephone line coupler/hybrid provides 32 programs; 32 ASCII strings (DTMF to ASCII); 64 macros; 16 relays; auto answer; 4-digit access codes and more.

**UI-411 Universal Interface**  
Perfect for adding logic functions to mechanical switches/relays, adding remote functions to transmitter control/logic, detecting phone line "ring", etc.

**DEC-16 Decoder, Auto-Coupler & Dialer**  
A dial-up, dial-out or direct connect DTMF decoder. The DEC-16 is capable of automatically calling in, out or connecting to an ENC 16, DTMF encoder or other DTMF encoders.

**PSC-II Programmable Schedule Controller**  
With 512 events intended for controlling up to two RS-232/RS-422 serial devices; 16-SPDT relays; auxiliary serial ports and relays all in a single rack space. The PSC-II controls functions by either scheduled time and date, time and day of week, serial port commands and remote input contact closures.

**BOR-4 (Box 'O' Relays)**  
The BOR-4 provides four independent 2PDT relay interfaces with two optically isolated or 5-volt TTL/CMOS compatible inputs.

**ENC-16 Encoder, Auto-Coupler & Dialer**  
A dial-up, dial-out or direct connect DTMF encoder. The ENC-16 is capable of automatically calling in, out or connecting to the DEC-16, DTMF decoder or other DTMF decoders.

**SRC-32 Serial Remote Control**  
Equipped with 32 opto-isolated and CMOS/TTL compatible inputs, 24 open-collector outputs and 8-Relay (Form C) outputs that may be controlled from a host computer or a pair of units may be used in a stand-alone configuration (relay extension cord).



SRC-1616L

MC-16

PSC-II

SRC-32

BOS, ROS & PBB-24



AVR-8

SSM

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DEC-16

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## TECH UPDATE

## Staco Updates UPS Line

The UniStar Sx Series from Staco Energy Products is a single-phase online UPS that offers protection with diagnostics and advanced circuitry. Double-conversion design isolates and conditions the power coming into the unit before it is distributed to the protected equipment.

Available in sizes from 700 VA to 3,000 VA, the UniStar Sx offers remote monitoring and diagnostic capabilities through an SNMP adaptor or its own power management software. For installation versatility, it is offered in tower and rack-mount models.

Battery diagnostics provide protection

against overheating, deep discharge and low-current damage. The UniStar Sx comes with a hot-swappable internal battery pack that provides time for equipment shutdown during an outage. With optional external battery cabinets, runtime can be extended. The UniStar Sx is intended to protect critical industrial and electronic equipment, including workstations, networking and telecom equipment.

The UniStar Sx provides zero-transfer battery back-up based on proven double-conversion technology and digital signal processors. All models deliver output voltage regulation and have customizable I/O configurations.

A three-year warranty comes standard with UniStar Sx models. Staco Energy offers other UPS and voltage regulation products for broadcasters' power protection needs.

For more information, including pricing,

contact the company in Ohio at (937) 253-1191 or visit [www.stacoenergy.com](http://www.stacoenergy.com).

## Superior Electric Customizes Gear

Superior Electric's Stabiline WHR Series Catalog allows for user specific application requirements to be configured to their specific needs.

The Stabiline WHR Catalog includes a power problems and solutions sections, product specifications, application/model selection worksheet, dimensional drawings, automatic voltage regulator technical comparisons and a list of approximately 25 options.

Catalog options include external bypass, delayed output, soft start, casters, door interlock switches, Nema 4X Enclosures

and reduced footprint enclosures.

WHR Automatic Voltage Regulators are available for use on AC power systems up to 660 Volts for single-phase and three-phase electrical configurations. They maintain constant voltage to the protected equipment, even when the input voltage and system load vary widely.

The catalog allows potential users to complete an application data form for a company-recommended model based on their individual needs. It is available in English and Spanish versions.

For more information, contact the company in Connecticut at (860) 585-4556 or visit [www.superiorelectric.com](http://www.superiorelectric.com).



## Stormin

► Continued from page 36

voltage transient problem described above.

It blocks high-voltage transient frequencies from becoming bi-directional and re-establishes them as unidirectional or one-way, away from sensitive electronics like Burk and Gentner equipment, short-haul modems and computers.

In 2000, the Electric Power Research Institute released information stating electrical transients, power sags and surges caused U.S. industry more than \$50 billion in downtime during the previous calendar year. In 2000, the figure exceeded \$100 billion. During 2001, the figures doubled again. The Spike Block is the only known cure for the electrical transient problem. The AM/FM/TV industry definitely sees their share of "downtime."

Don Pennington, a bright engineer and president and CEO of PVA Enterprises Corp., came up with this idea to eliminate transients coming up from the case ground. Los Alamos Laboratories in Los Alamos, N.M., also recognized his unique design because they were doing a government-classified program testing the effect of high-energy pulses that are emitted from EMP pulse bomb simulation. The EMP pulse would pass back down the ground wire through the UPSs that were rated at 2,500VA causing computers to lock up and damage microprocessors.

They installed 6 PVA Spike Block units as front-ends to the UPSs, and this resulted in no more computer lock-ups or damaged microprocessors. The PVA units blocked the high-energy pulse being radiated from the EMP pulse from the simulation bomb from traveling back down the ground wire, eliminating system failures.

In addition, Battelle, a non-profit organization that serves industry and government in the areas of technology development, laboratory management and technology commercialization, chose this technology as one of the few to be presented at the Naval Industry R&D Partnership Conference 2002 where 650 government and industry leaders were represented in Washington.

The retail price of one Spike Block is suggested at \$310.

For more information, contact the company in Florida at (727) 548-5418 or visit [www.storminprotection.com](http://www.storminprotection.com).

Join us at the **Radio Luncheon** on Tuesday, April 8 for the induction of **Scott Shannon, Air Personality and Program Director, WPLJ**, into the NAB Broadcasting Hall of Fame.

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TECH UPDATE

**MGE Offers Power Protection Gear**

MGE UPS Systems' Pulsar Evolution Uninterruptible Power Supplies (UPS) provide backup power to broadcast systems in the event of power blips and blackouts.

The rackmount UPS products are available in 1,500 VA to 3,000 VA models and are designed for power disruptions with high-power density, small footprint and external battery modules for extended back-up time. The 1,500 VA model is a single rack unit high which, according to MGE UPS, makes it one of the smallest UPS for high-density rack environments.

The Evolution models use high-frequency line-interactive technology that delivers a sine-wave output, voltage correction and wide input voltage tolerances, important in fluctuating power environments. The UPSs have enough battery power to keep electronic devices running

for up to 60 minutes.

For increased power protection, two to four of the UPS programmable outlets can be used to reset network devices remotely and allocate longer backup times to critical equipment. Data line surge protection via an RJ-45 pass-through connector shields a modem or network interface card from surges and spikes transmitted by phone or network cabling.

Local or remote network power administration is handled through the unit's USB and serial ports with MGE's robust Solution-Pac power management software for popular operating systems.

List pricing for the Evolution models starts at \$775. They carry a two-year warranty that includes battery replacement.

For more information, contact the company in California at (714) 557-9788 or visit [www.mgeups.com](http://www.mgeups.com).



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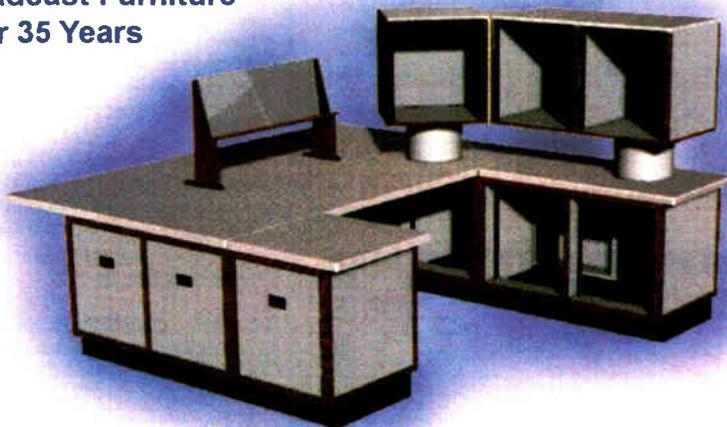
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McCurdy 11 channel, stereo console. Pulled from service in 2001. For donation to non profit organization - you ship. Rick Keefer, KICA, 1000 Sycamore St, Clovis NM 88101. 505-762-6200.

Schafer 5 channel mixer, very nice but goes "as is", ready to ship w/manual, \$100 +shpg. Mike Raley, 704-523-5555 or email: [Mraley@bbnradio.org](mailto:Mraley@bbnradio.org).

Yamaha 03D digital mixing console, \$2000. Peter Stover, Educational Media Corp, 830 Gunnery Hill Rd, Spotsylvania VA 22553. 540-582-5371.

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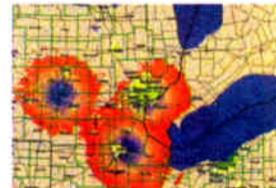
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Radio Design Labs STM 2 stick-on mic pre-amp with power supply & manual, new, (2) available, buyer pays shipping, \$50/BO (each). Bob Rivkin, KPLM, 442 S Calle Encilia #8, Palm Springs CA 92262. 760-320-4550.

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RCA 77-DX, 44-BX, KU-3A's, WE-639's, On-Air & recording lights wanted, top dollar paid! 615-352-3456, FAX: 615-352-1922. E-mail: billbryantmgmt@yahoo.com.

RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 972-271-7625.

## MISCELLANEOUS

### Want to Sell

Harris vintage remote transmitter control; Harris cart machines, 2 single, 1 record/play; Harris MSP 90; CLR system SPF 300 standard pre-emphasis filter; Harris Mono 5; Harris M1A 1000 watt AM transmitter tuned to 1490. Call 237-9500 to make offer on any or all of the above.

Honeywell medium intensity strobe system model K-6 225 TW KVA.6 120 VAC. Lines include Royal electric 12/7 SOW 600v at 132' royal electric 12/5 SOW-A 90c and 60c with lengths of 52' & 160'. Good for parts only. Will sell total kit "as is" for \$3500. Mike Raley, 704-523-5555 or email: Mraley@bbnradio.org.

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Inovonics Map II multiband processor, \$650 "as is" +shpg. Mike Raley, 704-523-5555 or email: Mraley@bbnradio.org.

Nidec motors (10) for Audio-cord "E" series. 117v 6H 3.1w 0.2amp 12p & 600rpms, will sell "as is" for \$40 ea. Working condition, just somewhat noisy, Mike Raley, 704-523-5555 or email: Mraley@bbnradio.org.

QEI ARC-27 automatic remote control, \$295 "as is" +shpg. Mike Raley, 704-523-5555 or email: Mraley@bbnradio.org.

Three 25 HZ TP-XT Zercorn dual tone detect & notch filter, \$70 ea "as is" +shpg. Mike Raley, 704-523-5555 or email: Mraley@bbnradio.org.

Delta 6730E motorized 4 port coaxial transfer switch, 1-5/8", 50 ohm, 120 VAC, good condition, rated at 13.6 kW @ 108 MHz, \$800. Mona Lewandoshi, WHRB, 389 Harvard St, Cambridge MA 02138. 617-495-9472, mail@whrb.org.

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Comtech 5.5m dish & mount. Originally purchased back in 1983 but in good condition, will sell "as is", buyer responsible for removal & shipment, \$5500. Mike Raley, 704-523-5555 or email: Mraley@bbnradio.org.

Matsushita access global DSP 7662 satellite receiver in good condition, buyer pays shipping, \$150/BO. Bob Rivkin, KPLM, 442 S Calle Encilia #8, Palm Springs CA 92262. 760-320-4550.

Wegner DN 86 digital audio receiver 3944.1 MHz, \$400 "as is" +shpg. Mike Raley, 704-523-5555 or email: Mraley@bbnradio.org.

Zephyrus Analog sat receivers (4), \$140 ea "as is" +shpg. Mike Raley, 704-523-5555 or email: Mraley@bbnradio.org.

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Harris-Gates FM-5G 5KW FM & Harris-Gates BC-5-H 5KW AM. Continental Communications, 314-664-4497. Email: [contcomm@fiastl.net](mailto:contcomm@fiastl.net).

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AnaCom ANASAT-C Series C-Band transceiver 10 watt. Just reconditioned, \$7000. For technical info email: [Rmuffley@bbnradio.org](mailto:Rmuffley@bbnradio.org). for purchase call Mike Raley at 704-523-5555 or email: [Mraley@bbnradio.org](mailto:Mraley@bbnradio.org) for pictures.

Crown 2000, all solid state 2 kW xmtr, like new, less than 2 yrs old, all manuals, replacing due to upgrade, \$12,000. Roger Wright, WLLX, 1212 N Locust Ave, Lawrenceburg TN 38464. 931-762-2916.

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## ◆ READER'S FORUM ◆

### GUEST COMMENTARY

# Shock Jocks Are On the Offensive

by Mike Repheune

It's a whole new world out there in radioland, and there are parts of it I just don't understand.

Alleged morning talents Opie and Anthony treated their WNEW(FM) New York audience to the sounds of a couple ostensibly having sex in St. Patrick's Cathedral, just a few feet from parishioners. Previously, when these guys worked at WAAF(FM), Boston, they deliberately misrepresented that the city's mayor had been killed in a car crash. They have a great career behind them now, as they were fired from both stations.

One "Bubba the Love Sponge" (real name: Todd Clem) thought it might be amusing to castrate and slaughter a live boar in the parking lot of his Florida radio station. That's always good for a couple of yucks.

New York-based Howard Stern has pretty consistently made fun of the physical and mental deformities of his zany cast of characters such as "Hank, the Drunken Dwarf."

Chicago's Erich "Mancow" Muller presents himself as an advocate of free speech. And indeed, he often makes provocative comments alluding to governmental conspiracies that may or may not be true. But why use his airwaves to slander the wife of a competitor? He repeatedly claimed on the air that Janet Dahl, wife of cross-town personality Steve Dahl, engaged in "adultery, fornication and sexual promiscuity in the vilest of terms," according to the suit filed against him.

But it gets worse.

According to the San Jose Mercury News, Mikey Esparaza of KSJO(FM) is a local legend. When his sidekick, "Hot News Girl Kelly," finished reading a story about a 7-year-old Philadelphia girl who escaped from her abductors by gnawing through duct tape, Esparaza said, "That's why I don't use duct tape; that's why I use nylon rope." After the commercial break he noted that a local hardware store sold nylon rope, tarps and lye "to dissolve the body."

Nationally syndicated Tom Leykis set a new standard for insensitivity. The Seattle Times noted in 2001 that Leykis broadcast the name of a woman who attempted to kill herself by jumping from a local bridge. This in spite of the fact that the rest of the town's media agreed to keep her name secret out of concern for her and her family.

But Mr. Leykis didn't stop there. He also mentioned an Internet site where a photo of the falling woman was placed, and he encouraged his audience to post funny captions. I'm sure the woman, who ended up in a hospital with spinal fractures, chest and abdominal injuries, had a good chuckle over that one.

C'mon, guys. Give me a break.

It's not as if these air personalities are standing up for a righteous principle, as did the founders of our country. These latter-day "free speech" proponents are obviously out to get ratings and enhance their own overbloomed egos with these juvenile stunts. They simply don't care whom they destroy. What a waste of the gift of free speech.

Please understand that I'm not a prude. Although I'm in my 50s, I enjoy the goofy humor of nationally syndicated "Bob and Tom," who just stick to good-natured double entendres and scatological song parodies. They don't deliberately set out to inflict pain or emotional distress on anyone.

What is the position of the Federal Communications Commission on all this? Did you ever see an ostrich sticking its head in the sand? They seem unable to even establish any workable definition of what is allowed and what is not.

Talk about clueless! Commissioners Michael Copps and Kathleen Abernathy suggested that broadcasters keep voluntary transcripts of all offending shows. I'm sure owners are eager to take on that thankless expense and effort so that they could later be hoisted on their own petard.

Here's what actually happens. When written listener complaints are received, the FCC goes through the motions of notifying the appropriate owners of the infractions, and eventually imposes fines that, through clever corporate lawyering, are usually later reduced. Some of these fines are simply paid as a cost of doing business by the big groups that provide homes to the personalities involved.

Not to mention names, but Infinity Broadcasting and Clear Channel Communications come to mind as frequent recipients of these little love notes from the FCC.

Imagine Howard Stern, who earns millions of dollars a year, being scared of a \$7,000 fine.

These companies obviously encourage their air talents to push these illusory indecency limits. The further the personalities push, the bigger the ratings until one day, oops! They go too far and are taken off the air briefly to attend sensitivity training ... or in some cases, where fall guys are needed in the name of investor relations, the offenders are summarily dumped. Management then apologizes for those "inappropriate comments" and finds some new suckers to take the gig.

Again, my problem is not with dirty words, it's with (mostly male) personalities who are just mean and thoughtless. And we shouldn't need a big, inefficient bureaucracy like the FCC to play big brother, either. The broadcast group programming heads should show a little leadership. They are the only ones who can change any of this, but apparently they choose not to.

Unfortunately, young teens don't have a point of comparison between what they are hearing on the air now and what human decency used to sound like.

On "WKRP in Cincinnati," a popular TV show of the late 1970s, DJ "Dr. Johnny Fever" explained how he ended up at that station. I paraphrase:

"There I was in New York, making big bucks until one day I said 'booger' on the air and next thing I knew I was in Cincinnati."

Oh, to have those innocent days back again.

*Mike Repheune is the nom de plume of an ex-jock "who has moved on and gotten a life."*

## ◆ READER'S FORUM ◆

**Who needs a demo?**

"Right on!" to Alan Peterson's "World According to ARP" in the Nov. 6 issue ("A Demo? You Really Want a Demo?").

It amazes me how many people expect to be considered for positions in an audio medium without bringing a demonstration of their audio skills to the table in the form of a demo.

It sounds like Al and I were cut from the same cloth. I don't mind if it's a home-made demo from your kid's karaoke machine, but I need to know what someone sounds like before I can realistically consider them for an on-air position.

"radio stations" and "TV stations" will be major players. In the future, it will be hard to distinguish the two except by the bandwidth of the payload.

And a very important segment of society has decreed that it shall be so by the actions taken so far. Mr. Pizzi and myself will have no control whatsoever over this outcome. But to ask the FCC to legislate how we're going there is like asking Rand McNally to predict where new roads will be legislated.

In fact, to be completely fair, the FCC has an extensive comment system (electronic, at that), which largely goes unused except by corporate communications

## How far radio and audio reproduction have come since the development and introduction of the CD.

— John Arndt

Al's point about not getting a job without doing what "da man" asks is also well-taken; why should I hire someone who can't follow instructions on how to apply for a job in the first place?

I always look forward to reading Radio World. Keep up the good work!

*Paul Wilson  
Director of Programming  
Clear Channel  
Communications, Hawaii  
Honolulu*

**The FCC and IBOC**

Skip Pizzi has a point about the marketing issues of IBOC ... er, HD Radio ("FCC's Action Is the Wrong Mandate," Dec. 4, 2002).

I find people to this day who say they're in radio but have no idea what IBOC is. So to say the least, IBOC broadcasters will have some educational issues with their would-be customers. Nobody in Consumerland is knocking down our doors with requests for digital.

But I think Skip has exited his area of expertise when he takes on the FCC. He would, I suppose, have our regulators get out their rusty crystal ball and create a detailed regulation for a new industry that is just beginning to be born. That industry is terrestrial digicasting. What are now

attorneys. Bless their hearts, they actually think that we will give them feedback from that real world outside the Beltway!

I suggest that Mr. Pizzi and others like him try it out. Almost every imaginable minor action of the commission has a public comment period. If it didn't, I could get my work done a lot faster.

This is a major mechanism by which the System evolves Regulation. And that mechanism will be an important force in the correct evolution of IBOC ... darn, HD Radio (or whatever it really should and will be called), if we actually use it, for a change.

*Gary Keener  
General Manager  
Paradigm Associates  
San Antonio, Texas*

**Anniversary of the humble CD**

In another trade magazine I saw a short article heralding the 20-year anniversary of the CD. In retrospect, I did realize that the CD was first put on the market in 1982; but how time does fly!

How far radio and audio reproduction have come since the development and introduction of the CD. Many of the advances we are enjoying and striving to implement in our business may have not been such a priority or even thought about

## Those Mysterious Digital Noises

Radio listeners, primarily on the East Coast, have been experiencing the buzz and drone of digital IBOC testing on the AM dial.

In the Washington, D.C., area, tests were conducted late last year at various frequencies. One near the middle of the 600-700 kHz range reportedly ended up spluttering a news-talk station at 630. Another test conducted at 730 kHz affected reception of a station at 700. During the week of Dec. 15, a new set of tests took place in the expanded band at 1670, where the nearest adjacent stations reportedly were in Iowa, New Jersey and Georgia.

Broadcast forums and chat rooms on the Web carried comments from Washington-area engineers concerned about the interference heard centered around 730 kHz. Some assumed it was emanating from WOR(AM) in New York and were appalled to think the digital sidebands were affecting radio receivers some 250 miles to the south.

This prompted discussion over how dependable the technology actually is in real-world operation, in spite of the FCC's Report and Order in October and its selection of IBOC as the technology of choice.

Despite the complicated mechanism that makes AM IBOC run, it must be understood that these are still the "crystal radio" days for that technology and that more testing and refining must be done. For the time being, terrestrial tests are being conducted primarily by day, as nighttime propagation characteristics are still unpredictable. Once the daytime tests have been completed under a number of conditions, it will be time to move on.

It is hard for us to stand by and ignore the obliteration of any station on the dial due to interference. Some stations already are up against the ropes and a defection of listeners due to interference could conceivably hasten such a station's demise. But we are hoping for the best the technology has to offer and are looking toward the future as a larger picture.

Will IBOC for AM be the salvation we have all awaited, or will it have no more effect than AM stereo and AMax did back in another time? It is the question of the moment. But we cannot ignore the potential benefits it offers AM broadcasters. And if the technology is flawed to the point where stations are badly affected by interference, it has to be retooled until it is right. Ibiqity needs to conduct its tests. We hope, though, it is listening closely to the consequences up and down the band.

On this page in the late 1990s, we took a stand against the Eureka approach and spoke out in favor of the IBOC solution. We stand by that decision. IBOC is on its way for AM and for FM, but before it gets here, let's make sure it works right.

— RW

if we hadn't made that seemingly simple first step in the mass production and distribution of audio on a CD in digital form.

The article further reported that in the year 2000, audio distribution on CD accounted for a staggering 91 percent of the industry. That's a very large number considering all the other formats we can use to distribute music, and I'm sure that number may even be a point or two higher since that figure was reported a few years ago.

So the next time you contemplate all the changes in the industry including IBOC or HD Radio, satellite radio, HDTV, DVDs, 5.1 audio, digital cable, digital satellite TV and the myriads of other digitally base forms we now enjoy or are striving to implement, stop

for a moment and thank Philips and its collaboration with Sony in making what was probably one of the most significant developments of the 20th century, the unsung introduction of the CD in 1982.

Time does fly. In 20 short years most people cannot even imagine music not being on a CD. The date the CD was introduced should be right up there, permanently etched in our minds just as clearly as the date that the transistor was invented. Without either invention, our industry would be very different, indeed!

*John Arndt, BSEE, CPBE, CBNT  
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