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Minnesota Teamwork

A college joins forces with a radio supplier to help students develop technical skills.

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Are You Ready for E-Filing?

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Radio World®

The Newspaper for Radio Managers and Engineers

July 21, 1999

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Visit RW Online at www.rwonline.com

French Suppliers Eye U.S. Market

by Randy J. Stine

Equipment shoppers can be forgiven for wondering if there isn't a French invasion happening in the U.S. radio industry.

A healthy economy here has helped foreign equipment manufacturers in general compete in the U.S. marketplace. This, despite the fact broadcasters here historically have preferred to buy critical gear — consoles, computer systems and transmitters — from American manufacturers.

For some reason, many of the recent entrants arrive with a French accent.

French companies that in recent years have either entered the U.S. market or substantially increased their visibility include Dalet Digital Media Systems USA, Netia Americas Ltd., Digigram Inc. and Aeta Audio. French on-air processor maker IDT plans to release a new FM processor in the United States this fall, and is seeking U.S. distribution for it. All five have developed solid reputations in their home country for delivering a variety of pro audio gear.

Why are these companies succeeding where many other foreign manufacturers have failed? Timing appears to be a key element. As a result of the strong U.S. economy, foreign-made

See FRENCH, page 6 ▶

Photo by Leslie Stimson

DataFM: Not Your Father's RDS

Radio Data System Plays Pivotal Role in Company's Messaging System Technology

by Lynn Meadows

ROME, Ga. Marshall Bandy, president and principal owner of DataFM Inc., is promoting a new use for Radio Data System technology that he believes could help emergency planners relay alerts while furthering support for RDS technology in the United States.

RDS technology allows radio stations to transfer text and other data on the 57 kHz subcarrier of an FM signal. The technology is popular in Europe, in part because of its Alternate Frequency feature that permits automatic re-tuning of a radio to the next strongest signal carrying the same program when traveling in fringe reception areas.

This works well where there are

See FM, page 5 ▶

Michael McDougald makes a data entry into the SC100.

Full service solutions at pit stop speed.

Lead, follow, or get out of the way is not only the motto in racing, but is quickly becoming the norm in radio broadcast.

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World Radio History

◆ NEWSWATCH ◆

High Court Strikes Casino Ad Ban

WASHINGTON Unanimously, the members of the Supreme Court struck down a ban on radio and TV advertising of private casino gambling in states where that gambling is legal. The case had been brought by the Louisiana Association of Broadcasters. The broadcasters said the ban violated their right to free speech.

According to NAB, broadcasters in the states in the 9th Circuit and in New Jersey, where the law had previously been held unconstitutional, can continue to carry casino ads. The 9th Circuit is comprised of California, Oregon, Washington, Arizona, Montana, Idaho, Nevada, Alaska, Hawaii and Guam.

The decision was a defeat for the U.S. Department of Justice, which had said that gambling contributes to corruption and organized crime. The DOJ also said the government believes that the roughly 3 million compulsive gamblers in this country "are especially susceptible to the pervasiveness and potency of broadcast advertising."

The Supreme Court agreed with a lower court ruling that said the government failed to connect casino gambling and compulsive gambling with broadcast casino ads.

The decision, written by Justice John Paul Stevens, stated, "There surely are practical and non-speech related forms of regulation — including a prohibition or supervision of gambling on credit, limitations on the use of cash machines on casino premises ... that could more directly and effectively alleviate some of the social costs of casino gambling."

Both NAB and the Distilled Spirits Council of the United States applauded the decision, noting that it strengthens free-speech protection for legal products in all industries.

New FCC Int'l Bureau Chief

WASHINGTON The FCC was due to get a new International Bureau

See NEWSWATCH, page 3 ▶

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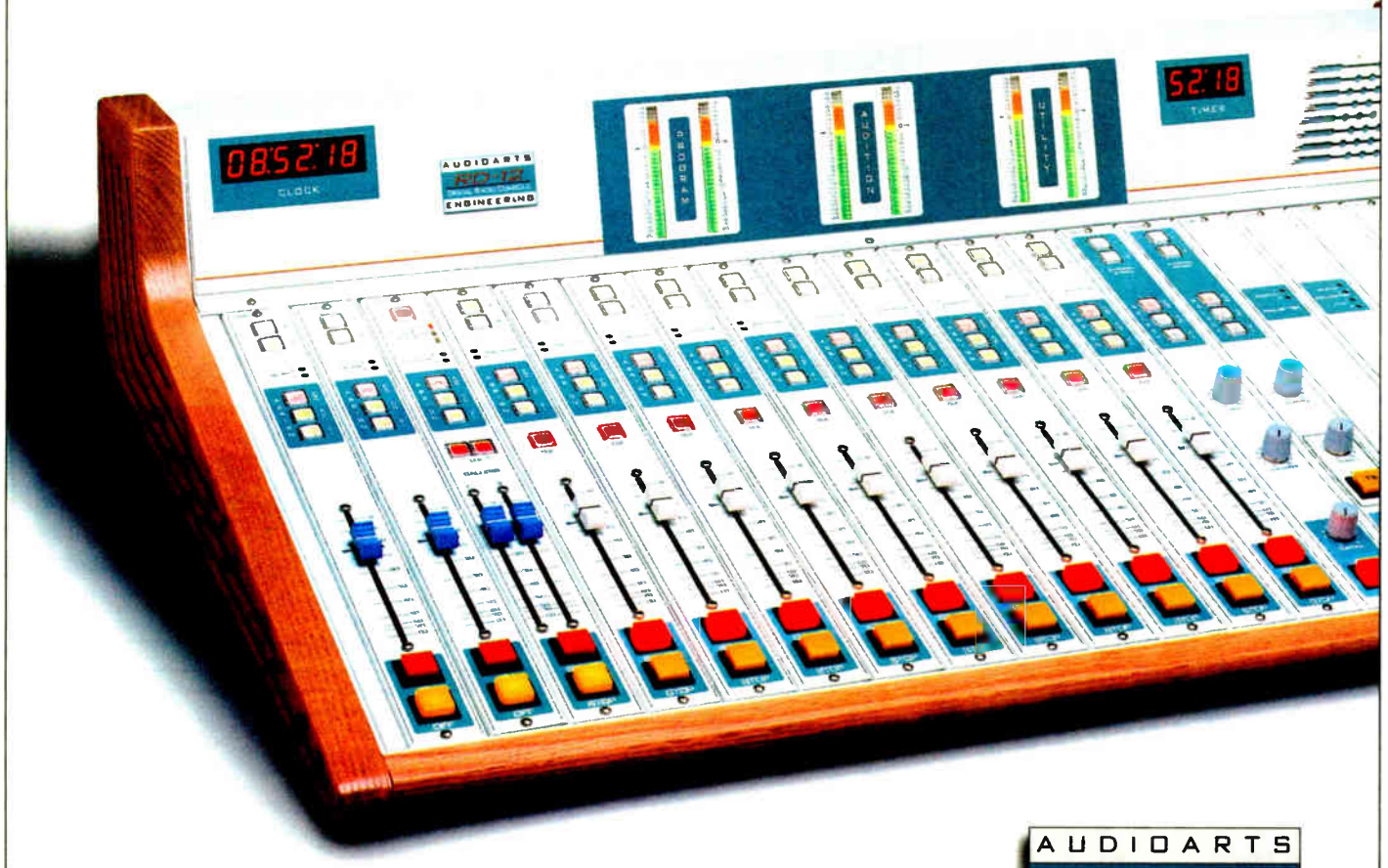

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DIGITAL NEWS

Slow Canadian DAB Irks Pioneer

by James Careless

TORONTO North of the border, at least one receiver manufacturer is seeing how sticky the introduction of digital radio can be.

At the end of 1998, Pioneer Electronics announced plans to design, manufacture and market digital car receivers specifically for the Canadian market.

Since then, however, the company has been able to sell only a handful of DAB receivers.

Official launch

The stumbling block is that Canada has yet to launch digital radio officially, even though commercial simulcasts have been running in Toronto since late 1998.

"I have had stock for three months," said Peter Cos, car audio product manager for Pioneer Electronics of Canada. Asked when Pioneer had expected digital radio to be launched, he said, "last November."

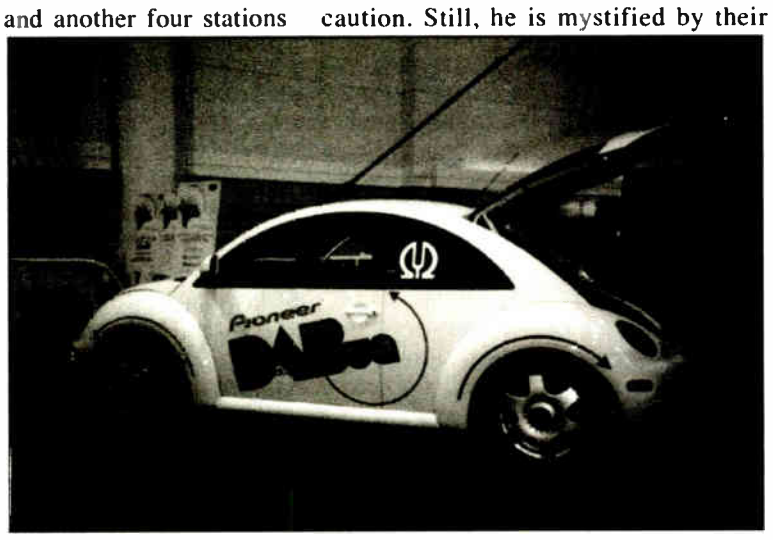
Pioneer is offering Canadian radio listeners the model GEX-P900DAB. Priced at about $650 in U.S. dollars, it is a trunk-mounted unit that connects to existing Pioneer AM/FM car receivers. Once connected, the GEX-P900DAB picks up Eureka-147 L-band DAB transmissions, and relays them to the car amplifier and speakers. A car dealer, consumer electronics retailer or a consumer can install the box, cables and antenna, Cos said.

The first units are targeted for in-car listening. Later, receivers would be produced for home and portable use.

Other manufacturers, including Sony, Bosch, Grundig and Kenwood, have similar "black-box" units available in Canada that are Eureka-147 compatible, but sources said those companies are not aggressively promoting those products as Pioneer is.

As of June, 19 commercial and public radio stations in Toronto broadcast DAB signals, and another four stations were about to join them. In addition, DAB transmission sites are being completed in the major markets of Montreal and Vancouver.

But despite all this activity, most Canadians have never heard of digital radio.



The Pioneer DABug, Equipped With Tuner GEX-P900DAB

No big splash

"We do not want to launch digital radio with a great big splash, and then have it disappear into the noise of everything else that is going on," said David Garforth, executive director of Digital Radio Research Inc., the Canadian broadcasters consortium directing the rollout of Canadian digital radio.

Canadian broadcasters still are smarting from the failed introduction of AM stereo here a decade ago, and therefore they are keeping quiet about digital radio.

Instead of hyping the new technology, Canadian broadcasters want to make certain both stations and receivers are available before heavily promoting DAB.

"They are working together to develop an overall strategy which is taking longer, perhaps, than was expected," Garforth said.

Garforth said that the DRRI never intended to launch DAB during 1998. "The objective was originally the spring (of) this year," he said, "and now it is sometime this summer."

Peter Cos understands broadcasters' caution. Still, he is mystified by their silence about digital radio.

"Our position is that when you are going to do something revolutionary like completely change a radio system around, I do not think you need to start on July 1 and go 'Boom! Hey! Guess what! We are doing this,'" Cos said.

"This is something that should have been ramped up over a period of time, and I do not think I have heard a single DJ even use the words 'digital radio' on air," he said.

All in all, Cos said he feels "disappointed in repeated delays" by Canadian broadcasters.

"They wanted us to be here at a certain time, at a certain price, and we have delivered every single thing that they have asked us," he said.

Overwhelming

Cos also worries that if Canadian DAB does not become operational soon, it may be overwhelmed by U.S.-based, satellite-delivered digital audio broadcasting services — CD Radio and XM Satellite Radio. Even though the companies do not plan to sell their services in Canada, Cos is worried consumers may figure out a way to receive it illegally.

"We are going to end up with a repeat of satellite (television)," Cos said. Earlier in the decade, more than 200,000 Canadians bought U.S. services like DirecTV illegally, because a Canadian equivalent was slower in coming on the market.

David Garforth and DRRI are not as pessimistic. "I think, as far as CD Radio is concerned, they are at least a year to 18 months away before they launch," he said.

As for Cos' complaints about the pace at which broadcasters are pushing DAB, "Pioneer has been a leader in promoting DAB in Canada, and he wants to get the benefit of that promotion; justifiably so," Garforth said.

"And the longer it takes the broad-

See DAB, page 7 ▶

◆ NEWSWATCH ◆

▶ NEWSWATCH, continued from page 2

Chief effective July 1. Chairman Bill Kennard intended to name Donald Abelson, assistant U.S. trade representative for Industry and Communications, to the post.

Before being named to his current position, Abelson was USTR's chief negotiator for communications and information, leading its effort to facilitate global electronic commerce over the Internet.

Rod Porter had been acting chief of the bureau. He was due to return to his previous position as deputy bureau chief when Abelson arrived.

Abelson replaces Regina Keeney as chief of the international bureau, who recently left the FCC to head up the Washington, D.C., office of Dell Computer.

American Tower To Buy UNIsite

BOSTON American Tower Corp. intends to buy antenna siting and tower management firm UNIsite for $205 million in cash. That figure is based on UNIsite owning and operating 600 wireless communication towers when the deal closes, expected by Jan. 31, 2000. The purchase price will be subject to adjustment for closing date working capital. The purchase price includes American Tower's assumption of about $40 million of debt and $165 million in cash.

UNIsite recently has expanded its scope from antenna siting and tower management to include site ownership and development. UNIsite owns about 400 towers suited for co-location.

Jim Einstein, chief development officer, American Tower, said, "The transaction not only adds an attractive group of towers to our portfolio, particularly in the Northeast, but also gives us an opportunity to expand our relationship with a number of carriers."

Including this and other pending transactions, American Tower owns and operates more than 4,000 towers, including 185 broadcast tower sites.

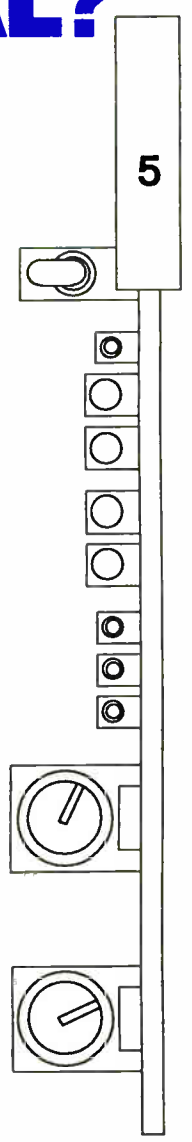
WHAT COMES AFTER DIGITAL?

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

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

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

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



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A College and a Supplier Team Up

Our industry needs young people with technical interest and savvy. One supplier is teaming up with a college to help, in an innovative arrangement that helps both.

The Austin, Minn., campus of Riverland Community College is partnering with Computer Concepts Corp. of Lenexa, Kansas, to make Austin the home of a training site on the Maestro audio management system.

Radio Broadcasting Instructor Eric Shoars said this arrangement will give students hands-on experience with new technology and improve their job opportunities.

"It's my hope that our grads will earn higher salaries, too," Shoars said. "As stations replace staff that has no experience with the newest technology, they'll want to hire someone who does. They'll find them here. That gives our program national exposure."

It also helps the supplier.

"It makes us the one and only Custom Training Center where current and new clients of Computer Concepts can get training on this system," Shoars said. "We anticipate that clients will come from across the nation and around the world, and we will direct-market this training to them."

Shoars told me he hopes to have about a half-dozen students in the program this year. He expects many more students by the fall of 2000.

Computer Concepts hardware and software are in use in Riverland's radio training facilities, and a new major has been developed for Riverland students. Shoars and Randy Randel of Computer Concepts developed a curriculum that will allow the supplier to use Riverland as a source of technical support staff.

The "Radio Broadcasting Support Specialist" curriculum provides training in radio broadcasting and Microsoft networking. That's an unusual — and powerful — combination.

This new major is intended to produce support technicians who install, maintain and repair digital audio systems. Graduates also would be qualified for on-air work, or a career in broadcast computer-networking.

I love to see this kind of creative thinking. I have visited too many broadcast classrooms and college stations that hobble along with antiquated equipment. Can these schools hope to offer meaningful technical training?

Partnerships like this one will help make our industry grow. This particular deal helps a school, it helps a supplier and it contributes to our pool of qualified technical radio professionals.

To learn more, visit the Radio-TV section of the Admissions page at *www.riverland.cc.mn.us*

★ ★ ★

Ahhh, Munich.

Deutschland in the spring. Mountain air. Traditional beer halls. Pretzels. Trains that run on time. And radio products.

You might expect that the annual Audio Engineering Society Convention would attract suppliers and visitors more interested in pro audio than broadcast. But the AES experience in Europe is much different than that in the United States.

As we report in this issue, radio was a big part of the AES event. Private and public broadcasters were well represented. The exhibit hall contained plenty for the radio visitor — lots of codecs, digital consoles and audio management systems, in particular.

I asked T. Carter Ross, editor-in-chief of our Radio World International sister publications, what trends he could detect.

"Lots of automation systems are out there," he said, "and many of them different from the ones at NAB99. While that may seem good to stations who want a lot to choose among, it is a bit confusing, and there is a question about how many different options the market will bear."

He said DVD-Audio received a lot of attention, as did the Internet.

"Several audio processors with Webcasting options were on offer at AES, as well as some automation systems with data/audio exporting options for the Web."

What about DAB?

"In Europe in general, Eureka-147 DAB is a fact of life," he said. "Public broadcasters and larger private broadcasters have been upgrading studios over the past few years and are ready, or almost ready, for the switch-over.

"Smaller broadcasters seem to be keeping an eye on it, and most equipment purchasing decisions seem to include a 'thinking about DAB' component, but they are not leaping into the void yet."

Our coverage starts on page 12.

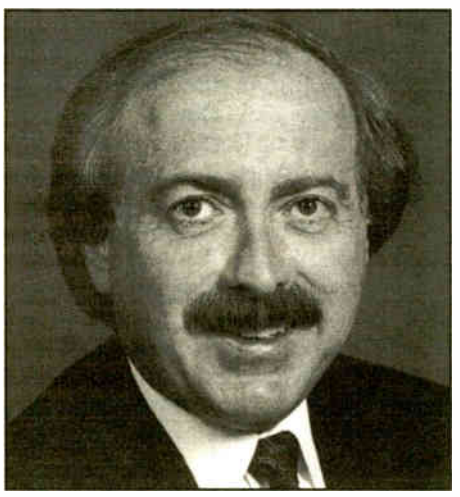
★ ★ ★

Also in this issue, we welcome Barry D. Umansky to the pages of **RW**.

Umansky is former deputy general counsel of the NAB and is now with the communications law practice group at Vorys, Sater, Seymour and Pease LLP, one of the 100 largest law firms in the country.

Six times a year, Umansky will provide our readers with an in-depth look at an issue of importance to broadcasters, bringing to bear his significant expertise gained working at stations, his seven years at the FCC and 20 years at the NAB.

"Over-the-air broadcasting has always been in my blood," Umansky told me. "I grew up in a broadcasting family; my dad was the GM of a radio/TV combo in Wichita, Kansas, and I've been involved in broadcast-related work ever since high school."



Barry D. Umansky

Thanks to consolidation, the advent of satellite radio and the expected migration of terrestrial stations to digital audio, the world of radio is changing, he said. So are the ways that stations conduct business with the FCC, such as electronic filing and auctions for new stations.

"These changes pose new and often difficult challenges for stations managers and others in our industry," he said. "But I have great confidence that these changes are manageable ones."

Stations that keep in tune with, and program to, the needs of the local community will continue to prosper, in his view.

Umansky believes the critical issue for managers is how they will make the best use of their signals and of digital technologies. IBOC, he said, will allow stations to provide better signal quality and a wealth of new data services.

"Stations should be making plans now to offer new data and content services to their communities."

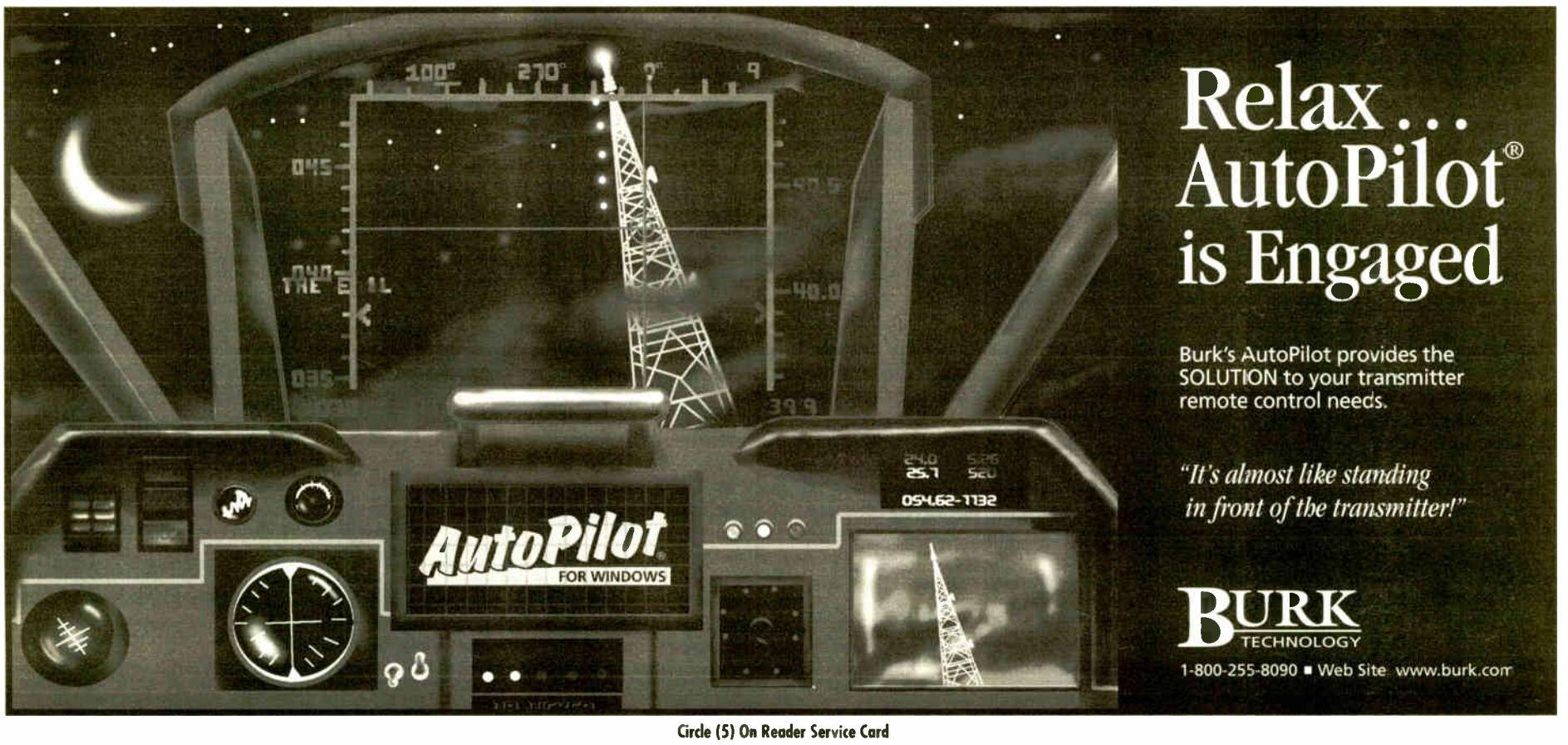
The same can be said for the Net.

"The Internet is changing the face of 'broadcasting' at a pace that no one could have envisioned just a couple of years ago," Umansky said. "Stations are programmers. There's no reason why local broadcasters can't offer multiple signals over their Web site right now — in addition to their current off-air programming. They know the community better than anyone, and they are well-situated to make digital communications work well for their audiences and their own bottom lines."

Umansky writes in this issue about how the FCC's new electronic filing system may help you — and what to watch out for.

From the Editor

Paul J. McLane



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World Radio History

FY '99 Regulatory Fees Rise 6%

The FCC is increasing regulatory fees nearly across the board for fiscal year 1999. Congress has required the FCC to collect $172.5 million to recover the costs of enforcement policy and rulemaking, international and user informational activities for FY 1999.

Stations must pay the fees for any licenses or authorizations that were transferred or assigned on or before Oct. 1 of last year.

The fees are due from Sept. 13 to 22 so the FCC can process them over several days. Those who send in the money late or send a partial payment are subject to a 25-percent penalty.

The new fees total to about six percent more — or $10 million — than fees for fiscal 1998. The new fee schedule becomes effective on Sept. 10.

In comments to the FCC about the fees, NAB stated that stations located in suburban areas close to urban centers are assessed higher fees because those stations are near larger advertising markets. NAB asked the commission to consider granting partial waivers (to reduce the fees) for some of these stations.

The FCC said it would consider such requests on an individual basis.

Noncommercial stations and RPUs used in conjunction with noncoms are exempt from annual regulatory fees. EAS licenses for auxiliary service facilities are also exempt.

To compare FY 1999 fees to those for FY 1998, see the charts below.

Fiscal 1999 fees not included in the chart are AM construction permit ($260), FM construction permit ($780), FM translator ($290), and broadcast auxiliary stations, including RPUs and STLs ($12).

For more information, call the fees hotline (202) 418-0192 or see the FCC's web site at *www.fcc.gov*

— Leslie Stimson

FY 1999 RADIO STATION REGULATORY FEES

Population Served	AM Class A	AM Class B	AM Class C	AM Class D	FM Classes A, B1 & C3	FM Classes B, C, C1 & C2
<=20,000	430	325	225	275	325	430
20,001 - 50,000	825	650	325	450	650	825
50.001 - 125,000	1,350	875	450	675	875	1,350
125,001 - 400,000	2,000	1,400	675	825	1,400	2,000
400,001 - 1,000,000	2,750	2,250	1,250	1,500	2,250	2,750
>1,000,000	4,400	3,600	1,750	2,250	3,600	4,400

Don't Forget....

Readers Forum is now on the last inside page of RW.

DataFM Anticipates New Uses for RDS

▶ FM, continued from page 1

many repeaters or stations with the same programming.

Four years ago, in an effort to promote RDS in the United States, the Consumer Electronics Manufacturers Association gave away RDS encoders to stations in the top 50 markets. Some stations use RDS to send song titles and names of artists playing, but many who received the free equipment simply transmit their call letters day after day, year after year.

Now DataFM has given RDS technology the pivotal role in its new local point-to-multi-point messaging system.

New life for RDS?

DataFM was formed two years ago and has applied for a patent on a special AM/FM/RDS radio receiver. The receiver owner may program up to 100 codes into the receiver. If an RDS message contains one of the codes programmed in the receiver, the text message will be displayed on the receiver. If not, it will be ignored.

Along with the receiver, the company has developed or purchased the software and hardware necessary to send messages via RDS. All together, DataFM has created a local point-to-multi-point messaging system to make it easier for people to communicate.

The person, group or company with a message to relay installs DataFM software on a personal computer. The software allows the user to dial-up the participating FM radio station and send a message using the installed SC-100 RDS Subcarrier Generator. DataFM purchased manufacturing rights to SC-100 encoder from Circuit Research Labs in February.

Bandy, a lawyer and owner of WSGC(FM), Chattanooga, Tenn., said the SC-100 was the only unit he knew of that had the networking capabilities needed by DataFM. If CRL had not sold it, he said, the company would have had to design its own RDS encoder.

Once someone sends a message using the DataFM system, people who programmed their receivers with the code for that person, group or company will get the message. To make distribution of codes easy, the "codes" will be the phone number of the sender, said Bandy.

"We are all members of tribes," said Bandy. He used sport teams, business groups, civic groups and religious groups as examples of modern-day tribes. The problem is, he said, as tribal members, we cannot all gather together on a daily basis and listen to our tribal leaders. The DataFM system is intended to allow "tribal leaders" like the coach of a boy's little league team to relay messages via RDS.

RDS has not been a big success so far in the United States. Bandy said there are two reasons for that: first, RDS does not generate revenue and second, the degree of interest in the text messages being sent is minimal.

"What makes (the DataFM system) different is that the consumer would have an interest in receiving messages that pertain to him personally," said Bandy. He said that the DataFM system would also generate revenue.

With the receiver developed by DataFM, a listener can enter up to 100 phone numbers representing people or groups the listener would like to receive messages from. A local church member could look up the church's

See FM, page 8 ▶

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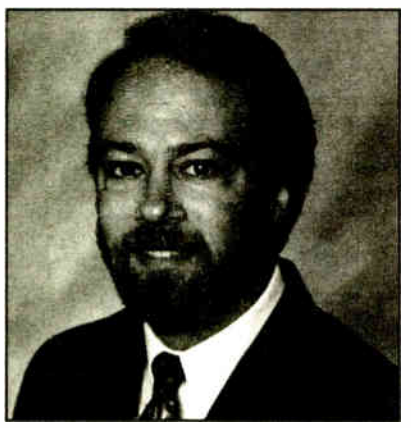
World Radio History

French Invasion Underway?

▶ FRENCH, continued from page 1

products have been competitively priced, while U.S.-made products have seen price increases both here and overseas.

Representatives of the companies said the private commercial radio market in France closely resembles that of the United States, so they are better suited to compete here.


Mark Kaltman

The French companies also have been aggressive in their pursuit of major radio groups planning new facility and studio projects as the industry in this country continues to consolidate.

Welcome to America

"I don't believe the stigma of buying from foreign firms is there anymore. It has truly become a global market," said Jim Woods, vice president of radio broadcasting for Harris Corp. Harris introduced Aeta POTS codecs to the United States in 1995.

"I think the French companies have adopted a classic 'enter the market' strategy. Their products are competitive from a feature standpoint and are priced very aggressively," Woods said.

Audio Broadcast Group handles U.S. distribution of Dalet digital audio software.

"I've been very impressed with the work ethic of the French companies," said Dave Howland, vice president of sales and marketing for ABG. "Dalet has come here with the attitude that they'll bend over backwards to make it work for their customers."

For their part, the French companies said their U.S. operations are sufficiently established that they consider them separate from operations in their homeland.

"We view ourselves as an American company," said Mark Kaltman, president of Aeta Audio. "One of the goals when we opened the U.S. office was to make sure sales, service and everything else was U.S.-based."

U.S. office

The codecs maker opened its U.S. office in New Jersey early this year. Aeta's dealer network includes such companies as Broadcast Supply Worldwide, Crouse-Kimzey and RF Specialties.

Kaltman said he spent many months re-writing Aeta manuals while engineers redesigned the functions and the look of the product line to "Americanize" the look and function of its codecs.

"Nothing can kill a company quicker than to have manuals with a foreign feel to it. It's very important to make sure everything has an American feel to it," Kaltman said.

Kaltman said as Aeta competes in an environment with major players such as Telos, Comrex and Musicam USA, it will certainly draw on the expertise of its French roots.

"With Aeta in France and the history of French Telecom in ISDN development and France leading the way in standardization, we were a natural fit in the U.S.," he said.

Kaltman said Aeta plans to introduce more broadcast products in the United States later this year, including a small portable field mixer and a mic pre-amp.

Other companies have experienced strong growth in U.S. sales.

"Our sales have doubled every year since 1995," said Anna Mae Sokusky, president of Dalet's UniteStates operations. Dalet opened its New York office in 1994. It has more than 110 U.S. customers, many with multiple installations.

"With consolidation here in the United States, people are wanting to connect locations and stations, either via WAN or some other customized method," Sokusky said. "We take our worldwide experience and apply it to U.S. customers. Somewhere around the world, we have come across just about every imaginable circumstance and application."

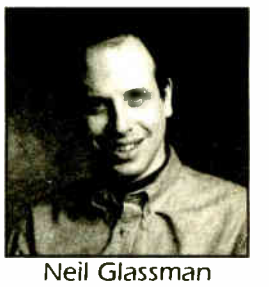
Local hires

Sokusky typifies the strategy of "hiring local," which foreign manufacturers can pursue to woo domestic clients. She is well-known to U.S. radio managers; she served as head of CBS Radio's AM station group for eight years.

French suppliers have succeeded in winning major clients here. In one notable deal, Dalet announced a contract with National Public Radio in December 1998. The Dalet5 will provide NPR with a digital system of more than 70 workstations linked by a 100 megabits-per-second network.

Mike Starling, vice president of engineering for NPR, said if all things had been equal, NPR would have liked to have bought American.

"We like to buy local just for parts availability and presumably a wider presence in the market. But it was Dalet that came the closest to our very specific needs," Starling said. "They had the most flexible and reliable architecture we could find."


Neil Glassman

NPR had used a smaller Dalet network prior to purchasing the Dalet5 system.

Digigram

Since opening its U.S. operations in 1997, Digigram has established itself in the sound card and audio technology field. The company's sound cards are incorporated into audio management systems such as those made by RCS, Arrakis, Enco, Computer Concepts and Scott Studios.

"Our situation is a little different in that these companies use our sound card in their live-assist and editing systems," said Neil Glassman, president of Digigram. "People know our name, certainly, but we work very closely with our development partners to make sure everything works together."

While Glassman acknowledges that the United States is the largest and possibly the most important market in the world, he said the country has lagged behind Europe in terms of computer-based audio.

Step by step

"That really happened in European countries quite a bit earlier. Therefore, with the dawning of independent commercial radio in Europe in the late 1980s, Digigram and other French companies were in position when many stations went from nothing to digital. There was no intermediary step like you had in the U.S. market," Glassman said.

Glassman said another key to his company's success has been hiring people who know radio in America.

"To be considered local, you have to sound local. Nothing will scare off a customer faster and intimidate them more than hearing a guy with a French accent giving them tech support," Glassman said.

Most of Digigram's sales go directly to its business partners, but it still gives technical support to any customer, regardless of what system the customer owns.

"One of the things we found out when we got to the U.S. was that people really didn't know there was a difference between sound cards. So it's been an educational process along the way," Glassman said.

The company has more than 20,000 sound cards being used by radio stations and recording studios worldwide, Glassman said.

Digigram also makes digital audio boards and multitrack editing software.

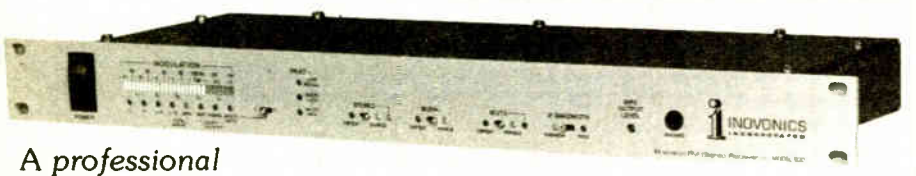
A recent entry in the U.S. market has been Netia. The audio manage-

See FRENCH, page 7 ▶

I don't believe *the stigma of buying from foreign firms is there anymore.*

— Jim Woods, Harris Corp.

FM "Relay" Receiver



A *professional* FM receiver for re-broadcast "translator" service, and for similar demanding off-air pickup applications.

- DIP-switch-programmable synthesized tuning.
- Composite MPX *and* balanced stereo program outputs.
- Selectable IF bandwidth.
- Carrier-loss and program-loss alarm outputs.
- Accurate front-panel metering of MPX and program audio levels, plus signal strength and multipath distortion.
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Circle (7) On Reader Service Card

World Radio History

▶ FRENCH, continued from page 6

ment systems company opened an office in Columbia, Md., after displaying its products at NAB99 in April.

No obstacle

Larry Gross, president of Netia's U.S. operations, said he doesn't see being based in a foreign country as a large obstacle to selling products in the United States.

"We have found that American broadcasters are extremely receptive to new technology. While they may hesitate to go out on a limb with somebody new, if you have well-grounded technology, they'll go with you," Gross said.

While Netia has not formalized sales agreements with U.S. distributors, it plans to make a major announcement regarding its U.S. sales network by late summer.

Gross said Netia took the best components of its products and packaged them to appeal to American broadcasters.

"The functionality of your software must be what U.S. broadcasters are used to seeing and working with. Certainly there is some customizing that goes into competing in the States," he said.

Time will tell

Howland of ABG said the viability of the French companies is still questioned by U.S. audio equipment makers. But he sees broadcasters accepting the French companies.

"When you think globally, which more and more audio equipment manufacturers are doing, you must succeed in America. I think most will gain enough market share to survive."

Woods of Harris is not totally convinced.

"It's still too soon to tell whether they are all long-term players or not," he said. "Dalet and Digigram have certainly had success, but can they stand the test of time? I think U.S. customers may put up with off-shore service initially, but fairly quickly you must deliver it from a local standpoint."

COMING SOON

Coming in Radio World

- Fractional Antennas And Their Applications
- Buyer's Guide: Consoles and Cabinetry
- NAB Radio Show Preview

Only in Radio World

Canada Slow to Push DAB?

▶ DAB, continued from page 3

casters to get digital radio launched, the more chances that there are for (Pioneer's) competitors to not necessarily catch up, but to be in there," he said.

Canada is not a large market. Even if Pioneer does win a major foothold here, it will not get rich from Canadian digital radio sales.

One source estimated Canada's car audio aftermarket as 5 to 7 percent of that in the United States. Canada has about 1 million new cars and light trucks on the road each year, while the United States has about 4 million. At best, Pioneer can use its Canadian research and development efforts to expand its sale of receivers in other Eureka-147 DAB markets in Europe, Asia and Australia.

Next time

Still, Cos said Pioneer stands ready to help the introduction of DAB in Canada.

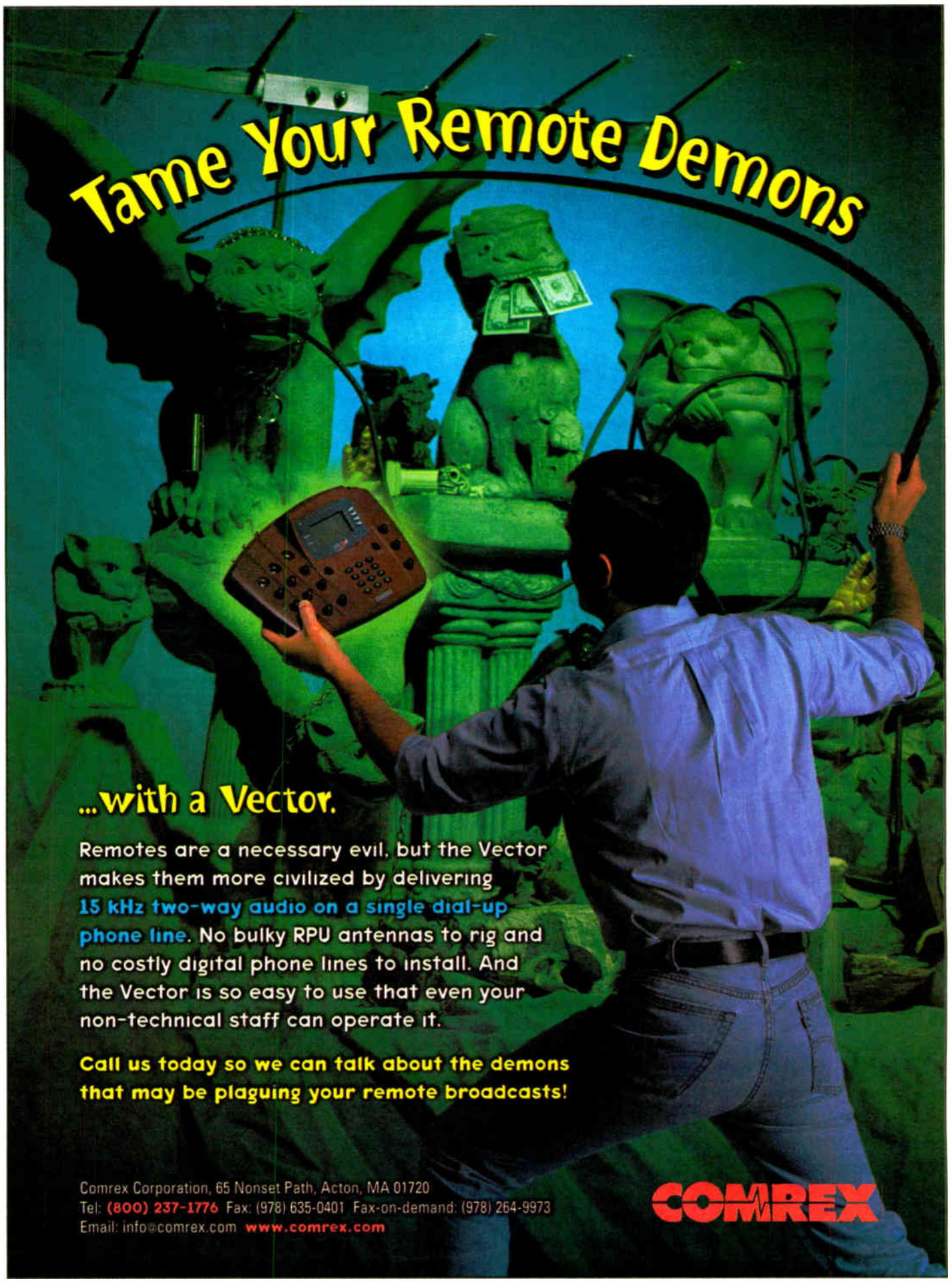
"Our factories were completely cooperative and helpful and bending over backwards" in making a Canada-specific digital radio, he said, "knowing full well that the kind of units that we were going to be selling would never, ever, ever pay back the kind of R&D involved in developing it."

Now that these sets are ready, Cos asked, "What happens the next time I go back and I have a special need for Canada? How quickly are they going to respond to me next time when I say 'hurry, hurry, hurry?'"

Other receiver manufacturers are likely to pay close attention to Pioneer's experience, and how the Canadian DAB rollout proceeds from here.

■ ■ ■

Leslie Stimson contributed to this story.



Circle (8) On Reader Service Card

World Radio History

Can DataFM Jump-Start RDS?

▶ FM, continued from page 5

number and enter it in the receiver to receive daily bulletins or prayer requests.

Free messages

For the consumer, the messages are free. The sender pays the bill.

But emergency agencies such as fire and police stations will be able to send messages for free, said Bandy. With hundreds of numbers available, he said, local emergency planners could divvy up a community into subdivisions or even individual streets for warning purposes. Someone living on Elm Street could enter in codes for his street, subdivision and region and also the emergency numbers for an elderly relative across town if desired.

The DataFM receiver could also help solve one of the problems with the Emergency Alert System. Emergency planners have long worried that there is no way to alert people of an emergency via EAS if their radio or television is turned off. One suggested solution was to put an "e-chip" in televisions and radios which would tell people to turn on an emergency channel.

Like an e-chip, Bandy said the DataFM receiver is capable of sounding an alarm to wake its owner in an emergency provided the receiver is programmed to receive emergency messages.

The EAS rules adopted by the FCC encouraged emergency planners to include RDS in their state and local plans. So far, only Tennessee is planning to incorporate the technology into its state plan.

Steve Terry, station manager and chief engineer for WYPL(FM) in Memphis, Tenn., and one of the emergency planners for Tennessee, is designing a special RDS receiver that will transmit all emergency messages without interrupting the air chain of the primary stations. Tennessee planners are also trying to develop a VHF network to transmit oral emergency messages off the air. Terry said that by using RDS, anyone with a car receiver that can spot the PTY31 emergency code will also be able to get the RDS alerts.

Testing

In June, DataFM had 10 hand-built receiver prototypes completed. United Circuits Inc. in Alabama was manufacturing another 2,600. The first 50 of those were scheduled to be tested in mid-summer in Ringgold, Ga., which is about 10 miles from Chattanooga, Tenn. Bandy said he expects the system to be fully operational beginning in late August or September.

Bandy expects the phone companies to sell or lease the receivers, or give them to schools and charitable organizations.

The rest of the receivers will be distributed to three Georgia telephone companies that are licensees of the DataFM system. Bandy said he expects the phone companies to sell or lease the receivers or give them to schools and charitable organizations.

The phone companies will bring in radio stations as partners. In addition to a percentage of the profit, the stations will be able to take advantage of some embedded codes inside the receivers to send promotional material and advertising to receiver owners.

Radio stations can also license the DataFM system. Former NAB Radio Board member Michael H. McDougald, president and owner of McDougald Broadcasting and member of the DataFM board of directors, has the SC-100 set up in WQTU(FM), Rome, Ga. He is waiting for the receivers.

"We have to remember that we have a totally 'unknown' service for which there is no known road map or blueprint and we must not only sell it, but teach it as we go," said McDougald. He said stations who participate will get a cut "off the top" of every dollar made.

"As a long-time broadcaster, I can appreciate what a new revenue stream can mean to the station and how easily this new service will blend right in with promotions, remotes, spot schedules, sports events, concerts, ticket sales, and all the things that good radio stations are involved with," said McDougald.

In Rome, Ga, McDougald said he hopes to distribute "a few hundred" receivers to "key people in the infrastructure of the community."

"Because this is such a new concept, there is a great educational opportunity out there to educate the community on what it is and what it does and how it can change lives, or even better, save lives," said McDougald.

Bandy said there are three potential sources of revenue for licensees of the DataFM system. The first is to lease the numbers to groups and businesses that wish to send messages. Second is the advertising that radio stations will be able to do using the codes embedded in the receivers. Finally, he sees certain preprogrammed channels that could carry information such as weather, births and deaths that will be followed by sponsoring information such as "brought to you by the XYZ Bank."

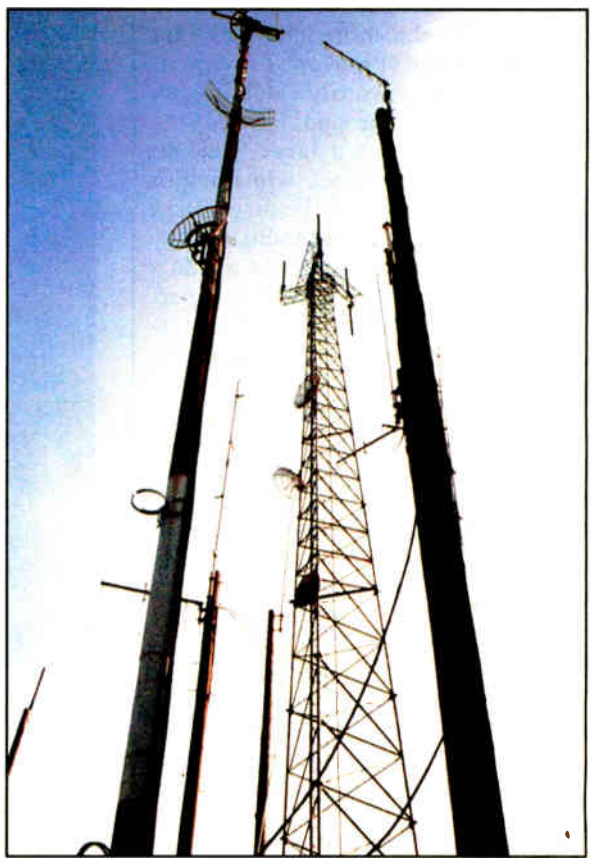
The equipment DataFM installs at affiliate stations still belongs to DataFM, but the stations can use it, said Bandy. He said stations can use the RDS features such as the Open Data Application feature and radio text messaging to display artist and song title.

"It's not meant to take the place of the EAS," said Hugh Atkins, director of the Emergency Management Agency in Rome-Floyd County. Atkins said he hopes the new system will enhance EAS and get emergency messages out more quickly than the tone-activated weather radios and sirens now used.

Weather radio is good, said Atkins, but not for non-weather emergencies. The sirens are not specific enough, he said. With the DataFM system, emergency managers will be able to get messages to specific areas of a county, he said. In emergencies such as a chemical spill or in a hostage situation, emergency workers could send messages to people's radios, rather than giving directions door-to-door.

Atkins, who applied for a grant from the Georgia Emergency Management Agency to buy receivers, said he hopes the new system will be an enhancement to EAS and to the ability of the emergency management community to get targeted information out more quickly.

For now, Bandy said, DataFM hopes to begin by proving the technology to the communications and broadcast world and eventually moving it from the southeast to the whole country.



Antenna farm at WQTU(FM), Rome, Ga.

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World Radio History

One Loves to Travel, The Other Prefers to Stay Home

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With its ground-breaking design and capabilities, the amazing new ZephyrExpress takes Zephyr's industry-leading operation wherever you need to go, and combines a full-featured ISDN codec and three digitally-controlled stereo mixers in a single, road-worthy chassis. With an unprecedented, easy-to-use interface and specs that blow away most studio codecs, the ZephyrExpress is like nothing you've ever experienced. Now you can hit the road without having to leave your Zephyr behind.

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NEW!

1402-VLZ PRO

14x2x1 • 6 XDR™ preamps • 60mm faders • 6 mono & 4 stereo chs. • 3-band EQ @ 12kHz, 2.5kHz & 80Hz + 18dB/oct.@ 75Hz low cut • 2 aux sends per ch. • Constant Loudness pan controls • 2 aux returns • RCA tape inputs & outputs • 6 channel inserts • XLR & TRS balanced outputs • switchable +4/mic level output • ALT 3-4 stereo bus • Switchable AFL/PFL Solo • Control Room matrix with Assign to Main Mix & separate outputs • Ctl Rm/Phone level control • 12-LED metering plus Level Set LED & RUDE Solo light • Aux 1 Pre/Post • EFX to Monitor • sealed rotary controls • built-in power supply • solid steel chassis

NEW!

1604-VLZ PRO

16x4x2 • 16 XDR™ preamps • 60mm faders • 16 mono chs. • 4 sub buses + main L/R • 3-band EQ with sweepable midrange (12kHz & 80Hz shelving, 100Hz-8kHz mid) + 18dB/oct.@ 75Hz low cut • 6 aux sends per ch.• Constant Loudness pan controls • 4 aux returns • RCA tape inputs & outputs • 16 channel inserts • 8 direct outs• TRS balanced outputs • Switchable AFL/PFL Solo • Control Room matrix with Assign to Main Mix & separate outputs • Ctl Rm/Phone level control • 12-LED metering plus Level Set LED & RUDE Solo light • Aux 1 & 2 Pre/Post • Aux Send master section w/level controls • Solo buttons with LEDs • Stereo Aux Return assign section with EFX to Monitor & Main/Submix assign • built-in power supply • steel main chassis • BNC lamp socket • Rotatable I/O pod allows 5 physical configurations

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No matter how much you spend on a microphone, its ultimate performance depends on how it interacts with the preamp it's plugged into. For years, high-end outboard mic preamps have provided fidelity that just hasn't been possible with the "stock" mic preamps built into mixing consoles. Until now. Introducing **X**tended **D**ynamic **R**ange discrete mic preamplifiers. The first in-mixer preamps that can effortlessly amplify the most subtle of sonic nuances, creating an aural panorama that's breathtakingly realistic, excitingly vivid and truly 3-dimensional in scope. The first built-in mic preamps that are impedance independent and designed with full protection from hot-patching and dead shorts. The first in-mixer mic preamps that really do sound like $500 to $2000-per-channel esoteric preamps.

It took us two years and a quarter of a million dollars. And you probably won't believe it until you actually audition the XDR™ circuitry with a high quality condenser mic. But it's true: Verifiable with your ears. Verifiable on the lab bench.

XDR's Controlled Interface Input Impedance system accepts an enormous range of impedances without compromising frequency response. Whether the mic/cable load is 50 ohms, 150 ohms or 600 ohms, XDR™ mic preamp frequency response is down less than one tenth of a dB at 20Hz and 20kHz!

Many mixers that tout low E.I.N. specs can't deliver that performance at normal +20 to

10 XDR™ mic preamplifiers with the finest sound quality (and specifications) ever on a mixer of any size. 0dB to 60dB gain range.

8 mono line inputs (Chs. 1-8), plus **4 stereo line inputs** (Chs. 9-15). +16dB to −45dB gain range.

Inserts on the first eight 1642-VLZ™ PRO channels.

75Hz low cut filters on all 10 mic channels. Sharp 18dB/oct., phase accurate circuitry cuts infrasonics caused by room and stage rumble, wind noise, mic clunks, P-pops & other crud.

Sweepable midrange EQ on Chs. 1-8. Incredibly wide 100Hz-8kHz sweep range lets you use this control as a second HF or LF control, too! Fixed shelving HF EQ at 12kHZ. Shelving LF at 80Hz.

Overload and ultra-sensitive, hyper-twitchy −20dB **Signal Present LEDS** on every channel.

4 aux sends per channel. 15dB of gain above Unity to drive wimpy effects processors. Auxes 1 & 2 are pre/post switchable; Auxes 3&4 are fixed post-fader.

60mm logarithmic taper faders with ultra-long-life resistance elements provide linear volume change from full-on to ∞.

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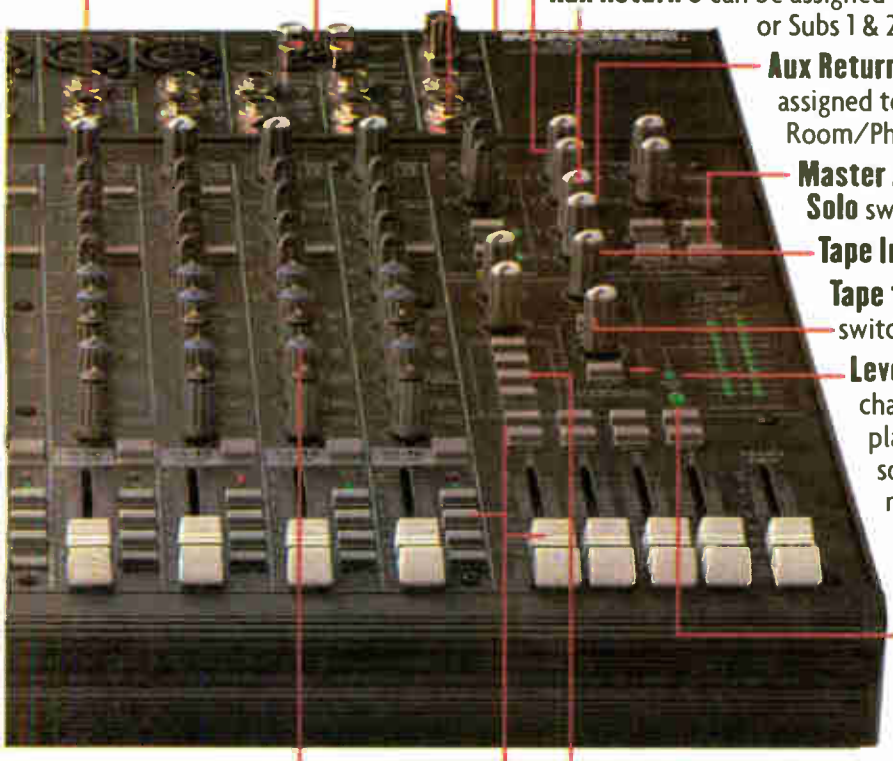
LUXURY VLZ PRO MIXER!

10 XDR mic preamp channels and 4 stereo line channels, channel, sweepable mid EQ and more for just $999*



Stereo line level inputs on Chs. 9-10, 11-12, 13-14 & 15-16.

Dual headphone ouputs.

RCA inputs and outputs with tape input control.

On the back: Direct outs (Chs. 1-8, bal./unbal.), TRS mono main output with level control, XLR stereo main outputs with recessed mic/+4 line level switch.

Effects to Monitor controls on Aux Returns 1 & 2 let you fold EFX back into stage monitor mixes independent of main PA.

Aux Return 3 can be assigned to Main Mix or Subs 1 & 2 or 3 & 4.

Aux Return 4 can be assigned to Control Room/Phones only.

Master Aux Return Solo switch.

Tape Input Level.

Tape to Main Mix switch.

Level-set LED + channel strip in-place stereo solo buttons make initial level setting fast and accurate.

RUDE solo LED in bright ecologially-correct green.

4-band EQ on Chs. 13-14 & 15-16. With 12kHz HF, 3K Hi-Mid, 400Hz Low-Mid and 80HZ LF.

True 4-bus configuration with bus assigns on every channel and master LR assign switches. Bus outputs are duplicated **(double-bussed)** so you can hook up all 8 channels of a digital recorder without constant re-patching.

Control Room/Phones Section with separate headphone and control room level controls. Source Matrix selects any combination of Main Mix, Subs 1 & 2, Subs 3 & 4 or Tape. In studio applications, the matrix gives you exceptional monitoring flexibility. During live mixing, it lets you create a third stage monitor mix or separate feed.

* $999 suggested U.S. retail price does not include extra toppings or optional thick Sicilian crust. Your price may vary. No user-serviceable parts in this footnote.

+30dB gain settings. Our XDR™ design maintains lower noise levels in this "real world" operating range than even mega-expensive outboard designs.

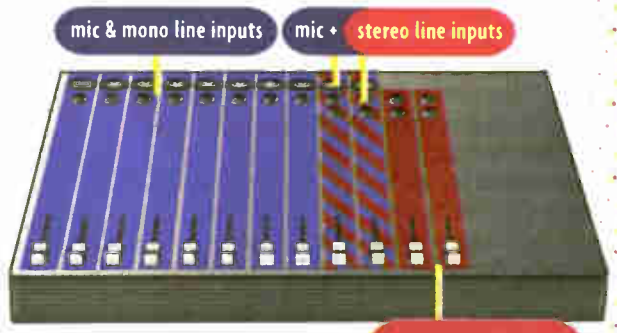
The more sensitive a preamp is, the more likely it is to also pick up radio frequency interference (RFI). XDR™ incorporates bifilar wound DC pulse transformers with high permeability cores that reject RFI without cutting audible high frequency response. Plus we direct-coupled the circuit from input to output and used pole-zero-cancellation constant current biasing. Bottom line for the non-technical: Our VLZ™ PRO Series has the best RFI rejection of any mixing consoles in the world. Period.

Hearing is believing. Visit a Mackie Dealer and audition XDR™ mic preamps with a really high quality condenser mic. Then get a 1604-VLZ™ PRO. Think of it as five expensive esoteric stereo mic preamps... with a really excellent compact mixer attached.

The 1642-VLZ PRO is perfect for broadcast where more line level inputs are required.

You asked. We listened. Scads of stereo line level inputs plus ten of the finest mic preamps ever offered on a mixer of any size.

The 1642-VLZ™ PRO is packed with features that make live mixing easier and more creative: EFX To Monitor for folding effects back into two separate monitor mixes, dual pre-fader



aux sends on every channel, sweepable midrange EQ, 75Hz low cut filters to cut room rumble and mic stand noise, Control Room/Phones switching matrix for creating a third monitor mix, broadcast mix or sending a separate feed to a crying room or foyer, Tape to Main Mix for music during presentation breaks, mono output with level control and XLR stereo outputs with recessed mic/line level switch for feeding "house" systems with unpredictable levels.

And unlike any other mixer with this kind of live mixing chops, the 1642-VLZ™ PRO is also a superb studio recording console. It's configured to make recording incredibly easy with two dedicated channels for tracking, eight for monitoring and two stereo channels for effects. Plus "double-bussed" submix outputs so you can feed all 8 channels of your recorder without having to re-patch.

Call toll-free or visit our web site for complete information on the new midsize luxury 1642-VLZ™ PRO. Learn why it's the best compact live sound mixer value on the planet.

1642-VLZ PRO

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World Radio History

Munich AES Highlights Radio

MUNICH, Germany The 106th Audio Engineering Society Convention attracted a healthy number of participants to the Bavarian capital.

The May event at the MOC Congress Center in Munich drew approximately 6,400 visitors, with significant turnout from Germany, Austria, Switzerland, Liechtenstein, the United Kingdom and Eastern Europe.About 300 exhibitors displayed goods. The sessions, workshops and technical tours proved popular, with standing room only at many sessions.

Observers familiar with shows in the United States said the European AES show offered more exhibits and sessions of specific interest to radio than its U.S. counterpart.

Tours and papers

Visitors had the opportunity to tour the new digital, networked B5 Aktuell studios of Bayerischer Rundfunk (BR) and local private station Antenne Bayern.

Papers included an overview of the new NHK Broadcast Center radio studio with disc-based mixing in Tokyo, which the Japanese public broadcaster uses for producing multichannel audio dramas.

The society streamed audio and video of the opening ceremony, featuring conductor Lorin Maazel, and, appropriately, the workshop "Audio Broadcasting on the Internet." Both events are available on the Web on demand until mid-August.

Attendees exhibited interest in DVD, particularly the new DVD-Audio standard.

Here's a sampling of new products on display.

On the telco side, Telos Systems exhibited its ISDN Hybrid, which creates a digital path from the studio to the telecom central office for exceptionally clear caller audio, the company said.

"The ISDN Hybrid exploits the telephone system's ability to cross-connect digital lines to analog telephone lines," said CEO Steve Church. "Only the far-end analog part of the call needs conditioning. Also, the digital connection means lower noise and faster call setup."

Telos also introduced the 2X12 ISDN Talk Show System, handling 12 lines. It allows broadcasters to upgrade POTS lines to ISDN service easily.

AEV demonstrated its Millenium digital audio codec, which handles ISO/MPEG Layers II and III as well as G.722.

Dialog4 exhibited its MusicTAXI VP-PRO codec, which enables users to select the coding algorithm with the press of a button and to choose any combination of audio mode, sample frequency and transmission rate.

Audio Processing Technology demonstrated its BCF256 broadcast communications frame, which offers "negligible" coding delay over dial-up ISDN and permanent digital networks, for STLs and networking applications.

Codec design is changing to reflect the larger capacities of transmission systems. For example, CCS Europe presented at AES the CDQPrima 2MUX-M, a 2 Mbps extension of the CDQPrima stereo codec.

Codec makers also are putting the power of the computer to work.

The Maycom Isys Pro is a PC-based ISDN audio codec for full-duplex communication with the convenience of a Windows application.

"The newest version of Isys offers auto configuring," said Jos van der Meulen of Maycom. "This means no worries about the type of remote codec, just dial and connect."

Mayah Communications released SendIt 3.1 software, incorporating automatic codec detection and fast synchronization. It uses FlashCast technology to simplify technical setups and hide them from the user.

ISDN capability is useful not only in standalone codecs, but in devices such as field recorders and mixers.

AEQ introduced the TLE-02D, a codec with terminal adapter, digital hybrid and portable mixer in one chassis. It operates on eight AA batteries.

The CTaxi MPEG Recorder from Dialog4 allows the user to record and manipulate an audio file on PCMCIA Flash card or hard disk, store it using ISO/MPEG Layer II or III data reduction, and then transmit the MPEG file with information about the file, via ISDN to another codec, or via FTP protocol to a server for use by automation systems.

AETA Audio was on hand with its Scoop Reporter II portable codec and mixer. The unit, originally designed for use on analog telephone lines, now incorporates a two B-channel ISDN codec.

The show featured an array of consoles for radio, post and live sound work.

The RM1d made its European debut at the Soundcraft booth. The RM1d is a digital air console available in two frame sizes.

Fostex introduced the VM200, a portable digital mixer featuring 32-bit processing and mixing and integrated digital effects. It is MIDI addressable.

Klotz Digital introduced Spherion, a digital audio console for live broadcast and production applications.

Mackie Designs showed its Digital 8-Bus console, as well as the HUI interface for digital audio workstations.

The V-Studio line of digital mixing consoles was on display by Roland, including the VS-1680, VS-880EX and VS-840. The units feature built-in recording and processing capabilities.

The 106th AES marked the 30th anniversary of Solid State Logic, which introduced new software for SL9000 J Series consoles, featuring extended machine control and revisions to parallel machine control and automatic ID and configuration for controlling serial machines.

Otari showed its Status and Élite range of digitally controlled analog mixing consoles. AEQ showed its established BC-300 radio broadcast console.

AETA Audio showed the ÉAA Micromix portable mixer, made by Électro-Acoustique

See AES, page 14 ▶

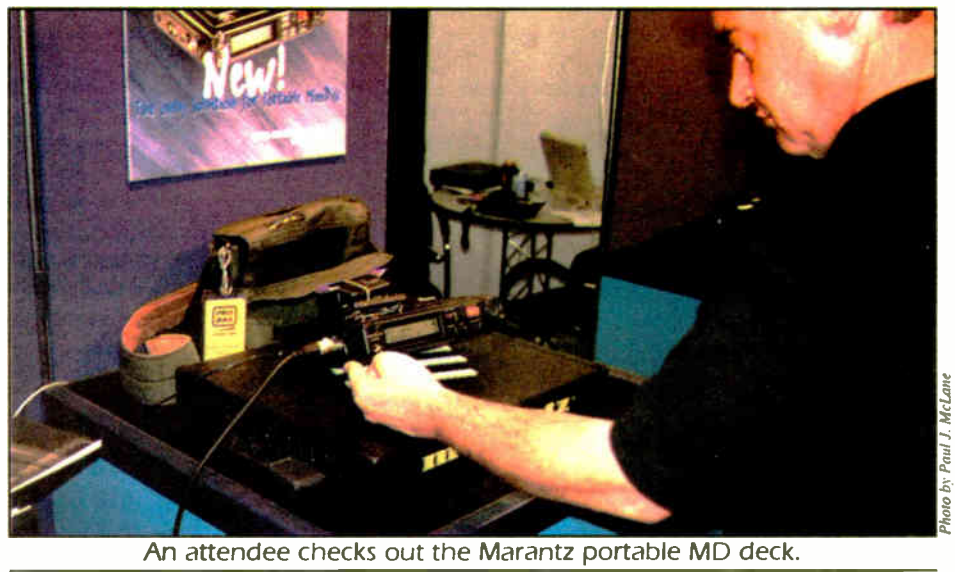

Photo by Paul J. McLane

An attendee checks out the Marantz portable MD deck.

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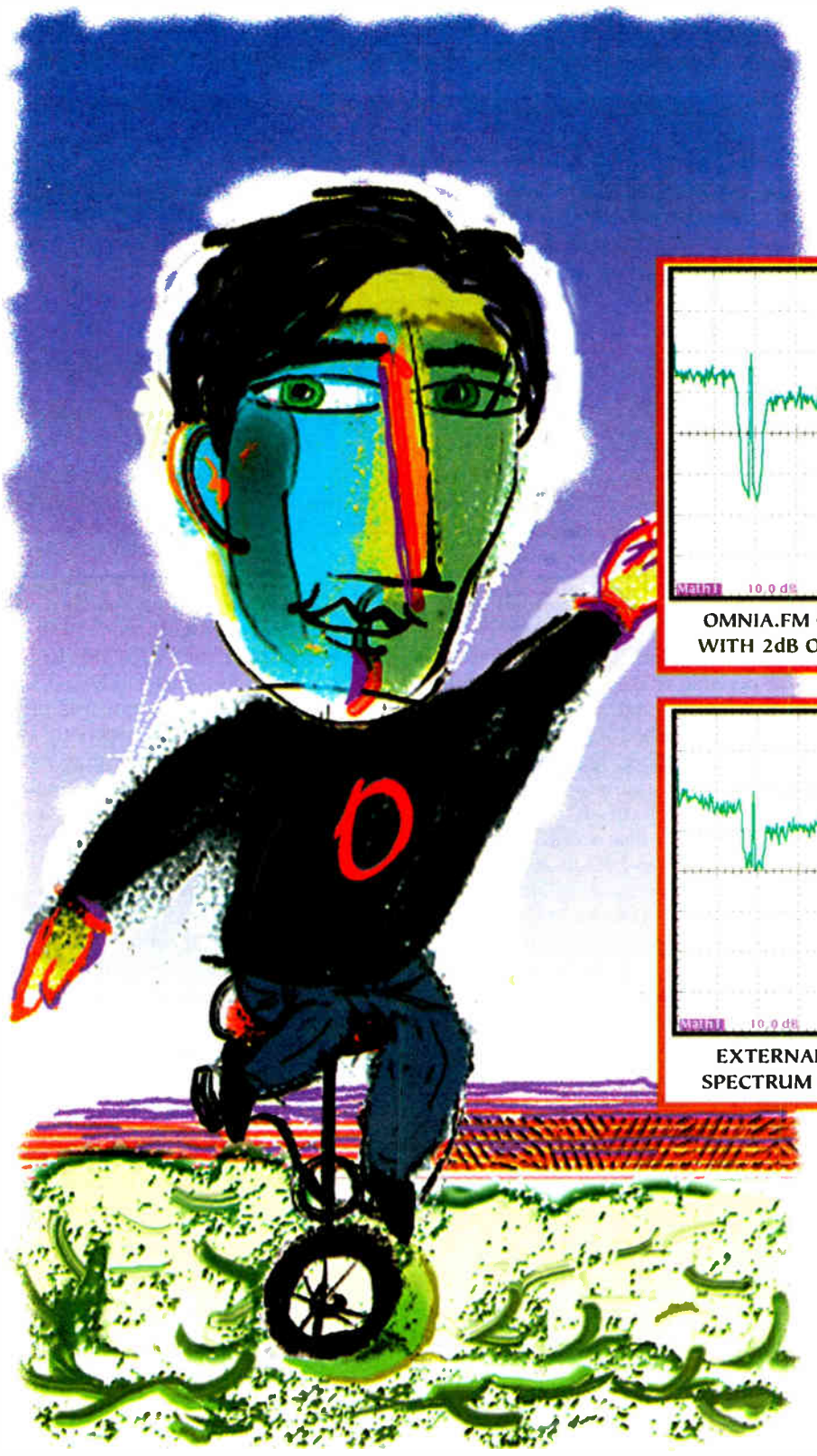
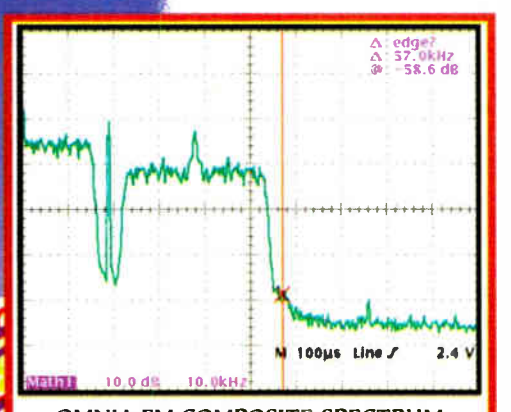
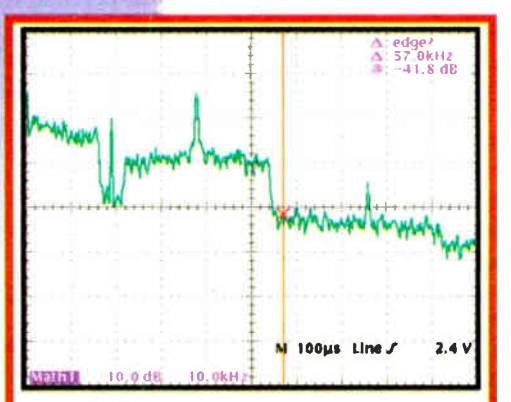




OMNIA.FM COMPOSITE SPECTRUM
WITH 2dB OF COMPOSITE CLIPPING



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SPECTRUM WITH 2dB OF CLIPPING

When you compare digital audio processors, it's not apples to apples. Why? Because only the Omnia.®fm gives you adjustable composite clipping, a powerful technique used by thousands of broadcasters for PD-pleasing loudness–loudness that can't be achieved in any other way, no matter which processor you're using.

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Make your own comparison and you'll find that the Omnia.fm provides unmatched performance, with or without composite clipping. Only the Omnia.fm gives you a choice. And only the Omnia.fm gives you a demo with a money-back guarantee*.

Here's how: *The test signals were generated by a Delta Electronics SNG-1 (Stereo Noise Generator); spectrum analysis was performed with a Tektronix TDS-744A Digital Scope in the FFT mode. The top graph shows the spectrum out to 100kHz of the Omnia.fm with its built-in, all-digital composite clipper and composite low-pass filter. The bottom graph shows a different processor combined with an external composite clipper. Both composite clippers were set for 2dB of clipping. Notice in the bottom graph the significant harmonic energy in the SCA region as a result of composite clipping.*

For a complete technical report, call us for a copy of our paper entitled "Omnia.fm: An Engineering Study." Or visit our web site at: www.nogrunge.com.

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World Radio History

6,400 Attend 106th AES

▶ AES, continued from page 12

Appliquée, which AETA acquired last year.

AKG Acoustics displayed its new, affordable WMS 61 VHF and 81 UHF wireless mic systems. Each features interchangeable components. The company showed the C4000B true large-diaphragm microphone, with a capsule with 6-micron thick gold-sputtered mylar.

Neutrik's Minirator MR1 is a handy test device.

On display for the first time at AES was the 4060 cardioid vacuum-tube mic from Audio-Technica. Also from A-T was the AT4033a cardioid capacitor microphone, designed for on-air vocals.

Highlighted by beyerdynamic were the MCD 100 digital studio mic and the M99, a large-diaphragm announcer microphone, with enhanced low-end frequency response.

Neumann showed its Series 180 miniature microphones, which consist of three compact, matte-black or silver-nickel miniature mics. Two new models, the KM 183 omnidirectional and KM 185 hypercardioid, joined the KM 184 cardioid unit.

Shure Bros. exhibited its new SM7A cardioid dynamic mic with a response of 50 Hz to 20 kHz. Shure also has a cardioid condenser for critical audio work. The side-address KSM32 has Class A transformerless preamp circuitry, a 15 dB attenuation switch, switchable low-frequency filter and pop grille. The SL version has an elastic shock mount.

At Sony, a new capsule was added to the WRT-867 and WRT-807A dynamic handheld wireless mics, which delivers a more smooth, open sound.

HHB showed its Circle 3 range monitor, which combines a linear response 13.75-centimeter bass/mid driver with a ferrofluid-cooled soft-domed tweeter.

Yamaha highlighted the MSP5 nearfield monitor with a biamplified design that provides 40 W of power to each woofer while separate amps feed 27 W to each tweeter.

TC Electronic announced an alliance with Dynaudio Acoustics. Under the deal, TC will take over worldwide distribution and marketing of Dynaudio monitors.

Processing power

On the processing side, AEV exhibited Exclusive FM, a 10-band device. Users can save 256 processed sounds; an internal pink noise generator allows sound spectrum analysis. Multiple interfaces allow connection to a PC or remote control devices. AEV also offers an AM version.

Cutting Edge announced that it had delivered more than 70 Omnia.fm processors to BBC Local Radio outlets. The company also introduced several plug-ins. The Hot plug-in is for louder formats, such as dance, hip-hop and rock. The Veris provides clean, loud sound for lighter formats such as classical and smooth jazz. For ambiance, the Space-Efx plug-in adds dimension to program material that lacks stereo "width."

IDT showed prototype versions of the Digital Virtual Processor (DVP), a 24-bit, 96 kHz device for FM. The DVP will use one-point FFT processing rather than a multiband approach.

The company said that this approach reduces the number of filters required for a more natural sound.

"This is particularly true for classical stations, but others want to impose their signature without affecting, too much, the natural sound," said International Marketing Director Andy Simpson. The company plans to market the product in the U.S.

Orban released version 2.0 software for its Optimod-AM 9200 processor. New presets for high-frequency shortwave broadcasting can also be used to extend the coverage of medium-wave broadcasts. The company also introduced software to improve the interface between its Optimod-FM 8200 processor and a PC.

TC Electronic promoted its DBMAX Digital Broadcast Maximizer, for precise control of a levels and dynamics in a hybrid analog and digital production environment.

Fostex exhibited its new DE-1, a dual multi-effect processor using internal 24-bit data processing, with 121 digital effects.

From Shure Bros. was a new dynamics processor, the DP11EQ. The single-channel, half-rack unit combines the digital power of a dynamics controller with parametric EQ and delay.

Sony showed a prototype of what it called an "entirely new" type of sampling-based digital reverb effect processor. The DRE-S777 recreates the natural reverb of live halls and other environments in real time by using sampled data collected from actual acoustic spaces. Sony used mic arrays in a variety of concert halls to capture the characteristic "signature" of each.

New from dbx was the Quantum, a 24-bit, 96 kHz studio mastering unit. Each of its four bands can be gated, compressed and limited individually. It also includes five-band parametric EQ.

Nagra's ARES-C Solid-State Recorder

Eventide demonstrated its new Orville Harmonizer effects processor alongside the 4000 Series of Ultra-Harmonizers. Displayed on the Roland stand were the SRV-3030 and SRV-3030D digital reverb processors.

For Webcasting, Orban demonstrated the Optimod-DAB 6200, also suitable for digital audio broadcast. The unit is designed to be located directly in front of the Internet server in the audio chain, and it works with all streaming algorithms.

Manufacturers are working to make their tapeless recorders better.

The portable Sonifex Courier records to PCMCIA flash RAM cards. Version 1.5 software adds support for .AIFF recordings and adds multiple-cut, multiple-mark and cut-and-paste editing.

Maycom demonstrated its Easycorder, which stores audio to internal memory or PCMCIA card.

The Ares-C solid-state recorder/player from Nagra Kudelski was on display, along with its post-production rackmount counterpart. Recording is via PCMCIA cards in G.711, G.722 or ISO/MPEG Layers I and II.

The PMD650 MD recorder was on display from Marantz Professional Europe. The unit has MD transport and recording controls similar to those of the PMD line of cassette recorders.

Denon promoted its new DN-M991 MD recorder/player and DNMP-R70 portable MD system. The former features a hot-start function via parallel remote, serial remote or PC control terminals. The latter is a docking station that allows for a portable MD unit to interface with professional I/O and controls.

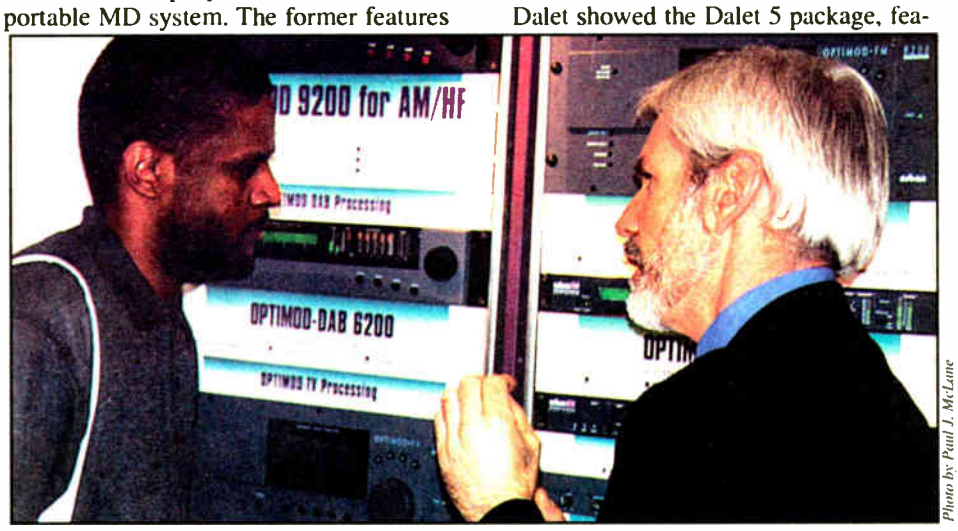

Photo by Paul J. McLane

Pitching Processing in the Orban booth

Tascam launched a new version of its MD recorder/editor, the MD-801RmkII. Improvements include a rapid-access transport mechanism that provides greater speed for disc access time, as well as new 20-bit A-to-D/D-to-A converters.

Also on the recording side, Tascam introduced the DA-40 DAT machine, successor to its popular DA-30 mkII.

In the groove

New from HHB was an 80-minute professional MiniDisc. According to the company, the disc achieves the recording time by reducing groove width by 0.1 microns.

HHB showed its new CDR850 PLUS CD recorder/player, with balanced XLR digital outputs and a Word-clock input, which allows the unit to be locked to a master clock source during playback.

A number of test and monitoring systems were on display.

Audio Precision showed testing solutions for digital radio with the Portable One Dual Domain, an audio/interface analyzer that simplifies digital audio measurements.

Neutrik introduced the Minirator MR1, an analog generator that provides a comprehensive set of audio test signals that are required in broadcast audio environments. Neutrik also exhibited the EaSZyCon Super Z series of XLR connectors. The system offers easy assembly with self-adjusting cable strain-relief that provides increased retention force under tensile stress.

TerraSonde showed the Audio Toolbox, a hand-held multifunction pro-audio test, calibration and acoustic analysis device. The unit unites more than 20 functions, which include a real-time analyzer, microphone and speaker polarity tester, time code generation and MIDI data monitoring.

Sonifex announced plans for expansions to its Digital Redbox Range. Prototypes included a digital distribution amplifier with S/PDIF or AES/EBU outputs, an A-to-D converter and a sample-rate converter.

Systems for editing and on-air management were available from around the world.

Nétia Digital Audio unveiled software packages based on the Radio-Assist line. The Quick Player live-assist system features a jingle player that manages up to 96 jingles and songs. One-Man-Show is based around two workstations, and provides a full automation solution.

AEQ highlighted MAR4WIN, a 32-bit automation system running under Windows 95 or NT that integrates audio, text and images and allows for simultaneous access to various databases.

Dalet showed the Dalet 5 package, featuring tools for program scheduling, audio and text management, production tools and live-assist or automated broadcasting.

The Enco Systems DAD$_{PRO}$ digital audio management system was on display at the Harris Broadcast booth.

RCS showed its Selector music scheduling system, RadioShow for broadcasting via the Internet, its Player system with drag-and-drop functionality, and Master Control NT.

Mediatron displayed its modular hard-disk-based digital audio system, AirControl NT99, which offers live-assist and automation capabilities.

Steinberg unveiled the WaveLab 3.0 audio editing and processing software with flexible CD burning capabilities and a real-time plug-in architecture. The new version features non-destructive editing.

Studio Audio & Video (SADiE) unveiled the Artemis DAW, configurable for eight to 24 I/O. Artemis can support 192 kHz editing and mixing.

Orban highlighted version 2.5 of its Audicy digital audio workstation software. The system can now support TCP/IP and Novell networking.

Fairlight introduced features for the FAME 24-track, 40-bit floating-point digital production system. Improvements include extended frame sizes, new macro creation/use capabilities and new software for faster, more intuitive operation.

Digidesign was at the show with ProTools 4.3.1 software update. ProTools now supports the Power Macintosh G3.

On offer from 360 Systems was an upgrade of the Short/Cut '99 personal audio editor, which features extended file interchange options.

New from Digigram was the NCX200 network audio terminal for audio distribution via a computer network. The NCX200 was shown alongside the VX pocket soundcard for portable computers, the PCX222np/PCX221np stereo soundcard and the VX222 linear soundcard.

■■■

T. Carter Ross, Marguerite Clark, Chris Joaquim and Paul J. McLane contributed to this report.

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Field reporting the way it's supposed to work. Introducing the all new Scoop Reporter II portable CODEC from AETA Audio. This rugged unit combines POTS and ISDN facilities with an integrated three-channel mixer and internal battery supply. Featuring 99 user programmable presets, the Scoop Reporter II will handle two microphones and one line level input. A balanced XLR output can be used for studio producer IFB and Mix-Minus feeds from studio, or to feed the local PA. The Scoop Reporter II will operate on voltages from 85 to 240 volts at 47 to 440Hz. When AC is not available or fails, the unit will run on standard "D" cell alkaline batteries. The intuitive interface is so easy to use, your talent will be able to run a remote broadcast with no technical assistance. And with our 24-hour technical support, you'll never miss another field report. The Scoop Reporter is the all-in-one box that will get the scoop anywhere, anytime.

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Workbench

Radio World, July 21, 1999

While on Remote, Have a Plan B

John Bisset

Backups are the name of the game, especially this time of year when remotes are common. E. J. Knight, a certified professional broadcast engineer from Chandler, Ariz., writes in with a suggestion to the problem of losing your phone coupler at a remote site. E. J. suggests carrying an ordinary "princess-style" telephone modified as shown in Figure 1.

The procedure is to wire a two-pole, double-throw switch with either a mini or quarter-inch phone jack mounted on the phone handset. When the switch is in the "normal" position, the handset microphone is routed through the telephone. When the opposite switch position is selected, the mixer output can be coupled into the jack and down the telephone.

E. J. writes that before phone manufacturers started sealing the talk and ear pieces on the handset, a pair of clip leads could quickly couple the mixer signal into the mouthpiece after removing the carbon microphone disk. Having the backup phone "saves" a remote, since E.J. can quickly dial into the station using a regular telephone line.

★ ★ ★

John Almon sends greetings from the TNN/CMT Earth Station in Nashville. He picked up on the fire extinguisher tip a few issues back and noted that the extinguisher was just sitting on the floor. In the Nashville area, the state requires ing to verify operation is in the "green" and the seal is intact. As for the dry chemical extinguishers, John inverts them quarterly and slaps the bottom to make sure the power doesn't try to cake. His local codes require an extinguisher every 75 feet.

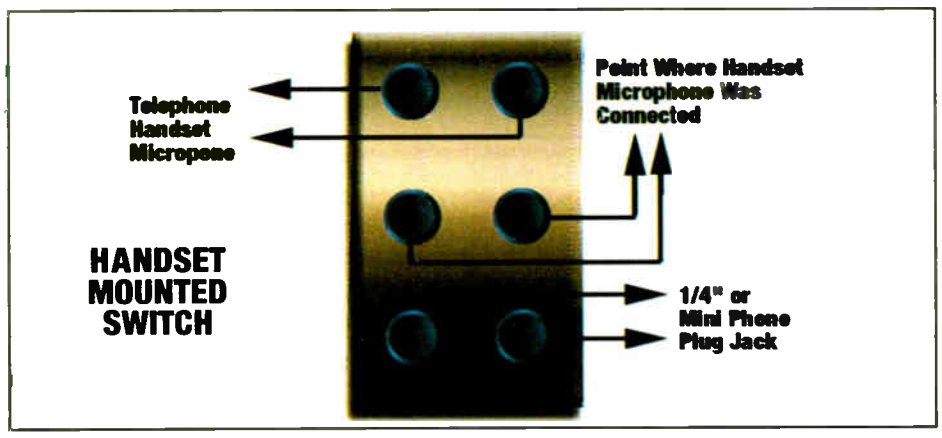

Figure 1: Modifying a Telephone for Emergency Remote Use

These are some great tips, John, and another area that gets forgotten as we juggle all those engineering balls. Before you blow this off, keep in mind that fire marshals in many jurisdictions can write citations for noncompliance. (That will get your manager's attention.) If repeated violations occur, they can and will padlock the building. (Great for ratings.)

One way to get the problem solved is to contact a fire extinguisher maintenance company and let it do a site survey. The cost is good insurance and they will recommend, supply and test the extinguishers for you. The site survey is usually free

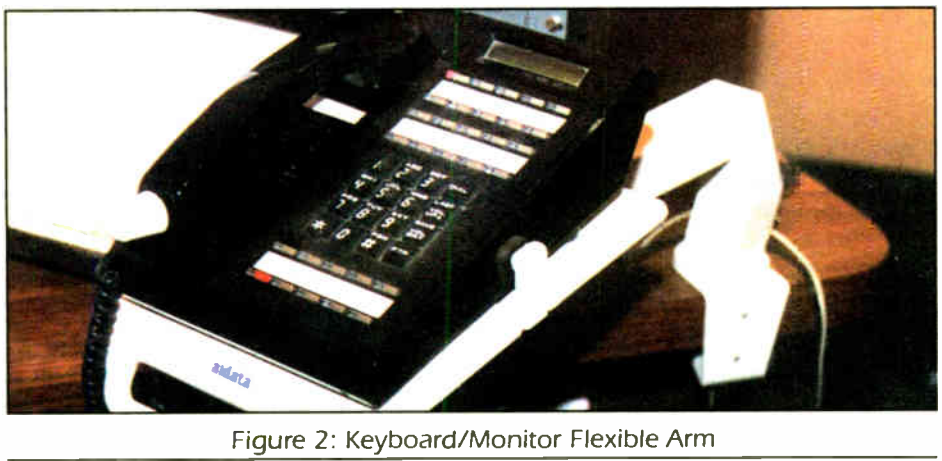

Figure 2: Keyboard/Monitor Flexible Arm

that extinguishers be securely mounted using an approved or supplied hanger with the bottom not less than four inches and the handle not more than 60 inches off the floor. If ADA requirements are followed, the handle must not be more than 48 inches off the floor.

Clearance issues need to be followed as well. In Nashville, there must be 36 inches of clearance in front of the extinguisher. They must also be tagged by a state-licensed technician each year and hydro-tested or replaced as necessary.

John adds taking a monthly gauge reador costs a modest sum which is rebated if you sign up with its service. If you live in a jurisdiction where they are particularly diligent about checking these things, try to work out an advertising trade deal.

★ ★ ★

John Almon used to contract for a group of stations, and while we talked about the fire extinguishers, he related a hilarious collections story to me; it's called the "30-day guaranteed payment plan."

The transmitter door is opened and a mothball is put in the interlock switch. Thirty days later, when the mothball finally evaporates, pow! The transmitter is off the air and you get your money from the tightwad owner.

If you've got a particularly funny or ugly collection story from one of your contract stations, fax it to me at (703) 323-8011. We'll keep names, stations and locations confidential if you so indicate, and who knows? As with this story, you might find another use for those mothballs I keep telling you to buy!

★ ★ ★

A clutter-free control room is another of the balls I alluded to that we seem to always keep in the air. Randy Kerbawy at WTNJ(FM) found the phone arm shown in Figure 2, which keeps the telephone within easy reach, but only when it's needed.

■ ■ ■

John Bisset has worked as a chief engineer and contract engineer for more than 20 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 via e-mail at jbisset@harris.com

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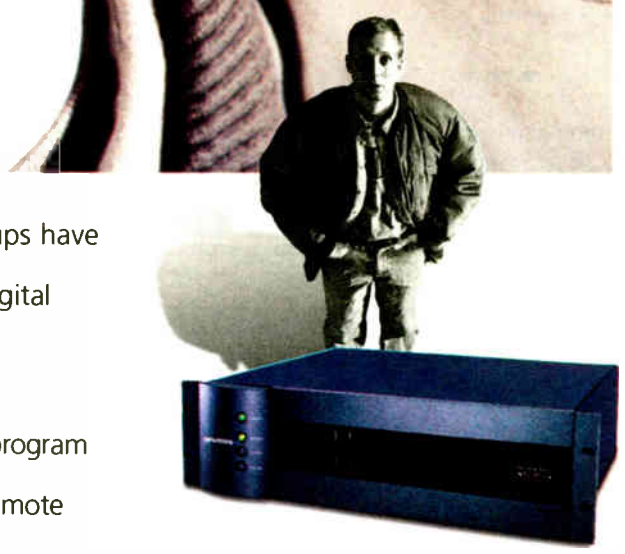
"Tom, we bought another radio station last night."



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CFA Debate Dominates Papers

Transmission Session Touched on Crossed-Field Antennas, Inverted Unipoles, Synchrocasting and More

Thomas R. McGinley

Digital might be the new kid on the block and analog the venerable senior citizen, but both ways of doing electronic transmission work still need real solutions to solve real problems.

In a session at NAB99 that could be called the annual rite of spring for radio RF, seven papers were delivered dealing with transmission topics of interest to any radio engineer.

A presentation on the controversial Egyptian MW broadcast Crossed-Field Antennas generated the most discussion.

Lightning

Leading the way was Crawford Broadcasting Director of Engineering and **RW** contributor Cris Alexander, who took on Mother Nature head first in a discourse on lightning protection for the broadcast facility.

Alexander opened by citing the impressive vital statistics of a typical average lightning stroke: millions of volts packing 20,000 amps or more with a 5-microsecond risetime and a 40-microsecond duration.

While it might seem obvious to many engineers, the fact remains that the most important thing to do to suppress lightning damage to equipment is to provide the lowest DC resistance and lowest AC impedance path to local ground, as close to the tower base as possible.

"You've got to dump the lightning energy into your best ground there, before it tries to find other paths to ground elsewhere in your facility," he said.

Use at least 16 eight-foot ground rods driven in around the tower base and tied back into any radial system with heavy copper strap. Horn and ball gaps placed on each side of a loop of copper tubing feedline connecting an AM tower form a low-pass pi filter, offering good rejection to high-frequency lightning.

Alexander described the relatively recent use of iron toroid cores as high-frequency chokes, placed around coax feedlines and primary power lines into transmitter equipment. Toroids are cheap and easy to install. The more the better, according to Alexander.

Of critical importance is establishing a good central grounding point inside your facility. All ground wires should find their way to this common central point via strap or large gauge copper wire. The use of separate surge suppressor boxes and one-shot "kamikaze" MOV devices across incoming power distribution lines are also highly recommended.

Frequency-agile AM

David Solt, founder of Omnitronix Corp., described a new frequency-agile, medium-wave AM transmitter for international and emergency applications. While frequency-agile transmitters are common for FM, designing one for AM was more daunting. International broadcasters often have the need to change channels quickly when jamming interference occurs.

This unit features a lightweight switching power supply and is built around PDM modulated broadband MOSFET power modules delivering 700 watts each. The modulators are part of each PA circuit board. A standard Motorola "hard logic" synthesizer chip controlled by frequency selector switches handles frequency synthesis. PA modules are combined using a parallel combining scheme, along with a multi section 70 kHz PDM filter.

The most expensive challenge of making this transmitter truly frequency-agile across the entire AM band is the need for harmonic filtering, which is frequency-dependent. Without this filter, the transmitter's output is rich in strong odd-order harmonics. Omnitronix offers these filters in seven sub-bands covering 530-1710 kHz. Unfortunately they cost as much as the transmitter itself. Solt conceded that the transmitter design had not yet been tested or optimized for DAB operations.

Inverted unipole

Antenna designer Grant Bingeman of Continental Electronics offered yet another new and novel wire antenna for the AM band, primarily intended for use as an emergency antenna. Called the inverted unipole, or "upside-down antenna," the design uses only wires and does not need the conventional buried ground system.

It uses one or two tall buildings as support structures so that a vertical "drop wire" approximately 150 feet long and 30 feet above the ground serves as the primary radiator. It is suspended in the middle of a horizontal wire stretched between two buildings, or a slanted wire from one building back to ground, which serves as the counterpoise.

The antenna is fed from coax cable via a resonated isolation coil from either the bottom end of the drop wire, or from the building at the end of the counterpoise wire. By playing with the dimensions of each wire, and the distance above ground, Bingeman was able to develop a system which delivered radiated efficiency just a few dB below a standard quarterwave reference vertical, with comparable bandwidth and driving point impedances. His model was only 74 degrees tall at 1700 kHz with 31-degree long arms.

The key to its success lies in the fact that the current loop is positioned high in the air, well above ground, so little current is lost via coupling into lossy ground. The disadvantages include the fact that the support buildings will distort the theoretical omnidirectional pattern, and high RF fields could pose a hazard to building occupants. Bingeman concluded by advising that any effort to obtain FCC licensing for the inverted unipole would require extensive field measurements.

Processing debate

Frank Foti, Cutting Edge founder and chief design engineer, was back extolling the virtues of 48 kHz sampling for digital peak modulation control for the digital FM audio signal.

Last year, Foti introduced DCET, a composite interface for a digital processor feeding a digital exciter. Foti cited the reality that while lots of things digital are plug-and-play, digital processors are definitely not. He referred to studies he performed that demonstrate significant aliasing distortion, overshoot and loss of loudness that can occur when using 32 kHz sampling with a processed digital signal driving a Harris Digit digital exciter. Frank played a tape of these artifacts, which he called the "Star Wars effect," or the "Tones of Death."

"You can have a final limiter which does not produce aliasing distortion, just like it's legal not to pay taxes," Foti quipped. He also said that the sharp low-pass filters needed to protect the stereo pilot with 32 kHz sampling can degrade the high-frequency performance. Sampling at 48 kHz prevents "sample slipping," according to Foti, wherein short peaks sneak through the lower 32 kHz rate, causing overshoot. He also said DAB FM will offer 20 kHz performance, so 48 kHz sampling automatically supports that improvement.

Raised eyebrows

In the question-and-answer session, many eyebrows were raised when Orban founder Bob Orban asked Foti how the Cutting Edge "predictive overshoot compensation" process could be described. Foti answered that "it was a fully linear process that produces a non-linear result."

Orban responded by saying such an answer was "gobble-de-gook," to which Foti suggested that his presentation be afforded the same respect which the many Orban inventions and

See CFA, page 29 ▶

The Crossed-Field Antenna presentation generated the most interest and discussion of this NAB session.

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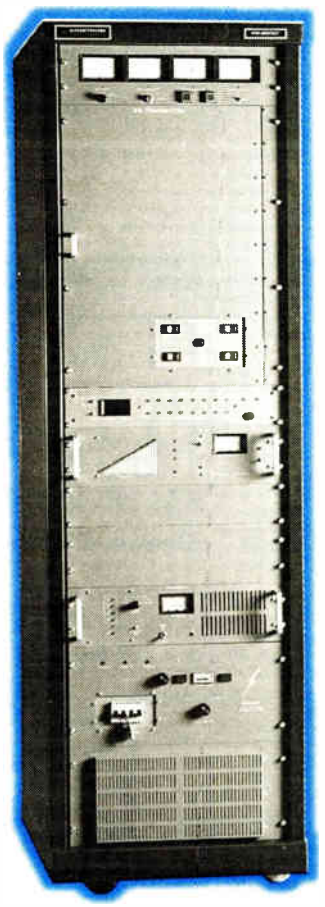

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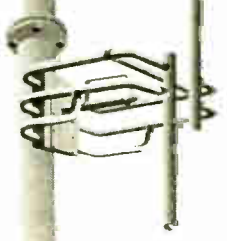

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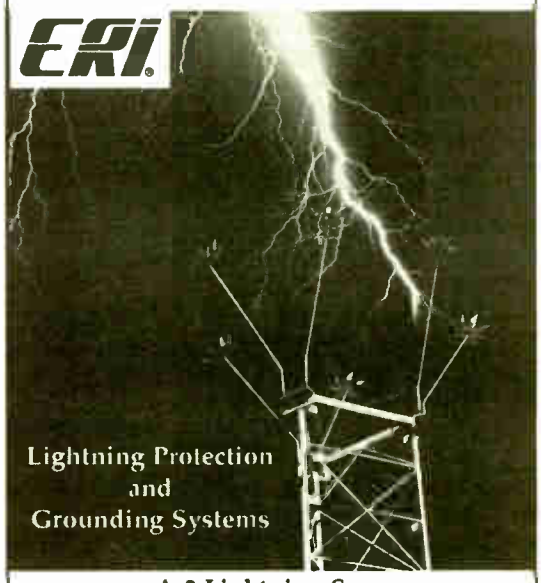

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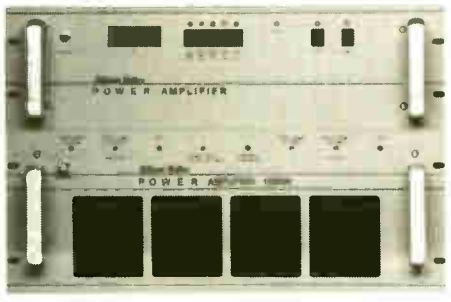

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World Radio History

Pushing Today's 'Hot' Processing

Paul Sanchez

This article was intended to appear in Buyer's Guide for On-Air Processing in the June 9 issue.

Radio station processing has come a long way since the Loudness Wars of the mid-1980s.There are new challenges posed by digital air-chains and mass consolidation. But competitive stations in markets like New York and Philadelphia still aim for much of the same goals today they did over a decade ago: dial dominance and brightness that won't fatigue listeners.

Only now, the ears of those listeners have been conditioned to expect the pristine quality of CDs and won't be as tolerant of the processing artifacts they may have overlooked in the past.

Improved processing

Loudness, brightness and presence, while still maintaining a clean sound, were aims that I shared with Mike Guidotti when we both worked at WGRC(AM) in Spring Valley, N.Y., in the 1970s. We agreed then, and still do, that if we could, we would find new ways to improve the current state of audio processing to push the envelope and make radio more exciting for our listeners — but not at the expense of the sonic integrity of the station.

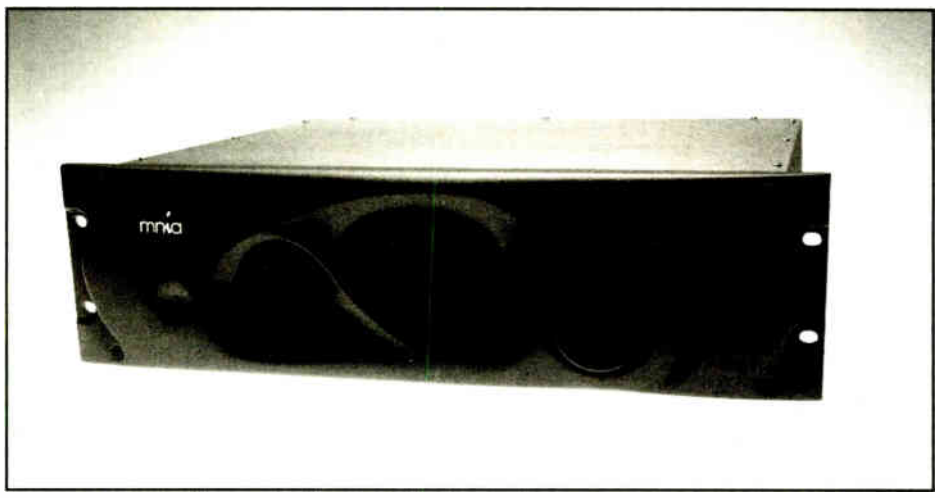
By the '80s, we were working at different New York City stations, me at WBLS(FM) and Mike at WLIR(FM). Using a mix of existing processing boxes and some of our own innovations, we developed a new form of analog audio processing that was amazing, loud — and clean.

A lot of processing falls apart on the vocals, but our devices kept voices and musical vocals clear and in the foreground without that edginess and without the distortion we heard at other stations. The bottom frequencies were strong and the overall sound was bright.

We kept pushing the frontier of processing even as we put our creations to the test at our respective stations. By the early part of this decade, Mike had moved on to Pittsburgh and ultimately to Chancellor station WYXR(FM) in Philadelphia. I stayed in New York, with a stint at WPLJ(FM) before joining the engineering team at Emmis, NY.

At each of these stations, we experimented with our processing creations. We'd also consult with other stations but we never aggressively marketed our brand of processing.

One of our colleagues, when we were both engineers in New York City in the early '90s, was a guy who gained quite a name for himself in radio processing, Frank Foti, then at Z100, WHTZ(FM). We were all competing for the loudest, brightest sound on the New York dial. By the time Frank started Cutting Edge and developed the Omnia, Mike and I had pushed analog processing as far as we could and were contemplating what we might do in the digital domain.



The 'Hot' is a plug-in for the Omnia.fm.

Then Frank brought his Omnia into Hot 97 for a demo, and we knew we had a whole new world of digital processing to explore. Mike and I thought the Omnia was competitive, but we were eager to see what we could do to push it to the next level.

The Omnia's digital platform was exactly what we were looking for. It had a great sound, and its engineering saved us a lot of development work of our own. With Omnia, were able to meld the worlds of analog and digital processing together.

We were particularly excited about Omnia's technology and processing benefits, especially its lack of artifacts, lack of aliasing and lack of phase error. Here was an ideal platform.

Digital platform

We began working with Frank to develop the Omnia's potential further, and the results were incredible. The Omnia platform allowed us to do things digitally that we hadn't been able to do with analog processing and all of its shortcomings.

In short, we were able to incorporate the advances we'd developed and begin to do what we'd only dreamed of doing in the past. And because what we'd already done was "winning" in the No. 1 radio market in the country, we could be innovative, yet use tried-and-true techniques at the same time.

I can't give away too many trade secrets here. But the results speak for themselves. What we've developed is a new form of digital processing that Cutting Edge is calling Omnia Hot. It's unbelievably loud, but without artifacts.

OK, the strongest part of what we've done with the Omnia is the limiter. Basically, what we've got is a wideband leveler; a multiband processor and a multiband limiter along with an integral high-frequency limiter and, yeah, a clipper. It's a whole system approach that uses timing, crossovers, circuitry and algorithms that optimize the circuits. And our bass circuitry is unreal.

A word on clipping: Despite its bad reputation in the past, clipping can be done well when it is artfully accomplished. Because of the way we've integrated our ideas into the Omnia, we need to do a lot less clipping to be really loud.

In short, what's different in the new word of processing is that it's less of a trade-off: how little you need to give up in order to achieve your goals. Loudness is the point — it's always the point. Now, we can give up a lot less in order to achieve it.

In developing the Omnia Hot, we've had to consider elements of format and also process for the real world of radio's digital environment. I've put the Omnia Hot on the three Emmis-owned New York stations: the classic soul and R&B of WRKS-FM, the smooth jazz of WQCD(FM) and of course, WQHT(FM)'s hip-hop format. The Omnia Hot sounds great on all three.

Digital rigors

At Hot 97 we use a digital hard-disk commercial play system and a digital link. Our signal is subject to all the rigors of a digital environment. But our Omnia Hot processed sound is clear and artifact-free.

Omnia Hot consists basically of a plug-in card and one extra DSP card for the Omnia. It's field-retrofittable or you can buy it from Cutting Edge as part of the product.

We've incorporated different levels of processing so each station can decide how best to take advantage of all that the Omnia Hot can do. Our presets are a good place to start. We've got Medium, Large, Extra-Large and Thermo, each in both Cool and Hot settings. You can work them further or just use them as they are.

The Omnia Hot is a Cutting Edge product, and Mike and I provide support for it. Yeah, other stations in our markets can now compete with us by using Omnia Hot, but that's OK. We'll still be working to push the state of the art of audio processing to an even higher level.

Who knows, you may be seeing some future "hot" versions of Omnia for AM, talk stations, maybe even the Internet, DAB and satellite.

Frank Foti is good that way, always looking to see what he can do next, just like Mike and I am. I feel that what we've done with Omnia Hot and all the steps that led up to it is to bump up the quality in radio. Overall, that's a pretty good feeling.

■ ■ ■

Paul Sanchez is chief engineer at Emmis, NY and can be reached via e-mail at ps@computer.net; *Mike Guidotti is engineering manager of Chancellor stations in Philadelphia and can be reached at* guidotti@pond.com

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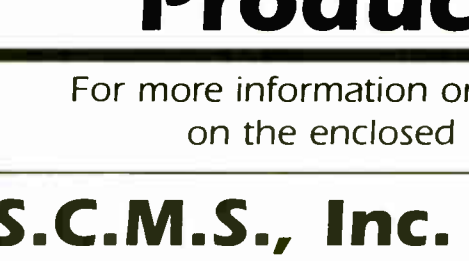

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PRODUCT EVALUATION

PressPower2 Goes for a Whirl

Paul Kaminski

The ink had hardly dried from my January review of the Whirlwind/U.S. Audio PressMite when I got a call from Whirlwind's Steve Czubara asking me if I'd like to test the improved PressPower2 multibox. I told him that I did, indeed, have a new venue for a test.

The new PressPower2 would get as tough a test as the Championship Auto Racing Teams (CART) FedEx Series "champ cars" get at the 0.946-mile Nazareth Speedway in eastern Pennsylvania.

The Penske Speedways track was opening a new media center, and Public Relations Director Keith Green was looking for a solution for news conference sound. This was Green's debut as track public relations director, and he didn't need people like me yammering about news conference sound.

The Penske in Penske Speedways is Roger S. Penske, who built a racing reputation on preparation and professionalism from his CART and NASCAR teams to his tracks. Given that background, Green approved the test.

The directions were so well-written that a layperson could get it to work.

I was familiar with the PressPower, as CART acquired one for its public relations department and reporters use it to cover conferences. When fed with clear audio, the PressPower works as advertised. It travels with the series on the road, and the organizers use it when they need primary or expanded distribution.

PressPower2 has 16 switchable mic/line output connections on switchable XLR male connectors. They are spaced so the users of plug-in Lectrosonics-type transmitters won't take up more than one output. It has two switchable mic/line inputs on XLR female connectors, so in small applications you wouldn't need a mixer. The inputs will supply 48 volts of phantom power on AC and 36 volts on DC so you can use a condenser mic.

The unit also has a tone generator, LED VU metering (in dot and bar modes) headphone monitoring and front-panel-mounted 9-volt battery backup. This furthers good operating practice on backup power supplies — the PressPower2 will run on not only the four 9-volt batteries and 120 volts AC, but also on any DC voltage from 12 to 36 volts, regulated or from a battery.

The PressPower2 has a switch to select 50 cycle 220 volts AC for foreign applications. It will switch seamlessly to the power supply with the most voltage.

The new model comes with an optional 16-unit expander that can also be powered by AC and battery power. It has a ground-lift switch and a Euro-style connector to connect it to the main box. Jim Kelsey, research and development director for Whirlwind, said the genesis for the expander came from the Seattle Mariners.

Hidden reporters

"They wanted to spread out the reporters in the news conference setting, so they asked us if we could build an expander that could be placed elsewhere in the conference room," said Kelsey. This keeps broadcast reporters from being hidden by the TV cameras and gives them a chance to be recognized in the conference setting to ask a question.

The media relations staff at Nazareth Speedway had the PressPower working the day before I got there. In most cases, media relations people aren't as technically oriented as we might be. The directions were so well-written that a layperson could get it to work. Green and his staff worked with the audio contractor so a proper signal could be fed to the box.

Once the proper connectors from the Electro-Voice mixer were found, the audio was similar to what is found in a studio. The sound was so good, one reporter complained about a rumble and thought it was an artifact. When I pointed out that a microphone was placed under an air-handling vent where a newsmaker was seated and the resulting rumble was the noise he heard, he was impressed.

This would seem to confirm the stated 20 Hz to 16 kHz frequency response and better than 95 dB isolation between mic outputs.

We didn't need the 16-output extender, but used almost every one of the 16 outputs on the main box. The TV people plugged in their transmitters, we plugged in our MiniDisc recorders and even savvy print people plugged in micro recorders with connecting cords. There were no complaints with any of the audio recorded.

At the Long Beach, Calif., CART event two weeks before, the audio feed was not up to snuff. When the feed from the mixer was plugged into CART's PressPower there were impedance and level mismatches, which were reflected

See WHIRLWIND, page 27 ▶

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Steve Lampen

We left our last installment, in the June 9 issue, talking about different impedances in coax.

There are some stories, possibly apocryphal, about the origin of 50-ohm systems. It is well known that RG-58 — that is the true Mil Spec RG-58 — is specified as 53.5 ohms. The reason for this number is lost in time (is there a Mil Spec historian out there?), though it probably has to do with the dimensions of the cable.

The impedance essentially calls out the ratio of size, so once you have chosen your desired impedance and you have selected the center conductor and a choice of dielectric, you have chosen all subsequent dimensions of that cable.

Another story concerns the making of the original hard line. This is coax made from two solid copper pipes. It is said that, if you take two standard copper pipe sizes together, you get 53.5 ohms. Thus the small cables had to match that impedance, and it was cheaper to buy big stuff off the shelf than make it yourself. Eventually, there were enough customers that companies began to make 50-ohm hard line (and the 50-ohm small stuff to go with it).

On the other hand, if you are most concerned with signal strength (i.e. attenuation), the ideal cable impedance would be 77 ohms. But that gives you an odd ratio. If you change that to 75 ohms, you can use off-the-shelf parts. That's why small signal cable designs such as antenna lead-ins and CATV/broadband cable are 75 ohms.

Bad planning

"But wait! All those coax-based computer systems were 50 ohms, weren't they?" Yes, and that was one of the worst decisions in the early history of computers.

So here's a mystery: Why did computers in the early 1950s use 50-ohm? Shouldn't they have used 75 ohms? The simple answer is yes, they should have. One later manufacturer did indeed use 75-ohm (Wang), but even the company created a problem by its choice.

The Mil Spec (RG-59) coax of 1950 was a high-frequency design, but at this time, computers were relatively low-frequency devices. (Do you remember when 1 MHz was a lightning-fast computer speed?) All RG-59 had center conductors which were copper-clad steel (that was the RG spec) because they were only supposed to work above 50 MHz where "skin effect" says only the skin is operating, so just have a skin of copper.

Those cables work poorly at lower frequencies. There the skin effect is much less and essentially, the entire conductor is used. It does not take a rocket scientist to notice that the attenuation of a copper-clad steel cable has just about twice the attenuation at 1 MHz as an all-copper cable (and more than twice the resistance at DC). So other computer people looked around for an all-copper cable. The first one they found with a reasonable size was RG-58, which the RG spec called out as all-copper center.

The wavelength at 1 MHz is 300 meters (984 feet). One-quarter wavelength is 246 feet. So, if your computer cable was less than 246 feet, it really did not matter what the impedance was. (And the majority of computer cables were indeed less than 246 feet.)

But by the time they went to 10 MHz (and eventually 100 MHz with "Thicknet" backbone coax) the critical distance was only 2.46 feet! However, it was too late — 50 ohms had been established as the coax computer standard. In a future column, you will find out that an almost identical situation has occurred to twisted-pair Category cables for computer networks.

It was the all-copper construction of RG-58 that lured them, and this legacy lives with us. Many installers still choose lower-cost video cables such as RG-59 for baseband (4.2 MHz) video, like surveillance cameras. But these cables are often copper-clad steel — poor choices due to high attenuation at low frequencies. These should be all copper center conductors!

Wang continued the problem because they chose a dual RG-59. While this was the "correct" impedance of 75 ohms, amazingly, they picked a copper-clad steel cable! (To be fair, there may not have been a standard all-copper dual 75-ohm coax at the time.)

So even in the 1970s and 1980s, the same mistakes were being repeated. However, the Wang system at least benefited from low signal loss due to choice of impedance. And, at higher data rates, this probably was more good than the "bad" of copper-clad steel conductors.

Back to audio

Getting back to the subject of audio, there are at least three other audio applications for coax. The first is for wireless microphones, which is really an RF application.

Wireless mics are becoming more popular. For remotes, they allow your on-air staff the ultimate in freedom of movement. By providing a Walkman to monitor themselves off-air and a wireless mic, your on-air staff is in the crowd doing interviews and creating exciting radio.

But if you use wireless mics, you

See LAMPEN, page 25 ▶

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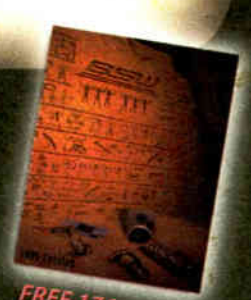

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World Radio History

Tower Lighting: Much to Learn

Charles S. Fitch

This is a continuation of the article on tower lighting that appeared in the July 7 **RW**.

Now our tower-lighting circuit has gone through the conductors from the building, the local disconnect, through some sort of tower-isolation circuit, through a photocell controller or control relay and finally started its journey up the tower.

Anyone who is not completely familiar with how difficult, detailed and serious the design and maintenance of tower electrical systems is should read the enlightening column by Troy Conner, the illustrious *Man of Steel*, in the Jan. 6 **RW**.

Wire is not indestructible. You may have heard the expression "soft drawn copper" in relation to the buried, bare-ground radials of an AM system. Copper wire is soft and malleable; that's why you can bend it. Wire also has weight whether it is romex, wire in conduit or coax.

The same way it is general engineering practice to support coax every so many feet to avoid stretch and distending, the NEC also requires you to support your wire as it goes up the tower in conduit, as a minimum, at no greater spacing than as specified in the NEC. The NEC also requires that you support all wires running vertically at the run's vertical termination as well.

For the sizes we have just been discussing, the above wire needs to have vertical support every 100 feet or less. This is true for all wire sizes between 18 and 1/0 AWG. Also, the wire must always be supported at the top per NEC 300-19 (a). The manner and means used to accomplish this support are covered in 300-19 (b).

Fantasy tower

Coincidentally, our fantasy tower is about 200 feet tall. For this reason our splice box, where we break off the sidelight wiring at about 100 feet AGL, can also be used as a location to support the vertical travel of all the wires in the system.

Experience over the years has dictated that, if you have a distance of more than 100 feet — say 160 feet — to travel between lighting fixtures, you divide that run into two 80-foot distances, placing a support point about midway in the run and

See LIGHTING, page 30 ▶

▶ LAMPEN, continued from page 24

might be aware that they come in a number of frequency bands, with differences in terms of reliability and quality and at a significant range of prices.

However, there is one thing in common: they are all transmitters and receivers, all of which work in bands that are pretty much "line of sight" between the transmitter end (hand-held, head-worn or lavaliere) and the receiver end. Another thing in common is that the transmitter is battery-powered, meaning that it has a finite life before you get no signal.

One of the secrets to reliability in any wireless system is to get the receiver as close to the transmitter as possible. This reduces RF reflections (multipath) off nearby objects and increases the signal strength to the receiver. The inverse-square law says that, by cutting the distance in half, you are increasing the signal strength by a factor of four. This also means that a transmitter with a battery that is dying will work longer or give extended acceptable performance if the receiver is closer.

It is unlikely, even in temporary installations, that you can simply pick up the receiver and move it closer to the wireless transmitter. You certainly don't want to move your wireless receiver somewhere up close to the wireless transmitter where you can't read the meters or make adjustments. What you need is to put the antenna up close and simply put some low-loss coax in between that antenna and the receiver. This assumes, of course, that the antenna can be removed from the receiver. If it can't, then ... well it can't!

We'll discuss how to choose the appropriate low-loss cable in our next installment and include a discussion on wireless mics and diversity antennas.

■■■

Steve Lampen is a senior audio video specialist for Belden Wire & Cable Co. in San Francisco. His book, "Wire, Cable, and Fiber Optics for Video and Audio Engineers," is published by McGraw-Hill. Reach him via e-mail to shlampen@aol.com

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World Radio History

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Cash Time Reduction

A station can always use Cash.

Cash is the trademarked name of a new product from **Prime Image**, which makes digital audio and video processing products. Cash lets radio broadcasters create additional commercial time without affecting pitch or creating digital artifacts.

The company says the real-time process realistically could create an additional 60 seconds every 10 minutes, thus representing a potential new source of profit. The amount of time is variable from zero to four minutes, which can be added to any period of time from two minutes to two hours.

Tests with mono signals have created 30 seconds in as little as two minutes, although the company does not recommend that extreme rate. A stereo version is available.

For information, contact the company in California at (408) 867-6519, fax to (408) 926-7294, visit the Web site at www.primeimageinc.com *or circle* ***Reader Service 92.***

XLR Connectors

Neutrik recently debuted its EaSZyCon Super Z Series of XLR connectors for the broadcast industry. The Super Z reduces assembly time by as much as 60 percent.

The NC3FSZ and NC3MSZ EaSZyCon XLR cable connection system offers quick, simple assembly with self-adjusting cable strain relief. Screwed assembly is not necessary and the system provides increased retention force under stress. The Super Z Series accepts a range of cable diameters. Gold-plated, self-cleaning tuning fork contacts extend its lifetime.

A latching mechanism features a positive lock with, according to the company, all mating male connectors available on the market. The assembly tool for the Super Z Series is designed as a pair of pliers that facilitate speedy cable preparation.

For more information contact Neutrik in New Jersey at (732) 901-9488, fax (732) 901-9608 or circle ***Reader Service 99.***

Format Converters

Videoquip offers the FC-1 and FC-2 stereo digital audio format converters for S/PDIF and AES/EBU digital audio signals.

The low-cost FC-1 provides conversion from S/PDIF to AES/EBU. The compact unit features both coaxial (RCA) and optical digital inputs, a locking XLR AES/EBU digital output, sample rates of 32, 44.1 or 48 kHz and status indicators for signal verification.

The Phase 3 FC-2 provides two independent converters; each may be configured as either S/PDIF to AES/EBU or vice versa. AES/EBU connections are XLR and S/PDIF connections are coaxial (RCA). Sample rate (32, 44.1 or 48 kHz) and mode indicators are provided for each channel. The unit is housed in a half-rack space for desktop or rackmount use.

For more information contact Videoquip in Ontario, Canada, at (416) 293-1042, fax (416) 297-4757 or circle ***Reader Service 83.***

Assistive Listening Catalog

The catalog from **Listen Technologies Corp.** features its new FM assistive listening product line, detailing transmitter, receiver and complete accessory options.

Listing 57 frequencies at 72 MHz or 57 at 216 MHz available on every Listen transmitter and receiver, this information can be used to cross-reference compatibility with other major ALD systems. Listen's unique LCD display, "Seek" feature, and in-unit NiMH battery recharging capabilities are described.

For information, call the company at (800) 330-0891 or (435) 647-0318, or circle ***Reader Service 102.***

Harris Digital Switcher

The HDAS 6 x 1 is a digital audio switcher from **Harris Broadcast Systems**, providing two output splits of a selected input. HDAS can be used as a preselector for a source selector for any type of AES/EBU equipment.

These are half-rack devices with optional mounting hardware. Selection is via front-panel, illuminated pushbuttons or from a remote panel. The unit is equipped with software to allow automation control via RS422/485 port.

The HDAS 10/110 is a balanced, 110-ohm device with screw terminal connections. The HDAS 10/75 is an unbalanced, 75-ohm version with BNC type connectors.

For information, contact Harris Corp. at (800) 622-0022, visit the Web site www.harris.com/communications *or circle* ***Reader Service 86.***

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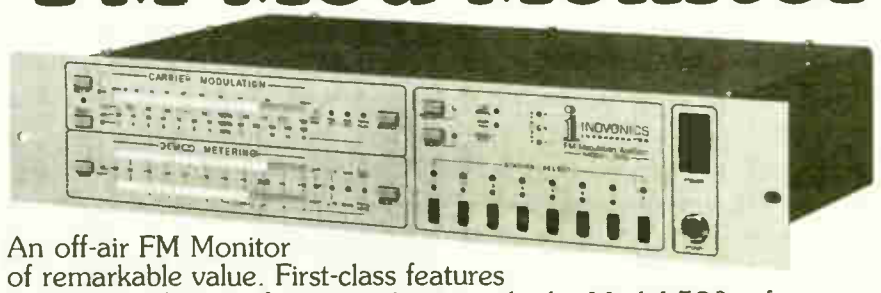

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World Radio History

Power in the Press Box

▶ WHIRLWIND, continued from page 23

in the outputs to recorders, etc. Like any good multibox or DA, the PressPower only distributed what was put into it. Some then unfairly rapped the multibox without realizing the cause-effect relationship between input and output audio: garbage in, garbage out.

When the public address microphone input is fed from the multibox and the multibox fed directly from the mixer, the resulting PA and our recording feeds seem to be cleaner. That's how the people at Richmond International Raceway, Lowe's (Charlotte) Motor Speedway and North Carolina Speedway do their infield press box feeds, and it works. It might take up an output, but it'll solve the problem (absent a DA at the mixer output for both the PA and multibox).

If your job and reputation depend on getting sound out, and you can't afford a glitch (presidential and other news conferences come to mind here), this box could literally save your job. The PressPower2 is the most versatile multibox I've encountered. I can find no minuses with the box. Kelsey and the design team listened to end users like the Mariners, equipment manufacturers (like Lectrosonics, who loaned the transmitter to them so proper spacing could be designed) and people like me who use boxes like this almost every day. It's the "Leatherman-style" tool you need to insure quality audio for all reporters who may need to hear or record conference audio.

■■■

For more information contact Whirlwind in New York at (716) 663-8820, fax (716) 865-8930 or circle ***Reader Service 101.***

Paul Kaminski is the news director for the Motor Sports Radio Network.

Reach him via e-mail at motorsportsradio@compuserve.com

The New PressPower2

Whirlwind Puts Comments to Use

When I returned the PressPower2 to Whirlwind's headquarters outside Rochester, N.Y., I was introduced to Jim Kelsey. On his bulletin board was a copy of my PressMite review (**RW,** Jan. 20). Jim took me on another tour of the U.S. Audio and Whirlwind facilities and explained how our suggestions for the PressMite were incorporated into newer models. The PressMite still has the same specs and versatility it had when I tested. Now, it has AC power capability.

Whirlwind/U.S. Audio is a sophisticated operation, with computer-controlled manufacturing equipment, and (probably the most important part), people who use the wire products and mixers to make music or distribute audio.

Like remote broadcasting, people involved in these applications can separate pretenders from contenders. Kelsey and I discussed the problems people run into on the road. One of those concerned the connection of professional mics to devices like MiniDisc recorders, DATs and cassette recorders. We talked about the use of Belden's mini star-quad 1804A cable with connectors (like his company's proprietary XLRs) and concluded the low hang weight of the cable would put less strain on the internal connectors of the recorder.

Kelsey said he liked to hear from customers and users because his department takes those suggestions and tries to come up with solutions to problems. He described the company as a classic "niche manufacturer."

Before I left the plant and offices, Jim and Steve Czubara presented me with their 1999 catalog, an impressive 73-page effort. The new catalog has tools for those who route, test, distribute and manipulate audio in both analog and digital modes.

The catalog deserves a place on your desk or bookshelf.

— Paul Kaminski

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World Radio History

Vandalism Hits Home at WEDO

Troy Connor

Being in the tower business, I hear about tower collapses many times each year. Ultimately, the causes of this type of catastrophic structural failure fall into one of two predictably basic categories: structural failures or human error.

Structural failures are by nature inherently attributable to either acts of God or human error. Acts of God are fairly self-explanatory; these include severe weather such as tornadoes, hurricanes, earthquakes, ice storms, flooding or any other "natural" cause.

Acts of God are generally not preventable, except at the point of original engineering. A tower can be designed stronger than is "required." It is rarely prudent to build any structure using only the bare minimum local requirements. This is particularly true when designing a tower in an area subject to high wind, heavy icing or both.

The second category, human error, is more complicated. This consists of structural failures caused by either ignorance or neglect and include extremely old and/or poorly maintained structures, which should have been inspected! Failures can also result from poor quality of manufacture, inferior materials or even faulty erection of the tower, which may lead to a fatal structural flaw.

The worst cases of human error involve the loss of human life, normally a tower climber or crew, who actually cause the failure while on the structure, usually killing everyone on the tower. Whether the result of inexperience, poor communications or a purely unavoidable accident, towers fail far too frequently with fatalities involved.

My personal opinion is that the tower industry, in a rush to keep up with the incredible glut of available work and to keep labor costs down, is guilty of using too many inexperienced tower hands. It can be argued that new (re: green) hands are inevitable given the exponential growth of the industry, in part due to the still growing national personal communications systems.

Random vandalism

A less common cause of structural failure with regard to towers is pure malice, meaning the intentional "cutting down" of a tower by vandals or even someone with a personal vendetta. These are, for the most part entirely, inexplicable and usually not preventable. It is difficult to prevent random acts of vandalism.

At some time late Sunday night, April 11, the WEDO(AM) tower was cut down, allegedly by a juvenile vandal. The WEDO tower, located in McKeesport, Pa., (just southeast of Pittsburgh) was a 300-foot tall guyed AM radiator. It was apparently brought down by the use of either a hacksaw or a set of bolt cutters used to cut one of the guy wires.

At this time, information is still a bit vague, as the suspect is only 16 years old. All involved parties, somewhat understandably, are reluctant to make any formal accusations as to conclusive guilt, prior to the hearing which was tentatively scheduled this month.

However, according to North Versailles Police Chief Jim Comunale, McKeesport Middle School officials alerted police of information they had concerning the tower. After speaking with the juvenile, detectives said they believed they had a suspect instead of a witness.

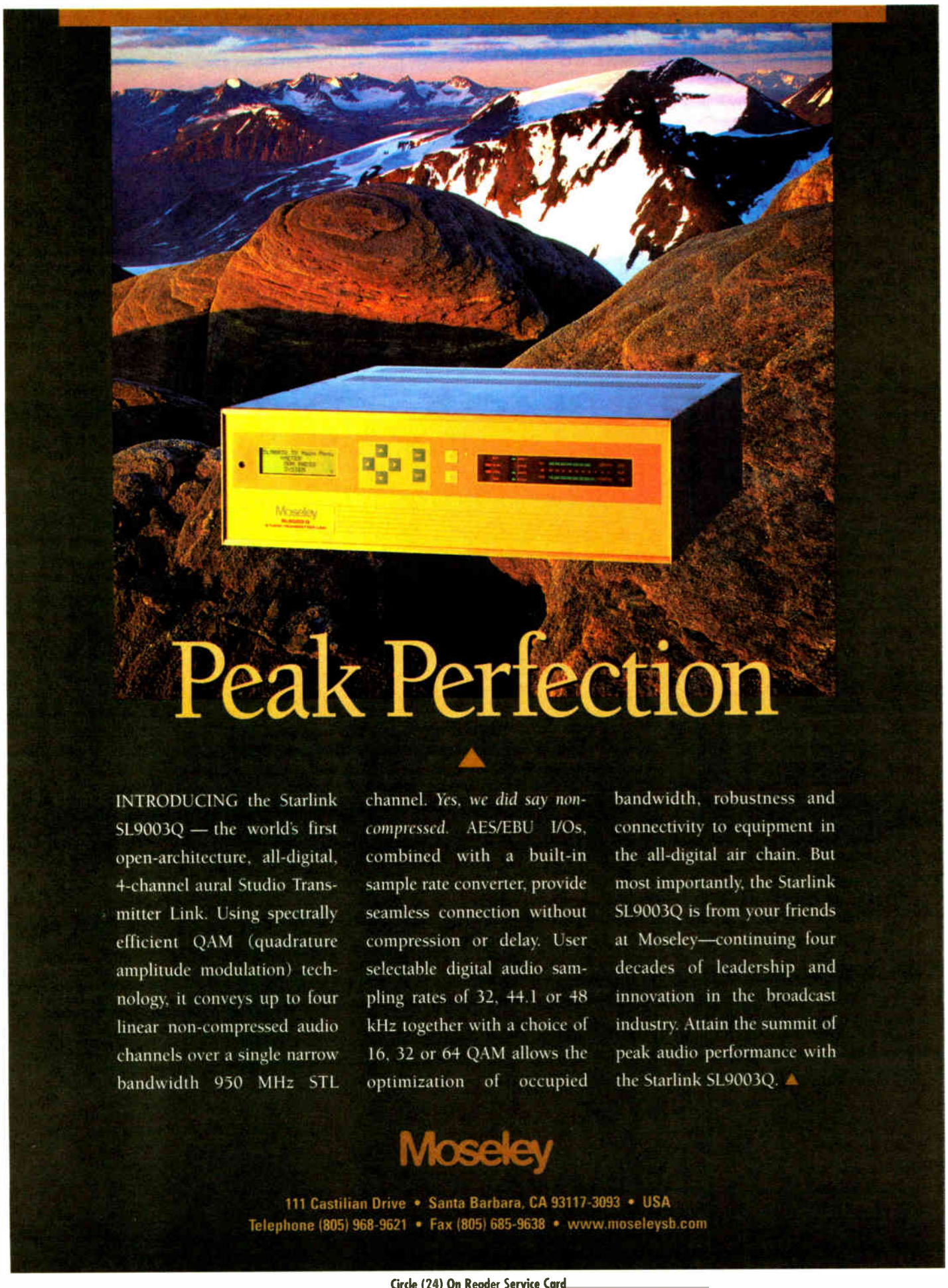
Felony criminal mischief

Police arrested the 16-year-old White Oak resident, who lives in proximity to the tower, little more than two weeks after the incident on a charge of felony criminal mischief.

Edminston Tower Inc., of Evansville, Pa., is due considerable kudos for its speed in erecting the replacement tower and getting the station back on the air in about 10 days after the incident. John James, general manager for WEDO, said the normal cost for a tower of this size is about $60,000, but with the involved site cleanup and new fence required, he's not sure how much the cost will be.

What lesson can be gained from this

See MAN OF STEEL, page 29 ▶



If someone is determined to cut down your tower, his chance for success is dismaying.

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World Radio History

Transmission Session at NAB99

▶ CFA, continued from page 19

presentations had received at NAB over the years.

"Three Egyptian MW Broadcast Crossed-Field Antennas" produced by far the most interest and discussion of this session. Co-inventors Brian Stewart and Fathl Kabbary described the design and implementation of the CFA antennas operating on the Egyptian desert outside Cairo (**RW**, March 31 and June 23).

Efficiency

The CFA is based on Poynting vector synthesis, which launches the radiated signal from a "capacitor" formed by a metal cylinder placed above a large metal plate. Each is driven in-phase, and work above a ground plane structure. The inventors claim the antenna produces efficiency up to 9 dB above the conventional quarter-wave vertical and buried ground system with excellent bandwidth, using very small dimensions. And it emits no induction field or vertical angle radiation!

Many of the questions following the presentation concerned possible FCC acceptance and licensing. Stewart conceded that many field measurements would be required to prove its performance. He said he would be releasing the field data they had collected within two years.

Many wondered why such data was not revealed as part of the paper. An American consulting engineer stated he had built a scale-model CFA antenna in his backyard and said it does work, although he had not yet performed any real measurements.

After the session, many others voiced skepticism about its claims. Without supporting field data to compare a known antenna at the same site, scientific conclusions seem to be insupportable. If it does work, even at reduced efficiency, it could still be quite useful in situations where space and height restrictions make conventional antennas impossible to erect.

Stewart and Kabbary invited anyone interested in the CFA to "come to Egypt and see it for yourself."

Extended coverage with GPS

Synchrocasting (**RW**, April 14) is becoming more popular as a method of providing additional coverage around metro areas. Bill Gould of Harris/Intraplex described the new, improved way of doing on-channel simulcasting in his paper entitled "Using GPS Synchronized Transmitters for Extended Coverage in FM Broadcast." Some group owners are acquiring and simulcasting several lower-power stations on the same channel around various large markets to achieve full market coverage.

Continental Electronics ***described the inverted unipole, a novel wire antenna for AM primarily intended as an emergency antenna.***

"The advent of GPS technology to help synchronize the timing of all the various signals now provides an affordable and much more accurate time-base standard to optimize the performance of such a network of stations," Gould said.

Previous methods to control timing differences of signals of similar strength arriving at the same point were not as effective or stable in minimizing the multipath interference artifacts which are a normal by-product of synchrocasting.

Using the Harris/Intraplex Synchrocaster package including a T1 digital STL, GPS receivers and timing synchronizing hardware, plus the digital stereo processor and exciter, gives the user the ability to "tune" the location and size of the areas where coverage of two or more co-channel transmitters overlap. The GPS time-base accuracy can be maintained within 2 microseconds for each station.

By taking advantage of FM receivers' "capture effect," along with the precision time-base control, a car radio listener can drive around a metro area listening to each co-channel transmitter in the network almost seamlessly, without encountering significant interference. Not only are the RF carrier frequencies locked together with the GPS time-base signal, but the audio and the pilot signals of each station are as well.

Gould emphasized that those stations which have achieved the greatest success implementing this technology are "all digital," from console through to the exciter.

Data in the sidebands

Kenwood Electronics Design Engineer Atsushi Shinoda presented the final paper of the session.

"Trial of AM/Digital Multiplexing Transmission" described a novel method of transmitting digital data in the sidebands of an IBOC AM signal, including the analog AM program on the carrier wave. The data modulates the carrier using QPSK/OFDM digital modulation, producing both an upper and lower sideband, which are phase reversed from each other.

A synchronous detector can then demodulate only the AM analog component with no degradation from the digital data. A difference detector is employed which will only respond to the digital data, without degradation from the analog AM host. Data rates of up to 7 kbps could be supported using this method.

■■■

Tom McGinley is chief engineer of WPGC-AM-FM and WARW(FM) in Washington, D.C., Infinity Broadcasting Corp. (CBS Radio) and technical adviser to ***RW****.*

Reach him via e-mail at k7qa@aol.com

▶ MAN OF STEEL, continued from page 28

tower tragedy? Unfortunately, not a whole lot. Towers located in remote or rural areas are difficult to protect completely from vandals. If someone is truly determined to cut down your tower, his chance for success is dismaying.

However, a more obvious preventative measure is good fencing, and not just around the base of the tower. I have seen many towers without any protection for the guy anchors. A fence around the base of the tower is always needed to deter unauthorized access or recreational climbing.

The guy anchors should be similarly protected because they are perhaps a tower's most vulnerable structural component. In addition, it is not unheard of having a tower brought down by a delivery truck or even a tractor. A quality six- or eight-foot tall barbed wire-topped enclosure is strongly recommended around each of the guy anchors.

If power is available, infrared triggered motion lights might also be a good deterrent. Another idea to consider is purchasing a monitored electronic security system. I know of one station owner who has power poles with street lights at each of the six guy anchors. This station's eventual plans include the addition of six weatherproofed security cameras with a circuit that will sense any motion in the picture and bring that camera up in the control room.

I need to thank Jerry Juran, librarian at The Daily News in McKeesport, for taking the time to dig up, photocopy and mail me the three newspaper articles on the story. If you have any tower tales to tell, feel free to contact me.

We here at Tower Maintenance Specialists are finally (and admittedly grudgingly) making the leap into the future and onto the Internet. I hope we have the site up and running before fall. As soon as we have an address. I'll pass it along.

■■■

Troy Connor is owner of Tower Maintenance Specialists in Brasstown, N.C. Reach him at (828) 837-3526 or fax (828) 837-1015.

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World Radio History

Tower Lighting a Complex Issue

▶ LIGHTING, continued from page 25

below the 100-foot limit. Because you have to support the wire, you might as well splice it (normally a terminal block) to simplify troubleshooting and allow easy replacement of defective sections.

AM towers in lightning-prone areas seem to take a wire short at least once every seven years. Replacing just 80 feet of a single wire is a lot less expensive and easier than replacing 450 feet.

Just before we leave tower lights, let me reiterate a few basic NEC concepts so that there is no confusion:

The neutral is a grounded conductor which is part of the electrical-supply system.

The bonding/safety ground is the grounding conductor installed for personnel safety and to carry away any fault currents.

It is general engineering practice to run your tower lighting circuits in galvanized metal thick/heavy wall or rigid conduit.

Internal wiring

On AM series-fed tower systems, your lighting circuit will need to be isolated to get onto the tower to avoid disturbing the RF parameters. Once on, since the tower is used as the antenna, it is viewed as a device or a machine.

In this case, the wiring on it does not follow the usual wiring restrictions but is considered more internal machine wiring. Ergo, the conduit is part of the tower wherein the wiring inside is machine wiring for lights.

On grounded-base AM towers (such as the unipole), FM and TV towers, the NEC continues to view the tower as a structure since it supports but is not part of the antenna(s). Obviously, the base (and the rest) of the tower is at ground potential. The better the bottom is grounded, the better it works. The tower lighting circuits are viewed as structure wiring. Therefore, the conduit continues to be the bonding/safety ground and the wiring inside of it is a branch circuit.

In the case of the isopole/unipole or a tower with detuning loops on it, and in keeping with what I just mentioned regarding the two different conductors, there are some special details.

Because it is GEP to supply the lights on an AM tower in metal conduit, the galvanized steel conduit coming out to the tower or the ground*ing* wire that is part of a direct burial UF circuit would be the ground*ing* conductor and would be grounded at the base as part of the tower-grounding effort.

If it is conduit, to avoid creating a loop at the base, it is best to bring it up to the tower at the very bottom or use an enormous strap jumper at this location to go from the conduit at the tower face to the ground system.

A "U" section or drip loop of LA/LT "liquidtight" at the tower is not a bad idea if for no other reason than as an expansion joint between the two runs of metal conduit. Don't forget a breather/drain.

Maintaining continuity

The conduit on the tower usually is a continuous connective conductive as it goes up the tower via an inch or more of threads at each junction and isconnected along its length to the tower through its hangers. This arrangement does an excellent job in helping to maintain the electrical continuity of the tower and to provide shielding to the circuit wires within.

UF (ultraviolet resistant) romex can also be used but is not really the best solution on an AM tower (especially over 1,000 watts) for all the reasons discussed above.

Recently I have noticed the use of flexible cord material such as SJO on towers for lighting purposes and deicers. I have several problems in using this wire type, including SRO cable, which seems to be specifically forbidden by the following:

1. *The cable is not listed in the current NEC. (See table 400-4.)*

2. *Section 400-8 appears to specifically preclude the use of a flexible cable in this instance since it cannot be used as a substitute for permanent wiring in/on a structure.*

3. *Although some recognized and approved "drop cable" is UV-resistant, flexible cables in the Sxx series are not readily available in a UV-resistant outer covering.*

See LIGHTING, page 31 ▶

AM towers in lightning-prone areas seem to take a wire short at least once every seven years.

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Live tags, trivia and copy are displayed automatically on the screen. Announcers don't need a clumsy copy book or liner cards. They can talk as early as they want before songs fade and over intros or in the clear. VTVI is *so* simple to use: a touch of the space bar triggers the next song or the next spot. Voice Trax are recorded with the computer's regular sound card with exceptional digital quality.

Unlike live radio, any or all of the Trax can be reviewed and possibly improved by re-recording. With the VTVI's Segue Editor, announcers can fine-tune their timing of song intros, back sells and donut spots without re-recording.

VTVI is Goof Proof!

VTVI includes Scott Studios' exclusive Voice/Music Synchronizer. Whenever the announcer mentions song title or artist, he or she turns on the link so the back sell or intro plays ***only*** with the correct song.

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Here's Scott Studios' Voice Trax Via Internet (VTVI) software, shown with the optional Segue Editor. VTVI allows a distant announcer to pre-record a 4 hour show in about 15-20 minutes with nothing more than a Windows computer with an ordinary sound card, an Internet connection and a good microphone.

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When the announcer is done, a click on the VTVI Auto-Send button dials the Internet over a standard phone line and uploads the entire show to your Scott Studios digital audio system automatically. Transfer does take a long time, but your announcer can be answering e-mail, writing copy or creating promos on the VTVI computer while the show transfers.

VTVI isn't limited to music announcements. It gives high quality audio to recorded spots, remotes, weather, stock reports, news and election returns.

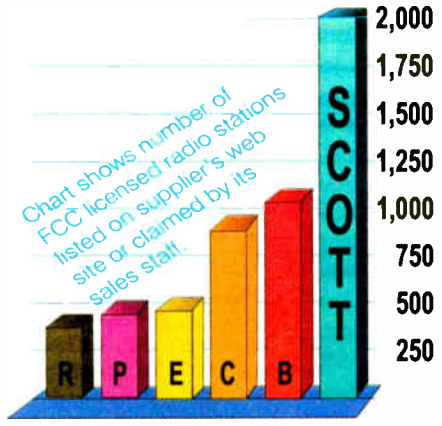
Your station will sound great with Scott VTVI! The only thing you need is an Internet connection on each end, a $29 a month FTP transfer site and the Scott NT System with Remote Recording Router.

Voice Trax play seamlessly without anyone back at the station. And if the announcer forgets to record something, or if songs or spots get changed at the last minute, Scott's Voice/Music Synchronizer automatically substitutes a generic Voice Trax with the same voice for the day and hour of that break.

3 VTVI Models: Good, Better, Best

Scott Studios also offers a $500 VTVI+ that sends your distant announcer telescoped song intros and endings via the Internet. With VTVI+, a telescoped aircheck can be previewed and fine-tuned in the context of starts and ends of songs and spots.

Or with VTVI Deluxe, your announcers record their Voice Trax ***while listening to song and spot intros and endings*** in context!



VTVI is just one of several ways Scott Studios digital systems can improve your sound ***and*** your bottom line.

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World Radio History

▶ LIGHTING, continued from page 30

4. *To continue that thought, unless recognized and certified as for "drop cable" use, Sxx series cables should not be used in a vertical run situation. If they are certified, approved and suitable for continuous drop, the special kellum grip supports needed are very expensive, laborious to install and generally cumbersome.*

Isolation circuitry would be redundant and superfluous on a unipole or loop detuned tower. However, chokes (such as ferrite toroids) on the wires going to the transmitter building might not be a bad idea to try and keep any lightning flow currents out of the associated building(s).

The *neutral*, although a grounded conductor, is inside the conduit and is *not* grounded to the tower. It goes directly to the light sockets.

NEC Mystery

Everyone loves a mystery. The current version of AC 70/7460 is version J which I have reviewed only on the Internet. There was no version I because the FAA feels that the typographic similarity between a "1" and an "I" is such that drastic confusion could be engendered.

However, between H and J, 0 paragraph 53, which delineates the requisite supplied voltage, has disappeared. If you comply with just version J, then theoretically you could turn on your tower lights and run them at 1 volt. (But don't!)

The plus or minus 3-volt standard also appears in AC 150/5345-43e, which is the FAA's manufacturing and operation standard for obstruction lighting. You are obligated to make sure those bulbs are fully illuminated.

Also, paragraph 52, which dictates when the red lights should run, is so rewritten that one wonders what happened and/or why. The new J text is, in my estimate, even more confusing than the H version. If you parse/diagram the sentence for when you can turn off the lights, it appears that literally you could turn them on and then turn them right off because "the control device should turn off the lights when the northern sky luminance rises to a level of not more than 60 foot candles (367.7 lux)."

In a classic case of "I know what you mean but that's not what you said," this sentence allows you to literally turn off the lights at any point up to 60 FC.

We know what the FCC/FAA wants even if they don't. Let the lights run to 60 FC.

Version J is available on the net at *www.faa.gov/ats/ata/circular/OML-HOME.HTM*

The FAA lighting specs are available on the Net at *www.faa.gov/arp/5345-43e.pdf*

Incidentally, neither of the changes discussed above were noted on the associated change sheet!

On a historical note, it is the industry perception that the FAA standard for your light system to operate at plus/minus 10 percent of rated line voltage means that "it can survive these extremes" reliably — no bulbs will blow, no devices will fail-safe, etc. However, if the FAA ever wanted to enforce the full scope of that standard, every light system in the country would need a voltage regulation system to keep the red-light-bulb voltage within 3 percent.

— Charles F. Fitch

Hot debate

Lately there has been hot debate amongst several broadcast engineering exchange peer groups concerning grounding the neutral of the tower lighting circuits at the base of the tower under NEC 250-24(a). This section doesn't really address the connection of the supplied neutral to a grounding conductor or a local grounding electrode for a single circuit. What it does address is the re-establishment of the ground*ing*/safety path and the neutral *if* you have a local distribution panel. Since most towers do not have local distribution nor more than one supplied circuit on them, I do not believe it wise to universally dictate that the neutral be grounded to the tower ground system.

As always, the best way to proceed is to have an advanced review done by the local BI, underwriter or whoever has final code authority in your locale to make sure that your planned installation is code-compliant before you proceed.

If they do not agree with your collective genius and you feel that your way is best, there is a process for adjudicating disputes. It takes some time to get a decision but when done, you will have the final word on whether your installation is compliant and insurable.

Now that we have progressed to the station loads, in upcoming episodes we will address NEC details concerning the branch circuits to and installation of the transmitter, bench, rack, HVAC, UPS and isolated ground-type loads.

Editor's note: Our author has promised to return to tower lighting in the future to address some circuits for not only tower light control but automatic monitoring as well. Circuits and schematics for these systems that you can use as a departure point for your design will be available on the ***RW*** *Web site,* www.rwonline.com

■■■

Charles S. Fitch is a registered professional consultant engineer based in Connecticut.

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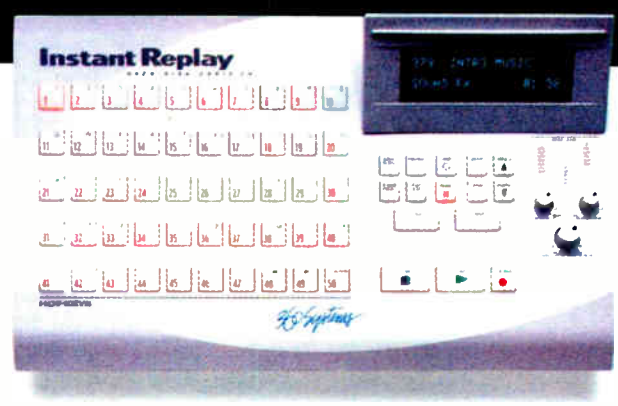

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World Radio History

GM Journal

Radio's New Top 20

Page 37

Radio World | Resource for Business, Programming & Sales | July 21, 1999

NEWS ANALYSIS

The Brave New World of E-Filing

Barry D. Umansky

Later this year, radio and television broadcasters will begin filing FCC applications electronically over the FCC Web site.

Electronic filing at the commission is not a new concept for some broadcasters. Earlier this year, television stations were required to submit their Children's Television Reports — the FCC Form 398 — electronically, using the FCC Web site as the vehicle for transmitting the report.

Photo by Paul J. McLane

FCC Headquarters. The commission's e-filing plan can benefit you, but there are pitfalls to avoid.

And it wasn't pretty. The FCC computer system crashed and the agency had to grant an extension of the deadline for filing the kidvid form.

The tower registration process has been undertaken electronically for some time, as has been the licensing of a variety of non-broadcast services through the Wireless Telecommunications Bureau's Universal Licensing System. Additionally, later this year the FCC should be employing its all-new electronic system for call letter reservations and changes.

But the big turn will be when the commission initiates the mandatory electronic filing of broadcast applications this winter. These will be broadcast applications for everything from new station CPs and mods to transfers and assignment applications. LPTV and FM and TV translator applications also will be filed electronically, using the FCC's Web site. (See the box on page 41 for a listing of the forms to be part of the FCC electronic filing regime.)

There also will be plenty of room for confusion and computer problems at the agency. In addition to the Children's Television Report episode, the experience gained under the commission's often slow or service-suspended "Electronic Comment Filing System," combined with recent service interruptions of the entire commission Web site, broadcasters can expect to encounter some rough times in the evolution of our transacting FCC business electronically.

The commission will be giving broadcasters and broadcast applicants six months of voluntary transition time from the date that each of these new electronic application/reporting forms are released to the time that they must be filed only electronically — no paper copies and no diskettes. During these six-month periods, you will have the option of filing electronically; but when the six months are up, all applicants must employ the electronic method for filing the particular form.

The basic construction permit form (FCC Form 301) and the assignment and transfer forms (FCC Forms 314, 315 and 316) will be the first ones made available for electronic filing.

The system

Here are the key components of the FCC Mass Media Bureau electronic filing system:

FCC Web site — The FCC says the system will be "user-friendly" and, because it is web-based, will work with any commonly-available computer hardware or software employed by a station, communications law firm or engineering consultant.

Mandatory Six Months After Release of Form — Though these periods might be extended if there are problems with particular forms or with the Mass Media Bureau electronic filing system generally, the commission says it will afford a six-month "get-acquainted" period for broadcasters, their communications counsel and engineering consultants to examine and experiment with the electronic versions of individual reporting forms before they would be required to be submitted over the commission Web site.

For example, if the commission were to release an electronic version of a particular broadcast application form on

See UMANSKY, page 40 ▶

The Health Market Buys Into Radio

James Careless

When it comes to health supplements, Chattem Inc. is not a household name. In fact, mention the company to most people and chances are you will get them scratching their heads.

But, for radio stations, Chattem is an advertiser that deserves attention. That's because the maker of Sunsource Melatonex Sleep Aid, Garlique, Harmonex Herbal Remedy and Propalmex is definitely one of the industry's best friends.

Health supplement sector

The reason?

"The health supplement sector spent about $19 million on radio ads in 1998," said Stewart Yaguda, president of Radio 2000, Interep's new business development program.

Out of the $19 million figure, Yaguda said, "Chattem was spending $9 million of it, so they're good for us."

According to Yaguda, the health supplement sector spent about $250 million on media last year.

According to Competitive Media Reporting, Chattem's Sunsource Melatonex Sleep Aid was the top vitamin sponsor on network radio in 1998.

See HEALTH, page 45 ▶

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WFMU: Independent and Loving It

Alan Haber

If Jersey City, N.J., freeformer WFMU(FM) isn't a public radio station ... or your standard community radio station ... or a radio station based around any kind of politics you'd care to lobby ... or a college radio station ... then what is it?

General Manager Ken Freedman calls it an independent freeform radio station. It's also a station, he suggests, that has "developed its own personality and has not had a personality or an agenda imposed on it. It's a station that has developed its own approach and own personality by itself over time, and it's a community in the sense that oftentimes listeners run into each other or see the bumper stickers on the cars and there's this sense of something shared between listeners of the station."

In others words, WFMU is a killer beamer that fights the good fight for its loyal and dedicated ears, in both its local coverage area and on the Internet, where its signal is Webcast by broadcast.com.

But WFMU is *not* — repeat, *not* — a college radio station. This might be because the station *was* a student station at one time.

WFMU hit the airwaves in 1958 as a 10-watter; in 1965, the power was upped to about 1,400 watts and the station, operating out of the now-defunct Upsala College in East Orange, N.J., realized coverage of the New York metro area.

One year post-Summer of Love, WFMU hung a full-time, freeform shingle out for all to see and hear, an act which was followed in true freeform style in August 1969 with the staff walking out and the college closing down the station.

"The staff walked out because they felt like the counterculture had sold out," said Freedman. "They saw the first Woodstock celebration as evidence of the counterculture completely selling out, and they kind of felt like they had taken this thing as far as they could.

"Basically, the outsiders had taken over the college radio station and Upsala College was very unhappy about that. They knew that the college was going to clamp down on them. So rather than getting into a huge fight, they just walked out."

The station was dark for 10 months, at which point Upsala brought in a professional manager "and attempted to remake the station in a more professional model," said Freedman. "They tried to remake it kind of as a student training ground kind of station."

Luckily, the right cadre of DJs, dedicated to freeform and all it stood for, came back on board and the station once again forged on with its purpose through the '70s and '80s; all the while Upsala College was having financial problems and giving WFMU less money. When Freedman took the post of manager in 1985, "We were not getting any direct cash subsidy at all from the college, but they were providing non-cash subsidies such as free rent, free electric, things like that," he said.

The station had been doing on-air fund drives since 1968; the more money it made, the less money the college gave it. Freedman says the college taught the station "to be self-sufficient, so that when the college finally declared bankruptcy and was completely liquidated, we already knew how to raise our own money and how to spend it to keep the station on the air."

So WFMU, an eclectic, freeform radio station, continues to fight the good fight, not from the 40-acre grounds of what once was Upsala College but from its new home in Jersey City, where it moved in August of last year.

The station's principal competition is Fordham University's WFUV(FM), with which WFMU overlaps some artists while it approaches its on-air mix from a different perspective. There isn't really much competition past WFUV; Freedman said he sometimes wishes there were.

"I think it might actually improve us," he said. "But the fact that there is nobody even attempting to do what we do leaves us completely free in that sense to do whatever we want to do. That's a good thing and in a mild way it's a bad thing." Because it doesn't motivate people to do their best? "It can lead to some self-indulgence," he said. "It can lead to people being a little lazier than they would normally be."

Into the music

It certainly doesn't *sound* as if anyone on the air at WFMU is a lazy sort. The on-air folks sound truly and deeply *into* the music they play — they sound like the kind of people you desperately *wish* were working at your local record store and could turn you on to new and exciting sounds.

But even as the platters spin at WFMU, the business of business goes on, and Freedman has a firm grip.

"From a business standpoint, I run an extremely tight ship," he said. "I'm running a business. It's a not-for-profit business, but it's a business, and we try to do things efficiently and effectively. I read trade publications that are for the corporate world to get ideas on just how to run WFMU more effectively as a business."

It's another story from the programming point of view. "We leave the DJs completely alone," said Freedman. "We really don't try to nudge them in any direction. We certainly might give them suggestions. The program director and I both give people suggestions or constructive criticism, but we don't lay down any guidelines about how often they speak or how they speak or so on and so forth. We do train people on how to deal with FCC regulations and all that, but people are free to program their shows and they really are free to come up with their own formats, too."

Ken Freedman

The on-air voices come from the listenership, Freedman pointed out. "Pretty much every person on the air started off as a listener," he said. "That's how they got on the air. And that's the sense in which the station is a community. The station really is a community of people, even if I say we're not a community radio station. We definitely serve a community. We come out of a community. The listeners are the people who keep the station funded."

WFMU, which counts only three people as its full-time staff, is 100-percent funded by listeners and 100-percent listener-operated. The station, said Freedman, could not develop "in this day and age."

"It's been a combination of a whole bunch of different factors," he said, "and luck definitely being a part of it ... The elements of luck were there in that we got coverage of a huge metropolitan area. If we were in the middle of North Dakota, we would not be a freeform radio station because we wouldn't economically be able to survive as a freeform radio station."

WFMU holds one fund drive each year — only twice in the last five years has there been a need to hold a second in the fall. The station is always strapped for cash. "Two months ago, we were on like the brink of bankruptcy and then we just had a fund-raiser and it was incredibly successful," said Freedman. "We raised almost half a million dollars, but that's the way it goes."

For six to eight months after a fund-raiser, said Freedman, "We're doing okay, and then as it gets to be the fall and the early winter and January and February, we're completely desperate. Everything starts getting repossessed. We start getting cut-off notices from the electric company and the telephone company and Federal Express and we can't buy anything and we start owing everybody lots of money, and then the marathon comes and it just washes the debt all away."

Which, to WFMU's local listeners and those listening on the Internet (an estimated 500 to 1,000 a day, according to Freedman), is a good thing.

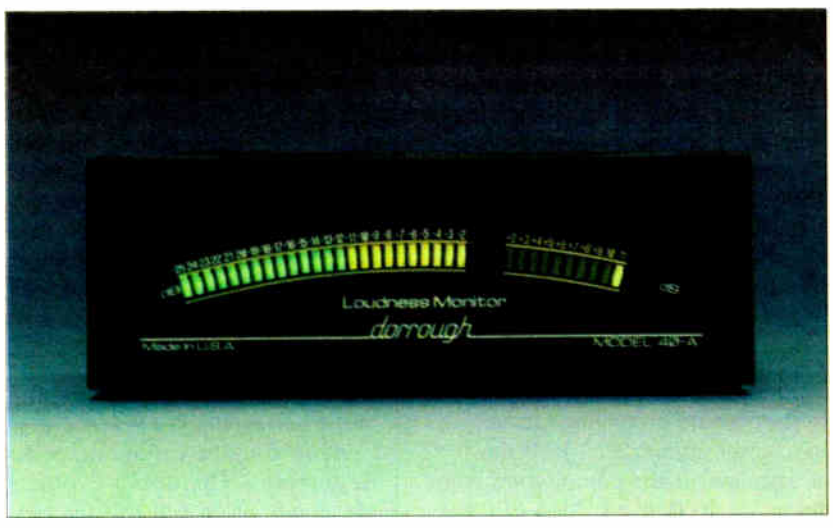
WFMU's cyber home is at *www.wfmu.org*

■ ■ ■

Alan Haber can be reached via e-mail at zoogang@earthlink.net

WFMU is a station that has developed its own personality and has not had a personality or an agenda imposed on it.

— General Manager Ken Freedman



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World Radio History

Getting My House in Order

Alan Haber

And so it has come to pass that after a year of musings about radio's relationship with the Internet, I am moving on.

The Internet and I are old friends.

I've been surfing the cyber-waves since the pre-browser days. I'm going to say that I was the first person to write a column on this stuff (if you know better, keep your thoughts to yourself — this is *my* party, after all).

Those of you who have been with me since the first "Haberspace" appeared know where I'm coming from, and will probably not be surprised to see me going. You will also probably remember that, initially, "Haberspace" had another name that we had to change in a hurry.

What's in a name?

We were in the IMAS Publishing booth

at a spring NAB — me, former editor Lucia Cobo and then-news editor John Gatski — and were stuck for an alternative moniker. We batted around a couple of options, each one sillier than the one before (at least as I remember it). And then Gatski (at least I *think* it was him) said, "How about 'Haberspace?'"

I don't mind telling you I thought he was nuts. I probably resisted the idea — in fact, I'm *sure* I did. But "Haberspace" it was and "Haberspace" it continued to be until I left **RW** for a while to edit the late, lamented Tuned In magazine. When I came back, and after a slight change of perceived view and a couple of milkshakes, "Haberspace" morphed into "CyberHouse."

A slight change of perceived view? Yeah, I guess I went through somewhat of a change of brainial venue between the closing of "Haberspace" and the opening of "CyberHouse." I started to think about the way the Internet was being perceived by radio people and I decided I was feeling a bit let down.

I am absolutely in awe of the Internet. I think that it is so magical it might as well have been imagined by Walt Disney. Radio has never had such an opportunity to expand and reinvent itself. It's almost as if this is KDKA all over again.

Yet our industry seems to be bogged down in endless think and strategy sessions and a whole lot of bellyaching about the quality of Internet audio and how nobody's making a dime in cyberspace and all it's going to get everybody is one big fat stomachache and plenty of sleepless nights.

Surfing for fun

Some of us have lost our sense of wonder. And that's what this is all about, folks. Yeah, I hear you — radio is a business, dammit, and anybody who doesn't treat it as such is a fool. Well, you've got a point. Radio *is* a business.

But is anybody having fun anymore? Radio is supposed to be *fun*. But it's become bogged down in business, and business can rip the heart out of something and take the fun along with it.

So, I urge you to regroup your thoughts. Remember why you got into radio in the first place.

Don't be like all of those baseball players who got into the game because they loved it and it absolutely consumed them, and after years of growing up in sandlots and ripping holes as big as tires in their jeans and T-shirts they became adults and secured agents to do their bidding and became businessmen in the process. And maybe went on strike and didn't play while their futures were being dissected in corporate boardrooms.

Look at the Internet as one huge set of possibilities. And act on them. You can strategize only so much.

I guess I'm a bit burned out, so I'm going to go away and recharge my batteries. I've had a ball talking to you over the past years.

I've forged friendships with a number of you and I'll treasure them forever. Our back and forth, even when you didn't agree with me, has been more than valuable. I appreciate all of you.

So here I go, in the home stretch as I type my last words. After I key in my last period, I will go to *www.webradio.com* and pick a station at random to listen to.

My RealPlayer or Microsoft Media Player will fire up, some exciting sounds will come at me through my computer sound system, and I will go about surfing the Web, looking for new, magical experiences.

I hope you will encounter many of the same.

■■■

RW salutes Alan Haber for his forward thinking and dedication to the possibilities for broadcasters in radio and the Internet.

Radio's New Top 20

Here's what the big-group radio landscape will look like when all pending deals are completed, according to BIA Research. Companies are ranked by BIA's 1998 estimated parent revenues. Figures are as of June 24.

BIA Rev Rank	Parent Company	BIA's 1998 Est. Parent Revenues (in $000s)	Parent # Stns	Parent # Mrkts
1	Chancellor Media Corp.	1,861,355	469	101
2	CBS Radio	1,667,550	163	35
3	Clear Channel Comm.	1,212,286	463	82
4	ABC Radio Inc.	355,650	44	18
5	Cox Radio Inc	283,650	57	12
6	Entercom	199,700	43	8
7	Hispanic Broadcasting Corp.	187,125	42	13
8	Citadel Communications Corp.	164,325	116	20
9	Susquehanna Radio Corp.	162,600	24	8
10	Emmis Communications	158,450	16	6
11	Cumulus Media Inc.	157,475	242	38
12	Sinclair Communications Inc.	140,070	54	10
13	Bonneville International Corp.	127,200	15	6
14	Jefferson-Pilot Comm.	112,050	17	5
15	Greater Media	109,050	14	4
16	Spanish Broadcasting System	99,050	15	6
17	Radio One Incorporated	97,450	26	10
18	Beasley Broadcast Group	87,500	28	6
19	Saga Communications Inc.	77,825	42	10
20	Journal Broadcast Group Inc.	65,500	37	8

Source: BIA's MEDIA Access Pro. Photo by Alan R. Peterson

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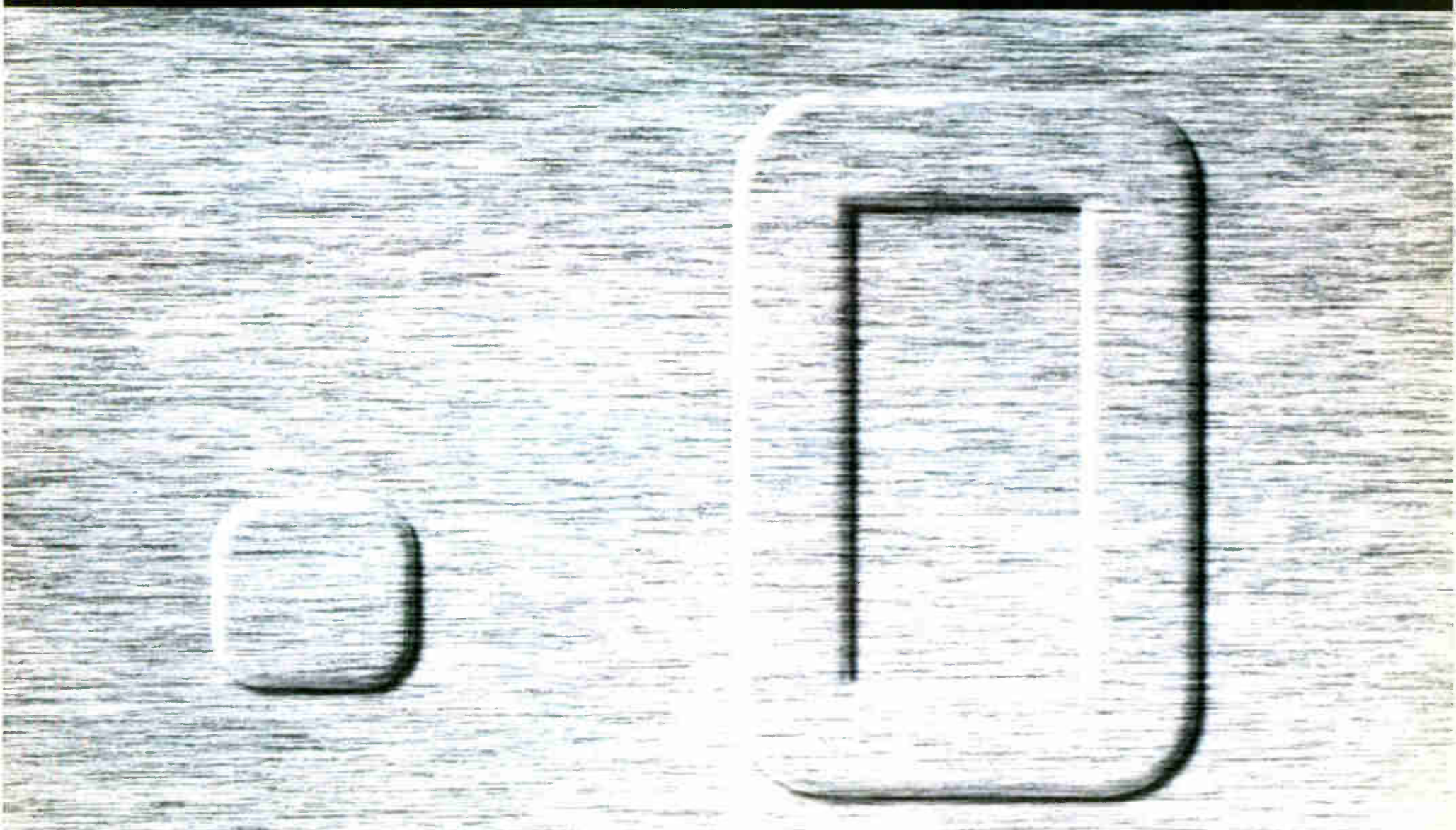

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MICHAEL KERNAN. WCSX/WRIF/WXDG, Detroit

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Electronic Filing at the FCC

▶ UMANSKY, continued from page 35

Sept. 1, 1999, broadcasters still could use paper forms (or voluntarily employ electronic filing) until March 1, 2000.

Broadcast Hardship Waivers — It is not lost on the commission that some broadcasters may not have the financial wherewithal to purchase computers, modems, phone lines, etc. to access the Internet from the station. However, on the theory that these costs are diminishing every day, and in light of the access the public has to Internet-ready computers in public libraries and other local sites, the FCC says that it does not expect that mandatory electronic filing will prove to be a financial hardship for the vast majority of broadcast licensees, permittees and new broadcast applicants.

Though the FCC has stated that it does not intend to grant such waivers routinely, it will accept waiver requests submitted by broadcasters who genuinely do not have the resources to conduct business electronically with the commission.

Likely Timetable for FCC Implementation of Electronic Filing — In its Report and Order released last fall, the commission said that it did not expect any of the 15 Mass Media Bureau forms listed to be available for electronic filing earlier than March 1999.

That prophecy has proven true. As of this writing, none of these forms has been made available for filing over the FCC Web site. As a result, it would appear that the very end of 1999 or the first part of the year 2000 would be the earliest that mandatory electronic filing would become a reality. This timetable, of course, allows for broadcasters and their counsel to better prepare for the eventuality of mandatory electronic filing.

(On June 14, the FCC released revised *paper* versions of FCC Forms 301, 314, 315 and 316. In that action, the FCC said it would not accept earlier-released versions of these forms on or after July 15. This FCC action does *not* constitute the start of the six-month period after which these forms must be filed electronically.)

Certainty That Applications Filed are Received by the FCC — For anyone who has sent an e-mail, ordered a book online or engaged in any other Web-based communication, there often is that nagging question as to whether what you sent out is reaching the intended recipient or is simply meandering through cyberspace. The Mass Media Bureau's system is designed to ease most of those fears.

The system will immediately notify the applicant that the application sent has been received. Broadcast applicants will be sent a page (which they can print out as a "receipt") indicating the status of the application (e.g., "received"). Applicants also will be able to print out a copy of the entire application. Indeed, the commission still will require that such a paper copy of the application (such as a "filed" copy printed off the FCC Web site) be placed in the local public inspection file.

Meeting FCC Deadlines — In the regime of paper filing of applications and reports, for many years the FCC had required that applications and reports subject to a deadline be filed by 5:30 p.m. Washington time on the deadline date. In May 1999, the commission changed that 5:30 p.m. deadline to 7 p.m. for documents for which a fee was not required. Documents requiring filing fees still must meet the 5:30 p.m. deadline.

Broadcasters can expect to encounter some rough times in the evolution of our transacting FCC business electronically.

Under the electronic filing regime, it appears that parties will have until midnight — presumably Washington time; the FCC will need to clarify this issue for broadcasters located in other time zones — to submit the document on the filing deadline date. The commission also says that, with the "receipt" and "filed application" printing features of the system, the agency does not want stations to file additional paper copies during the phase-period or otherwise. Of course, parties may still, at their option, submit service copies to various FCC personnel.

Submission of Application Fees — Until the commission's computer system is "enhanced" to allow for the acceptance of credit card payments, stations still will pay application fees the old-fashioned way — by mail. For any application requiring the payment of a fee, the FCC's electronic filing system will inform the applicant that a fee payment must be made.

The applicant can click on the FCC Form 159 (fee payment form) icon and the form will be displayed on the screen, and then may be printed out. The FCC Form 159 printed in this fashion from the FCC Web site will have at least some of the form already filled out, based on the information you already had keyed into the application form. The address (including box number) for payment to the Mellon Bank also would appear on

See UMANSKY, page 41 ▶

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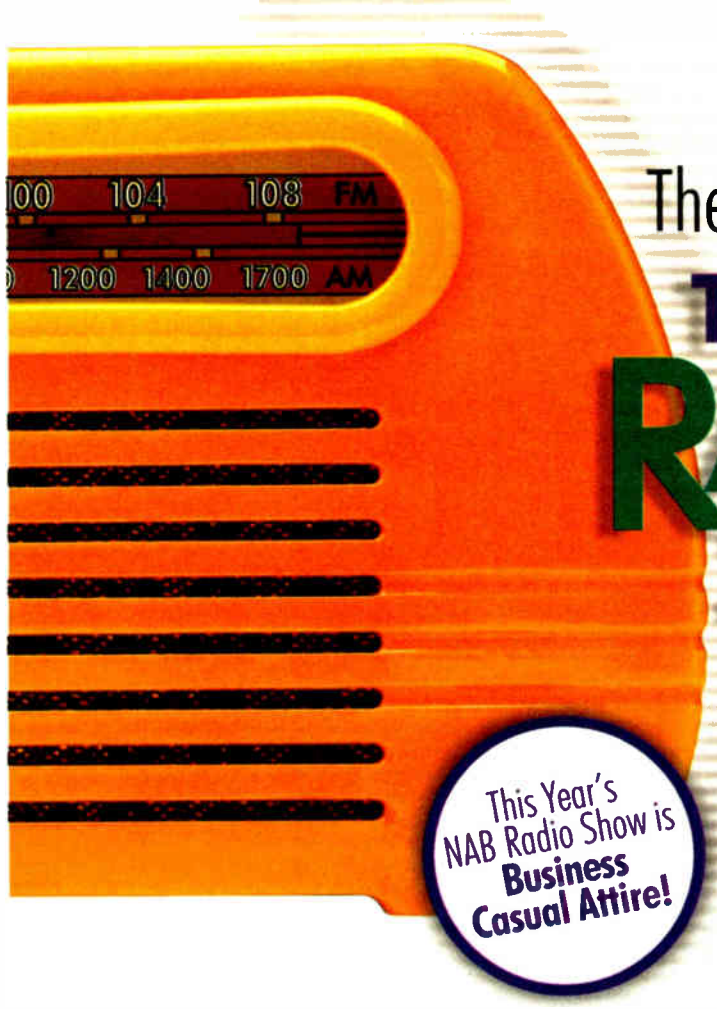

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▶ UMANSKY, continued from page 40

the screen. The applicant then will complete the FCC Form 159, print it out and mail it and a check to the FCC's "lockbox" Mellon Bank in Pittsburgh.

Once the FCC receives an electronic confirmation from the Mellon Bank that the fee was paid, the electronically-filed application will be accepted for processing at the FCC. Though the FCC and broadcasters hope that this communication between the Mellon Bank and the commission will be prompt and reliable, it can be anticipated that some problems and delays will occur, particularly during the early months of the electronic filing system.

Security — Because we are now in an age of computer hackers, computer virus creators and cyber-terrorists (of various levels of sophistication and malevolence), the Mass Media Bureau's electronic filing system will be incorporating features affording what the agency hopes will be a significant level of security.

This security system will employ a combination of features — such as Taxpayer Information Numbers ("TINs," which are required to be employed in the FCC system by virtue of a 1996 Act of Congress), applicant-specified passwords, FCC-generated "unique account numbers" for applicants and FCC-generated application reference numbers. It is hoped that this combination of features will provide security for applications, amendments to applications, etc.

Public Access to Electronically-Filed Applications and Reports — On the FCC theory that the public eventually should have Internet access to virtually everything that may be found in the station files at the FCC's headquarters, the commission's general policy will be to make electronically-filed documents publicly accessible.

The FCC says that all such Internet-accessible documents will be made available on a "read-only" basis, so that others accessing the documents will not be able to alter them. Also, the commission says that, to enhance security, members of the public accessing particular applications/reports will not be able see the identifying TIN numbers or other numbers/passwords intended to make the process more secure.

The commission finds no difference between the availability of such information at the FCC public reference room and station public files and the availability of this information on any computer in the world. However, the reality may be otherwise.

The impact

What are some of the practical consequences of, and concerns over, broadcast electronic filing?

Less Technical and Other Information Provided on the Forms — With less information contained in the streamlined forms, it is essential that broadcasters, their communications counsel and their engineering consultants be increasingly vigilant in ensuring that particular applications, if granted, will not cause increased interference to protected broadcast service.

Under a review process that undoubtedly will give less individualized FCC staff attention to particular applications, there is a significant concern that one practical effect of the electronic filing/streamlining process will be an increase in the overall levels of interference on the broadcast bands. Only time and further experience will tell.

Unintentional "Misrepresentation" — There also is concern that the "yes/no" nature of most of the questions on the revised forms may lead to applicant/licensee misrepresentation — misrepresentation based either on an honest mistake or on an inability to provide sufficient information to the commission on the application form.

Attempting to enhance the speed of staff application processing, the FCC eliminated most of the questions that formerly had required a textual response. Although the commission has included an

See UMANSKY, page 47 ▶

Forms to Be Filed Electronically

Under the commission's current, overall plan for broadcast electronic filing, the FCC will be making a variety of forms and reports subject to mandatory electronic filing, in addition to the Children's Television Reports (FCC Form 398) which already is required to be filed electronically. These include everything from the short station address change form (FCC Form 5072) to a variety of substantive application forms. Here's the list:

FCC Form 301	Application for Broadcast Construction Permit
FCC Form 302-AM	Application for AM License
FCC Form 302-FM	Application for FM License
FCC Form 302-TV	Application for TV License
FCC Form 302-DTV	Application for DTV License
FCC Form 314	Application for Consent to Assignment of CP or License
FCC Form 315	Application for Consent to Transfer of Control of CP or License
FCC Form 316	Short Form Application for Consent to Assign or Transfer of Control of CP or License
FCC Form 345	Application for Transfer of Control of an FM or TV Translator Station or LPTV Station
FCC Form 346	Application to Construct or Change an LPTV, Translator or TV Booster station
FCC Form 347	Application for LPTV, TV Translator or TV Booster Station License
FCC Form 349	Application to Construct or Change an FM Translator or FM Booster Station
FCC Form 350	Application for an FM Translator or FM Booster Station

Because we now are in a hiatus between station license renewal cycles, the commission has not created an electronic version of the FCC Form 303-S. However, that may be a future development. In addition, the FCC says it plans to make electronic formats available for various other FCC forms, such as the broadcast ownership reports (FCC Forms 323 and 323-E).

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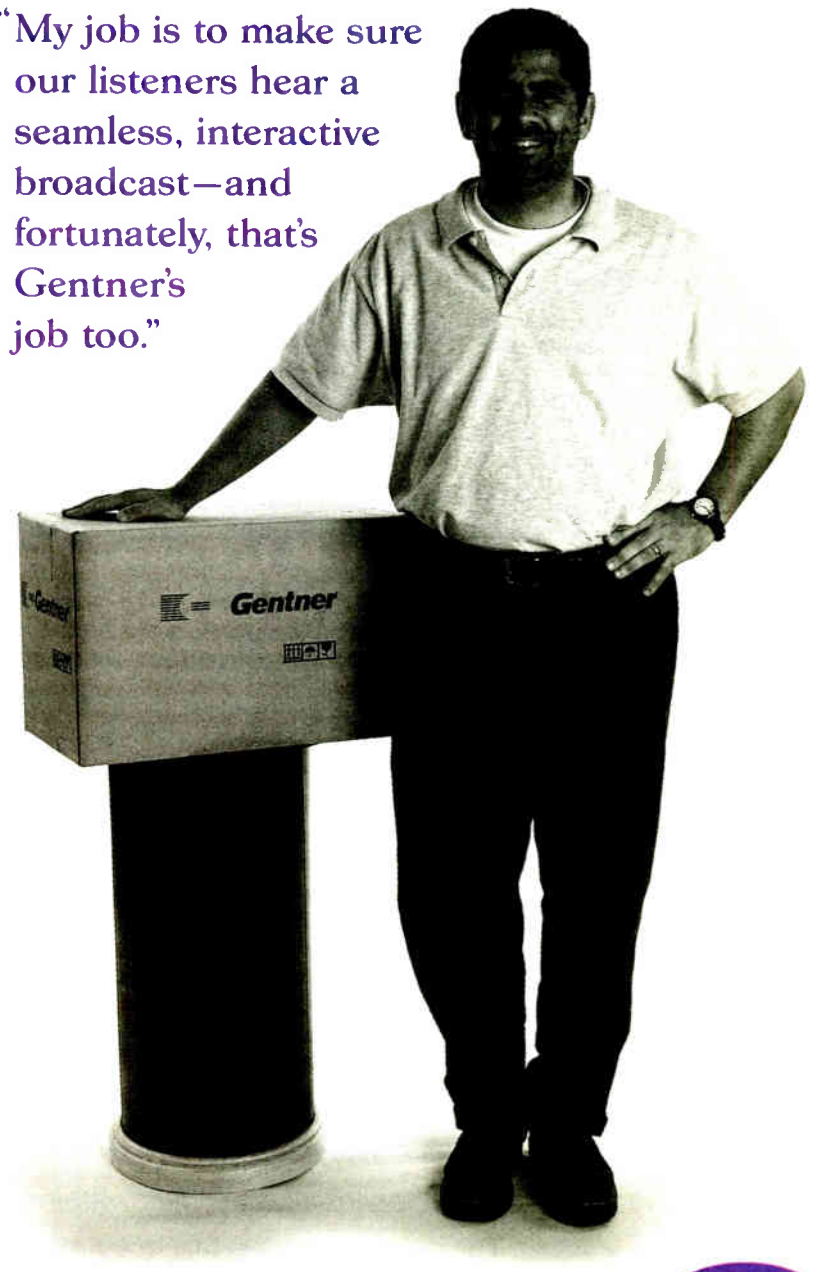

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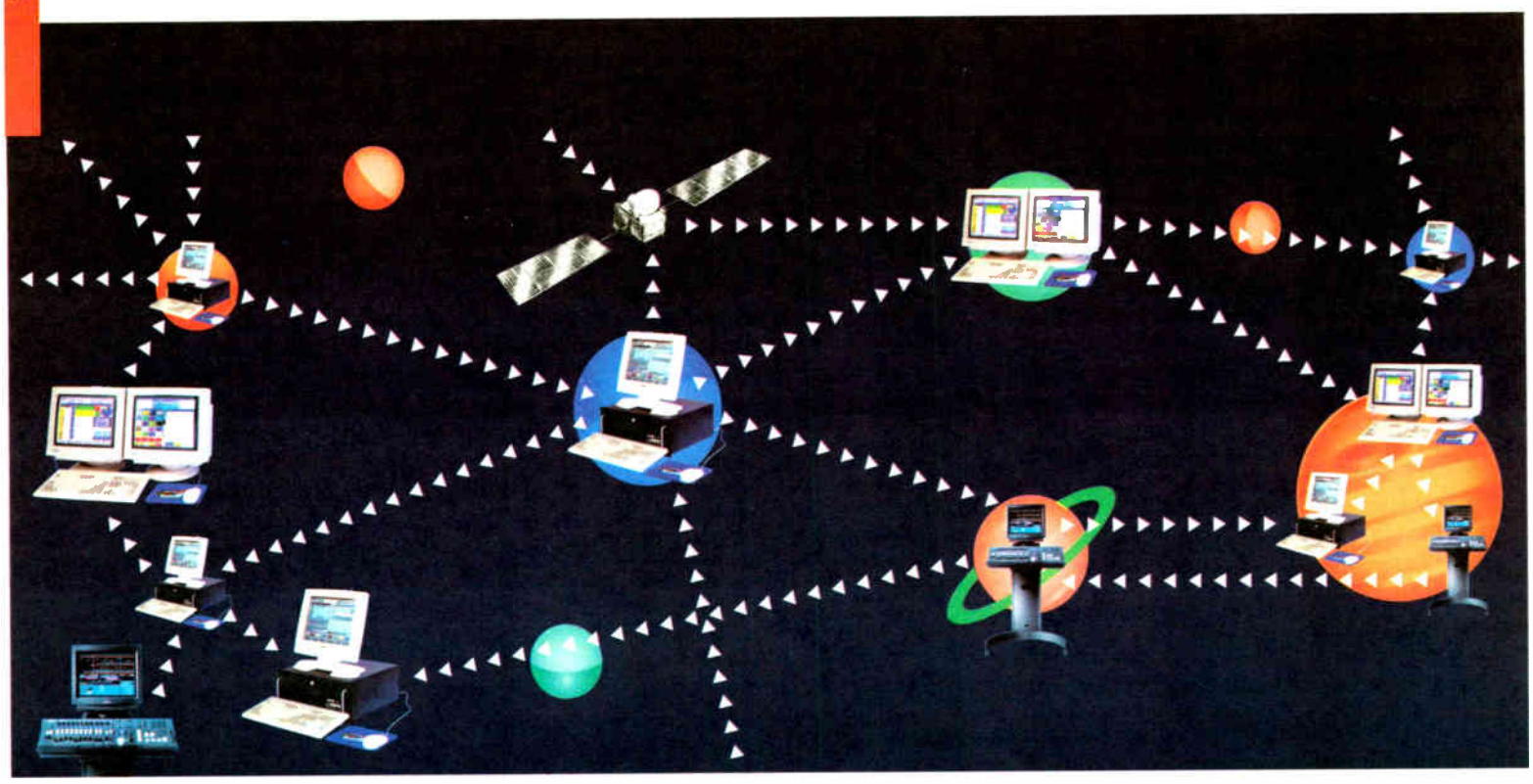

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GUEST COMMENTARY

Reform the FCC's Spectrum Rules

Jesse Walker

The following commentary is from an article in the June issue of Reason magazine, outlining the history of the low-power radio debate. In this excerpt, the author urges reform of how the FCC regulates the spectrum.

William Kennard's proposal to begin licensing "micro" radio stations has its flaws, but it's a welcome step toward opening the airwaves. But even if the government adopts the Kennard plan, and even if that plan's benefits end up outweighing its drawbacks, there will still be much, much more that Washington could do — or, rather, stop doing — to allow lively radio to flourish. Ideally, it would forget the idea of a special micro "service" and instead radically reform how the FCC regulates the spectrum.

What would such a plan look like?

It would lower entry barriers. It would permit stations to broadcast at less than 100 watts and would remove the fees and paperwork that would-be broadcasters now must endure. It would also reform the FCC's expensive technical specifications, which were enacted to prevent interference with other signals.

On the surface, that sounds sensible, but it's actually inefficient: It would make much more sense just to hold broadcasters liable for any interference they may cause and then, with that incentive in place, let them figure out how they're going to avoid stepping on other signals' toes. Among other things, this would fuel technical innovation, as low-budget engineers strive to build cheaper equipment that nonetheless gets the job done. The present system, by contrast, locks archaic technologies into place.

The author says the FCC should lower entry barriers, allow frequencies to subdivide and open new spectrum.

More efficiency

It would allow frequencies to subdivide. Suppose a station can be heard over, say, 100 square miles. That same area could be served by several stations on the same frequency, if they divided the region into smaller coverage areas with appropriate buffers between them. But under present law, while one can sell a signal, one cannot sell a piece of that signal.

That's not exactly accurate: Technically, the spectrum is government property, and you can't sell a signal you don't own. But one can, with relatively little trouble, sell a license to broadcast over a particular frequency. What one can't do is subdivide a frequency and sell off a chunk of it.

So if our hypothetical station (let's call it KBIG) decides to sell itself outright to a chain (let's call it KRAP), it can. But if it wants to reduce its wattage and let an entrepreneur or civic group take over part of its previous coverage area, it will somehow have to guarantee to the buyers that the FCC will allow them to transmit to the space it has emptied. There is, of course, no way to do this; and even if there were, the application process for the new station would still be long, stormy, and expensive. The risk for the buyers would be too high.

When a giant falls or falters, smaller outlets ought to be able to rush in and take pieces of the electromagnetic ground where he once stood. Instead, the law says he has to sell all his ethereal territory at once, meaning that only another giant can afford to buy it. So the law encourages consolidation, which in turn encourages centralized, automated, prefabricated programming.

It would allow stations to broadcast closer to one another. To avoid interference, there must be buffers between broadcasters. That is why, for example, there are no stations at 101.2 FM — the FCC won't risk interfering with the outlets at 101.1 and 101.3.

No one disputes the need for some policy of this kind. But the current rules are based on the technical standards of the 1950s; it's now possible for far more stations to fit onto the spectrum without interfering with one another. The FCC is already pragmatic enough to allow stations some leeway in bargaining with each other to set the actual boundaries of their coverage areas. It should let them actually sell interference easements, allowing both established and new broadcasters to set up shop at a close-by frequency if they pay for the privilege.

Downconverters

It would open up new spectrum. Anyone who keeps up with both broadcasting and point-to-point communications will soon note a strange contradiction. The broadcasters believe the airwaves are almost completely filled. The phone companies believe the available spectrum is actually expanding: As new technologies make it easier to divide the electromagnetic spectrum ever more finely, for all practical purposes we get more of it.

This conflict doesn't just reflect the fact that broadcast stations cannot compress or split up their frequencies. It reflects the fact that they are limited to two artificial reservations, the AM and FM bands. If the FCC would open more of the ether to broadcasting, manufacturers could sell downconverters — small devices that would attach to or sit near a radio and convert signals sent over other sections of the spectrum.

This conflict doesn't just reflect the fact that broadcast stations cannot compress or split up their frequencies.

Such devices are not science fiction: The Philips Clevercast, used for converting data broadcast from satellites, works on a similar principle. So, for that matter, does DirecTV, which lets a TV set built to receive UHF and VHF signals pick up broadcasts made in the SHF band. But if you want to bring down the price of the converter, you'll need a highly integrated device without a high parts cost, and to get companies to invest in developing such a machine, you'll need a regulatory regime that will allow the product to be put to the use for which it was devised.

In the pithy words of Bennett Kobb, author of the widely used SpectrumGuide: Radio Frequency Allocations in the United States, "Manufacturers will make just about any gizmo if they see a mass market." Until then, Kobb notes, "We're using a 60-year-old technology with FM, and it's creating an artificial scarcity, when we could accommodate for all practical purposes an unlimited class of stations." ...

"By adopting a licensed, advertiser-supported, limited-channel broadcasting system," the social theorist Ithiel de Sola Pool wrote in his 1983 book Technologies of Freedom, "America has penalized itself for half a century. It has undermined its tradition of free communication, and it has limited broadcasting to mass provision of the few most popular formats of entertainment." We may be — just maybe — on the edge of something better.

■■■

Reason Associate Editor Jesse Walker is writing a book on micro radio. The full text of this article is available at www.reason.com

***RW** welcomes other points of view.*

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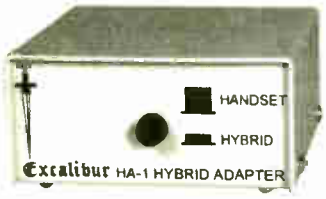

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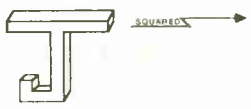

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READER SERVICE NO. 232

World Radio History

Health Booms on the Radio

▶ HEALTH, continued from page 35

In fact, Melatonex spent all of its 1998 media expenditures in radio: a sum amounting to a tidy $2.63 million. In the No. 2 spot was Harmonex Herbal Remedy.

Unlike Melatonex, not all of Harmonex's 1998 budget, which is more than $9 million, went to network radio. Still, the $2.56 million that *was* spent here made a nice contribution to the industry's bottom line.

So did No. 3, Garlique — which bought more than $1.8 million worth of radio ads, out of a total $3.42 million spent on all media by the company.

The fifth-ranked vitamin sponsor, Propalmex, expended all of its 1998 budget on radio, a figure that amounts to more than $1.5 million.

An effective message

So why is network radio such a priority for Chattem?

"From a CPM standpoint, it's very affordable," said Steve Lefkowitz, Sunsource's director of marketing, referring to the cost per minute.

He said the second reason for investing in network radio is targetability.

"Radio allows us to target the specific demographics and profile of our particular target markets, based on the brands that we sell."

Chattem's Sunsource Melatonex Sleep Aid was the top vitamin sponsor on network radio last year.

The health supplement sector spent some $19 million on radio ads in 1998.

A third reason, according to Lefkowitz, is that radio allows Chattem to create credibility for its products without violating FDA regulations with medical-style claims.

"For example, it allows us to use spokespeople to get our message across," said Lefkowitz.

A prime example is Larry King, who promotes Garlique, and has, in the past, endorsed Harmonex as well.

Lefkowitz said that, by using such "well-known, credible people who are interested in our products," radio helps Chattem get its message across effectively.

Finally, buying spots in shows such as Rush Limbaugh and Dr. Laura Schlessinger gives Chattem exposure when listeners are receptive. "It allows us to reach people in parts of the day when they're very attentive, like drive time in the morning when they're on the way to work, or on the way home from work," he said.

Attentiveness is also why Chattem prefers talk radio slots over music, because during talk shows people are more likely to be paying attention to the spoken word.

Of course, Chattem isn't the only big booster of radio in the vitamin category. For instance, Schiff Pain Free Pain Relief spent $1.67 million on 1998 ads, giving it the fourth spot for network radio time purchases.

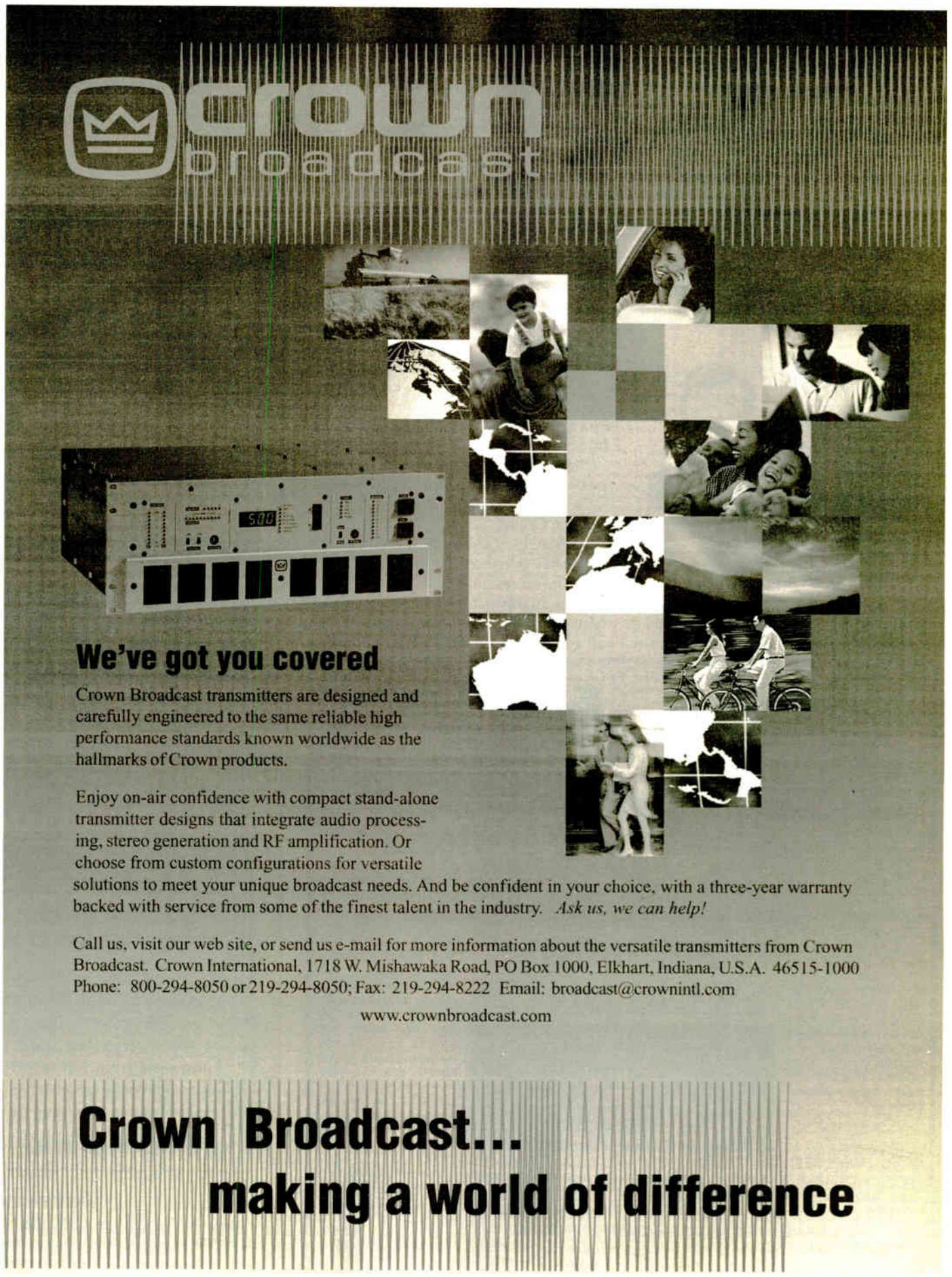
Pharma Botanixx Strenixx vitamins came in sixth, with $1.27 million expended.

So what does this mean? Jack Nail, vice president and director of talk sales at Premiere Radio Networks, which syndicates Limbaugh and Schlessinger, among others, said, "The health supplement category is booming in radio because of the direct-response mechanism radio offers, the aging of the Baby Boomers, and a health-conscious society. In fact, that category in radio has exploded over the last 12 to 24 months."

If there's a moral to this story, it's that radio is an ideal medium for health supplement companies trying to attract attention without spending a fortune on TV. For companies savvy enough to grasp this truth — like Chattem — the pairing of products and radio can be a marriage made in heaven.

■■■

James Careless can be reached via e-mail at james@tjt-design.on.ca



Circle (36) On Reader Service Card

World Radio History

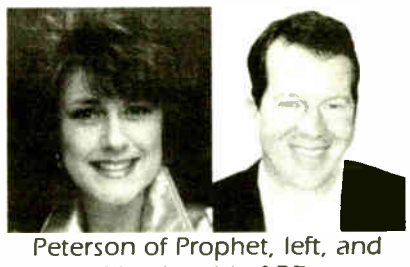
Prophet Picks Peterson

Prophet Systems Innovations has appointed **Tracy Peterson** to the position of media relations manager.

Peterson previously served as the public relations specialist for Broadcast Electronics and as the communications manager for Pacific Research & Engineering.

In her new position, Peterson is responsible for PSi's media interface and sales support material.

Prophet Systems is a division of CapStar Broadcasting and is a supplier of digital audio software to the radio broadcasting industry.



Peterson of Prophet, left, and Macdonald of BE.

BE Hires Macdonald

John Macdonald has been appointed to the position of sales manager for Europe, the Middle East and Africa for Broadcast Electronics Inc.

Macdonald previously served as the regional sales manager, Latin America for Thomcast. He also worked as the Latin American sales manager for BE from July 1989 through December 1998.

Macdonald will be based in Quincy, Ill.

BE designs and manufactures equipment for the broadcast industry.

PR&E Appoints Caputo

Pacific Research & Engineering Corp. has appointed **David J. Caputo** to the post of vice president of operations. He boasts over 17 years of operations experience in the high-technology sector.

Previously, Caputo worked for Sync Research of Irvine, Calif., and for Systech Corp. and Staefa Control Systems, both of San Diego.

PR&E manufactures broadcast studio products and provides turnkey studio design/integration services to the broadcasting industry.

CEMA Names Deutsch, Stevens to Sales Posts

The Consumer Electronics Manufacturers Association has named **Donna Deutsch**, staff director, International CES sales and exhibitor services, and **Wendy Stevens**, senior national accounts manager, International CES sales and exhibitor services.

Deutsch previously served as director of operations, corporate sales and operations for Phillips Business Information Inc.

Stevens has worked with CES since 1995. She previously worked as a meetings and exhibits coordinator at the Pearson Group.

CEMA is a sector of the Electronic Industries Alliance (EIA), a trade organization representing all facets of electronics manufacturing. CEMA represents more than 500 U.S. manufacturers of audio, video, accessories, mobile electronics, communication, information technology and multimedia products that are sold through consumer channels.

New Faces at United Stations

United Stations Radio Networks Inc. has announced the appointments of **Rita Deas** and **Dan Weisenberg** to its advertising sales team.

Deas will serve as account executive, ad sales and will be based in New York City. Weisenberg will serve as account executive, Midwest sales, and will be based in Chicago.

Rita Deas (left) and William F. Adams

Deas joins the sales team from the United Stations' affiliate relations division, where she served as affiliate relations manager. Weisenberg previously served as an account executive for AMFM Radio Networks.

Meantime, **William F. Adams** has been promoted to vice president of finance at United Stations. In his new capacity, Adams will oversee financial planning for the network's full range of services.

United Stations currently distributes and produces several format-specific services to over 2,300 rated radio stations across the country.

American Tower Hires Morgan

Bob Morgan has been named vice president of the broadcast tower division of American Tower Corp. Morgan comes to American Tower from CBS Corp. radio stations in Rochester, N.Y., where he served as vice president/general manager and CBS market manager.

Morgan's new responsibilities include overseeing operations and management of American Tower's broadcast towers in development.

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WEBSTER AUDIO PRODUCTS

Circle (37) On Reader Service Card

World Radio History

The FCC, E-Filing and You

▶ UMANSKY, continued from page 41

"explanation" checkbox beside some of the questions on its forms, the potential for unintended misrepresentation is very real.

One method for better ensuring that stations not fall into the trap of misrepresentation could have been a commission requirement that stations file at the FCC, or at least retain locally, the filled-out worksheets the FCC has produced to aid broadcasters in completing applications. However, the commission, at least for now, has declined to require either the filing or the local retention of the worksheets. A prudent broadcaster will retain those worksheets, nonetheless.

Obviously, it is essential that broadcasters consult their communications counsel before they file anything over the commission's Web site.

Your Adversaries Will Have Immediate, Local Access to Everything You Submit Electronically — Today if one goes to the commission Web site, immediate access can be had to every Children's Television Report submitted by TV stations. It is advocacy groups who are the ones most likely to make widespread use of this kidvid information. Thus, the realm of electronic filing has provided a benefit to those who might choose to raise issues against station licensees, whether or not the broadcaster is in a license renewal cycle.

Critically important

As a result, it is critically important that broadcasters submitting materials through the FCC's electronic filing system realize that all the materials being submitted are going to be available — easily — to competitors, former employees, disgruntled employees, potential petitioners-to-deny and others who may be poring over these documents, looking for, among other things, evidence of misrepresentation or lack of candor.

Again, broadcasters must consult their counsel whenever they are getting ready to place a document in the FCC's electronic filing "glass house."

Instant Jeopardy — Pushing the "Send" Button Too Fast — With the move to electronic filing, there is the added risk of filers submitting their applications/reports before they have given the document and the underlying process a thorough review — a review of not only the information upon which the party relied upon in filling out the form but also the completed form itself, e.g., for typos, unintentional checking of the wrong box, etc. Clearly, the watchword is "let the filer beware."

Though application "streamlining" and the electronic filing process may result in greater "efficiencies" for the FCC and, in some cases, a more rapid FCC processing of an application, there is no doubt that its advent is resulting in greater potential jeopardy for stations.

Updating Your Computer System and Giving the Forms a "Dry Run" — Because broadcasters and communications counsel/engineers have at least a limited amount of time before we face the full brunt of mandatory electronic filing, now is the time to make sure your own computer system is geared to conduct FCC electronic business. Obviously, a faster processor and larger monitor will make things easier.

Also, make sure that your station computer system doesn't have a "firewall" that will impair exchange of information with the FCC. If so, see whether alterations may be made to your system or whether a stand-alone computer could be made available for FCC filings and other Internet-based station activity.

Also, check with your communications law firm and make sure that they are geared up for FCC electronic filing — with the computer systems and trained personnel that will ensure a properly filed application or report. Make sure your communications lawyer is computer-savvy and can guide you in this new area of FCC law and procedure.

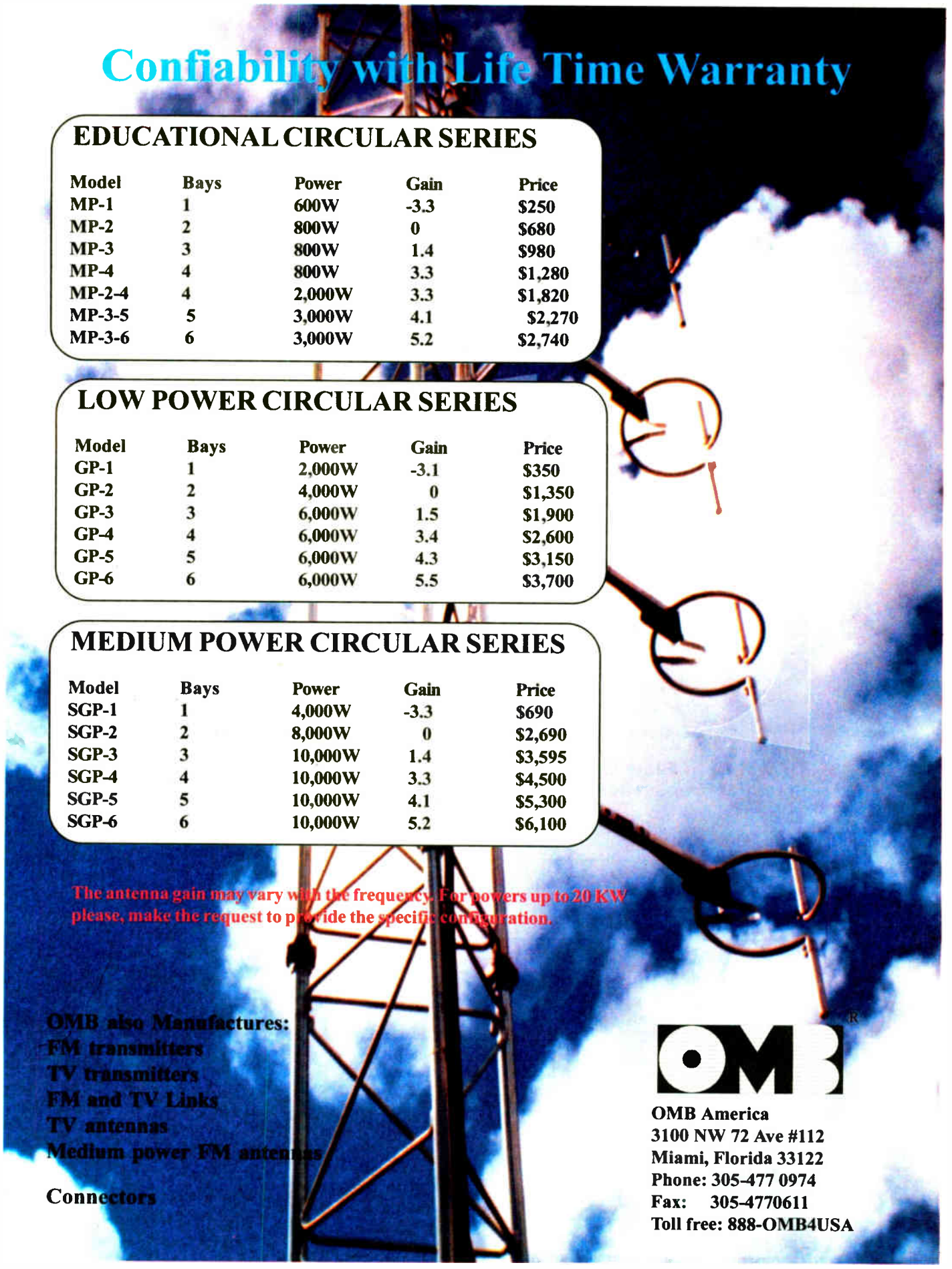
Materials submitted to the FCC's electronic 'glass house' are available to competitors, disgruntled employees and potential petitioners-to-deny.

And once a particular FCC form is released in electronic form, take the time to access the form and become familiar with its layout and contents. Taking these steps now will help avoid application and reporting form panic as a deadline approaches.

■■■

Barry D. Umansky is the former deputy general counsel of the National Association of Broadcasters. He is now with the communications law practice group at the law firm of Vorys, Sater, Seymour and Pease LLP.

Contact him via e-mail to bdumansky@vssp.com



Circle (38) On Reader Service Card

World Radio History

CBC Radio Three Plan Draws Fire

James Careless

When the Canadian Broadcasting Corp. goes after the youth market, commercial radio takes notice.

And at least some commercial broadcasters in Canada are vehemently opposed to the public broadcaster's proposed youth-oriented Radio Three English-language network.

Planned to supplement the Radio One news/current affairs and Radio Two classical music/cultural networks, Radio Three would target a market almost entirely missed by current CBC programming.

Two reasons

CBC Radio has two reasons for launching a youth-oriented service, according to CBC President and CEO Perrin Beatty.

First off, young Canadians, according to Beatty, are unhappy with commercial radio. In fact, according to extensive research, "they (Canadian youths) felt that often the music they wanted to hear was not being played," said Beatty, "and they felt that there was a hole that needed to be filled."

The second reason is much more self-serving: For CBC Radio to justify its existence at the expense of taxpayers, it must appeal to all Canadians.

With the exception of the Radio One Saturday afternoon program "Definitely Not the Opera," CBC Radio programming definitely skews toward older listeners. This situation has left the corporation waiting for people to age into CBC radio programming, Beatty said.

Obviously, this is not exactly a dazzling recruitment strategy, but it has been the best the CBC has had. Trying to blend programming targeted to under-25-year-olds into the current CBC service mix simply will not work, said Beatty.

"If you have formats that are jarring — that simply do not fit together — what it does is to drive people away," he said. That is why Radio Three is viewed as the best solution for CBC Radio.

Of course, for the moment, these plans are simply that — plans. They have yet to be considered, let alone approved, by the Canadian Radio-Television and Telecommunications Commission (CRTC).

However, the very idea of a youth-oriented public service incenses Gary Slaight, president and CEO of Standard Broadcasting, one of the major private radio chains in Canada.

"It is crazy," said Slaight when asked about the Radio Three proposal. "They (CBC Radio) cannot run the radio networks they are currently operating efficiently (and) effectively."

Furthermore, "the CBC is supposed to be to provide something that private (commercial) radio does not provide," he said. "There are stations all across the country that this (Radio Three) would compete directly with, who are not receiving government and who have to compete with all sorts of other factors, without having to compete with another channel."

As a rule of thumb, commercial broadcasters do not like any new competition at all.

— Perrin Beatty

The fact that Radio Three would be noncommercial — with funding coming from "efficiency savings" in the CBC budget — is no consolation for Slaight. In his view, any service that takes listeners from commercial radio would hurt its audience, and thus how much it can charge for advertising airtime.

Avant-garde rock

Meanwhile, the very fact that Radio Three would be noncommercial worries Hal Blackadar, general manager of The Edge, CFNY-FM in Toronto, one of the most avant-garde rock stations in Canada.

The target audience for Radio Three,

Perrin Beatty

The Edge and most other youth-oriented stations tends to hate commercials. The attitude generally is "the fewer commercials, the better," Blackadar said.

Therefore, a noncommercial Radio Three "would clearly have potential impact on us if they were to draw away a portion of that audience that listen to commercial radio," he said.

Despite these complaints from private broadcasters, Beatty remains unfazed; he is accustomed to commercial broadcasters objecting to any new CBC initiatives.

"As a rule of thumb, they (commercial broadcasters) do not like any new competition at all," he said, no matter where it comes from.

It remains to be seen how the Radio Three concept will be dealt with by governmental officials and regulators in Ottawa.

Certainly the timing is interesting: The idea comes as CBC Radio and TV face a sweeping review by the CRTC. In fact, Radio Three is part of CBC's positioning strategy, to prove that the cash-strapped public broadcaster is looking ahead to the future.

Perhaps the best hope for the CBC is that the CRTC has a long history of actively promoting Canadian culture. This, and the continuing willingness of the commission to endure criticism from commercial radio, may mean that Radio Three stands a chance of being licensed.

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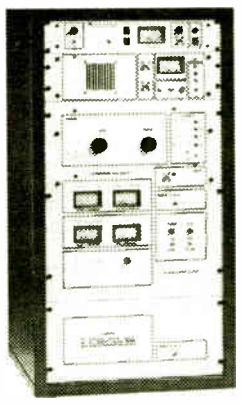

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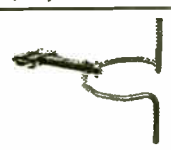

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World Radio History

Use Your Voice Wisely.

See Page 53.

Studio Sessions

Radio World — Resource for Radio Production and Recording — July 21, 1999

FOCUS ON PRODUCTION MIXERS

The Right Tools for Production

Ty Ford

When I took my first job at a radio station in October 1969, I had already been exposed to the production studio.

Back then, production mixers at radio stations were often some configuration of an RCA or Gates slant-top console, the main section of which contained one or two mic channels, one turntable and a cart playback. The larger "production" section had several lines of buttons that allowed the user to punch up numerous sources on either of two pots. There were no aux sends or returns, no inserts, no onboard EQ, no reverb and no Harmonizers.

Heck, back then I didn't even know a production mixer was also someone who recorded film sound for motion pictures.

Throughout most of the 1980s and early '90s, radio stations followed the music industry model of using music consoles and multitrack tape machines. For one of my first NAB production seminars, I was allowed to use a brand-new system that was headed for Don Elliot's studio at KIIS-FM in Los Angeles.

It was a relatively huge Pacific Recorders console with an Otari 16-track analog machine and many racks of gear. Having come from a setup with six mono but "pannable" cart machines, an Ampex four-track reel-to-reel, a few Ampex 350 and 440 machines as well as a new Ward Beck console, I remember wondering what Don planned to do with all of those tracks.

Elliot now is the house voice of KFI(AM)/KOST(FM) in Los Angeles and uses SAW and Sonic Solutions digital audio systems as opposed to analog production mixers. He voices and produces most of the promos in his home studio.

"I just sold my last piece of analog at home," said Elliot. "I now have three SAW systems, including one on a laptop. I have a 1604VLZ that I use all of two pots on. The Mackie EQ with the sweepable mids is pretty musical (and) the EQ with SAW is quite wonderful."

Audio Concepts in Ohio uses the Yamaha 02R mixer.

For small jobs, Elliot said the 8 in x 2 out MIDIman Mixim 10 works well with its two mic inputs and phantom power. He's also had good experiences with the Orban Audicy, with a standard console and production system, having an Audicy freed up the console for another production, while editing and mixing was done on the Audicy.

My first DAW was an AKG DSE7000 (the predecessor of the Audicy), in October of 1990 — eight tracks, digital editing, smooth scrub and a 10-channel digital mixer. During that period, I came to realize was that I didn't really need a full-featured production console to cut spots, narrations and audio for video.

(Note to cost-conscious broadcast accountants who have strayed to this article by mistake: Make sure the mixer you get for the production studio has enough capability to sub as a main air console when the main air console dies.)

If you don't have those worries, you can do quite well with a simpler mixer by using it as an input router for CD players and recorders, mics, turntables (really!), MIDI modules, samplers, DAT machines and cassette machines.

Patch around

I don't do large music sessions on my DAW, so I only need one stereo buss. I also wired a semi-normalled patchbay between my sources, the DAW and the mixer. Devices I use regularly are normalled to the faders of a Mackie 1604 VLZ XDR, but I can patch around them to bring in other outboard devices.

My first compact mixer was a Revox C279 with limited EQ and one send/return circuit. I rely a lot on small amounts of limiting and compression, so I put an Aphex Compellor/Studio Dominator between the console outputs and the DAW input. They stayed there until I was persuaded to replace the Revox with a Mackie 1604. The 1604 had a bit more EQ, more sends and, most important, inserts for each input and across the master stereo buss.

The Compellor/Studio Dominator worked nicely in the stereo buss inserts, allowing me to trim the final level to the DAW with the 1604 master faders. I did notice that the 1604 was much brighter and edgier than the Revox, but was able to get the sound I needed by not pushing the Mackie too hard and by careful EQing.

My upgrade from the DSE7000 to the Orban Audicy with its new console

See MIXERS, page 56 ▶

Your Artists Deserve The Best

Alan R. Peterson

Artists do their very best work when using the proper tools. While it is possible to create masterpieces with crayons and Play-Doh, fine sable brushes and high-quality pigments go further in creating true works of art.

It is likewise possible to cut compelling ads and promos using a 1970s Gates "Yard" mixer, but who would want to anymore?

The need for clean sound, speed and flexibility in today's radio environment all but demands that the production room be outfitted with its own special brand of console — one that eschews the typical Program and Audition busses in favor of Aux and Utility sends, maybe multiple EQs across all inputs, and perhaps even four to eight output busses to accommodate multitrack recorders, ADAT-style decks or multiple-port DAW soundcards.

Digital control and processing also become important — not necessarily for audio quality (you would need to search far and wide today to find a bad-sounding mixer), but for total and instant control over processing and the ability to reconfigure the board for a specific purpose.

These are the requirements of today's production studio, which is why these specific consoles differ from their on-air counterparts. Such an elaborate production console placed in an air studio would stand out like Pamela Lee at a convent picnic.

See ARTISTS, page 52 ▶

Circle (41) On Reader Service Card

World Radio History

◆ PRODUCT GUIDE ◆

Products for Radio Production

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

Spirit by Soundcraft

The Digital 328 from **Spirit by Soundcraft** is the company's first digital mixer. It offers an intuitive hardware-based interface that will be familiar to those who have used an analog eight-bus console.

The mixer comes in a 32/8/2 frame size that includes 16 mic/line input channels with the company's trademarked Ultramic+ preamps, high-pass filters and inserts as well as 16 tape return channels, all routable to groups and mix. Five pairs of stereo inputs have also been included for a total of up to 42 inputs. Mic/line inputs, tape returns and group and master levels are accessed in banks of 16 via three fader bank buttons.

Every input has access to identical facilities that include three-band, parametric EQ, four external effects sends and access to two internal Lexicon effects units with editing and storage parameters. Two floating stereo dynamics units, including compressors, limiters, gates and duckers, are assignable to any input or output.

Sixteen-track recording is possible "straight from the box" with two Tascam TDIF and two ADAT optical interfaces as standard. Two Digital 328 mixers can be cascaded to provide 32-track digital recording and up to 84 inputs.

A recent software upgrade, Version 1.1, adds the following features: Channel Linking, which links parameters of a mono input channel to another mono channel; MIDI Controller Faders, which allow the faders of the 328 to be assigned as MIDI faders; and stereo grouping capabilities.

For more information contact Spirit by Soundcraft in California at (916) 630-3960, fax (916) 630-3950 or circle ***Reader Service 85.***

Mackie Designs

Mackie Designs offers several production mixers in the analog and digital domains.

The MS 1402-VLZ features six high-headroom/low-noise mic preamps, 60-millimeter faders, 3-band EQ, mute and solo switches and ample routing flexibility. A low-cut filter on mic channels 1-6 allows the user to cut out mic thumps and general noise without sacrificing the low-frequency EQ.

The Control Room/Phones matrix makes mixdown routing simple. Additionally, the Mute/Alt 3-4 features provide two extra output sources to turn this 2-bus board into a 4-bus unit.

On the digital side, DSP technology has been employed in the company's Digital 8-Bus mixing console. The unit uses a 32-bit Pentium Compatible CPU processor with 16 MB of RAM. It keeps track of 72 channels of audio as well as performing data operations like reading and writing to built-in floppy and hard drives.

Write-Record enables automation on the channel in use. For instant hands-on control, the unit's automation can be run in Touch mode. When a recordable control is adjusted, the corresponding channel automatically goes into automation record mode.

For more information contact Mackie Designs in Washington state at (425) 487-4333, fax (425) 806-6383 or circle ***Reader Service 103.***

Tascam

The TM-D1000 from **Tascam** is a 16-channel digital recording mixer that delivers four channels of dynamics processing and 10 on-board effects with four XLR microphone inputs with phantom power (plus 48V), eight channels of TDIF-one digital I/O, two XLR AES/EBU digital outputs and two RCA S/PDIF digital outputs.

The unit incorporates one stereo pair of effects such as reverb, delay, flange or chorus, enabling the engineer to tailor an audio program without patching in external signaling processors. It is simple to add external signal processors if desired. A digital external input is offered, as well as analog TRS balanced and RCA unbalanced stereo outputs. Up to 128 scenes (EQ, Aux, Mute, Effect setups) can be memorized and recalled from the front panel or via MIDI message. Recorders can be controlled directly from the mixer via MIDI Machine Control (MMC) messages.

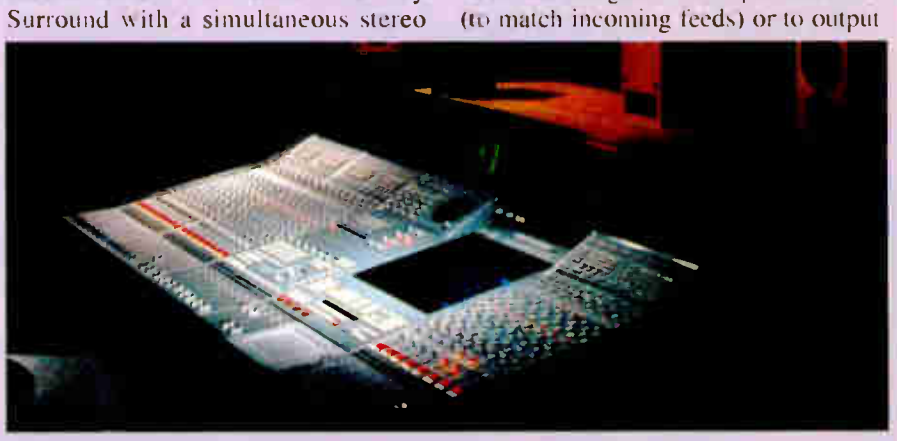
Featuring eight quarter-inch inputs, the TM-D1000 provides the flexibility to accommodate a substantial number of analog inputs. The mixer communicates digitally with DTRS format recorders via the integral TDIF-1 port.

The TM-D1000 can be expanded by adding two optional cards. The IF-TD1000 interface card adds eight channels of TDIF and four channels of AES/EBU or S/PDIF. The FX-1000 Effects Board adds four channels of Dynamics Processing and one Stereo Pair of Reverb, Chorus, Delay, Flange, etc. In mix mode, the mixer's four-bus architecture doubles as four effect sends.

For more information contact Tascam in New York at (323) 726-0303, fax (323) 727-7635 or circle ***Reader Service 113.***

Solid State Logic

The Aysis Air digital console from **Solid State Logic** now incorporates new software that provides up to 96 fully featured channels and a number of new capabilities including improved surround-sound operating modes for 5.1 Surround and Dolby Surround with a simultaneous stereo mix. Monitor inserts for LCRS and LR are also provided.



"The ability to provide 96 channels in a 48-fader frame is of particular importance for mobile units, where space is always tight but numbers of inputs are always increasing," said John Andrews, marketing director. "Aysis Air's remote input/output (RIO) feature is also a major factor, with SSL's HiWay fiber connection system enabling microphone amplifiers to be sited up to two kilometers (more than one mile) from the console."

Another enhancement is the availability of adjustable delays of up to 1300mS, assignable to input channels (to match incoming feeds) or to output groups, enabling compensation to be provided for processing delays encountered with virtual studio (blue studio) technology.

For more information contact D. Pagan Communications in New York at (516) 784-7865, visit the Web site at www.solid-state-logic.com *or circle* ***Reader Service 71.***

World Radio History

Truth in Advertising

The hype for digital audio has been deafening. While digital offers advantages for storage and control, it has severe limitations for dynamics processing. Indeed, Cutting Edge® claims their Omnia unit sounds almost as good as analog.

The Aphex 2020 FM Pro offers the purity of an all analog signal path with the power of digital control. Through its use of 11 patented circuits, the 2020 achieves the greatest possible loudness while retaining musicality and naturalness.

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

Contact Aphex today for a demonstration, and we'll show you there *is* truth in advertising.

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Circle (42) On Reader Service Card

World Radio History

Hand-Me-Down Days Are Behind Us

▶ ARTISTS, continued from page 50

All of these features are necessary to create the adrenaline-soaked production that holds our stations' programming together. But it was not always like this.

Ye olde days

Once in another era, when the air studio would get a new console, the old one was taken out and handed down to the production room. The old production console would then get handed off to the newsroom.

This meant the jocks had a production room board that they already were familiar with. In some stations in smaller markets, this rite of passage persists even today.

But it does nothing for creativity. The most one can do with an air console in the production room is pull up a fader and drop in some tape echo (assuming a tape machine still exists in there). Maybe the Audition bus can be configured as an Effect Send, and an unused pot becomes the Effect Return. Anything set on Audition is fed into the effect processor.

There are some operations that press a "disco" mixer into service as the production board. In most cases, it is false economy to hope an $89 mixer has what it takes to pound out high-energy radio production, above and beyond a basic music-with-read spot.

Limited RF immunity on these mixers means you will be stringing ferrite donuts on every cable. The unbalanced inputs and outputs on these mixers come with their own sets of problems. And even a good dynamic mic such as an RE20 never sounds quite right through one of these babies.

Little guy

The popularity of "small mixers" such as those made by Mackie Designs (and others inspired by Mackie) has redefined the kind of mixer that can be suitably used in radio production. They sound good, are durable and well-built, and are very affordable.

The difficulty comes when one lays out the console topology. Because many of these mixers have an abundance of mono inputs, it becomes necessary to pull up two faders to accommodate a stereo source such as a CD deck. When several stereo sources must come together at the same time, the mixer surface becomes a circus act.

Similarly, radio consoles require very few Auxiliary busses compared to the requirements of concert halls and music studios. When speed is the issue, an overabundance of knobs and returns can be intimidating.

This is also why consoles such as the Yamaha 02R and its siblings have drawn favorable attention. Sure, the thing is complex under the surface, but all of the features a creative production person needs — including dynamics control and instant reconfigurability — are immediately available through a control surface that is uncluttered and easy to navigate.

This fact is not lost on manufacturers of digital radio consoles. Many on-air consoles can just as easily turn into powerful production machines with a software tweak. A mixer surface with a similar look and feel as the on-air console goes a long way in assuring operator comfort.

Really little guy

At the far end of the "small mixer" phenomenon is the station that uses the tiniest possible component to do the job.

Do you remember the mid-'70s Sparta Ditty Desk? This was a five-pot mono or stereo mixer coupled with a pair of turntables, built into a transportable case with a flip-off lid that could be used as a bench.

These turned up everywhere I worked or wandered into. WHPC(FM), Garden City, N.Y., based its entire production room around a Ditty Desk, as did WSBS(AM), Great Barrington, Mass. I also recall seeing WHAI(AM), Greenfield, Mass., use a Ditty Desk mixer as its on-air console.

Even smaller, I have seen a couple of stations use a five-pot remote mic mixer from Shure in combined newsroom/production booths.

Once, for a station requiring a second voice and music room (for when the "big" room was tied up), I diagrammed a production-room-in-a-rack equipped with an Intelix mixer and several sources. The whole affair fit atop a microwave oven cart.

And anyone with a pencil, a ruler and a whit of creativity can see the possibilities offered by those tiny ATI Micro-Amp mixers. You may not want to build a production room around one of these, but it is fun to think you actually can.

Is it necessary to consider a specialty mixer solely for the production room? The answer is yes.

The production director is the one with the golden ears. He or she knows when the EQ is not right and how to fix it, or knows why a Plate reverb with a long first-reflection delay is more appropriate for a project than a Memphis slapback echo. The production director knows the right moment to pull up the fader for that nice flanged ringout at the end of the promo, or just how much compression to put on a voice track to squish the life out of it.

If many or all of these features can be found in a digital production console, or be partially or totally controlled from an analog mixer, so much easier is the job. These are tasks that are not normally necessary in an on-air console, but very necessary in the money room down the hall.

The argument can be made that modern workstations, with their built-in DSP modules and automated mix capabilities, have made production consoles obsolete. The console then becomes little more than a spigot, allowing multiple signals to flow into the DAW for further processing.

Perhaps in some regards this is true. But many radio producers I know can tweak EQ and dynamics faster by ear in real time at the console. Some find flying fingers to offer a more tactile experience than mousing a mix.

And let's face it: that big, fancy shiny console sure looks impressive when clients come over to voice their used car commercials.

Consider what it is your production studio needs to be capable of. If a dedicated analog production mixer is in the cards, so be it. Just be prepared to live with your decision: Those digital rigs you read about are picking up steam and, with next week's software upgrade, can become even more powerful than what you thought you bought.

The crayon days are over. Time to move upwards and onwards.

■■■

Al Peterson is a technical consultant for RW. His column "The World According to ARP" is a regular feature in Studio Sessions.

Radio's Most Wanted

PROFILE: Terry Baun, CPBE

Vice-President and Director of Engineering
Cumulus Broadcasting, Inc.
Radio World reader for more than 20 years

Favorite piece of equipment: Anything that continues to provide service well beyond its warranty period with a minimum of broken switches, knobs and software upgrades.

Least favorite piece of equipment: Anything that ships with a "Preliminary" manual or requires more than one factory "mod kit."

Favorite place to listen to the radio: In the automobile, because I now understand that it contains the only receiver by which program directors and consultants can judge the performance of any radio station. To heck with $25,000 worth of test equipment!

Favorite format: I enjoy oldies - both from the 18th century and the 20th.

Hobbies: Computers, high-end audio & collecting (Conelrad-era transistor radios, tuning fork Accutron watches).

Pets: Two cats, Buster and RF (Radio Frequency). RF was found abandoned at a transmitter site, natch.

Proudest moment professionally: Fighting local bureaucracy and citizen opposition to re-erecting a fallen transmission tower in time to meet a deadline for a station transfer. What a lesson in both civics and politics!

Proudest moment personally: Working with the SBE as a board member and officer to initiate a meaningful strategic planning initiative to help move the organization forward and improve member services. As Chairman of the SBE Certification Committee, I am very proud of the efforts SBE has made and continues to make in setting achievable standards by which our industry can judge engineering competencies.

Favorite Radio World columns: I enjoy Paul McLane's "Earwaves" column because it often gives insight into technology issues bubbling just below the surface. And, because I'm dealing with more than 45 market managers throughout Cumulus Broadcasting, the "GM Journal" is a must-read.

Reads RW because: It is the most genuinely useful of the industry technical publications I receive. There is always something that speaks to issues that our Cumulus engineering team is working on.

Terry Baun, standing in front of the Ron Rackley designed diplexer which allows Cumulus' SIEW Tallahassee AM (WHBT) to successfully diplex with another SIEW station only 80kHz away (Great bandwidth!)

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Tell us why YOU read RadioWorld!

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PRODUCT GUIDE

Ramsa/Panasonic

The DA7 digital mixer from **Ramsa/Panasonic Pro Audio**, together with the MAX expansion software package, allows for incorporation of a Macintosh computer into any broadcast environment using the DA7.

MAX increases the DA7's versatility and functionality, enabling entire mixes to be controlled and edited from the computer, including parameters such as automated faders, surround panning, channel on/off assignment, aux send levels, EQ, dynamics and routing.

Features inherent in the 32-input, 8-bus, 6-aux mixer include 24 bit I/O capability, surround-sound mixing capabilities, dynamic and snapshot automation and one function/one step screen layer operation.

Ergonomically, the DA7 has the look and feel of an analog unit, housing an LED Farm display, a series of LEDs enabling a quick reference at the console's current routing status, Automation Modes, Channel On/Off status, EQ On/Off, Dynamics On/Off, Panning In/Out, and Aux Send On/Off.

The Custom Views feature of the MAX expansion software enables individual tailoring of the mix interface graphics to accommodate personal working preferences. Edits to faders can be made in the this section, including punches in and out, or changes to other parameter controls as desired.

The Graphic Editing view displays the current mix as curves on a time line. Mix edits can be made by dragging fader curves in the editing window. Multiple channels can be viewed at the same time, giving a quick and accurate status update of upcoming mix events. Multiple mixes can be opened simultaneously, and mix parameters can be copied and pasted between mixes.

*For more information contact Ramsa/Panasonic Pro Audio in California at (714) 373-7277 or circle **Reader Service 72**.*

World Radio History

Voice Plays a Part in Production

Don Elliot and Julie Amato

Most of my career, I have written and talked about production without putting a lot of emphasis on something usually taken for granted, at least in a local radio station: the voiceover.

Without a solid voice performance, you're building a production piece on a sandy foundation, and it's doubtful just how well the finished piece is going to communicate.

Allow me to take you through some observations, so you can begin to make your production start with a winning V/O instead of trying to rescue a bad vocal performance by burying it with effects, or what I call "voice-under." It sinks in the sand, along with your career.

Radio and voiceovers

The word "enough" is a feast to an idiot. "Just enough to get by," "good enough" or "adequate" are expressions that make me cringe.

My best friend in radio has the best voice I have ever heard. He is also one of the laziest people I know. What makes this even worse is that radio stations for years have paid him an insane amount of money for doing time and temperature, and for reading copy. He doesn't have to work hard at it.

He also has a hidden talent that's been buried. He is not working at his full potential.

I told him that if I had his voice, I'd go up on top of a mountain and talk to myself. I also told him that if I had his voice and didn't do over a million this year that I'd consider getting *out* of the business!

That was just enough of an insult to get him excited about shedding some of what I call the bad radio patterns, both in his speech and his lifestyle. So he had a little voice coaching from a good director and learned some basics about talking with the audience and not *at* them.

Almost immediately, he bagged a national airline account and a couple of food companies. It just started growing. He took my insult as a challenge.

It is from these personal realizations, from observing and hanging with people around me who are much better than I am, which led me to some self-discovery. These are startlingly simple conclusions and could lead to serious money-making.

If you have been in the radio business for more than a year or two, ask yourself

The author's recently released CD-ROM video is about digital production of promos.

how many disc jockeys you have heard on national commercials. I can't name any. Gary Owens and Casey Kasem don't count; they made what I call "the jump."

Now ask yourself why.

A few years ago, I noticed that the only way I could "talk" on the radio was in a slightly crumpled up position hunched over the table, wearing loud headphones and leaning forward to the point that my diaphragm was completely folded in half, and yelling at the top of my voice into a $1,800 microphone that was less than one-half inch from my lips!

The amazing thing about this was that I learned that was "normal" from everybody else I came up with in the business. Then I started listening more to television spots that grabbed my attention and I realized that the source of that voice was probably not in the same position as what I have just described.

He explained that one should respect the microphone as a human ear.

Was this the first step? And what if another radio person found me in a new "position" as I spoke; would I be drummed from the corps?

Around this time, I had the pleasure of being at a session where longtime voice professional and former radio jock Danny Dark was cutting some network IDs, actually in the same room with the engineer. As he recorded, that "bigger and friendlier than a barn door" voice that I had heard for years was actually inaudible to my ear from eight to 10 feet away.

He explained that one should respect the microphone as a human ear. How would I feel about someone yelling into my ear from one-half inch away? I started thinking about that. I paid big bucks to learn how to talk without headphones on, because it made me listen to *myself* instead of thinking about what I was saying.

It was around that time I realized that the people doing the hiring didn't know any better either. They know they need people on the air with an ability to follow a format, talk over records with a sense of timing, have a lot of personality on the air and perform spectacular bits. However, they never hired us to do commercials, and most of us had no training in that area. So to wonder, curiously, why we never get hired to do the thing we do the worst, is certainly ignorant.

Hobbyists and professionals

Now let's look at who's getting all the work. There are 40,000 folks registered as AFTRA/SAG members in Los Angeles alone, but only around 400 of us can possibly say we make a living in voiceover work.

There are a lot of "wannabes" and hobbyists out there. I for one thought it was odd that the SAG folks were nervous at the recent vote for or against the AFTRA-SAG merger, claiming that "the AFTRA people will all get our jobs,"

See VOICE, page 54 ▶

PRODUCT GUIDE

Yamaha

The 02R from **Yamaha** is a digital recording and mixing console suitable for audio post and music production. The Version 2.0 system software adds increased functionality for the aforementioned applications.

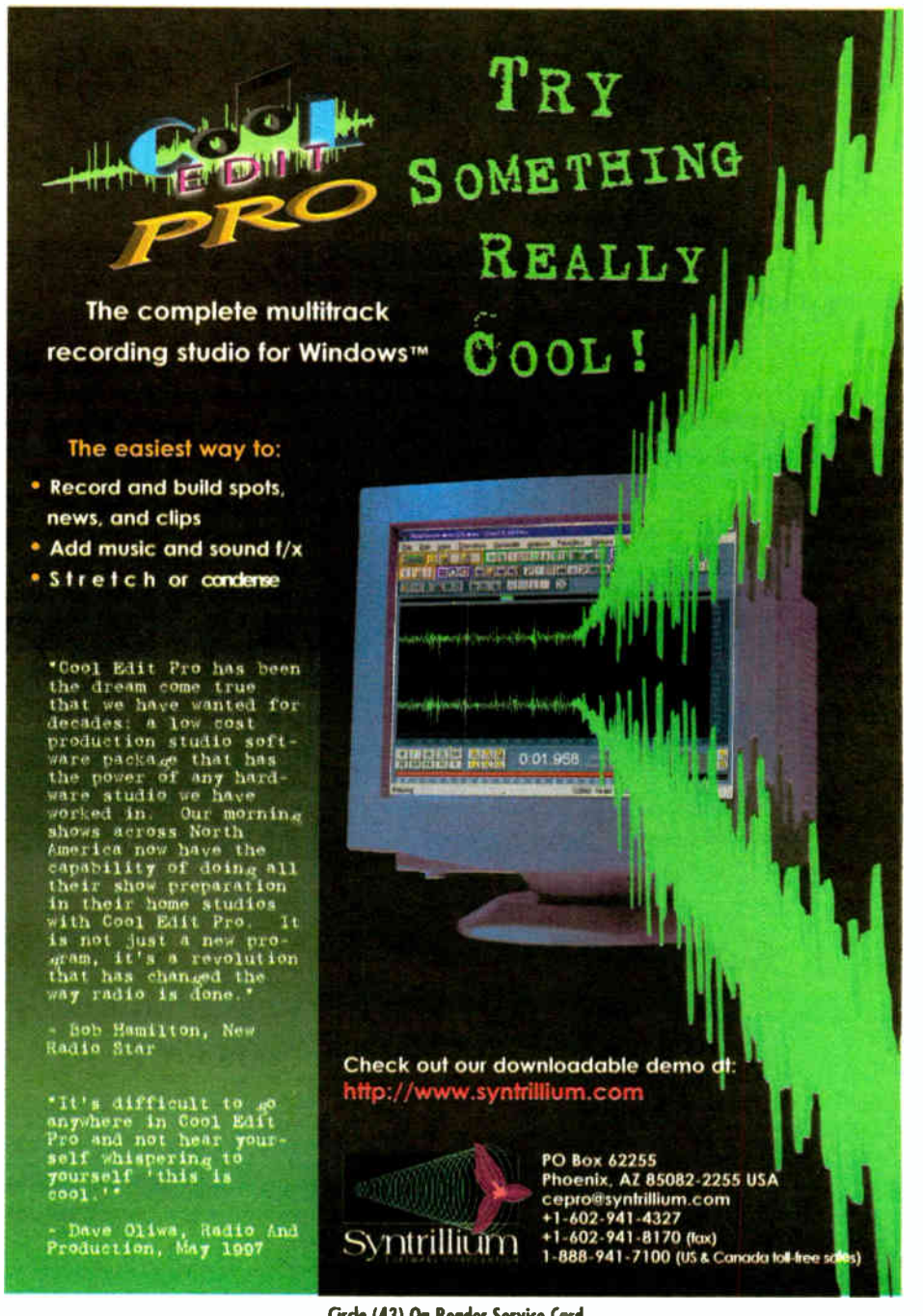
By use of two recorder tracks per channel, high-resolution digital audio can be recorded at the maximum wordlength of 24 bits. Recorder tracks 1 through 4 are used for the upper 16 bits while tracks 5 through 8 are used for the lower 8 bits. Up to four tracks of 24-bit audio can be recorded on an 8-track digital multitrack recorder.

An End option added to the automix Edit Out function allows the user to cease recording soon after making a level change and allows the 02R to automatically rewrite the data up to the end of the automix without having to run the timecode to the end.

Automixes can be synchronized to MIDI Clock (with support for Song Position Pointers) in addition to SMPTE, MTC and INT. Automixes synched to MIDI Clock can be offset plus or minus relative to the incoming timecode. Up to 56 signature changes can be entered in the time signature map.

There are also more digital sends available with the 2.0 software. Bus outs, aux sends, channel direct outs and the stereo output can be assigned to the YGDAI digital outputs.

For more information contact Yamaha in California at (714) 522-9011, fax (714) 522-9522 or circle ***Reader Service 91.***



Circle (43) On Reader Service Card

World Radio History

The Ins and Outs of Spot Copy

▶ VOICE, continued from page 53

when the opposite is actually true.

Actors do nearly all of the commercial voiceover work, in case you haven't been around any media lately. You should also know that of all the money brought in through AFTRA/SAG sources, the majority of the money isn't from movies or television shows — it's from commercials.

Take heart! This "training we never had" (acting classes) is actually something we all have inside of us which we can tap into. It's that improvisational ability we use when we're on the air live: pulling from the spark of the moment to help in our creative reading of scripts. This helps us learn some of the actors' techniques and successfully compete against them. It's about getting in touch with the "kid" in you that gets masked as we grow older and become molded by our peers in society.

If you have been fortunate enough to be able to take an acting class, it won't have hurt you at all. Get into an improv group! Check out what happens on the ABC television series "Whose Line Is It Anyway?" Watch the work of Ryan Stiles and try to get behind his brain.

Is there a bias?

"The agency and director and the disc-jockey bias."

This could be a misnomer, but most of the scripts I look at in the area of casting instructions and direction usually include the phrase, "no announcers." They want *real people*. But never forget that being natural is still a performance.

In all this rhetoric about being natural, I'm about to introduce what might at first blush feel contradictory: the concept of "rules" for doing a spot. First of all, they aren't rules, nor should they be considered framework — they are, instead, "mother's little helpers." They don't have to have a name if they will make you feel constrained.

Instead, these are suggestions for great mobility. Imagine learning to dance in a structured way. The step is a limit, but then it allows you freedom and great mobility of expression. Without the structure, however, there would have been no dance to begin with. So in a way, with limitation there is freedom!

When looking at a piece, here are some tricks and questions for analyzing the script:

- *Who is the client? What kind of business is it?*
- *Is it for radio or television, and are there visuals, storyboard, sound effects, etc.?*
- *How long is it?*
- *Read the last line first so you'll know where it's going and get a sense for it.*
- *Read it for the first time for information, like it was a newspaper. What is the writer trying to say?*

If you don't know what the writer had in mind, how can you go on? This is the breakpoint where failure becomes what my best friend in the beginning of my story was doing — just merely reading out loud.

Next, read the copy through for attitude and speed. Mark emphasis where it feels right or on points that leap out at you as being important. Mark places to breathe and break "laundry lists" down into threes. There's a rhythm to that; people relate and remember these kinds of patterns, and it makes your read more naturally if you group lists into this "three pattern."

The first take

The first line of the copy is *not* usually the first line of the copy.

Life is a series of events ... something happened in the world just before this copy started, and will likely go on after you have finished. It is up to you to try to figure out what the missing line might have been just before your opening line. You can make one up to do in your head so that you will hit the ground running on the first line of the copy.

Let's say your spot's opening begins with, "Tires are a funny thing ... you never know about the tread on them and whether you've got a month or a year left to go on 'em." I'll bet most people would read the first line with rather centurion tones if left to their own devices.

However, you could self-direct yourself into a "backstory" of your own makeup that might read something like: " ... *and the overhaul of the engine will give you great peace of mind before that 3,000-mile trip in a 10-year-old car ... and that's not all, tires are a funny thing ... .*"

Of course, don't start the spot until the word "tires," unless you have an accommodating editor who is savvy to the technique. The difference in how the listener hears both versions for the first time perceives the naturalness in your performance.

Emotion in commas

Punctuation in properly written copy is the indicator of emotion and what to do with intonation at important parts of the message, like the ends of sentences. It telegraphs megabits of what the writer had in mind.

Take three breaths before you read. This is enough to help most people relax, and a relaxed body results in a relaxed voice that can command its full range for delivery.

Every commercial is dialogue copy, even when written for one voice. Why? Because you are always talking to *somebody*. Decide on a point of view, that is, who you are. Visualize yourself in the setting of the commercial. Decide on who you choose to talk to. Is the listener sitting or standing? How old is the listener? Is the listener male or female? Talk to only one person. There is no such thing as "ladies and gentlemen." What is your relationship to the person you are talking to? Is that listener big, small, intimidating, aggressive or subordinate to you?

Don't be afraid to let emotion show; just think of your real-world experience with music and song. People will feel the emotion from your intonation, but they may not always hear all the words. You want them to get a *feeling* about the product. That is why emotion is important.

Where are you? If it's a supermarket spot, put on the apron and be the butcher, not the announcer. Own the company. Look at what the great job Lee Iacocca did; you *knew* he ran the company. What a perfect spokesman. He was able to convince people, and the truth leapt out of his message.

Have a feel for these words that aren't yours; make them yours at all costs. It's a lot like fantasizing: You must substitute feelings. When you are talking about food, think about sex.

I once asked Chuck Riley, a longtime voiceover professional, how he was able to keep his big promo style "on" an angry-like delivery for a trailer he was cutting in my studio. Without so much as a one-beat pause, he looked up at me and said, "Why that's easy! I just think of my ex-wife's lawyer."

In other cases and for a high percentage of copy, it can help to mentally lower the age of the listener and become a storyteller as if to a child. After all, you are really talking to the child in every listener most of the time.

Have an opinion. People will not listen or care about someone who has no opinion.

Finally, *love all copy*, no matter what!

Remember Casey Kasem's philosophy: If he had to read the same one-liner card every day, the next day he would read it like he was saying it for the very first time. Everything is bright and new to Casey every day that he wakes up.

■■■

Don Elliot has released an instructional CD_ROM video called "Producing Promos Digitally." It is available at iqsoft.com *or by contacting him directly at* voiceovers@earthlink.com

His voiceover credits include Dodge Trucks, Honda, AT&T and Mervyn's.

Julie Amato is a voiceover talent and voice coach who lives in the Los Angeles area. Reach her at Jamato9@aol.com

Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No.(s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

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Mini Mix
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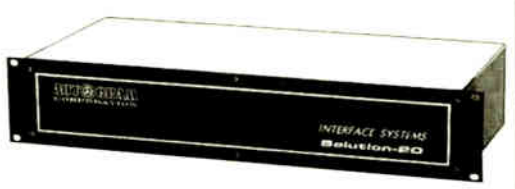

Solution 20

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World Radio History

SPECIAL REPORT

The Joys of Audio Compression

Loren Alldrin

We live in a world where sounds come in all shapes and sizes, from barely audible to painfully loud. Our voices can generate a broad range of volumes, as can musical instruments, machinery and sporting events. We call the difference between the loudest and softest sounds living together *dynamic range*. Real life has a very high dynamic range.

Dynamic range

Unfortunately, recording and playback systems don't deal so well with a great dynamic range. Sounds that are too soft can slip away into electrical noise, while louder ones cause clipping distortion. The radio broadcast chain struggles when presented with too great a dynamic range, right down to the listener him or herself.

Soft sounds can get masked by the roar of freeway traffic, while loud sounds may find the listener reaching for the volume knob to reduce the volume.

In simple terms, compression is a process to reduce dynamic range. A compressor works its magic on an electrical signal, in turn affecting the resulting sound. The process is far from complex — when a signal exceeds a certain strength, compression reduces its level. Smaller signals slip through unchanged.

Whether you think of a compressor as bringing up quiet signals or reducing loud ones, the end result is the same — the audio program's dynamic range gets reduced.

In control

You'll find compressors both as rack-mounted hardware devices and software plug-ins, and they usually share the same controls. Here's a quick rundown of the knobs (virtual or real) that matter.

Threshold: This sets the signal level at which the compressor starts to work. When the signal exceeds the threshold, the compressor reduces its strength based on the ratio setting.

Ratio: This setting controls how much the compressor reduces the signal as it passes the threshold. A 2:1 ratio, for example, means every 2 dB increase of the input signal above the threshold will result in a 1 dB increase at the output. At 8:1, a healthy 16 dB increase at the input makes the output rise just 2 dB.

Attack time: This controls how quickly the compressor acts on the signal when it exceeds the threshold. Slow attack times will let an initial burst of signal through unscathed before the compressor compensates.

Release time: This controls how quickly the compressor lets up on the signal after it drops back below the threshold.

Makeup gain: With the loud parts of the signal reduced, the end result will sound quieter. This control lets you bring the overall signal level back up to where it belongs.

A compressor's "gain reduction" meter tracks how much the compressor is reducing the signal level. This is the most important feedback you'll get from the processor, as it lets you see at a glance what the compressor is doing.

Mild compression is less than about 4 dB of gain reduction, moderate compression may get up to 8 dB or so and gain reduction in the 10 dB-and-up range qualifies as "heavy" compression.

Radio producers can apply compression at two points in the production process — on individual tracks and on the entire mix. Each application has its own unique benefits, which we'll explore here. For most productions, the best bet is to compress individual tracks *and* the full mix.

Compressing the full mix will add perceived power and volume to your audio program.

The advantages of compressing individual dialogue, narration or sound effects tracks are numerous. First, compressing a given track will make it "sit" better in the mix. A compressed track is far less likely to disappear one minute and be too loud the next. In most cases, a compressed track will also seem to have more in-your-face energy and clarity.

Balancing numerous compressed tracks is usually much easier than mixing uncompressed tracks, as their levels are more consistent. Compressed tracks are also less likely to catch you with slow, unnoticed level shifts. If you've ever discovered (in horror) that your overall audio level has dropped 6 dB over the course of a four-minute package, you know what I mean.

Working wonders

When applied properly, compression can do wonders for the spoken word. A tight on-mic delivery is a good start, but still may lack the immediacy and power you're after. Compressing a spoken word track brings it forward and helps it jump out of the mix.

Compression also reduces the odds of narration or dialogue getting swamped by music or sound effects (which are often compressed). A nice, consistent level makes mixing much easier when speech delivery sags a bit or the music swells.

Finally, compressing tracks let you record them a little hotter without having to baby-sit the peak lights. Hotter tracks translate to less noise and distortion, especially as their numbers climb. In the digital realm, a compressed track uses all those available bits better. With analog recording, a compressed track stays farther from the noise that lurks at low levels.

Compressing the full mix can make your audio program seem more cohesive and well-balanced. This final compression step may seem redundant, but it's really not — individual tracks (even those that are compressed) interact to create a whole new dynamic. If your mix has a few bumps and rough spots, compression will help level things out.

Most importantly, compressing the full mix will add perceived power and volume to your audio program. Your program will pop off the speakers with more authority, and will sound louder than an uncompressed version.

Most radio stations have audio compression somewhere in the signal chain, but you're still better off sending them a nice, hot mix. For proof, consider all the times you've heard an audio program that sounds twice as loud as the show it follows. Really "filling the meters" with your audio is a very good thing.

Compression recipes

Every compressor, track and audio program requires a slightly different approach. That said, there are some general compression settings you can use as starting points for your experimentation. Dial these in to begin, then adjust to taste.

Close-mic'd dialogue or narration: Try a compression ratio of about 2:1 or 3:1 and adjust the threshold until you're seeing 3 or 4 dB of maximum gain reduction. Set attack time near the fastest

See COMPRESSION, page 56 ▶

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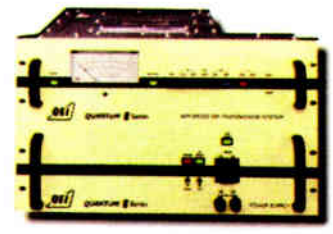

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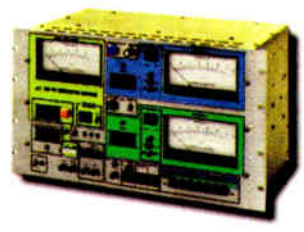

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Many Methods of Compression

▶ COMPRESSION, continued from page 55

setting (smallest number) and release time near the slowest.

If your compressor has a "soft knee" setting, try engaging it for the smoothest-possible sound. As with all the following recipes, bring up makeup gain to restore lost level.

Music bed: Try a ratio around 2:1, with fast attack and release times. Adjust the threshold until you're getting about 4 to 6 dB of maximum gain reduction. Try the compressor's "auto" setting if it has one, as well as a soft knee mode if available.

Sound effects: Compression can radically alter sound effects for better or worse, so you'll really need to experiment when applying compression. Start with ratios in the 3:1 to 6:1 range, and set your threshold for maximum gain reduction of about 6 dB. Start with a fast attack and medium release, and plan on trying lots of different combinations. Remember that some sound effects don't need compression at all.

Ambiences and backgrounds: A light touch is usually all that's required with background sounds. Try a ratio of 1.5:1 or 2:1, with threshold set to give 2 to 4 dB of gain reduction. An auto setting for attack and release times is probably best; if you have to set these controls manually, try a fast attack and medium release.

Full mix: A lower ratio (in the 2:1 vicinity) is usually best with a full mix, with threshold set for 3 to 6 dB of reduction. Try a medium to medium-fast attack time, and medium release. If your compressor offers an auto setting, try it. Software plug-ins designed for full-mix "mastering" compression rarely offer much in the way of controls. The key with these is to use your ears, and watch the gain reduction meter for a maximum reading of about 4-6 dB.

Too much of a good thing

Like any good thing, compression can be overdone. Too much compression can make a track or mix seem dull and lifeless. If your sound is better with the compressor bypassed, you may be going overboard. Try a lower ratio, higher threshold or slower attack time to return some life to the sound. If you can actually hear the compressor working (sometimes called "breathing"), experiment with different release time settings.

Compression can also make unwanted noises more obvious, whether background sounds bleeding into a mic or hiss from a poor analog recording. If you need to compress noisy tracks, try a noise gate or a noise-reduction plug-in before using the compressor.

Finally, compression can accentuate sibilance when words start with "s" or "t." Try less compression or a faster attack time when sibilance becomes a problem, or insert a de-esser into your signal chain.

The subtle effects of compression can be hard to hear at first, so don't be discouraged if the compressor doesn't seem to be doing anything. Repeatedly compare the compressed and bypassed signals, and experiment with the controls. You can't hurt anything with radical settings, so don't be afraid to try everything. Good luck.

■■■

Loren Alldrin is an audio/video engineer, consultant and writer. His book, "The Home Studio Guide to Microphones," is available from Mix Bookshelf. Reach him at loren@worldnet.att.net

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Mixers Share Analog, Digital Styles

▶ MIXERS, continued from page 49

and digital I/O module several years ago gave me 24 tracks (10 tracks at a time), more faders, more knobs and more buttons, an internal effects system with EQ reverb, delay, compression and arguably one of the best time compression algorithms on the planet. The Mackie 1604 VLZ XDR mixer I use at press time replaces the original 1604.

The 1604 VLZ XDR sounds noticeably nicer than the original 1604. The preamps are not edgy, the internal busses sounds smoother and overall the sound is more open and has more bass than its predecessor. It's not configured to be used as an on-air board — it doesn't have cue-detent pots or automatic monitor mutes — but I wouldn't be surprised if someone was using it on-air somewhere in the world.

Different strokes

I called Steve Drepperd, production director at WQSR(FM) in Baltimore, to find out what was going on at WQSR, WWMX(FM) and WXYV(FM). They have nine production studios, three for each station.

Drepperd said the main room for each station has an Orban Audicy and all rooms have Pacific Recorders AMX26 mixers which can go on-air if needed. Seven of the nine production rooms are also equipped with networked Broadcast Electronics AudioVaults.

Cam Eicher, sales manager at Harris Corp., has seen sales of mixers go in two directions from the larger Tascam M2600, Ramsa and Yamaha MM2000. Eicher said smaller, more featured mixers like Yamaha 02R, 03D and Ramsa DA7 are picks for people that want a digital console but still want to use all of their outboard gear.

Those with DAWs using digital audio delivery systems can get by with a smaller analog or digital mixer like the Yamaha 01V or Mackie 1604, although a minimal installation can consist of a Mackie 1402 VLZ or Broadcast Tools 6x1G stereo switcher. Eicher also moves a lot of Audioarts MR40 four-buss modular mixers with stereo input modules and monitor mutes because they can easily be used as on-air backups.

Eicher sees a future in which control surfaces retain some of the familiarity of analog consoles, but with more DSP power, a routing switcher and remote control with editing, mixing and mastering all in one control surface and in one piece of equipment. Right now, the closest piece is the Orban Audicy, although it's not quite there yet, he said.

Tascam's M2600 MKII

Future man

The most futuristic production systems I've seen in the last year were the Desktop and Poststation workstations from Digital Studio Processing in Australia. Designed to take advantage of the power of a Yamaha 02R (or other digital console) the DSP offers touch screens for mixer interface, track display and real-time surround panning, along with hard controls.

The Desktop provides a less expensive entry price, allowing you to add tracks and capabilities as needed. The two scalable system provide 8, 16, 24 or 32 tracks, with up to 80 channels of digital mixing. Each audio drive supports up to 32 tracks of playback. It's not as easy to use as the Orban Audicy and is more expensive, but it offers an amazing amount of control.

As DSP becomes more affordable, we'll see it used more in both component and integrated systems. I don't see components going away. The *a la carte* school likes its discrete toys and its members will never surrender to an integrated system.

We also will see a continuation of plug-ins, hopefully ones that are always equal to or better than their standalone predecessors. Right now, and for some time, getting the best performance will require an intelligent mix-and-match approach of analog and digital, as well as component and integrated systems.

■■■

Reach the author at www.jagunet.com/~ford

Ty Ford's equipment reviews and V/O files can be found at www.jagunet.com~tfo

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Sony PCM 501ES, 44.1 PCM digital audio processor, A-D converter, $500. B Meuse, 650-969-2433.

Orban 8000-A in vgc, recently re-capped & aligned, $1650. J Bahr, 787-728-0364

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Otari MX 5050 1/2 trk r-r; Scully 280 stereo r-r. J Phillips, 419-782-8591.

Otari MX5050BII (3), excel cond, $1245. J Sanders, 714-738-1501.

Revox A-77, fair-gd cond, BO. D Lurtey, 864-370-1800.

Otari ARS-1000 tape deck, low hrs, gd cond, $200. J Cunningham, 580-265-4496.

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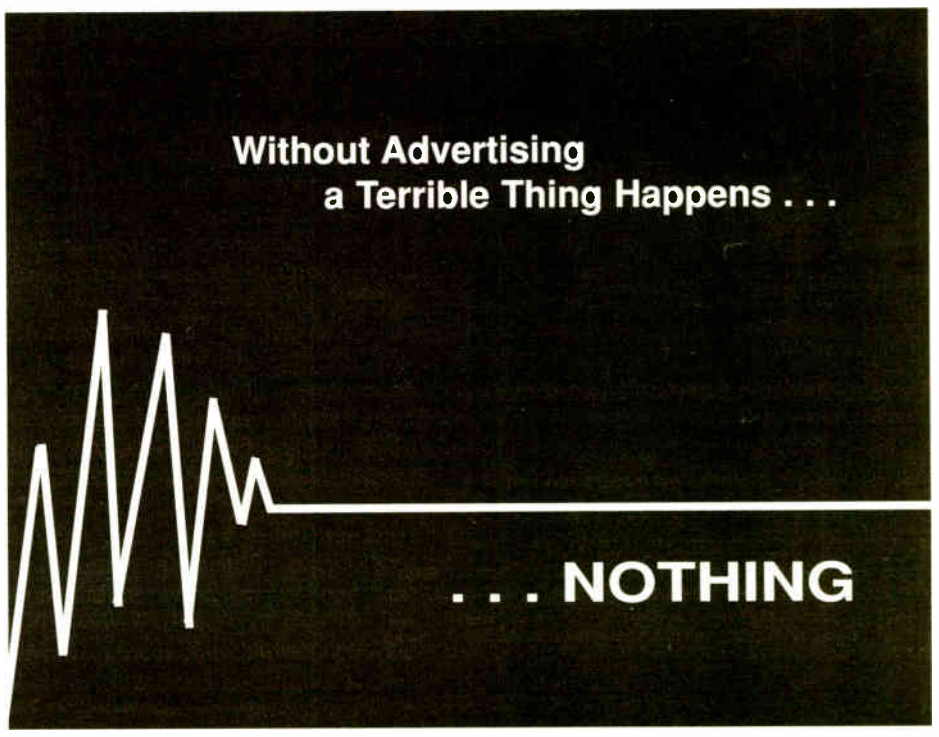
Remote & Microwave Equip.
Repair Services
Satellite Equipment
Software
Stations
Stereo Generators
Tapes, Carts & Reels
Tax Deductable Equipment
Test Equipment
Transmitter/Exciters
Training Services
Tubes
Turntables
Positions Wanted
Help Wanted



World Radio History

ACTION-GRAM

EQUIPMENT LISTINGS

Radio World's Broadcast Equipment Exchange provides a FREE listing service for radio stations and recording studios *only*. All other end users will be charged. This FREE service does not apply to Employment Help Wanted ads or Stations For Sale ads. These are published on a paid basis only. Send your listings to us by filling out the form below. Please be aware that it takes one month for listings to appear. The listings run for two consecutive issues and must be resubmitted in order to run again. Thank you.

Please print and include all information:

Contact Name _____

Title _____

Company/Station _____

Address _____

City/State _____

Zip Code _____ — _____

Telephone _____

Brokers, dealers, manufacturers and other organizations who are not legitimate end users can participate in the Broadcast Equipment Exchange on a **paid** basis. Line ad listings & display advertising are available on a per word or per inch basis.

Are you currently a subscriber to Radio World?
❑ Yes ❑ No

Signature _____ Date _____

Please check only one entry for each category:

I. Type of Firm

- ☐ D. Combination AM/FM station
- ☐ A. Commercial AM station
- ☐ M. Ind. Engineer
- ☐ B. Commercial FM station
- ☐ C. Educational FM station
- ☐ E. Network/group owner
- ☐ L. Consultant
- ☐ N.Delivery Service (Internet/Cable/Satellite)
- ☐ F. Recording Studio
- ☐ K. Syndicators/Station Providers
- ☐ G. Audio for Video/TV Station
- ☐ H. Consultant/ind engineer
- ☐ I.Mfg. distributor or dealer
- ☐ J.Other _____

II. Job Function

- ☐ A. Ownership
- ☐ B. General management
- ☐ C. Engineering
- ☐ J. Promotion
- ☐ H. Programming/production
- ☐ G. Sales
- ☐ E. News operations
- ☐ F. Other (specify)
- ☐ K. Production Mgt or Staff

WTS ❑ WTB ❑ Category: _____
Make: _____ Model: _____
Brief Description: _____
Price: _____

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Make: _____ Model: _____
Brief Description: _____
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Brief Description: _____
Price: _____

WTS ❑ WTB ❑ Category: _____
Make: _____ Model: _____
Brief Description: _____
Price: _____

*Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.

Broadcast Equipment Exchange

PO BOX 1214, Falls Church, VA 22041 • Tel: 800-336-3045 • Fax: 703-998-2966

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This listing is provided for the convenience of our readers. Radio World assumes no liability for inaccuracy.

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World Radio History

◆READERS FORUM◆

Cart chunk

Dear **RW**,

Thanks for publishing my article on the proposed "cart" chunk extension to WAVE files (**RW**, May 12). As we had hoped, the response, especially from the user base, has been very enthusiastic and supportive.

With the accelerating use of technology-based equipment in radio production and delivery, along with greater emphasis on file-based audio management, commonly accepted interchange standards between diverse applications is sure to become more important. It's important that manufacturers recognize this and adopt these common standards in preference to proprietary, expensive connections.

As you might surmise, the WAVE "cart" extension is in the proposal and discussion stage. Currently, a number of manufacturers have been involved in the discussion, and I am coordinating the discussion with standards organizations here and abroad. Not surprisingly, the proposal is evolving as the various participants make their relevant suggestions. As we reach a final consensus, I would be more than happy to keep **Radio World** apprised of the latest version.

In the meantime, we welcome your comments and suggestions. You can reach me through my e-mail address at *Dpierce@world.std.com*

Again, my thanks to the staff at **Radio World** for their timely interest and assistance in getting the word out on this important topic.

Dick Pierce
Principle Software Engineer,
Orban Audicy
Hanover, Mass.

MarketWatch mishap

Dear **RW**,

I agree with the letter writer from Minnesota in the March 17 *Readers Forum*. Your MarketWatch feature needs to include noncommercial stations. Many of them have a significant impact in the markets they serve.

I have been disappointed with MarketWatch and its emphasis on commercial radio. A suggestion would be to do a sidebar-type of story for each market you cover on the noncommercial side.

I manage Family Radio's KDFR(FM), one of our 40 stations nationwide. You certainly have many readers like myself who work at noncommercial stations but have long felt that MarketWatch doesn't tell the full story of a given market. And how about noncommercial stations that operate on commercial frequencies?

I hope that in the future you'll strive for a more balanced coverage of radio. I enjoy **Radio World** and except for this continuing flaw, I encourage you to keep up the good work.

Larry L. Vavroch
Operations Manager
KDFR(FM)
Des Moines, Iowa

Joe Radio rumblings

Dear **RW**,

I enjoyed "Why Joe Radio Has No Character" (**RW**, May 12) by Mark Lapidus.

We can't relive the past and I wouldn't want to, *but* the elements that made great radio stations will always be around for those who know how to use those elements. One of those elements: Hire good people and allow and encourage them to do what you hired them to do. Many are afraid to promote the talent because they will ask for more money. If that talent is bringing more money into the station, I'm very happy to give them more $$$$.

Keep up the good work.

Roger Carroll
Chief Executive Officer
Roger Carroll Broadcast Group
Los Angeles

Sky? What Sky?

Radio managers, booming along on a wave of stock valuations and increasing ad revenue, have yet to get too worked up over predictions that their sky may start falling when satellite radio services come online in the next year or two.

Some analysts believe radio has much to fear. "Radio has not experienced a change like this on the dial since the debut of FM," stated an article in The Wall Street Journal.

Satellite Today quoted investment bank C.E. Unterberg, Towbin, as saying that satellite radio has "the capability to revolutionize the radio industry in the same manner that cable and satellite television revolutionized the television industry," thanks to its ability to provide niche programming.

One radio equipment expert wrote to **RW**, "Within the next three to five years, radio in the United States is going to have to make some big changes."

Satellite radio has been hovering over the horizon for years. It seems a lot closer now that big-name program suppliers are signing deals with the satellite companies, and GM and Ford are planning to include receivers in certain models. Automakers are our traditional partners in reaching the audience where few other media traditionally penetrate — in the car, on the road. The investment by leading carmakers is a signal that satellite radio really is coming.

The sky isn't falling, though. Yes, radio, like other traditional media, has felt the impact of blossoming consumer choices and of the Internet. Yes, the makeup of our listeners and our business models have changed.

But radio is a survivor. Through the advent of TV and cable and cheap cassette tapes and CDs and MiniDiscs and Net audio and the information explosion, radio lives. Despite our occasional gripes in this space about the content of what radio stations air, we still believe in radio.

Radio remains a good bargain because it is ubiquitous and free. Satellite radio can only hope for the former. It will never be the latter. Satellite won't kill the radio star. And as a wise person once said, what doesn't kill us makes us stronger.

— RW

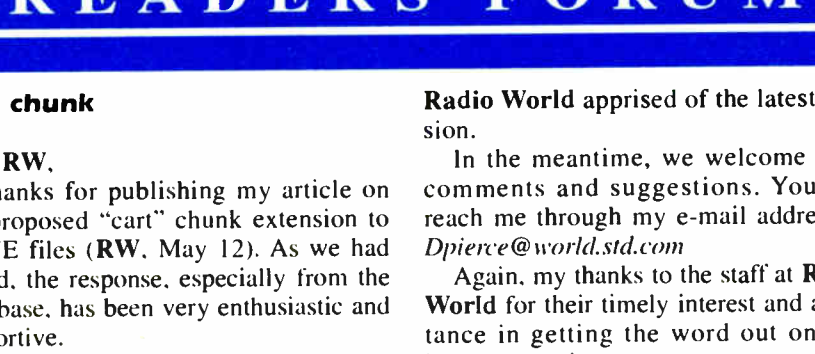
Roots of radio

Dear **RW**,

Congratulations to Bill Ryan for his interesting article on wire recorders (**RW**, May 12).

Of course, he neglected to mentioned what happened when the 10,000-foot wire broke when moving at three feet a second, which it was prone to do. You cannot imagine the tangle!

Ryan's brief mention of the "new German magnetic tape machine" deserves a major story of its own. This was Dr. Goebbel's pride and joy, and many U.S. troops invading small German towns were amazed to hear full symphony orchestras broadcasting to the locals at the height of bombardments, only to discover a small and totally unknown tape recorder playing back the symphony on the local radio station.



Wire Recording Diagram

Of course, the real story is how Bing Crosby was able to get his hands on one of the first captured units, leading to the creation of Ampex Corp. in Redwood City, Calif.

Robert E. Richer
Owner
International Media Consulting Inc.
Farmington, Conn.

Write to Us

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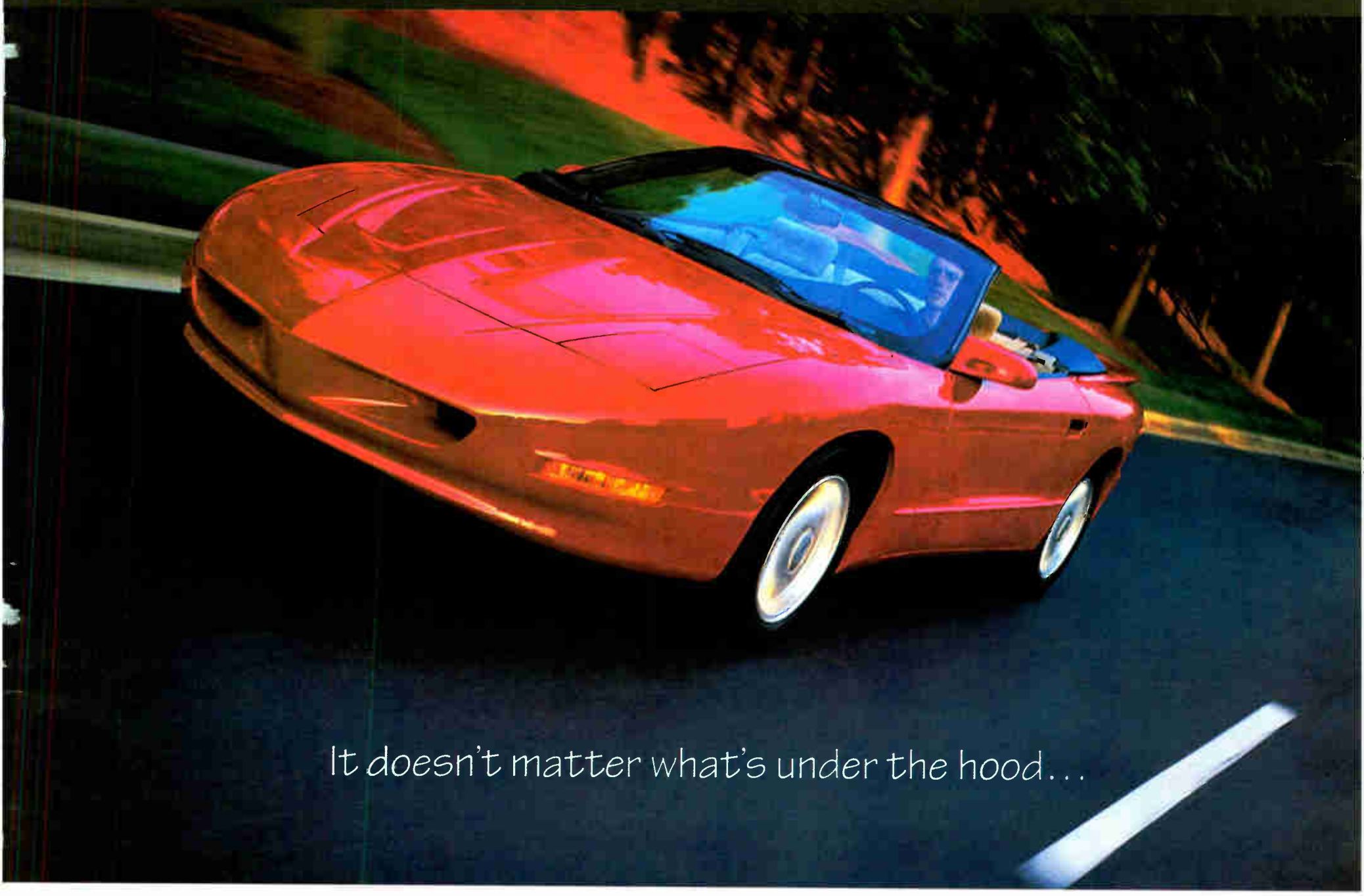
—Printed in the USA—

World Radio History

Everyone Wants to Own a Convertible!



So...How About a Convertible Radio Console?

Our New WHEATSTONE A-5000 gives you the **best** of both worlds. Order it from the factory now as a topnotch ANALOG on-air console. Then later, when you're ready, switch it out to DIGITAL! That's right, this new design accepts modules from our top-of-the-line D-500 and D-600 consoles, allowing it to be converted from analog to digital in the field!

Think of it: no new studio furniture, *no rewiring*—all your existing studio connections simply replug. And while we're at it, no re-training your staff either. A painless switchover on your own timetable, right in your own facility! If you need a new radio console *now* but aren't quite ready for the Big Switch, then check out our new A-5000—you'll like what's under the hood!

Wheatstone Corporation

600 Industrial Drive, New Bern, North Carolina 28562 (tel 252-638-7000/fax 252-637-1285/email: sales@wheatstone.com)

Circle (45) On Reader Service Card

World Radio History

DIGITAL INTEGRATOR

DON'T LET THE TRADITIONAL LOOK FOOL YOU! This new audio console from Wheatstone has the most advanced DIGITAL FEATURES available on the market today! How about **serial control** of all switch, fader and eight-character source display settings—for **TRUE INTEGRATION** with routers and automation systems? Four stereo mix busses with simultaneous digital and analog outputs? Multiple mainframe sizes? Dedicated phone modules with DSP generated mix-minus for easy control of two to four callers?

BUT DON'T STOP HERE: optional DSP equipped modules allow programmable ducking with gain reduction and master/slave selection, digital input attenuation, pan/balance, 4-band sweep EQ (plus sweep high pass), and compressor/limiter with threshold, ratio, attack, release and makeup gain—all on *each* input!

A meterbridge **router controller panel** can run our new Wheatstone rackmount switcher for hundreds of additional inputs. The totally modular hot-swap design accepts both analog *and* digital inputs. Dual metering is simultaneous VU and full scale digital peak. Add a PC based **setup program** for quick configuration of all displays, mutes, tallies, machine starts and mix-minus assigns (once set the PC is removed for console stand-alone operation) and you begin to see the *power* that lies behind this intuitively simple control surface.

SOUND LIKE SOMETHING YOU'RE LOOKING FOR? Give us a call here at **Wheatstone** and **ask** about the brand new **D-600 DIGITAL AUDIO CONSOLE**—our sales engineers would love to tell you more!

Wheatstone Corporation

600 Industrial Drive, New Bern, North Carolina 28562 (tel 252-638-7000/fax 252-637-1285/email: sales@wheatstone.com)

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