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The Newspaper for Radio Managers and Engineers
December 20, 2000

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NEWS ANALYSIS

When the Customer Is Also the Owner

At Least Two Major Radio Chains Have Purchased The Companies That Make Critical Station Systems

by Randy J. Stine

While the radio industry has witnessed master purchase agreements between big broadcasters and equipment suppliers, a couple of groups have taken that relationship a step further in the past two years, purchasing vendors outright.

The industry has taken notice of the more direct approach after Capstar Broadcasting Partners — now Clear Channel Communications Inc. — bought Prophet Systems Innovations and Cumulus Media Inc. acquired Broadcast Software International.

Melissa Montana, operations director and interim GM of WLAB(FM), Fort Wayne, Ind., using BSI digital software. BSI is owned by Cumulus Media.

Those deals have yet to spark a trend, but there are indications the relationships have worked well for both broadcaster and subsidiary. A remaining question is what the long-term implications of the arrangements will be.

Industry experts said the deals make

See SUPPLIER, page 10 ▶

NEWS MAKER

EAS Alert: Frank Lucia Retiring

by Lynn Meadows

WASHINGTON The FCC is about to lose an engineer who has served the agency for 35 years, and spent 25 of those working directly with broadcasters.

Photos by Leslie Stinson

Frank Lucia

Frank Lucia, an engineer and special advisor for the Emergency Alert System, plans to retire in the first week of January after guiding the FCC through the planning phases of both the EAS and its predecessor, the Emergency Broadcasting System.

The 58-year-old Lucia has hefty praise for broadcasters who have made both systems work.

"The quality of the people is unsurpassed. These guys have contributed thousands of hours of their

See LUCIA, page 6 ▶

◆ NEWSWATCH ◆

DG/StarGuide to Merge Next Month

IRVING, Texas Stockholders have approved the merger of DG Systems Inc. with StarGuide Digital Networks. The deal is expected to close in January. DG operates a digital network for distributing audio and video that links ad agencies with radio and TV stations. StarGuide's latest service, called CoolCast, aggregates and delivers audio and video to desktop PC users.

According to the agreement, 1.7 DG shares of stock would be issued for each outstanding share of StarGuide stock. When the deal is done, the combined company will have about 80 million fully diluted shares outstanding, with current DG shareholders owning about 41 percent and current StarGuide shareholders owning about 60 percent of the combined company.

Radio's Big 3 Earn 72% of Revenues

NEW YORK Consolidation helped revenues of radio's publicly traded companies grow 20 percent to more than $8 billion from 1998 to 1999, according to the latest Veronis Suhler & Associates industry report.

Three radio groups — Infinity Broadcasting, AMFM Radio and Clear Channel Communications Inc. — accounted for more than 72 percent of the adjusted total annual radio revenues and 84 percent of combined assets at publicly reporting radio groups in 1999.

Publicly reported Internet companies accounted for more than $9.6 billion in 1999, a nearly 70 percent increase over the year before. At the same time, Internet companies continued to report operating losses, totaling more than $3.9 billion in 1999, up from reported losses of $1.5 billion in 1998.

Publicly reporting communications companies saw their revenues rise 12 percent in 1999 to a total of $271 billion.

FM Auction Slated For February

WASHINGTON The FCC plans to auction more than 350 FM construction permits on Feb. 21. Most of the vacant allotments in what is being called Auction 37 are Class A CPs, but some are Class C.

The commission has proposed to award the CPs in a single-stage, simultaneous multiple-round auction. This methodology offers every FM CP for bid at the same time in successive rounds of bidding. Details, such as the amounts of upfront payments to deter frivolous or insincere bidding, had yet to be announced in late November.

Index

BUSINESS DIGEST

New Roles for Harris Managers

MASON, Ohio Several top managers have settled into new duties and titles in the wake of a restructuring at the Broadcast Communications Division of Harris Corp. this summer.

In the months ahead, they hope to take part in a rollout of digital audio broadcasting, and are expecting brisk sales driven by industry consolidation.

Supplier health

Commenting about the health of the radio supply industry in the era of consolidation, the managers replied with optimism.

"Consolidation has been very positive" for Harris, said Jay Batista, vice president of sales and marketing for the division. "We've been working on e-commerce and relationships to strengthen our business with groups, (but) small radio stations, the mom-and-pops, are still important to us. We have no intention of becoming arrogant."

Dale Mowry, vice president of transmission systems, said consolidation has produced in his customers "a level of sophistication in the buying process that we've not seen before."

He said Harris has shipped more than 100 digital television transmitters, and said its research and development in DTV will assist the company in making digital radio products.

He pointed out that Harris is an investor in iBiquity Digital Corp. and described the relationship of Harris with iBiquity as close.

Jay Batista

Jay Adrick

Dale Mowry

"We're well positioned for the rollout," he said.

Company officials said its sales team is not affected by the management shift earlier this year, and that customers will not experience any dramatic changes. They said the restructuring will help the division become more focused on its business goals.

Jay Adrick is the vice president of studio products and systems, which includes the Harris Pacific console line, television systems operations, DTV products and the arm of Harris that distributes other companies' products to radio buyers.

Previously, Adrick held a systems management position that involved mostly television.

Batista, formerly of Adaptive Broadband Corp., is now VP of sales and marketing. Earlier in his career, Batista worked for Allied Broadcast Equipment, now part of Harris.

Mowry is the VP of transmission systems, which encompasses Harris radio transmission products, the Intraplex product line as well as TV transmission equipment.

One transmission VP

Radio clients are accustomed to seeing the name Jim Woods. That is likely to change; Woods has moved to the west coast and become vice president of automation, overseeing the business arm created by the acquisition of Louth Automation, a television-oriented unit.

Among the benefits of these changes is that radio and TV transmission products, which had been managed separately, now are under one vice president.

Mowry said the lines share a lot of design needs and had been competing for resources; this arrangement is intended to be more efficient.

Adrick, Batista, Mowry and Woods answer to Bruce Allan, president of the Broadcast Communications Division, headquartered at the new Harris facility in Mason, Ohio, near Cincinnati.

Another familiar name has left the company; Dave Burns departed this fall to pursue a marketing venture as an independent product rep. Adrick said Burns left Harris on good terms. "We'll miss him and we know this is a good move for him."

— Paul J. McLane

DIGITAL NEWS

ITU Eyes AM IBOC

GENEVA The International Telecommunication Union, a standards-setting body, has issued a draft recommendation to its members endorsing iBiquity Digital Corp. and Digital Radio Mondiale's AM system for in-band, on-channel digital audio broadcasting. The ITU said the IBOC system met its DAB standard in the bands below 30 MHz. The draft endorsement followed extensive testing. It now goes to the ITU's 189 member countries for review.

iBiquity hopes members will ratify the recommendation by May 2001.

iBiquity and Digital Radio Mondiale hope to get their system approved as a worldwide standard for AM IBOC for licensing purposes.

Dutch DAB Pilot Ends

AMSTERDAM The Dutch DAB Foundation has ended its digital audio broadcasting pilot project because there is no government policy on licensing DAB frequencies.

How long DAB transmissions would be off the air was unclear. Foundation Chairman Marc Maters told Radio Netherlands it could be a few months. DAB broadcasts stopped Oct. 1.

The Dutch DAB Foundation began its pilot project in January 1995 by introducing the Eureka 147 form of DAB to the Western portion of the Netherlands. Transmitter operator Nozema provided transmission facilities with an experimental frequency license.

See DIGITAL NEWS, page 5 ▶

The Treasure in My Stocking

From the Editor

Paul J. McLane

Aircheck Factory

AIRCHECK ACRES · WILD ROSE, WISCONSIN 54984 USA

November 2, 2000

"Mojoe"

Paul J. McLane
Radio World
P. O. Box 1214
Falls Church, Virginia 22041-0214

Dear Paul,

I enjoy your "From The Editor" articles in Radio World. You have a flair for communicating using the printed word (I would imagine on the air as well.)

My latest issue of Radio World arrived yesterday and, while having a little breakfast and listening to Radio Australia, I began perusing the magazine/newspaper. Your "What Is It About A Radio Station?" feature was especially readable. The memories you shared conjured up my own, though I never "made it" in radio. I grew up DXing, wanting to work in radio, and, today, sit here in Central Wisconsin surrounded by airchecks from all over the world (I'll enclose some of my lists.) Oh, I DID work behind the scenes in radio, but not on the air, except for my college station, WRSE-FM in Elmhurst, Illinois (Elmhurst College.) Anyway, this is of no importance.

The sentence that caught my eye was your mention of the WHN leather belt-buckle. I knew the individual who manufactured those and he had sent me many samples from various stations, including a WHN. When you commented "...what I wouldn't give to have it (the buckle) now...." I thought "Hmmm, I wonder if I still have that WHN buckle?" So, I checked, and sure enough I did. It sits by my typewriter now as I write to you.

The reason I'm not just putting it into the mail, though, is I highly suspect that with Radio World's readership that, by now, others would have contacted you with WHN belt buckles. However, if not, you can have this one. Sure, it's part of radio memorabilia that I saved, but it obviously would mean more to you.

Just drop me a note if you want it, or if you prefer leave a message at (920) 6[illegible] 3447. I'll send it right off, priority mail.

Thanks for the good reading. I'll continue to enjoy your articles.

Sincerely,

Tom

Tom Konard

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paul j. mclane
editor, radio world magazine
P.O. box 1214
falls church, va 22041

dear satisfied whn listener (I always loved to open a letter like this!)

what a nice surprise to hear that whn radio piqued your interest about getting into this crazy industry.

as someone who spent 14 years there, from 1974 until it became wfan in 1988, it's always amazing to me how well-remembered the station is.

anyway, I was glad to read you won a coveted leather whn belt buckle. sorry, too, that you got the belt buckle but not the girl.

hopefully, the enclosed leather whn belt buckle will help rekindle more good memories of whn radio (and hopefully not too many painful ones about your lost lady love).

sincerely,

jim nedelka
november 6, 2000
/enclosure

p.s. - in case you're wondering, I started out as a 1-day-a-week production assistant in the whn news department (remember news departments at music stations!) eventually becoming production director and producer of the mets' radio network

Industry Changes

QEI Corp. has appointed **Bill Harland** as sales manager. He previously worked for Continental Electronics. He's also held sales positions at Andrew Corp., Broadcast Electronics and Harris Corp. in the past.

Cox Radio has appointed a new CFO: **Neil Johnston** succeeds **Maritza Pichon**.

Clear Channel Communications Inc. has named **Kevin Mayer** to the newly created position of chairman and CEO of the **Clear Channel Internet Group**.

National Public Radio has a new vice president for communications. **Celeste James** succeeds Cheryle Robinson. Other staff changes at NPR include the appointment of **Bruce Drake** as vice president for news and information. **Barbara Rehm** has been named managing editor of NPR News.

"Performance Today," NPR's daily classical music program, welcomed **Fred Child** as weekday host and **Korva Coleman** as weekend host.

Kathy Ramsey has been promoted from vice president to senior vice president, broadcast government relations, at the **NAB**. The association has added **Lori Holy** to the staff as government relations' legislative counsel and lobbyist.

John Andrews

John Andrews was appointed broadcast development director at **Solid State Logic**. SSL also announced **Colin Pringle** as the new group marketing director.

Gentner Communications Corp. tapped **Stephen Hertzenberg** as its director of corporate marketing.

ATC Teleports Inc., a subsidiary of **American Tower Corp.**, has added **Norman A. Bikales**, a partner with Sullivan & Worcester, Boston, to its board of directors.

Meantime, American Tower has named **Debra Huttenburg** president, Galaxy Engineering Services Division. **Jimmy Kawalek** has been appointed market development manager/Western region for the audio division of **Group One Ltd.**

Jayson Tomlin

Jayson Tomlin has been appointed national sales manager for **SADiE**. Tomlin previously worked as national sales manager for Digital Audio Labs Inc.

Harman Pro North America has appointed **Tom Der** to the post of national sales manager. Der formerly worked for Soundcraft, a sister company, in the same capacity. **Robert Benson** is the new vice president of marketing and sales for **Harman Music Group**, while **Janice Palamides** has been appointed human resource manager.

Robert C. Johnson

Highpoint Tower Technology has named **Robert C. Johnson** as director of tower construction.

Sybergen Networks has recently changed its name to **Sygate Technologies Inc.** and has appointed a new president and CEO, **John De Santis**.

Sweetwater has added four new sales engineers to their professional sales staff: **Andrew Diekroger**, **Duane Shimmel**, **Brad Slate** and **Matt Martel**.

David Hansen has been named director of product marketing for **Euphonix**. **Mike Cheng** has been appointed to the position of president of the Eimac division for **CPI Wireless Solutions**. **Keith Hatscheck & Associates**, a marketing and public relations agency specializing in the media and entertainment technology industries, has announced staffing changes.

Merrie Harper joins the agency as an account management associate and **Kim Williams** has been named public relations assistant.

Statistical Research Inc. has promoted **David C. Tice** to director of client services.

Larry Downes has been named manager of radio and Internet services for **BlazeNet**, a company owned by **Susquehanna Media Co.**

CBS Radio/News has named **Constance Lloyd** general manager. **Clint Culp** has been appointed vice president, stations, for the **Radio Advertising Bureau**.

Premiere Radio Networks has appointed **Rhonda Munk** director of sales.

NBG Radio Network has named **Felix Lasin** to the post of music director and **Andy Young** to the post of producer for Bigg Snoop Dogg Radio.

Scott Ferrall has joined **SportsFan Radio Network** to broadcast his syndicated sports radio show "Ferrall on the Bench."

Seattle-based Broadcast Programming is now known as **Jones Broadcast Programming Inc**.

Rick "Bwana Johnny" Johnson has joined the company, working primarily with oldies and gold-based formats. **Fred Weber**, former CEO and co-owner of The Broadcast Group, has accepted a position on the board of directors of **WestStar TalkRadio Network**.

Leo Hindery Jr. has been appointed chairman of the board for **Coollink Broadcast Network**, an Internet broadcast solutions provider. **Dotcast Inc.**, a start-up company preparing to launch a high-speed broadband digital network, has announced the appointment of **James P. Elder** as director of corporate communications.

Got a job change to tell us about? We want to hear. In particular ***RW*** *invites news about radio engineers changing jobs or titles.*

Send press releases and photos to srae@imaspub.com *or to the address on the inside last page.*

Digital News

▶ Continued from page 3

Lack of receivers is also a problem. Maters told RN to help spur receiver uptake, the foundation has agreed to subsidize 100,000 cards that allow DAB transmissions to be received via computer costing between $100 and $150.

Sirius Plans January Launch

NEW YORK Sirius Satellite Radio, one of two companies developing satellite-delivered DAB radio as a subscription service, expects to begin airing programming on its 100 channels in January, slightly behind its previously projected December beginning.

Its ground spare, dropped and damaged during assembly at the Space Systems/Loral plant, is now set for delivery to storage in August 2001. Sirius would only launch the spare if necessary.

Sirius was set to launch its third satellite into space Nov. 30, while XM planned to launch the first of two satellites late this month.

iBiquity, Fujitsu Allies

DETROIT iBiquity Digital Corp. and Japanese auto receiver manufacturer Fujitsu Ten pledge to work together to develop and market an in-band, on-channel digital audio broadcasting product.

Fujitsu Ten is one of Japan's leading automotive component companies. iBiquity also has receiver deals with the following manufacturers: Alpine, Harmon Kardon, Kenwood, Mitsubishi, Recoton, Sanyo and Visteon.

— Leslie Stimson

Lucia

▶ Continued from page 1

own time. You couldn't ask for a better group of people to work with. The government owes them a big debt."

Lucia has spent thousands of hours helping states, localities, the National Weather Service, the Federal Emergency Management Agency — just about any group — plan for emergencies. When EBS was in its infancy between 1976 and 1980, Lucia was conducting roughly 100 seminars a year on the topic.

Cold War childhood

His childhood in Johnstown, Pa., helped develop his curiosity about disasters. "Of course, that is where they had the disastrous floods. So I guess I became interested in disasters and early warnings of emergencies. Also, it was the height of the Cold War and warning of a nuclear attack was in the back of everyone's mind," said Lucia.

But emergency planning is really Lucia's second career at the FCC. When he graduated from the University of Pittsburgh with a B.S. in Electrical Engineering in 1964, he went to work in the Office of the Chief Engineer at the FCC laboratory in Laurel, Md.

There were other offers, but Lucia and a few of his classmates decided on the FCC.

As a teenager, Lucia listened to distant AM broadcast stations and visited local television station studios and transmitter sites. He was interested in their operations and knew he did not want to work in the local steel mills, as his father had.

A year after starting at the FCC, Lucia joined the Research Division, where employees were studying data on FM and television propagation.

Renowned engineers

"I had the privilege to work with renowned engineers like Ed Chapin, Harry Fine and Bill Roberts," said Lucia. Chapin and Fine were fellows in the Institute of Electrical and Electronics Engineers.

"I learned a lot about radio engineering," said Lucia.

Lucia served in the Navy Reserves during the late 1960s. He was shipped to the Philippines after attending radio school in Pensacola, Fla. Because of his engineering degree, he was told he should take the Navy test to become an equipment maintenance specialist.

"Then a really strange thing happened," recalled Lucia. After he passed the test, he was told that the Navy had too many people maintaining the equipment. He was sent home and back to his Navy reserve unit. After serving 15 months of his two-year stint, Lucia was back at the FCC's Research Division.

Lucia was placed in charge of an FCC field-intensity measurement truck doing ignition interference measurements to land mobile communication frequencies from 30 MHz up to 900 MHz.

He helped take measurements involving the ducting of frequencies from transmitters in Philadelphia to receivers in Washington at 450 MHz. He also conducted measurements on different frequencies to determine the effects of foliage on coverage and on the feasibility of conventional land mobile operations at 950 MHz. The reports he wrote found their way into coverage maps for the different frequencies.

Frank Lucia

1942 — Born in Johnstown, Pa.

1964 — Graduates from University of Pittsburgh with a BSEE

1964 — Joins FCC laboratory in Laurel, Md.

1965 — Goes to work for FCC Research Division

1968-69 — Serves in the U.S. Navy Communications Group

1970-76 — Returns to the FCC Research Division.

1976 — Named Chief of the Communications Operations Branch in charge of the Emergency Broadcast System state and local program and the Broadcast Station Protection Program.

1980s — Leads the development of the Primary Entry Point concept to provide the president with a direct connection to several broadcast stations for national level messages

1989 — Begins working on the Emergency Alert System

1997 — Named director of the Emergency Communications, Compliance and Information Bureau. Currently assigned to commission's new Enforcement Bureau as Special Advisor for EAS.

"We were on the road a lot," said Lucia. He said he saw first-hand the dedication of broadcasters. For example, Lucia conducted six workshops in Texas in 1978 over a two-week time period.

Frank Lucia in the TV studio of the FCC's public meeting room

In 1976, the commission posted a vacancy for an engineer to oversee the planning of the new Emergency Broadcast System and the Broadcast Station Protection Program. The workload included conducting about 100 workshops a year inviting broadcasters, the National Weather Service and Federal Emergency Management Agency people into the discussion.

Bill Bradford of KSST(AM), Sulphur Springs, Texas, and the state EBS chair, co-directed all six workshops with him during those two weeks.

"The great thing I liked about Frank is that he kept insisting, 'I know what

See LUCIA, page 7 ▶

Lucia

▶ Continued from page 6

the regulations are. You guys tell me where they work and what we need to do.' We worked together beautifully. Frank managed to sit down with the National Weather Service, the Defense Civil Preparedness Agency and put together a thing that really worked."

By 1981, every state had a plan and the system was established. In the early 1980s, Lucia suggested using select stations to back up the national networks for the national, presidential-level EBS.

The result was the Primary Entry Point program, which provides the president with a direct connection to several stations for relaying national-level messages.

Unattended operations

New changes such as the increasing popularity of cable and broadcaster interest in unmanned radio stations forced the government to rethink its emergency warning system. Broadcasters were looking at other techniques that did not require an employee in the studio to relay warning information.

Lucia suggested field testing an automated warning system.

"The industry was wonderful with this. It didn't cost the commission a dime," said Lucia. Rigorous field tests were held in both Denver and Baltimore in 1993.

The FCC issued the Report and Order implementing the Emergency Alert System rules in 1994. EAS incorporated cable systems and allowed broadcasters to relay warnings even while running unattended.

"Since we'd done all the EBS plans, it was a little easier to do the EAS plans," said Lucia. "We had the foundation in place, we just had to change the house."

He acknowledged that some broadcasters have been vocal in their opposition to the systems both for EBS and EAS.

"But when put in a context of helping local communities, the realization is there that 'This is a benefit to my community' and that invariably wins out." He cited the Amber Plan in Texas which uses EAS to find missing children as an example of broadcasters using EAS to help their communities.

The next logical step for EAS, said Lucia, is digital television and digital radio. How stations would encode and decode EAS messages when they make the transition to digital is still being worked out.

Nuts and bolts

Meanwhile, every state has submitted an EAS plan. A few still need to be finalized, but Lucia said "all the nuts and bolts are in place." Almost every major city is in a local plan, said Lucia. There are 129 local plans in all.

Lucia said in Maryland, all the 911 centers have EAS encoder/decoders. "We think that is probably the next step."

Beyond that, Lucia said both Internet providers and the wireless industry have been interested in being a part of the system somehow. But that fine-tuning will probably not involve Lucia — although he already talks about doing some part-time consulting work for government or industry if the opportunity arises.

Lucia has spent thousands of hours helping states, localities, the NWS and FEMA plan for emergencies.

Lucia isn't the only long-term engineer to leave the FCC recently, and some contributors to engineering chat groups have expressed their concern.

"It is something the commission may have to address if the shortage becomes too critical," said Lucia. He said there is a need for "referees" — engineers who can make sure that the commission has accurate engineering information.

"My hope is that certainly the commissioners will try to recruit new engineers to replace a large number that are leaving now," said Lucia.

A spokesman for the Enforcement Bureau said several applicants are being considered for Lucia's position, but no decision had been made by late November.

Come January, Lucia said he plans to enjoy the house he built with his wife, a retired teacher, in Frederick, Md., and visit their children and grandchildren.

When the Emergency Alert System warns him about those summer thunderstorms, perhaps he can also enjoy a sense of accomplishment.

CBC Ponders Transmission Sale

by James Careless

OTTAWA Publicly owned Canadian Broadcasting Corp. is considering selling its national radio and television transmission network.

Potentially up for sale are 608 towers and 2,500 transmitters, supporting a total of 1,400 television and radio channels. All told, these towers provide 98 percent of the Canadian population with six networks: four radio and two TV.

Budget cuts

The idea of selling off transmission facilities follows decades of cuts in federal funding for the broadcaster.

It is a plan employed by non-commercial broadcasters in other parts of the world, notably the BBC in the United Kingdom and the Australian Broadcasting Corp.

Canadian Broadcasting Corp. services would retain a predominant place on the towers.

"The return has been in the hundreds of millions of dollars," said George Jackson, CBC executive director of corporate engineering.

Given the sheer size of the CBC transmission plant, Jackson said, "there would be every reason for us to expect it (the sales price) would be in the same ballpark."

The goal would be to sell off the physical assets and then to lease back the facilities and services from whoever takes them over.

Jackson said he expects the maintenance costs charged to the CBC under such a deal to be 10 percent to 15 percent less than its current expenses.

This assumes that new tenants are added to the towers, and that they pay a share of the total upkeep.

To find out if anyone wants to actually buy its transmission plant, the CBC has put out an informal Request for Information asking prospective buyers to let the corporation know if they are interested in the facilities.

If enough private companies respond to the RFI, and if the money being mentioned seems high enough, the CBC may issue a formal Request for Proposal.

Buyers

But are there buyers? Yes, according to Toronto-based telecom analyst Ian Angus.

Angus cited the booming Canadian wireless industry, in which Internet-driven data fuels a demand for both two-way messaging pagers and high-bandwidth fixed-broadband networks.

Also, the Canadian public generally is hostile to new towers — referred to as NIMBYism, as in "not in my backyard" — so wireless providers are desperate to find additional antenna sites.

"In the case of the CBC, the fact that the towers are already there makes them a very valuable resource," said Angus.

Virtually all Canadians are within earshot of a site, making them attractive to wireless providers.

Anyone buying the CBC transmission plant would have to agree to a few conditions.

First, CBC services would retain a predominant place on the towers.

Second, buyers would have to provide space both for digital audio broadcasting and DTV services.

For the CBC, both of these conditions are non-negotiable.

Many ways

This said, the emergence of alternative media, such as the Internet, cable TV, satellite TV and wireless cable means Canadians now have many ways to receive CBC programming.

As a result, over-the-air transmissions are not quite as important as they used to be. This is particularly true for CBC Television, which is received by the majority of viewers via cable.

Jackson said these changes make palatable the once-unthinkable notion of selling the CBC transmission plant to the private sector.

These days, Jackson said, "to own your own infrastructure in one particular delivery method seems to be rather restrictive."

"Why tie ourselves to an over-the-air system when there are so many other delivery systems out there ... Why not give ourselves the choice of any of them?"

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Supplier

▶ Continued from page 1

sense because of the post-consolidation infrastructure boom in radio, specifically in the digital audio storage segment of the industry.

The reasons for the acquisitions, they say, were two-fold: cost savings and investment opportunity.

"It seems logical that as you get companies with hundreds of radio stations they begin to say, 'Why should we pay a vendor all of this money, when we could just buy them and do it in house?' I think it does make some sense," said Richard Blackburn, president of media broker Blackburn & Co.

Part of the appeal of such a purchase to a group broadcaster is that the group can standardize its equipment inventory throughout its many stations, thus simplifying the process of training staff and stocking parts.

"Cumulus had committed to standardizing on (BSI) software before buying the company," said Ron Burley, the former owner and current president of BSI.

"When Cumulus looked at the total cost to do that, I think they figured it made more sense to buy (BSI) outright. It was more or less a bookkeeping issue."

Cumulus Media, which owns 252 radio stations, purchased BSI in 1999. Terms of the deal were not disclosed.

The standardization of the Cumulus chain to WaveStation and WaveCart automation software is well underway. Burley said the job will take several years.

Arm's length

"(BSI's) ability to produce systems and train Cumulus personnel fast enough has been the only question. We have only 20 employees right now, so we've had to make sure we can keep up the pace to satisfy Cumulus and our other customers," Burley said. BSI is based in Eugene, Ore.

Burley described as "arm's length" the relationship between BSI and Cumulus. "Remember, we are a subsidiary, not a unit of Cumulus. Certainly we work closely with them because they are our biggest customer by far," Burley said.

The benefits of being associated with Cumulus are numerous, Burley said.

"They certainly helped give us a higher profile and opened up other avenues for our expansion and growth. The feedback we receive from the field from Cumulus engineers is invaluable. It's a nice training ground for cluster-oriented broadcasting. In the end, it's allowed us to produce a better product," he said.

At Clear Channel, more than half of the company's 1,119 stations are equipped with the Prophet Systems Innovations digital broadcast systems.

"Our plan is to move all of our stations to Prophet Systems. We'll roll out another 60 to 75 stations this year," said Jeff Littlejohn, Clear Channel's vice president of engineering services.

When Capstar Broadcasting purchased Prophet Systems Innovations for about $25 million in 1998, Capstar/AMFM and Jacor Communications had already decided to standardize on Prophet, Littlejohn said.

J.J. Duling, PD of WSHE(FM) in Orlando, Fla., with Prophet's digital automation system

"I think purchasing them was just a good business investment," he said.

Prophet Systems Innovations was contacted for this story and declined comment. Marketing Director Jackie Lockhart referred questions to Clear Channel.

At the time of the sale, Prophet President and Chief Executive Officer Kevin Lockhart said his company could be more aggressive in acquiring new clients and developing new products as a result of the new ownership (RW, June 10, 1998).

"It's given us instant credibility," he said then.

Since that time, Clear Channel engineers have worked closely with Prophet research and development employees to design a digital audio system that has a friendly user interface and absolute redundancy, Littlejohn said.

"We now have a system designed specifically for our needs. Prophet got to have real-world input from guys that are out in the trenches everyday," he said.

Littlejohn said one of the benefits to standardizing a group's stations on a single digital storage system is that all the stations are using the same language.

"For instance, if an engineer in Fresno is having a problem, we can communicate through the entire group very quickly. Having multiple platforms would make that more difficult," he said.

No special treatment

Even though it operates as a subsidiary of Clear Channel, Littlejohn said preferential treatment is not what he expects from Prophet when it comes to customer service.

"Prophet really runs as its own entity. They know they have to service their clients in order to be successful. We work together closely, but we're just another customer of theirs," he said.

Privately, that close relationship is what worries some broadcast engineers when it's time to consider buying a digital audio system. Why buy from a supplier whose owner is a competitor in certain markets?

"I've never had anyone tell me that was a concern," said BSI's Burley. "I tell everyone who will listen that they can expect the same level of service as a Cumulus station."

David Stewart, director of engineering for Hispanic Broadcasting Corp., said when his company purchases studio gear, it considers many things. Of Hispanic Broadcasting's 47 stations, 10 have Broadcast Electronics systems, two use Scott Studios systems and one uses MediaTouch.

"We want the best system. That's easy to say and very hard to quantify," Stewart said. "The fact that Prophet, for example, was owned by a competitor didn't directly worry us."

However, Stewart said he was aware of the relationship. "We asked ourselves, 'What would happen if Clear Channel spun Prophet off?' That kind of thing," he said.

Clear Channel is not only a competitor; it also holds a 26 percent ownership interest in Hispanic Broadcasting.

"I think the ownership issue would be of a slight concern to (Greater Media)," said Milford Smith, vice president of radio engineering for Greater Media Inc. The majority of Greater Media's 14 radio stations are equipped with BE's AudioVault digital system.

"When you're buying on-air systems and other mission critical items, customer support is vital and one of the first things we look at. I would have to be very satisfied with our agreements and have everything well documented before I would proceed into (such) an agreement," Smith said.

Other factors in the traditional buyer-seller relationship also change when a group owns a supplier, insiders say. Some station managers find it tempting to treat the newly purchased supplier as an in-house engineering resource for all sorts of problems. Demand for such services may or may not be what the new owner had intended.

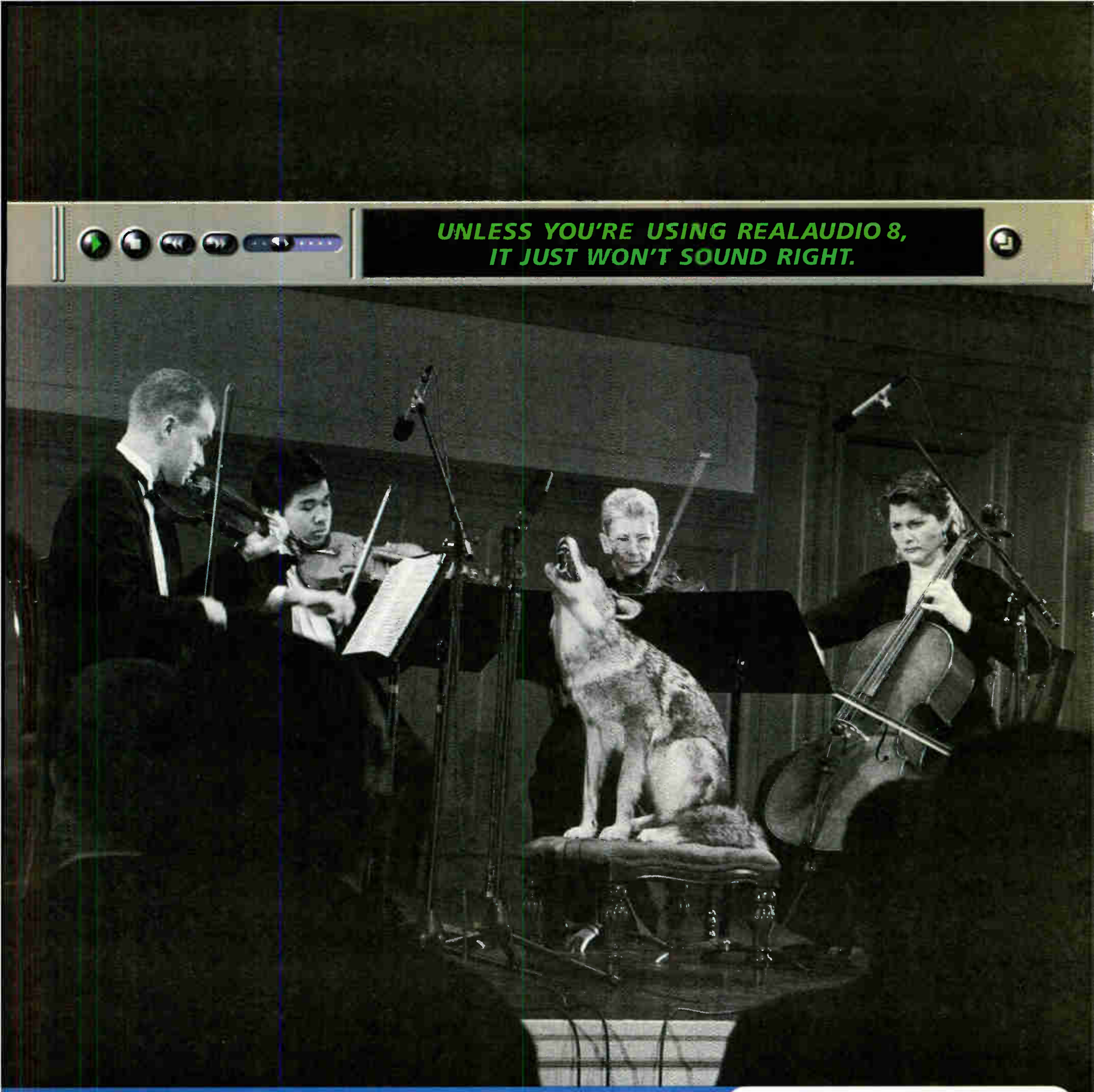
On the other hand, the supplier benefits by having a pool of presumably friendly stations at which it can test new products or features.

Will more groups be buying their mission-critical vendors?

Maybe not for a while. Industry experts interviewed for this story predict the political climate and concerns about the stock market might stem consolidation for a time, including the desire of radio executives looking to diversify.

"Certainly money is harder to borrow. Many broadcasters have had some serious pullbacks. I think it depends on whether a broadcaster determines if a supplier could be a strong asset with some strong upside over the long haul," Blackburn said.

One ulterior motive for broadcasters is the hope that certain pieces of audio equipment could eventually become the industry standard, Blackburn said. "People watch very closely what the major broadcast groups are doing," he said. "And if they see a Clear Channel using a particular system it may eventually be viewed as the industry norm. Then you have leverage to sell it to your competitors," he said.



Sometimes Internet audio doesn't exactly come out sounding like it was meant to sound. You need RealAudio® 8. It captures more of the highs and lows in the music before it leaves the station. In fact, nearly 9 out of 10 people tested couldn't tell RealAudio 8 at 64kbps from the original CD. And Rea Audio 8 can immediately cut your bandwidth costs by up to a third of what you're already paying. It just adds up. Better sound and better use of bandwidth equals better business. Let us show you how to put RealAudio 8 to work for you. Visit **realnetworks.com/listen** or call **800.444.8011.**

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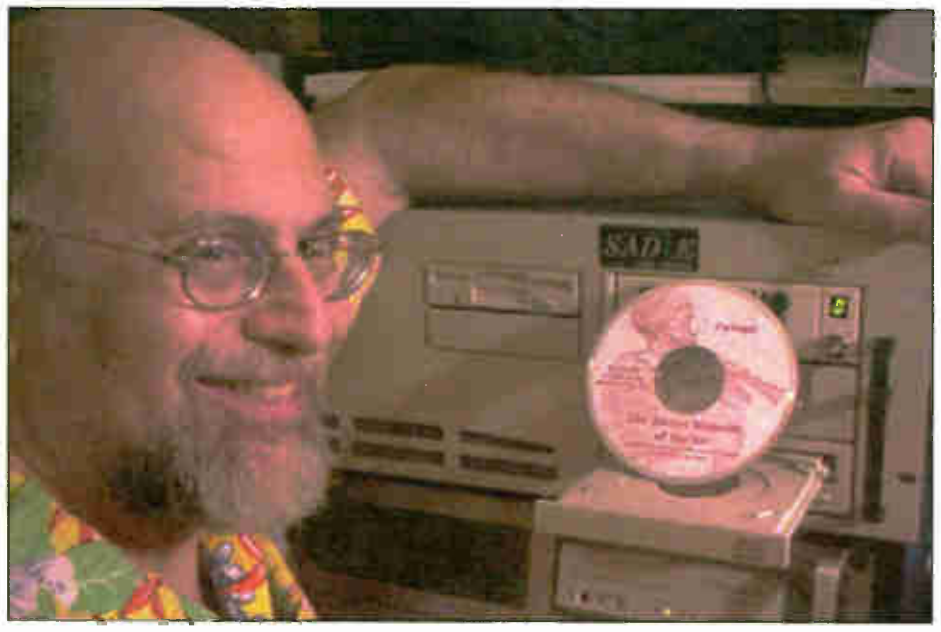
RDA Systems was selected by the **Hispanic Broadcasting Corp.** to serve as systems integrator for all of its studio projects to be undertaken in 2001.

RDA completed a large project for HBC in Miami, and will be undertaking moves in Los Angeles and San Francisco and a remodel/rewire in Dallas....

The radio program **"The Secret Museum of the Air"** uses the **SADiE** Artemis digital audio workstation to remove pops and skips from the many shellac records the show relies on.

A collection of 40,000 records made between 1890 and 1960 are the source for the hour-long radio program. Citizen Kafka, also known as Richard Shulberg, is producer and technical engineer. The program used a private grant to upgrade to an Artemis, one of the systems in the SADiE DAW family that has been designed for applications requiring large amounts of digital signal processing.

"The Secret Museum of the Air" broadcasts on WFMU(FM) in East Orange, N.J., and is streamed on the Web at *www.wfmu.org*. Archives are at *www.secretmuseum.net* ...



Citizen Kafka

Texas ad executive **Roy Williams** updated his studio's microphone to record a holiday radio campaign for his client, Chicken Soup for the Soul, publisher of the self-improvement books. He chose a **Brauner Valvet** studio microphone.

Williams, who calls himself"The Wizard of Ads," runs a $20 million ad business from the town of Buda, Texas. Williams Marketing operates a broadcast production facility in Austin (including two TV studios, four radio studios, a gymnasium and a bar) and creates radio spots to air on more than 550 radio stations.

The Brauner Valvet is hand-built and uses an omni/cardioid switchable pattern that can be configured remotely. It includes a patented shock mount that is pressure-fitted to avoid accidental release. The company claims usable frequency response of 20 Hz to 24 kHz and signal-to-noise ratio of 81dB. The model is priced at $2,695.

Roy Williams and his new Brauner Valvet

Brauner mics are distributed in the U.S. by Transamerica Audio Group.

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

Companies with news of unusual or prominent sales should send information and photos to: Radio World Managing Editor, P.O. Box 1214, Falls Church, VA 22041.

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SPECIAL REPORT

Radio Engineering's Best Schools

Sharon Rae Pettigrew

Broadcast engineering jobs are dwindling. Broadcast equipment is becoming more and more reliable. Many consolidated radio operations don't even have an on-staff chief engineer these days; some facilities rely only on an on-call contractor for emergencies.

But will the trend of disappearing jobs continue?

"The real problem will present itself down the road," said Dick Kernen, vice president of industry relations for Specs Howard School of Broadcast Arts in Southfield, Mich.

"Currently most engineers are between 30 and 50 years old. In 20 years, the radio industry is going to have to shape up."

Where will future engineers come from?

Rocks in the head

Specs Howard doesn't teach broadcast engineering any longer — and so the story goes with many broadcast schools. Young people interested in electronics don't often go into radio engineering.

As one industry vet tells it: "If you come out of an electronics program with a certificate, you gotta have rocks in your head to go and get a job in a radio station."

His point: why work for peanuts at a radio station when you can work for a dot-com or a cable company for significantly more money?

"The radio business continues to refuse to be competitive pay-wise," said Kernen. "All the CEs I know are in the radio business because they love radio."

The SBE certifies a handful of broadcast engineering schools (see sidebar, page 26). The SBE's certification committee reviews a program's curriculum and works with schools to ensure the curriculum provides an acceptable level of instruction for those entering the industry.

John Poray, SBE executive director, said the certification committee is chaired by Terry Baun and made up of volunteers, all broadcast engineers.

"There are a lot of good programs out there, and some of these schools aren't very well-known," said Poray. "We have 14 schools currently on the certified list, and would like to expand this list in the next year or two. We look upon these schools as key components to providing broadcast engineers for the future."

Linda Godby-Emerick is the SBE certification director.

"Every three years we go through the curriculums provided by the schools currently on the list to make sure they are teaching the most up-to-date technology," said Godby-Emerick.

"We look for a combination of the basics in electronics, communications and math. Then we look for industry-specific competencies such as electronics principles, maintenance, troubleshooting, broadcast formats and broadcast electronics."

Michael Scott, CBTE, is a department head at Bates Technical College in Tacoma, Wash. Scott also serves as certification chair for Seattle SBE chapter 16.

Bates offers a two-year program. Students can specialize in broadcast engineering.

A student gets hands-on experience at St. Louis (Mo.) Community College at Florissant Valley

"Last year, we had 14 people graduate with an associate's degree in broadcast engineering," said Scott. "They are all now working full-time in the industry."

According to Scott, the Bates program includes the traditional reading, writing and arithmetic — but focuses also on the hands-on operation of engineering equipment and systems. Internships and externships also make up a large part of Bates' program.

As for a placement office, Scott said it's not necessary.

"After people go through our curriculum, it's not so much a question of if you're going to get a job — the question is where."

Cockpit errors

Scott says his program also focuses on the systems aspect of engineering.

"Most errors these days are cockpit errors," he said. "Somebody threw the wrong switch or pushed the wrong button. It's a systems error. Engineering is not so much about soldering a part on a board as it is fixing a situation such as a mic that's the wrong impedance for the board, or the right piece of gear hooked up in an improper way."

Scott said that computer literacy is another area in which engineering students must be proficient. Transmitters can be run by computer. Audio boards are virtual.

Jimi Petulla is president of Radio Connection in Beverly Hills, Calif. He's got approximately 25 people enrolled in his broadcast engineering program. Petullah's program is not a traditional classroom-type operation.

"My belief is the best way to get into any career is to get in the door and be an apprentice," said Petulla.

Petullah's program works like this: If someone calls Radio Connection up from, say, South Carolina and wants to get into broadcast engineering, Petulla hooks the student up with a "mentor" engineer in the

See SCHOOLS, page 26 ▶

WIRED FOR SOUND

Quad Error Demonstrandum

Steve Lampen

You Catholic school graduates, or other Latin scholars, will get the pun in the headline.

For the rest of you, Quod Erat Demonstradum means, "It has been shown." It's something mathematicians put at the end of a solution to a problem ("QED"). In fact, in my hometown, San Francisco, the local public television station is KQED. They used to make fun of their name, but even for the "educational" crowd, most people didn't get it.

This is as far as my Latin goes. My Latin pun refers to quad or starquad cable and the fact that many people who use it don't understand it and use it "in error."

Let me tell you a couple of stories about starquad microphone cable. I know these are true stories because they happened to me.

No hum

About 10 years ago, I went with a friend to a talk given by Neil Muncy. Neil is the "king" of shielding and grounding. Part of his demonstration dealt with the ability of balanced line cables to reject 60 Hz.

I have mentioned in past columns the horrible secret that no shielding put on any cable today does anything at 60 Hz. The only thing that will have any effect is solid-steel conduit, which, if installed correctly, will provide up to 27 dB isolation at 60 Hz.

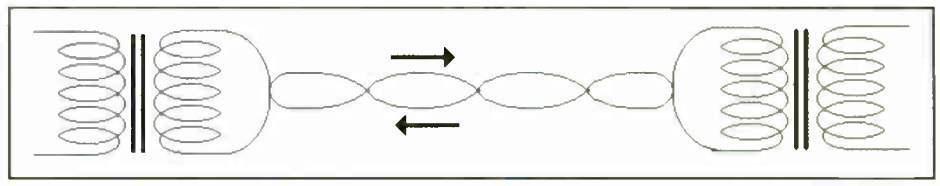


Fig. 1

I say "the only thing" ... until Mr. Muncy's demonstration.

He had modified an amplifier with a balanced input, and would plug in different types of balanced cables, microphone, install, low capacitance, etc., etc. To test their rejection, he would wind them around a hand-held tape demagnetizer. This device was wired so it was always "on." As you can imagine, a demagnetizer is a wonderful source of 60 Hz.

As Neil wound his cable around the demagnetizer, after a few turns you could clearly hear the 60 Hz hum coming from the amp. Some cables would go a few more turns than others, but all eventually succumbed .... until he hooked up a piece of starquad microphone cable. He wound, and he wound, and he wound, until the entire cable, probably 30 feet, was wound around the demagnetizer. And yet not a hit of 60 Hz.

I turned to my friend and said, "This starquad stuff really works!" We were both amazed.

Clean sound mountain

My second story:

Just south of San Francisco stands Mt. San Bruno. This is a sizeable mountain that cuts across almost the entire San Francisco Peninsula. Until the building of Sutro Tower, where I used to work, Mt. San Bruno was the key transmitter location for San Francisco. It is still the major site for FM transmitters.

All the cables eventually succumbed to 60 Hz hum until he hooked up a piece of starquad.

I was on Mt. San Bruno helping fix a sick transmitter and just happened to be outside the building. Up pulled a news van and out hopped a cameraman and talent.

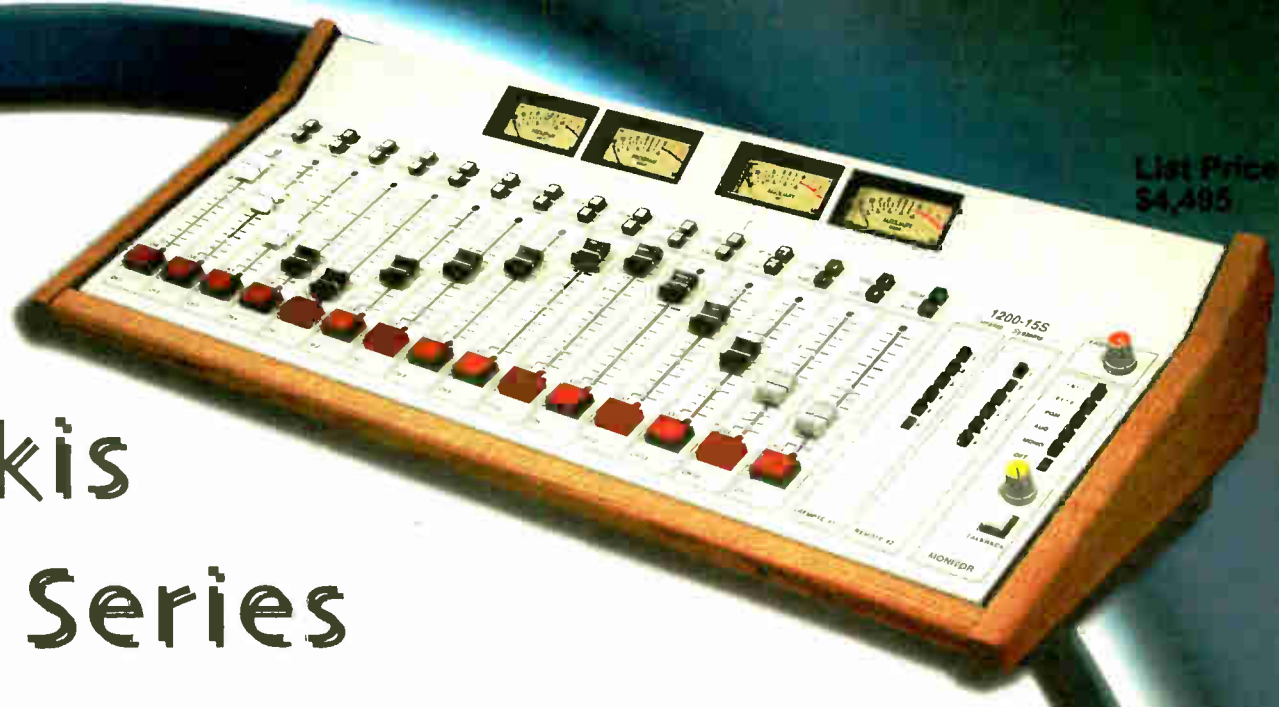
(Oh, now I can't help putting in the latest joke making the rounds on the Internet. Why didn't Mr. And Mrs. Potato Head allow their daughter to marry Dan Rather? Because he was a common tater.)

OK, so this cameraman and common tater got out and were setting up to do a shot on tape with the dramatic view of the city behind. The video was perfect but the sound was impossible.

And no wonder. There were millions of watts of RF all around. They were about to give up and just shoot some video when the cameraman said, "Wait. Let me try some of this starquad

See LAMPEN, page 20 ▶

The *Ideal* Analog Console . . .



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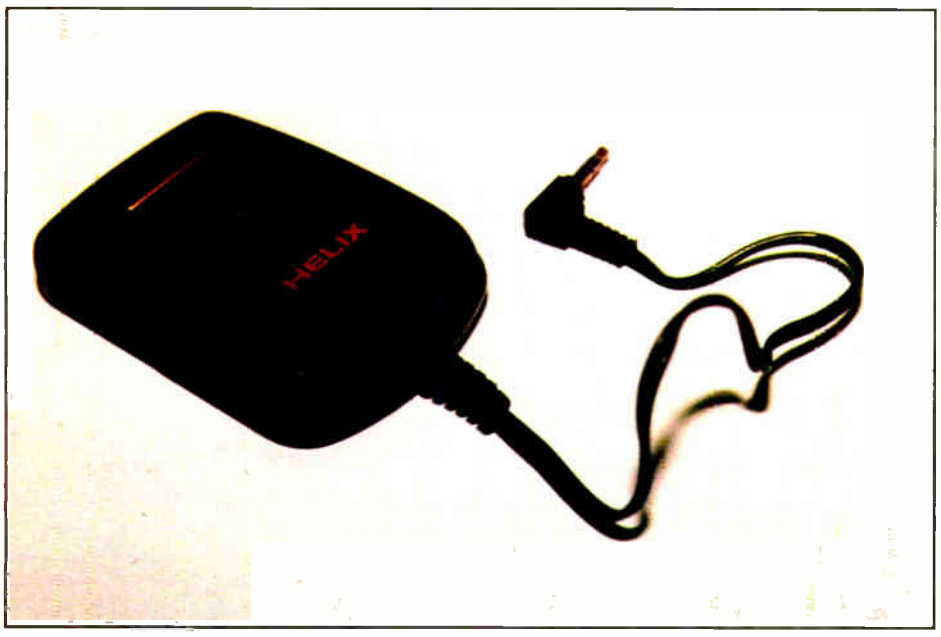
Holiday Gifts for the Engineer

John Bisset

The holidays are upon us. But before you regift the gaudy tie or the after-shave lotion, here are a couple of items you might want to buy for the engineer in your life or just for yourself.



Rebroadcast any audio signal through your radio using the Helix CT-100

The first goodie is an inexpensive but valuable audio tool, especially if you listen to Internet radio. The Helix CT-100 Mobile Audio Feeder, distributed by Paul Scott of Hoffman Communications in Richmond, Va., is perhaps the most convenient way to connect your computer or compact CD player into your existing FM stereo.

The CT-100 is one of those products that you didn't know how much you needed until after you bought it. Remember the old Lafayette "wireless mikes" that kids would use to start neighborhood radio stations? This unit is the state-of-the-art equivalent.

Smaller than a pack of cigarettes, the unit takes your stereo audio input (from your computer or CD player) and transmits it — in full stereo — on a FM channel that you select. A band switch divides the FM band into three sections. A tuning knob sets the channel. Find a hole in the FM band; tune the Helix CT-100 to it and you can listen to your Internet station through any nearby radio.

While working on your car, you don't have to miss the game being broadcast over the Internet several states away. The CT-100 will rebroadcast the signal, so you can pick it up on your car radio.

The transmission distance is limited, to comply with FCC rules, but you could conceivably use this gadget to provide IFB for a remote, when the talent is using wireless mikes. You could probably come up with a half dozen other uses, too!

A remote headphone jack and pot, the Symetrix HR-1 has a variety of uses

What is the best part? The price, of course. The unit sells for under $40!

Two 1.5-volt AAA cells power the CT-100, but if you're planning on using the device for remotes or more permanent applications, you will want to wire up a small DC supply. The device features a power LED and there is an on/off switch.

Alpha Enterprises of Colonial Heights, Va., distributes the Helix CT-100. Call (804) 526-5420 to order. You can get more information from the Web site at *www.eradioplus.com*

Don't forget to mention that you heard about it from Radio World!

★ ★ ★

Mac Wiley and I go back to the Metroplex days.

Those studios we built some 15 years ago are still going strong! When we worked on that project we didn't have the benefit of such an invaluable tool as a CAD (Computer Aided Drafting) system at our disposal.

After reading the Sept. 13 *Workbench*, Mac commented on the discussion regarding CAD programs. Specifically, he recommended going to *www.cadopia.com*, where you will find an excellent AutoCAD facsimile called IntelliCAD 2000.

What makes IntelliCAD 2000 such a find? It's free! Let us know what you think!

★ ★ ★

Last on our list of cool gifts is a gift for your talent is another of those "Why didn't I think of that?" products.

The HR-1, manufactured by Symetrix, is a small remote headphone jack and pot. The unit is self-contained in a metal box and can be mounted in a variety of ways.

HR-1 rear panel

The remote unit can be mounted under a counter; a faceplate permits it to be mounted in a headphone cutout in studio furniture; or it can be affixed to a desk mike stand or boom.

The HR-1 is powered from the Symetrix headphone amplifier and therefore needs no external power.

★ ★ ★

Feeding wires through conduit can be challenging, to say the least. A good test your ingenuity is to try to pull cables through the coiled Nycoil sheathing used on a remote mast.

Of course, the easiest path is to

See WORKBENCH, page 20 ▶

Lampen

▶ Continued from page 16

cable." So he pulled out a short piece of starquad and substituted it for the regular mic cable he was using.

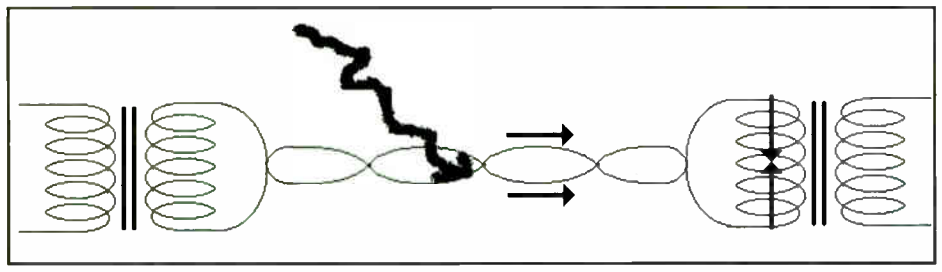


Fig. 2

The result? Perfect sound. Not a hint of RFI. No buzz. No hum. "Wow!" I said to myself. "This stuff even works at RF!"

Differential

To understand what starquad is and how it works, we need to revisit some of my earliest columns in this hallowed magazine regarding "balanced lines."

Here's a quick refresher. In Figure 1 on page 16, we have a balanced line. The signal on the balanced line goes in different directions, or is a "differential" signal. Some people call this an "AC" signal. And, indeed, it is "alternating current." Of course this has nothing to do with AC power out of the wall.

When noise hits the two wires, as in Figure 2, it travels the same direction down the two wires, where it meets itself at the end and cancels out.

The more "balanced" the two wires are the more they reject noise. And "balanced" means they are the same material, same metal, the same size (AWG), the same length, which is an attribute of how they were twisted together at the factory, and that they are as close together as possible.

This last aspect, that they are close together, is the key to starquad cable and its magical abilities. In fact, that's why we twist wires together into twisted pairs, to get them as close together as possible. And the reason is obvious.

Ideal

When noise hits the cable, if the two conductors are not close together, there will be a difference in time when the noise hits them. The two noise signals, one on each wire, will not arrive at the same time at the end of the cable and will not cancel out. Well, this is where the quad design comes in.

Figure 3 shows the end of a starquad cable. What you must do is combine the two wires opposite each other. You end up with two wires, each a combination of opposite single wires, and you connect them like any regular balanced-line microphone cable.

You can then see the genius of starquad if you think where the two conductors are in the eventual balanced line.

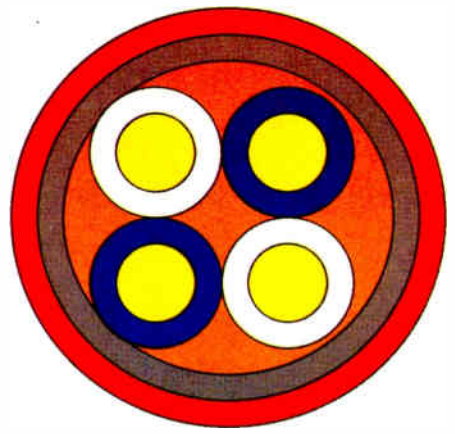


Fig. 3

and will be closer to canceling itself out with common-mode rejection.

Next time, we'll continue our look at starquad including using it for non-mic or non-balanced applications.

The proximity of the two wires is the key to the magical abilities of starquad.

Fig. 4

Figure 4 shows you that, in effect, the two conductors are in the same place, in the middle of the cable.

Remember we said that the closer the wires are together, the better the balanced line. Well, you can't get closer than putting the wires in the same place. That's the ideal for a balanced line. This means that any noise that hits the four conductors will be closer to identical than with any other cable, and will be closer to canceling itself out with common-mode rejection.

Next time, we'll continue our look at starquad including using it for non-mic or non-balanced applications.

Steve Lampen is technology specialist, multimedia products for Belden Electronics Division in San Francisco. His book "Wire, Cable, and Fiber Optics for Video and Audio Engineers" is published by McGraw-Hill. Reach him at shlampen@aol.com

Workbench

▶ Continued from page 19

have the factory install it. Next-best step is to stretch the Nycoil out along a chain link fence, securing the sheathing with wire ties.

If you visit an electric supply house, purchase the little foam plugs that have a string attached. A shop vac will suck the foam plug through the sheath, when fitted with a reducer.

Tie your fish tape onto the end of the string and pull the fishtape through. Tape your coax and wires into a tight bundle, secured to the end of the fishtape.

Generously apply a gel wire lubricant and pull. The job is a little difficult getting started, but once it gets going, you'll be fine. Remember to always add a couple extra wires; there's no way you'll add wires later!

Want the easy way out? Then you should contact ENG Mobile Systems in Concord, Calif., at (800) 662-4522. The company will do the job for you and save you the trouble — especially if you have more than one cable to pull.

The CT-100 is one of those products that you didn't know how much you needed until after you bought it.

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

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

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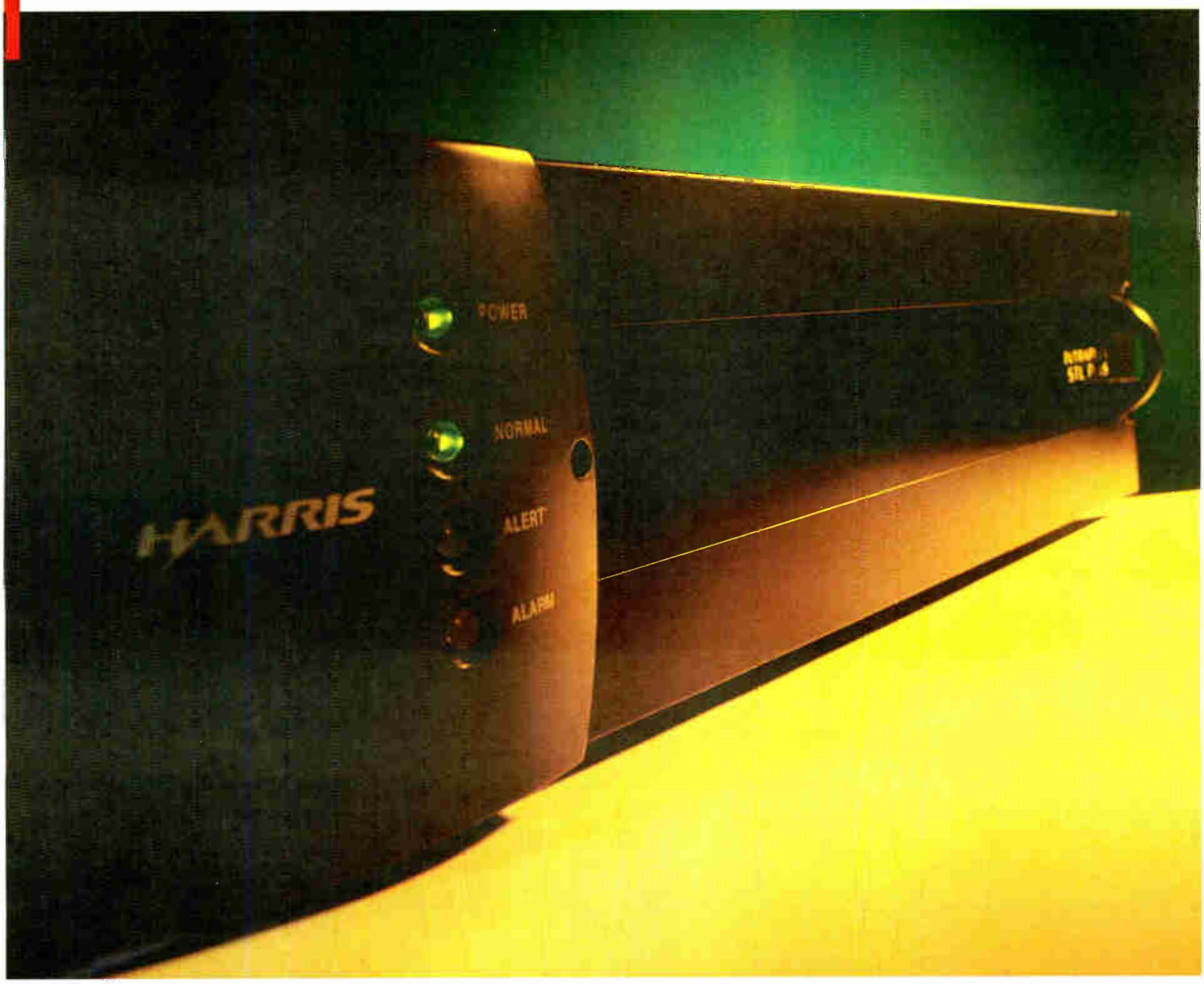

In today's rapidly consolidating radio industry, the race is on to buy stations. And the pressure's on to cut costs by sharing station resources. The STL PLUS by **Intraplex** is the industry's most widely used *true* digital transport solution, allowing you to link multiple transmitter sites and studio locations and share program audio, data, even telephone services. With a single STL PLUS system, you can handle one-way or bi-directional STL/TSL traffic over any distance or terrain. Consolidate LAN/WANs. And remotely control transmitters and broadcast facilities—for increased efficiency. With STL PLUS, you have the green light for smooth integration of your next station. And the next.

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SBE NEWS

Stocking Stuffers for Engineers

The SBE President Details Two Must-Haves for Enhancing Your Professional Life This Season

James "Andy" Butler, CPBE

RW regularly provides space for commentary from the Society of Broadcast Engineers as a service to the industry.

Affordable, accessible training and understandable equipment documentation are two gifts that would brighten any engineer's day this holiday season.

Be assured, the Society of Broadcast Engineers is working hard to get these two items off your wish list and in your stocking.

Training

The SBE Certification Committee continues to create great new training opportunities for Radio Engineers. They have just added a Networking Technologist Tutorial and a Designated Chief Operator Tutorial to their curriculum.

The certification program was created to recognize formally the skills and knowledge that broadcast engineers acquire and practice in our profession.

The levels were crafted carefully to recognize the various skills that are required in different facets of the business and to acknowledge the progressive increase in skill level as engineers grow in the profession.

Society Certification is an excellent reflection of the expertise an engineer has acquired. However, the process of acquiring that knowledge has traditionally been the responsibility of each individual engineer.

As the industry has consolidated, experienced engineers find it more difficult to keep up to date and still handle their daily workloads. At the same time, many traditional entry-level jobs that once provided basic training in the art of broadcasting have become scarce.

The new tutorials help address this problem by providing instruction in the key skills required to perform as a Certified Networking Technologist or a Designated Chief Operator.

The already widely received Certified Networking Technologist tutorial is a full-day seminar with an opportunity to take the CBNT certification exam. Topics are hardware-specific rather than vendor-specific.

The Designated Chief Operator/FCC Rules Review tutorial is a half-day program that clarifies and explains the current FCC regulations about the duties and responsibilities of designated chief operators for radio and television stations.

The course provides a thorough overview of the materials that chief operators must know to fulfill their legal obligations. The tutorial is closely aligned with the "FCC Self-Inspection Checklist" and includes a review of the most commonly violated FCC rules, as noted in actual inspection reports. Topics covered include:

- Appointment of Designated Chief Operators and posting requirements
- Mandated logging and reporting requirements
- Determination of transmitter power output (direct and indirect methods)
- AM directional rules and critical record keeping
- Procedures required for verification of modulation and frequency
- Tower marking and lighting requirements including notification of lighting outages
- Required equipment performance measurements
- City of license studio issues
- Public file requirements and file maintenance issues

The class provides a strong foundation for Chief Operators to help ensure that their stations will successfully pass FCC inspections. It is also excellent preparation for stations that want to take part in the Alternative Inspection Program.

There are many opportunities for you to take advantage of these educational programs. The following tutorials have been scheduled:

- Jan. 18, 2001: Chief Operator/FCC Boot Camp; host: South Carolina Broadcasters Association
- Feb. 15: CBNT Tutorial/Exam; host: Ohio Broadcasters Association
- Feb. 26: CBNT Tutorial/Exam; host: Michigan Association of Broadcasters
- March 30: Chief Operator/FCC Boot Camp; host: Ohio Broadcasters Association
- April 21: CBNT Tutorial/Exam; host: NAB/Ennes Workshop
- May 4-5: CBNT Tutorial/Exam; host: Louisiana Broadcasters Association
- June 9: CBNT Tutorial/Exam; host: Missouri Broadcasters Association

Other programs are being planned for 2001 in the following states: Kentucky, Mississippi, New Jersey, New York, Texas, West Virginia and Wisconsin. Please watch for more information on these and other programs to come.

EFD

The broadcast equipment market has become increasingly competitive. Companies are constantly "evolving" products to capture the latest technology developments and provide additional features to capture market share.

Even simple equipment comes with a mind-boggling array of optional features, input and output variations and plug-in upgrades. The right purchase decision can be difficult to make, even after you've chosen the pieces.

What types of connectors are used on a particular piece of gear? Where are they located? What are my mounting options? Is it possible to optimize operator ergonomics with the equipment I've chosen?

These questions and hundreds more are faced every day. Trying to find the answers in vendor literature or on Web sites can be difficult. In some instances, the lack of information is due to marketing pressures, but in most cases it is simply a lack of consistency from company to company.

The effort fix this problem began at NAB 2000. Former SBE President Richard A. Farquhar, CPBE, spearheaded a meeting to investigate the possibility of partnering manufacturers and engineers to create Engineer Friendly Documentation.

After a lively discussion they decided that a properly implemented EFD program should accomplish the following:

- Encourage consistency in content. From specification sheets, for example, one should be able to ascertain a "common" suite of information across all manufacturers.
- Allow portability that can be shared over a wide variety of internet-accessible platforms, using Web-ready protocols such as XML and XLS.
- Provide a mechanism for integrating applications.
- Allow information to be queried at a "feature" level.
- Provide supporting tools to automate information conversion to user applications.

Support for this effort continues to grow. Manufacturers, systems integrators and station engineers continue to join the core team.

The next meeting of the group will be held Jan. 19, 2001, in Orlando, Fla. Details are available on the SBE Web site at *www.sbe.org*

I encourage you to get involved in this critical effort. If you can attend the meeting in person, that would be great.

If you can't make it in person, please sign up for the EFD mailing list so you can review the group's proposals and offer your suggestions. To sign up for the list, send an e-mail to SBE Executive Director John L. Poray at *jporay@sbe.org*

Each of these programs provides valuable support for working engineers. Please check the SBE Web site for the latest tutorial schedules.

If your company or group would like to sponsor a tutorial, please contact SBE Certification Director Linda Godby-Emerick at (317) 253-1640 or *lgodby@sbe.org*

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Andy Butler, CPBE, is the president of the SBE and director of engineering for PBS.

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Cut Off the Rough Edges

Fitch Puts the Finishing Touches on the WQRM Fantasy Radio Station Generator 'Project'

Charles S. Fitch

This is one in a series of articles about the National Electrical Code and how it applies in the radio station environment. Previous installments can be found at www.rwonline.com

To finish our discussion of how the NEC applies to generators, let's complete our case study of the standby generator installation in our favorite bogus radio station — WQRM(FM), Utopia, State of Bliss.

The system is viewed by the NEC as optional and so covered by article 702.

For purpose of economy we ran one underground four-inch schedule 80 PVC conduit between the transmitter building and the foundation-mounted generator outside. We chose to run # 2 THHN copper conductors for phases and neutral from the generator's output in this PVC.

This modification fits the 115-percent current handling required by article 445 and lowers the IR drop from the 100-plus feet of wire.

All the associated control wires are contained in that same conduit. This conduit included the wiring to the engine battery from the battery charger located in the transfer switch.

In addition, we sent circuits out from the emergency panel for a GFI maintenance CO as well as power for a PL pole lamp. This photocell-controlled lamp prevented anyone from driving into the generator in the dark and made it easier to service at night.

Generator grounding is complex, so check with your inspector or underwriter before you begin.

As we have often mentioned, the NEC is a dynamic document and a new edition, sometimes with substantial changes, is issued every three years. In fact, suggestions for changes to the 2002 edition of the NEC must be filed right now to be included for consideration.

Recently there was a subtle code change with enormous impact for mandatory standby systems. In the past, mandatory systems required segregation of conductors by purpose. The net result of this was a high count of conduits and raceways with wires for different purposes in each.

Now, just as with optional systems, emergency, normal and related control circuits can all run in the same conduits and raceways. So before you cut, remove or are tempted to reuse any dead conductors you come upon, make absolutely sure that these are not just inactive emergency circuits.

Truth is in the details

Once again we come to one of those thematic threads in the NEC. If you have circuits of different voltages running together in the same conduit, the insulation on every wire must be in excess of the highest voltage present.

See article 300-3(c)(1) and other locations such as article 343-14(a).

In this case, the connection would be 240 volts phase to phase, so even the 12-volt battery charger wires have to have greater than 240-volt insulation. We solved the problem by using standard 600-volt THHN wire for everything.

We mentioned last time that a detailed drawing of this installation is available by writing to me via e-mail at *fitchpe@home.com*. You would notice some interesting minutia in the drawing. One point is that the surge suppressors should be placed on the supply input of the main panel but not on the standby panel.

Most generators are almost incapable of creating an over-voltage or high-voltage condition so surge suppressors are really not needed on the

See NEC, page 25 ▶

NEC

▶ Continued from page 24

standby panel.

When surge suppressor trips the main breaker, the generator control system identifies this as a power failure and turns on the generator. As a result, you don't want these connections on the generator to load it down.

Another overlooked detail is locating the fuel pump on the standby panel.

Although our example is an LP (liquid petroleum) powered engine, I annotated this circuit primarily for gasoline or diesel systems. The fuel pump location is the most common mistake made by people not intimately familiar with the installation arrangements of standby generators.

Inexplicably, the fuel pump is put on the main panel, so when the day tank calls for a refill, the fuel pump can't run because its power comes from the, now dead, main panel. I've seen this error at least three times in my career and in one case, when the generator stopped, it knocked a network headquarters off air.

This wiring error is never noticed in an ordinary exercise because the main panel still has power. The situation is only observed in a long-running outage when the day tank is drained down.

Standing on firm ground

When you are in the planning stages for your generator, call your fuel supplier and ask if a truck-grounding electrode is needed. Many municipalities, when it comes to delivering volatile fuels such as gasoline, LP or propane, require that the delivery vehicle be grounded before fueling. If that is the case and there is no grounding electrode, you won't get any fuel.

Make the vehicle grounding electrode part of the complete grounding scheme. Your delivery firm can indicate its best location for ease and safety when unloading.

In prior additions of the code, the transfer switch was required to switch all conductors including the neutral. Present versions do not have this requirement but do require that the generator frame be bonded to the neutral and that there be a grounding electrode at the generator.

Generator grounding is complex so check with your inspector or underwriter for the locally preferred and approved arrangement before you begin.

Prior editions of the NEC allowed the use of a 125-percent CB or some fuses as protection and disconnect on the supply conductors at the generator. In the current version, in lieu of an "engineered system" the generator should be fused at its nominal rated output.

In the case of our 8 kW, where the maximum rated supply current is 34 amps, we have a 40-amp CB also used as local disconnect. This is the nearest convenient standard value.

I mentioned the above example to explain what appears to be a contradiction when an older generator is replaced with an identically rated new unit. The CB or fuses on the new generator are somewhat smaller than the original for the same rated output.

The question I field most often about transfer switches addresses those units that have discrete contactors to switch between main and standby. Inquiring minds want to know why they are sometimes different sizes.

This sizing discrepancy is due to the code exception that allows the contactors to be sized for the maximum current available from the source that feeds it.

It is not unusual to have a 200-amp single-throw contactor for the primary utility feed and a single-throw 60-amp for the generator feed. Not only is there a notable cost saving involved, the 60-amp is more than adequate for something like the 8 kW 240-volt generator discussed above.

All clichés offer a kernel of truth but, when it comes to generators, the chestnut "if you fail to plan, you plan to fail" is truer than most.

Generator decisions are some of the most expensive and important you will make. These choices can affect the reliability hence the success and fortune of your station. Only a person who has full knowledge of power plants and command of all the variable factors should make these assessments.

Invest in maintenance

Big, expensive mistakes are easy to make.

If you take away only one piece of information from this series on generators, let it be this: Once your generator is installed, a regular program of maintenance and exercise can assure its reliability and availability.

Sort of sounds like your heart, doesn't it. If ignored, it will be unreliable. If forgotten, it will fail.

In past episodes we have promised to return to some important topics and expand on them. Our next topic will be raceways and conduits that house conductors. In future we will revisit the dreaded demand factor penalty multiplier that appears on our electric bills and explore some methods to reduce that extra expense.

Charles S. Fitch, W2IPI, is a registered professional consultant engineer, a member of the AFCCE, a senior member of the SBE, lifetime CPBE, licensed electrical contractor, station owner and former director of engineering of WTIC-TV and WHSH-TV.

He has been a FCC licensed commercial and amateur operator for more than 40 years. You can contact the author at fitchpe@home.com

Schools

▶ Continued from page 15

area. The engineer and the student are provided with material and a syllabus outline.

"This is a self-paced course," said Petulla. "Many people do it around their regular jobs. If a student can go 20 hours a week, they can finish the program within four to five months."

Jimi Petulla, Radio Connection

Hiring bonus

According to Petulla, 80 percent of the time, the apprentice winds up getting a job from the company the mentor works for. That mentor then receives a hiring bonus.

"The mentor does all the work," said Petulla. "We just set it all up. We're the in-between, but who really makes it happen is the mentor."

St. Louis Community College at Florissant Valley in St. Louis, Mo., offers a certificate in broadcast engineering. Dan Landiss is a professor of engineering.

"Our program prepares students to operate and maintain equipment at radio and television stations and production facilities," said Landiss. "There are three options to the certificate: analog maintenance, digital maintenance and production."

According to Landiss, when the school spoke to GMs, they relayed there were three basic categories of jobs to fill: those who would be maintaining analog equipment such as antennas, transmitters and boards; another group maintaining digital equipment; and a third group involved in the production of the on-air material.

Course work at St. Louis Community College involves lab work as well as lectures. The school is affiliated with and certified by NARTE. Graduates automatically receive a commercial radio license.

Steve Keeler works as a professor and director of telecommunications and broadcasting programs at Cayuga Community College in Auburn, N.Y.

"All of our facilities are used as living labs for students including our 3,000-W broadcast radio station WDWN(FM)," said Keeler, who was recently named national educator of the year by the SBE.

Cayuga's two-year program is called "Telecommunications Technology" and leads to an associate's degree from the State University of New York.

Steve Keeler, Cayuga Community College

Keeler estimates about 100 majors right now in the telecommunications program. Graduates are certified as broadcast technologists by the SBE.

"Students get a basic grounding in electronics — digital electronics, analog electronics, electronics for digital computers ... all the way up to intermediate electronics," said Keeler. "Students take courses specific to telecommunications and broadcast engineering ... networking, data communications, telecommunications systems operations and maintenance and a course in RF technology."

Hocking College in Nelsonville, Ohio, offers an associate's degree in broadcast engineering and production technology.

CIE headquarters, Cleveland, Ohio

Hands-on program

"Our program is extensively hands-on in nature," said Harry Tompkins, coordinating instructor of the broadcast engineering and production technology program at Hocking. "Our students don't spend a lot of time in traditional lecture — we try to do as much real-life stuff as possible and students spend a lot of time in the lab."

Hocking's program includes the basics of AC/DC electricity and electronics, semiconductor devices, digital logic and basic electronic communications theory, including modulation and multiplexing. A student's second year gets very specific into audio and video theory concepts including system design and installation. Training also includes equipment troubleshooting and maintenance.

Hocking's placement office helps students locate jobs after graduation.

Another Ohio-based broadcast engineering school is the Cleveland Institute of Electronics. The 18-month course in broadcast engineering equates to 25 credit hours.

"We are an independent-studies school," said Scott Katzenmeyer, director of guidance counselors at CIE. "All education is done through distance learning and independent study."

According to Jerry Casebeer, an instructor at CIE, the program starts out with the fundamentals of electronics, then goes into more advanced subjects such as amps and power supplies, then onto more specialized material on transmitters and receivers. Studio equipment, antennas, transmission lines and AM, FM, TV, satellite and microwave topics are covered as well.

"We expect students to have some background going into our course," said Casebeer.

Recruiting new engineering talent seems to be the only answer. Bates' Michael Scott likens broadcast engineering to being in the circus.

"It's like the Flying Zambinis," he said. "You have to be one of them to know what it's all about. Everyone wants to be a DJ or a cameraman, but nobody knows anything about the mics, or the transmitter site or behind-the-camera operations."

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www.bates.ctc.edu

Boise State University
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(208) 426-1156
www.idbsu.edu

Cayuga Community College
197 Franklin St.
Auburn, NY 13021
(315) 255-1743
www.cayuga-cc.edu

Cuyahoga Community College
2900 Community College Ave.
Cleveland, OH 44115
(216) 987-4006
www.tri-c.cc.oh.us/Metro

Cleveland Institute of Electronics
1776 E. 17th St.
Cleveland, OH 44114
(800) 243-6446
www.cie-wc.edu

Hocking College
3301 Hocking Pkwy.
Nelsonville, OH 45764
(740) 753-3591, ext. 2346
www.hocking.edu

John Wood Community College
150 S. 48th St.
Quincy, IL 62301
(217) 224-6500
www.jwcc.edu

Milwaukee Area Technical College
700 W. State St.
Milwaukee, WI 53233
(414) 297-7274
www.milwaukee.tec.wi.us/campus/milw

Mitchell Technical Institute
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Mitchell, SD 57301
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www.mti.tec.sd.us

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Pasadena City College
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BroadcastAmerica

Page 37

Move It or Lose It: The Texas Way

Population Boom Creates Demand for Increased Radio Service in North Texas

Scott Fybush

They do things big in the Lone Star State — big ranches, big money, big oil. So it should be no surprise that when it comes to the FM table of allocations in north Texas, the only word to describe the changes taking place over the last few years is: big.

Big, as in more than a dozen new FM allocations serving the Dallas-Fort Worth Metroplex in the last decade. Big, as in nearly a hundred stations as far away as Oklahoma changing frequencies and cities of license to accommodate the shifts.

And big, as in the nearly 2,000-foot towers sprouting north of Dallas to bring the new signals into the area.

A geography lesson

First, most of the FM stations actually licensed to Dallas and Fort Worth pump their Class C signals from a group of tall towers in the Cedar Hill area, well south of Dallas. But most of the population growth in the market is taking place to the north, in suburbs like Plano and Flower Mound that ABC radio engineering Vice President Bert Goldman said are among the fastest-growing in the country.

That population growth has created a radio market that now sprawls more than 120 miles from north to south, leaving plenty of space for new signals at what had been the fringe of the metro.

"The areas between Dallas and other large markets are relatively sparse," said David Gates, vice president of First Broadcasting Management.

The first move-in of the modern era came back in 1987, when KDNT(FM) in Gainesville moved to a new 1,952-foot tower in Collinsville, about 40 miles north of downtown Dallas. It became modern rock KDGE(FM), "The Edge."

First Broadcasting made its first big move in 1998, buying the Class A station that had been on 96.7 MHz in Sherman, some 60 miles north of Dallas, and moving it to Flower Mound as a full Class C. But unlike KDNT's move, which simply put an existing facility on a taller tower, this move required a Texas-size shift.

David Gates

Stations in small towns like Eastland and Mineola in Texas and Comanche, Okla. moved from 96.7 to other frequencies, in some cases forcing other stations off those frequencies to still other channels.

Gates said the idea is to keep working outward in rings from the desired major-market move-in, "and finally you get down to one little station in the middle of nowhere that could be on any of four frequencies and still adequately serve its market."

Actually implementing the changes is then done in reverse, starting at the edges and moving inward.

"You set up a flow chart, because you have to move them in such a way that when one moves it's not going to interfere with another for even a short amount of time," said Goldman.

Making these moves happen also requires some persuasion in dealing with the station owners who have to change frequencies.

"Typically in our case," said Gates, "we compensate them for changing business cards, letterhead, painting promotional vehicles, and a reasonable amount for promotion." In some cases, he said, First also helps them find engineers and guides them through the procedural aspects of dealing with the FCC.

For most of these stations, Gates said changing frequencies is "minor — what we call a change of address on the dial."

In the case of 96.7, the result was a 100 kW station with good coverage across the Dallas-Fort Worth area. While the moves were underway, First arranged to sell the station to ABC once the upgrade was complete.

Costs

So how much does a series of moves like this cost? Neither First nor ABC would say, but Goldman said 96.7 was less expensive than an existing Dallas station "by many millions of dollars."

With the 96.7 move complete, other broadcasters began to eye the possibilities out at the edges of the market. A small station on 100.7 moved from Bowie, 60 miles northwest of Fort Worth, into suburban Highland Village.

From Stephenville, 50 miles southwest of Fort Worth, KSTV(FM) on 105.7 became a Class C in Decatur, 20 miles north of the Metroplex.

And up at the edge of all the suburban growth, the Sherman-Denison area, 60

See SWITCH, page 31 ▶

Boost Sales By Goosing Commissions

Lyssa Graham

It's not enough these days to have self-motivated salespeople, although that is certainly a job prerequisite. In order to have truly effective salespeople, you must find a way to motivate them beyond the standard 15-percent commission offered in most markets.

Jeff Tyler

So say three men who ought to know. Frank Kulbertis, corporate director of sales for Adventure Radio Group in Hilton Head, S.C.; Jeff Tyler, general manager of Clear Channel's five-station cluster in Madison, Wis.; and Eric Stenberg, director of sales at Clear Channel stations KFJO(FM), KSJO(FM) and KUFX(FM) in San Jose, Calif.

Kulbertis, Tyler and Stenberg stress that in order to achieve higher production,

See SALES, page 31 ▶

PROMO POWER

Budgets: Do the Same With Less

Mark Lapidus

So what can we cut out of the marketing budget that won't hurt us this year?

This question will be repeated from coast to coast as executives attempt to create budgets that will meet or exceed corporate guidelines. Have you prepared your reply?

The fundamental answer is that everything and everybody is expendable except for the tower, transmitter and the automation system. But is that what will deliver the best return on investment? Of course not!

Follow me on a journey through the maze of what to sacrifice and how it affects the future of your radio station.

• *The Outside Marketing Budget:* This is usually the first item to scrutinize — after all, it's the biggest chunk of change. Before you begin agonizing over whether or not to murder your television budget, be truthful with yourself. Have you really budgeted enough dough to being with?

The trend I'm seeing is that managers have slowly but steadily lowered the boom on this budget. Over the last few years, they've axed 20 grand here, 30 grand there and 50 grand another year. It's to the point at some stations that cutting the television line makes sense because there truly isn't enough in the pot to make an impact anyway.

If you're relatively new to the biz, dig up an old marketing director from five to 10 years ago and ask 'em what they thought a reasonable amount of money was required to get the groups they needed way back in the stone age. Their answer may surprise you.

This same line of logic can be applied to outdoor, transit, telemarketing and direct mail. If you haven't put in large enough numbers, then why spend money that doesn't have good odds of making an impact?

The trend I'm seeing is that managers have slowly but steadily lowered the boom on the outside marketing budget.

• *Salaries:* If you're not already sharing people across radio stations in your cluster, it's time to get with the program. There are many advantages.

1. You can pay the best managers more and still save money by eliminating others.
2. With greater exposure, entry-level employees will learn more and learn it faster.
3. Employees will realize that when one concept doesn't work for one station it may work for another, creating synergy. Caution: when it comes to promotion teams, think twice before slicing the budget for assistants. They are the get-it-done-group and if you don't have enough manpower, the whole system breaks down.
4. Web sites: If you're like most stations, you aren't investing enough in your site to begin with. You can't cut basic expenses like hosting and you're not being wise if you haven't budgeted for a full-time Webmaster.

With many Internet companies going bust recently, there are a lot of talented Web gals and guys out there to be had. Go get 'em!

• *Contests:* Most active, foreground radio stations absolutely need them. We have conditioned our listeners to expect them. Surecollective contesting is cheaper and although the report card is still out, I'm a huge fan of the concept.

For those who don't do collective contesting, insured prizes can also deliver a big bang. This is an area I'd very careful about cutting. If you cut and your direct competitor doesn't, look out!

• *Database and E-mail:* This is another area where you should sincerely hesitate with the knife. It doesn't cost much per impression and it offers tremendous potential for the future.

This will be a highly competitive arena, and those who don't get in the game will be left in the dust.

To play, you first have to acquire names. Once acquired, most have to learn which messages work and which don't through a process of trial, test, trial, test, trial ...

• *Street Toys and Equipment:* So you finally put some cash in for that new giant blow-up remote station van or even faster computers. Good for you for remembering to budget for the biggies this year!

For most companies, this falls in the "capital budget," so let some guy in a corporate suit make these cost-cutting decisions for you.

A special note for newbies: Be sure to ask for a lot so you give them something to hack at!

• *Conventions:* Unless you're sending a new employee to learn something specific, these kinds of trips are perks. Unfortunately, the universal trade conventions in radio have become predictable and not particularly useful to anyone in the biz. If you need to build in conventions for staff, so be it — but if you're struggling for bucks this year, this is one thing that's unlikely to give you a big return on investment.

• *Subscriptions to Trade Magazines:* This is an easy one. Cancel 'em all except Radio World!

Mark Lapidus is president, Lapidus Media. Contact him via e-mail at marklapidus@yahoo.com

If yours is like most stations, you aren't investing enough in your Web site in the first place to cut anything from its budget.

Sales

▶ Continued from page 29

job satisfaction and retention in your sales staff, you must motivate them in a creative manner.

Stenberg suggests a "Byzantine commission plan" with higher commission on harder-to-sell aspects of the business like Web advertising and non-inventory options like events and sponsorships.

The bottom line, said Stenberg, is that in order to get better results from your salespeople, you should reward your people when they achieve goals more profitably, and when they achieve the more difficult goals.

Graduated commission

Kulbertis offers a similar take on motivating sales staff. He uses a graduated commission plan in the stations he oversees, with assigned goals for each station every month.

Kulbertis pays higher commission for above average and lower commission for below average. Kulbertis said that his plan works.

"Income is goal-based. You pay more money for better performance and less money for below-average performance."

Kulbertis said motivation isn't always a positive.

"It's a stronger motivator to not have money than it is to have money," Kulbertis said. "People will work harder if the fear is that, 'Oh my gosh, I won't have enough to pay my bills.' You need to make it hurt if they don't perform and reward them if they do."

Or this way

Tyler also favors a goal-based commission system albeit a different one than Kulbertis'.

Tyler first sets both individual and team goals with the account executives. Tyler said this gives account executives ownership of their goals.

With a graduated commission system that goes up when individual goals are met and again when the team goals are met, Tyler is able to motivate his sales staff to achieve both their individual goals and the team goals.

"When's the last time any of you heard one of your AEs come in and say, 'Hey, we only need 2 more percent on station WXXX and we're all in the money. Who needs some help?' Doesn't happen much," said Tyler.

It happens all the time under his system, Tyler said.

Kulbertis, Stenberg and Tyler all stress using your bonus or commission system to motivate your sales staff to sell the things that are harder to sell, and to motivate your sales staff to meet their individual goals and their team goals as well.

"The sense of constant cooperation has worked very well," said Tyler.

The three sales managers also stress that properly structuring your commission system will not affect your cost of sales.

Kulbertis, Stenberg and Tyler, who took part in a session during last fall's NAB Radio Show, estimate that their cost of sales is about 18 percent of the total they spend to run their sales departments.

In fact, Kulbertis said his compensation plan, with its negative as well as positive motivation factors, results in outstanding returns.

"Here's the big question," said Kulbertis, "Does this work? Not to blow my own horn, but I have not lost a salesperson in the last 18 months. At the same time, in the last two years, we've increased sales 60 percent."

Frank Kulbertis

Motivate your sales staff to meet their individual goals and their team goals as well.

Switch

▶ Continued from page 29

miles north of Dallas, ended up losing all of its FMs. In addition to the 96.7 move in 1998, Sherman lost 104.1 to Sanger, Texas (the station now rebroadcasts a Fort Worth FM signal), while Denison's 101.7 and 104.9 moved to Azle, Texas (near Fort Worth) and Pilot Point (about 35 miles north of Dallas).

Add that to changes on the AM dial that left three of the area's four AM stations broadcasting to Dallas listeners, and it's been an interesting few years for that fourth station, KJIM(AM), at 1500 kHz in Denison.

"It's the damndest thing I've ever seen," said Bob Allen, the owner of KJIM(AM).

As the stations licensed to his market have moved south, Allen said stations that used to serve even smaller towns to the north, across the Oklahoma line, have set up studios and sales offices in Sherman and Denison to replace the signals that departed.

"If you get 'em where you are, and they're doing what you want to hear, it doesn't matter (where they're licensed)," Allen said of the move-ins.

With fewer local stations, though, "the demands for us on public service and the amount of time we spend on it has really increased," he said.

Meanwhile down in Dallas, the move-ins just keep on coming. ABC is getting ready to add another Class C to the market, in a juggling act that will rearrange 14 stations to put just one Class C FM on 103.3.

First has its own move-in in the works, transforming a Class A station in Muenster, north of Fort Worth, to a full C on 106.7 — and in the process, moving two other outlying stations out of the Dallas market entirely and a third station closer in. Applications are also pending to create new signals on 93.7, 98.3 and 107.9.

But as big as the Dallas area is, there's still only so much space on the FM dial. Once those changes are done, engineers say the dial will be about as full as it can get.

"The net result," said Goldman, "is that more listeners are covered by more stations."

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GUEST COMMENTARY

Don't Be So Quick to Pay Fines

David Tillotson

The *Cole's Law* article in the Oct. 25 Radio World which discussed recent FCC fines for "indecency" was accurate in its overview of the law in this area. But in my opinion it provided bad advice as to how a licensee should respond to an indecency fine.

Cole's advice is "to pay the stinking $7,000 fine and get on with your life." He predicates his advice (1.) on the observation that there is considerable expense involved to defend yourself against an action brought by the government to collect the fine and (2.) the risk of the licensee "incurring some black marks somewhere on its permanent record deep within the commission" for not paying up.

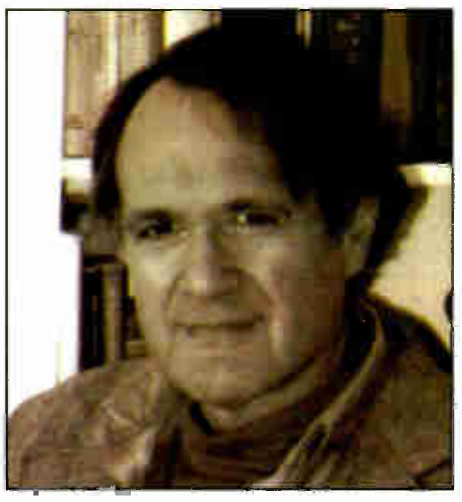
My advice would be not to pay the fine because (1.) the decision as to whether to incur the costs of defending an action to collect it can be deferred until a collection action is brought by the government and it is possible that an action will never be brought, (2.) no "black marks" attach to non payment, and (3.) payment is an admission of culpability which can and might well be used against the licensee if a subsequent violation is alleged to have occurred.

While it is true that court litigation can be costly, it is by no means certain that a U.S. attorney in the jurisdiction in which the station cited for the indecent broadcast is located would bring an action to collect the fine.

Consider this

The costs to the government in bringing such a case are also substantial, and, as pointed out in the *Cole's Law* article, the final determination as to whether the broadcast in question was "indecent" will be made by a local jury applying "contemporary community standards."

Faced with the costs of litigation, the risk that a jury will find the material not to be indecent, and the relatively paltry amount of the fine, I believe that most U.S. attorneys would decide not to bring a collection action. Moreover, in the event that a collection action is brought, at that point in time the licensee can opt to pay the fine and, thereby, avoid any litigation costs.



David Tillotson

Scuff-free

As for the concern about not paying resulting in a "black mark" on the licensee's permanent record, one of the carefully guarded secrets of communications law is that Section 504(c) of the Communications Act explicitly prohibits the commission from relying upon the fact that it has determined that a licensee is liable for a forfeiture for having violated the commission's rules or the act "to the prejudice or the person to whom such notice (of forfeiture) was issued, unless (1.) the forfeiture has been paid or (2.) a court of competent jurisdiction has ordered payment of such forfeiture, and such order has become final."

In other words, it is only after a licensee admits that it is guilty of the violation that resulted in the forfeiture by paying it, or is found guilty after an evidentiary trial *de novo* in a federal court, that the commission can use the fact that the licensee committed the violation for which the forfeiture was assessed "to the prejudice" of the licensee.

Clearly then, the best course of action for any licensee to take in response to the imposition of a fine for "indecency," or for any other violation for that matter, is not to pay the fine, as payment is an admission of culpability which can be used against the licensee and there is a reasonable chance that the local U.S. attorney will not bring an action to collect the fine.

When and if a collection action is initiated, the licensee can make a determination as to whether it should pay the fine or incur the legal costs of contesting it.

David Tillotson is a communications attorney in private practice in Washington. He was the author of Pacifica's brief to the Court of Appeals in the "seven dirty words" case in the mid-1970s and was lead attorney on the Supreme Court brief.

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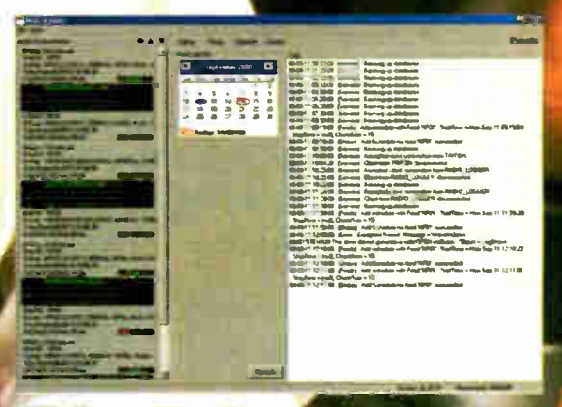

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Core Values of Cluster Management

Four Experts Offer Tips in Turning Your Radio Stations Into a Marketing Solutions Company

Lyssa Graham

As consolidation of stations in single markets continues, clustering strategies and operational issues are important to many managers who struggle to find the way to succeed with their new responsibilities.

"Things are changing," said Dave Crowl, senior vice president of radio at Clear Channel Communications in Covington, Ky.

New world

"As we are learning consolidation, the business continues to change. The dynamics out there, whether it is the economy or your particular market or regulatory issues, all continue to change the way you may have to manage your cluster."

Crowl said the challenge is no longer just to be the best station in the market but to "become a marketing solutions company for the retailers, advertisers and customers in that community."

The key to developing that "marketing solutions" company attitude, said Dan Latham, general manager of the Clear Channel Communications cluster in Chillicothe, Ohio, is quite simple — "It's the people."

"Managing a cluster," said Latham, "is really a work in progress." From merging traditional competitors into one organization to managing the day-to-day operations, Latham said it comes down to good people getting the job done. And that is true in big cities and small towns — a talented staff is key to successful cluster management in markets of all sizes.

Latham recommends that cluster managers use voice tracking to liberate on-air personnel for other duties, cross marketing sales and promotions and sharing personnel between stations.

Similar to Latham's theories, Bev Tilden, former senior vice president of marketing for Clear Channel in Boston, stresses that success follows when you "run the market as one business rather than six or seven."

Combining budget resources in order to do market-wide research can be very profitable and informative.

— Bev Tilden

Tilden suggests that combining budget resources in order to do market-wide research can be profitable and informative, allowing you to make better decisions regarding your own radio stations and giving you a glimpse into the fan base of other radio stations in your market.

Dave Crowl

Clancy Woods, general manager of Clear Channel's Phoenix cluster, says the key to managing consolidation is to identify what needs exist in your marketplace.

"Not just with your customers, " Clancy said, "but with your employees, and match them with the aligned interest of your company."

Congregate

Woods, Tilden, Crowl and Latham strongly recommend physical consolidation of your station cluster and promote the idea of trimming down extraneous personnel and duplicate facilities in order to streamline the station cluster for a more effective and profitable business.

Crowl suggests that multiple station owners "get everything into one building as soon as you can."

Woods said that even though you manage a cluster of stations, you're only consolidated if you're in one facility.

"Only then can you recognize the true benefits of consolidation by identifying what positions are redundant, where can the best talent emerge to handle more responsibility," Woods said.

"Unless you are in one facility, you have common ownership and you spend a lot of time dealing with problems rather than opportunities."

The experts took part in a discussion during last fall's NAB Radio Show.

WEB WATCH

Dot-com Delusions and *Savoir Faire*

Carl Lindemann

Web Watch is a roundup of all things radio and the Web. Send your news and tips to LD@imaspub.com

With the crash of so many online businesses' stock prices, it would seem that the world at large finally has to learn the principles of Economics 101.

After investor speculation ran high and wild on visions of mass audiences flocking for Internet streams, the low that is now following is at least as deep. Actually, it's probably deeper.

In these past few months, seemingly solid new media outfits have been forced to sell or restructure. Others have been axed altogether. It seems bleak and bloody — a far cry from the high water mark of the mania when **Mark Cuban** unloaded **Broadcast.com** for billions in July last year.

In retrospect, the reasons are not nearly as hard to figure out as a **Palm Beach "Butterfly Ballot."** This should have been far easier to predict than the election night outcome in Florida.

Beyond the fast-buck fortunes, blame the blight on an atmosphere where investors expect an immediate 20 percent-plus return on investment even in fledgling industries that have yet to turn a profit. Looking for an instantaneous payout on an "investment"? Try tossing money into a slot machine.

Legit investments take time. That may be hard to fathom for those blessed with Katherine Harris' patience. Still, these manic-depressive swings in streaming media will eventually settle out as viable — and profitable — businesses are built.

Surfer dudes to the rescue

In the meantime, the body count rivals that of an Arnold Schwarzenegger film. Despite claiming the mantle of the **"World's Largest Internet Broadcaster," BroadcastAmerica** announced in early November that it was "pairing" with the up-and-coming **SurferNETWORK.**

Actually, Portland, Maine,-based BroadcastAmerica was running out of money. The immediate million-dollar influx from SurferNETWORK kept holiday paychecks from bouncing. The promise of several million more to come — and a voluntary filing of **Chapter 11 bankruptcy** — were part of the arrangement to get BroadcastAmerica back from the brink.

Gordon Bridge

The rejuvenated BroadcastAmerica will maintain its name and contracts with various content providers. The major changes will be in the executive suite.

Seasoned surfer **Gordon J. Bridge,** chairman and CEO of SurferNETWORK will take the same title as the companies combine under the BroadcastAmerica moniker.

John Brier, BroadcastAmerica's president and COO will remain president. The bulk of the board positions will be taken up by SuferNETWORK founders **Harry Emerson, Robert Landmesser** and **William Grywalski.**

John Lauchlan and John Brier

Beyond the unsettling aspects for those that created the "original" BroadcastAmerica, the "pairing" should combine to make a formidable enterprise. Aside from access to deep pockets, the SurferNETWORK crew appears to have sufficient savvy to make this a going concern.

Add their proprietary technology to give "instant-on" to audio streams make the BroadcastAmerica offerings a far more user-friendly experience.

As reported earlier from **The NAB Radio Show** (see **RW**, Oct. 25), SurferNETWORK seemed to be a solid management team with a great technology bound to rival the "established" content aggregators in time.

Now, combined with the content collected by BroadcastAmerica, they're ready to cook.

Seeking new partners

Meanwhile, across the continent, Vancouver-based **GlobalMedia.com** is scratching for scratch. In mid-November, the company announced it had restructured its board of directors and raised $1 million through a stock sell-off.

Chief investors include Canadian broadcaster **Standard Radio Inc.** (with two of its executive officers, **Gary Slaight** and **David Coriat** taking part) and Global Media's own Chairman, President and CEO **Jeffrey Mandelbaum.**

Barr Potter

The dollars raised are only enough to buy time to scrounge more money. Other measures include axing 25 percent of the workforce while bringing on media mogul **Barr Potter as president and COO.** Potter is best known in movie circles for doing distribution deals.

Mandelbaum remains chairman of the board and CEO but will focus his efforts to raise cash.

Rumors floating around suggest that a BroadcastAmerica-style bailout may be at hand. Expect major changes as the New Year begins.

Eyeing future

Meanwhile, back across the continent again, Massachusetts-based **CMGI** decided to give **iCast** the axe. With a 91-percent drop in stock price since last January and a withering $2.2 billion operating loss in the past fiscal year, CMGI decided to cut costs and write off the online entertainment venture.

Negotiations with several prospective buyers are said to be underway. Other outfits feeling the heat include **audiohighway.com.** A whopping 21 of 30 employees received pink slips (or whatever is the equivalent in the online environment) the week before Thanksgiving. Even **Audible.com,** the seemingly well-established spoken word audio download destination seems shaken.

With the stock down to about a buck in late November from an earlier high of about $18, the clock was ticking as cash reserves dwindled. A lot can happen to Audible.com before they estimate their dough dries up next fall.

What is most incredible is that the market that poured money into so many obviously pointless endeavors can't cough up enough to keep such well-thought-out ventures afloat. For all those who wished last year that they'd leapt at some of the wild Internet opportunities (myself included), many more can be thankful they didn't now that "irrational exuberance" has turned to irrational idiocy.

Still going

Not everyone is digging in to weather the storm.

StreamAudio has claimed the title of "world's leading provider of streaming audio for terrestrial radio station Web sites" after signing its 600th station. The Tacoma, Wash.-based firm was launched in mid-1999 and is the creation of radio program director **Bob Case** and software designer **Darren Harle.** StreamAudio's proprietary **"Station Manager"** software allows real-time readings of listener habits.

StreamAudio is not only a Microsoft Windows Media division "preferred provider," but is also joined through a marketing alliance with Intel's Internet Media Services division.

Others pushing back the bears include **Cox Radio's** newly formed **Cox Radio Interactive (CXRi)** to

See WEB WATCH, page 38 ▶

Web Watch

▶ Continued from page 37

exploit new media opportunities as well as manage existing Internet assets.

The Atlanta-based division will be headed-up by **Gregg Lindahl**, the former president and COO of **MP3Radio.com**.

LMIV

Likewise, the **Local Media Internet Venture** announced at The NAB Radio Show (RW, Nov. 22) seems to be coming together. The joint venture's founding board members are Bonneville International Corp., Corus Entertainment, Emmis Communications, Entercom Communications and Jefferson Pilot.

Emmis' Chairman and CEO Jeff Smulyan serves as LMIV's chair. Other's getting aboard the Internet audio bandwagon include **Excite@Home** and **MYVi** with their partnership to launch **Excite Music**, a repurposing of **MTV** and **VH1 content**.

Jeff Smulyan

It would seem that the upshot of all the dot-com commotion is that radio professionals see opportunities not so much for standalone Webcast ventures as much as for the Internet as offering ways to enhance existing properties.

But there are still some dot-com types out looking to create entirely alternate means for music listening. **Listen.com** has launched **Listen Radio** with 17 "stations" as well as an additional 46 "stations" on the **Listen Radio Affiliate Network.**

Rob Reid

The network is composed of genre-specific music compiled by a 30-person editorial team. According to **Rob Reid**, Listen.com's founder and CEO, this is all part of a new focus to the San Francisco-based outfit.

"Now we can offer our partners the tools to develop streaming entertainment systems for their own audiences," said Reid. Of course, success will depend on whether anyone will be listening to Listen.com.

Measuring up

Determining audience is increasingly the province of online metrics magicians **MeasureCast**. The company's grown by leaps and bounds over the past few months and may soon establish a difficult lead for anyone else (I am not so crass as to mention any names) seeking to become *the* name brand in new media measurement.

The company's latest leap came when **RealNetworks signed MeasureCast** to deploy its **Streaming Audience Measurement Service** on the **Real Broadcast Network (RBN)** servers.

Insofar as those servers handle more than 650 radio stations as well as television and cable content, that extends MeasureCast's reach considerably. RBN's General Manager Ian Freed sees this as a tremendous value-add for their clients.

"(This) enables our joint customers to measure and analyze the impact of their broadcasts, which in turn will help support the generation of substantial advertising revenue," said Freed.

Edward T. Hardy

For MeasureCast's CEO **Edward T. Hardy**, this is a long step to promote "the benefits of streaming and reduce Internet broadcasters' time to profit."

Onward

For all the business glitches, online technology continues to move forward. **Sonic Foundry** announced a new proprietary audio codec that achieves up to 5:1 compression without sacrificing sonic fidelity.

Unlike MP3 and various other "lossy" codecs, Sonic Foundry's "**Perfect Clarity**" does not employ the usual psycho acoustic shenanigans to reduce audio file size.

The codec is initially being offered in the **SIREN Jukebox** product but will be included all across the company's products.

But for Seattle's non-commercial KCMU(FM), even if it's not "lossy," codecs are lousy.

KCMU announced the first successful attempt to offer *uncompressed* audio over the Internet or, actually, over Internet2, the next-generation network being created for academic and research purposes.

The analog audio is fed to a Windows Media Encoder to create an uncompressed 1.4 megabits per second stream.

Given the wide acceptance of compressed audio, opting for the enormous bandwidth eaten by such schemes seems dubious.

Making this commercially viable may take some doing. In the meantime, could I interest you in a slightly used dot-com?

Carl Lindemann is a frequent contributor to RW. He has worked in radio as a field reporter and production director. He consults on radio/new media projects and writes extensively on these subjects.

Reach Carl via e-mail to carl@cyberscene.com

Routing Signals With the PM-64

See Page 40

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Hooked on the Classics at KHFM

Ken R.

"Classic Hits" on most radio stations means the Beatles, the Beach Boys or Chuck Berry. However, to Bob Bishop, production director at KHFM(FM) in Albuquerque, N.M., it means Beethoven, Brahms and Bach.

"I grew up listening to classical music in L.A. on KFAC(AM)," said Bishop. "Classical really grabbed me."

KHFM is part of an eight-station cluster owned by Citadel Communications Corp. It is a commercial operation, unlike most classical stations in the U.S. Also, KHFM eschews the stuffy approach to the format.

Bob Bishop sits at the controls in one of the KHFM(FM) production suites

Free and easy

"Our announcers are free and easy on the air," said Bishop. "In fact, we held a 'Blow It Out Your Kazoo' promotion which we had a lot of fun with."

For this promotion, the station ordered 25,000 kazoos with their logo as well as that of a local advertiser, Chevron Ready-Marts.

"We'll have a 'kazoo moment' on the air and we blow the kazoo to relieve stress, then play something goofy like a yodeling song or something," said Bishop.

KHFM is currently among the top 10 stations in the 12-plus demographic for the Spring 2000 Arbitron ratings for Albuquerque, and No. 3 out of 11 stations in the Santa Fe market.

Bishop holds two jobs at the station: production director and afternoon-drive air talent.

"We don't have a playlist. I program as I go," said Bishop. "I use the Chase calendar of events to find something interesting and play a song that reflects that mood."

Kip Allen, the station's program director, also doubles as morning-drive talent on the air. The third air personality is Connie Moore, who handles middays and who also holds a degree in medicine. Moore works part time on KHFM and also volunteers at a local public station when she's not healing patients. KHFM is automated using a Scott Studios digital audio system between 6 p.m. and 6 a.m.

In the Albuquerque/Santa Fe area, there are 10 Pueblo Indian tribes. There's also a large Hispanic population, much of which is bilingual.

"We play pieces by Mexican and South American classical and contemporary composers," said Bishop. "We actually get calls from listeners thanking us for that."

For production music backgrounds, Bishop primarily uses standard classical recordings by artists who died before 1925.

"That means the copyright has expired," said Bishop. "We also have a Network production library, but we don't use it much."

Land of 10,000 discs

Most of the station's musical library is contained on more than 10,000 CDs, all of which are classical.

Bishop said they use Opcode's Sound Designer software-based two-track editor for almost everything.

There are four production studios in this Citadel cluster. Bishop is one of three production directors in the building who oversee the four studios, but he only records for KHFM.

His assistant Bonnie Renfro and other station announcers can also lend their voices to the cause.

"Although usually the guys from our sister country stations don't work out too well for our format," said Bishop.

Commercial production is voiced from scripts provided by the salespeople, but Bishop always has a hand in polishing the copy.

"People who listen to classical music are usually pretty well-educated," said Bishop. "If we use bad grammar, listeners call."

Another aspect of the station that is unusual is that KHFM uses a high percentage of live copy on the air.

"We sell 15- and 30-second spots and we might have four or five an hour, plus opens for traffic reports," said Bishop.

If it doesn't fit

How does Bishop finesse a screaming car dealer commercial that is produced elsewhere and would stick out badly within a classical format?

"We transcribe it and re-cut it, if that's all right with the client," said Bishop. "Some of these advertisers are intelligent enough to realize an inappropriate spot would have a negative effect if allowed to air. Some of the advertisers even cut a special spot that just runs on our station."

KHFM may opt to eliminate music entirely when the spot is revised or they

See KHFM, page 42 ▶

Bishop *uses no compression in his production process and the station uses almost none going to the transmitter.*

PRODUCT EVALUATION

PM-64 Routes the Ins and Outs

Rich Rarey

CM Automation created the PM-64, a sophisticated 32-by-32 audio router that will be at home in many sound-related locations. The unit lists at $2,500 and packs a box full of features in two rack spaces.

The PM-64 has only a few front-panel controls, with the exception of 64 small buttons for routing all 32 inputs and 32 outputs. The user does not have to hunt through menus or lists to find the desired crosspoint. Just press a Source button, and select *None*, *Some* or *All* destinations for that Source.

A soft function knob acts as a universal selector control for cycling though the menus. A quartet of conventional buttons provides quick selection of important device controls.

The 12-segment LED display can be programmed to reference +4 or -10 level displays on either Source or Destination signals. A three-character readout displays memory location and other system parameters.

Functional

While the number of exposed controls appears small, the device control buttons, function knob and audio buttons give the PM-64 surprising functionality.

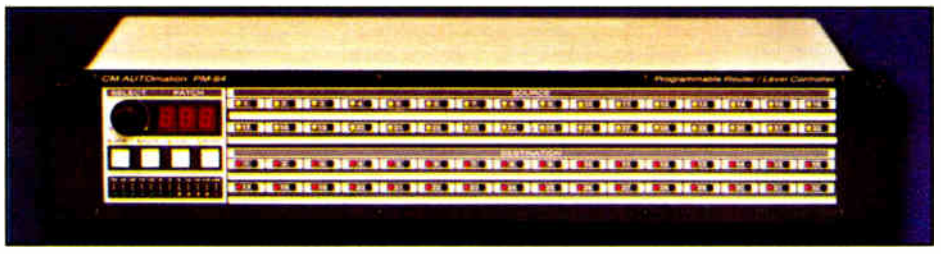
Because the router is designed for both hands-on and -off use, the user must unlock the controls when it is first powered up. Pressing the Save and Route buttons simultaneously performs this process. Pressing these buttons a second time relocks the controls.

Once unlocked, the user presses a Source button, then presses the Destination buttons meant to receive source audio. The source-to-destination take is instantaneous.

Interestingly, the PM-64 offers an Undo feature that restores the previously saved settings, just in case a mistake is made during work setup.

Because pressing fewer buttons is nice, the unit has functionality built in. One such functionality allows sources and destinations to be programmed as pairs for stereo.

Only adjacent inputs and outputs can be programmed to operate together, but a user can have a convenient melange of stereo and monaural signals from which to choose. However, stereo sources can be switched only to stereo destinations.



PM-64 by CM Automation

Pressing the left button of the stereo destination actuates this command. By pressing the right button of the stereo destination, the PM-64 will feed the left source to the right destination and the right source to the left destination for quick and easy channel reversal.

In addition to routing audio, the PM-64 offers control over individual source and destination levels with a range of -96 to +10 dB.

Control levels by pressing the Level button, then pressing a Source or Destination button. Rotating the function knob raises or lowers the level in 1 dB increments. Pressing the knob while rotating it kicks the resolution up to 10 dB increments.

As only one level can be adjusted at a time, a user might want to confine these level changes to setup and then save the whole setup into a memory location.

For stereo pairs, the function knob acts as a stereo balance control.

While the LED meter displays only one source or destination at a time, the company realized there would be a need to extend the sensitivity of the LED display and they put a button labeled Meter to do that.

Fine meter mode

When metering a source, pressing the Function knob engages the Fine meter mode. This recalibrates the LEDs surrounding the zero LED to indicate 0.25 dB steps. As the Source looks at an incoming signal prior to level control, the fine meter mode is a nice feature for trimming external sources to a standard reference before messing with destination gain or loss.

To save the program, CM Automation included 90 non-volatile memory locations in the PM-64, each location representing a snapshot of the state of the device. This includes crosspoint routing, source and destination levels.

The user selects which of the 90 locations are used, a helpful feature for shops that have multiple engineers working on the same equipment.

In addition to saving work, the PM-64 can clear the programming — if the user knows the right combination of buttons and switches.

Normalizing the levels of all 32 sources and 32 destinations to unity gain (input = output with no level shift) is a great timesaver; just press the Function knob and the Level button.

Fortunately, XLR breakout cables that present those eight pairs are available from many companies. I used the Carver Professional BLS Series 8 channel snakes. The cables can be ordered with XLR female or male connectors and the DB-25 plugs easilyinto the PM-64.

A word of caution: check the documentation with these cables to determine the pair numberings. I found my cables presented the Ins and Outs on the breakout side in reverse order. What was marked "Channel 8" was actually Channel 1.

When 32 ins and 32 outs is not enough, multiple PM-64 can be slaved together. The entire package can be controlled through a master PM-64 unit by MIDI control through the RS-232 port.

Command and control information is sent among the individual units by MIDI cable as each device is user-assigned an address from 0 to 15. The RS-232 port has a fixed rate of 38.4 kbps. The MIDI and serial command implementation is published in the back of the operation manual.

Putting it to work

To put the PM-64 to work, I used two Carver Pro snakes to connect the Ins and Outs 1 thru 8 to devices such as a CD player, an Otari reel-to-reel and a Digigram soundcard. One of the outputs fed directly into an input to the Philips audio crosspoint switcher, while the remaining outputs fed back into the reel and soundcard.

This arrangement was most convenient to extend the number of inputs that could be fed into the main crosspoint; inputs into the Philips crosspoint are scarce and the occasional use of these sources did not justify using up inputs. For other shops, this may be a quick fix to dwindling resources.

I thought I would enjoy seeing the routing state at a single glance, but after a few days, squinting at the small label strip and hunting for the right buttons became tedious.

Saving and restoring configurations is a possibility, but MIDI or computer control is probably recommended when doing a bunch of small, quick changes. It seems the PM-64 is most capable when used in non-air situations.

The PM-64 in Rich's rack

To clear all routing assignments, press the Function knob and the Routing button. If all the routing is cleared by mistake, just push and release the function knob once and the settings are restored.

The manual also details the short steps needed to return the PM-64 to factory defaults and the steps to clear all 90 memory locations. The Undo function cannot be used for those functions and the user is warned in the manual.

CM Automation chose to use DB-25 connectors on the rear panel to connect the 64 balanced audio pairs in the space available. This scheme makes eight balanced pairs plus shield per connector, for a total of eight DB-25 connectors on the back of the unit.

When a cluster of sources was configured to act as stereo pairs, I found the switching was reliable. Though in one peculiar instance, pressing Source 2 activated *only* Source 2, while pressing Source 1 correctly activated both Source 1 and 2.

Interpreting the three-character codes in the LED display took repeated visits to the operations manual to resolve. A user would expect once the PM-64 was set up, that they would rarely visit the MST or

See PM-64, page 42 ▶

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528E Voice Processor:

Known as an industry standard for analog voice processing for more than a decade, the 528E offers five major functions in a single rack-space unit. They include a high-gain mic preamp with phantom power, compressor/limiter, expander/gate, de-esser, and parametric EQ. The 528E uses minimum components in the signal path, resulting in very low noise and better natural sound. List $749.00

628 Digital Voice Processor:

Now you can lock in custom settings for each and every voice talent at your station and access them at a touch of a button. The programmable 628 digital voice processor offers 128 processing presets and combines six separate functions (a premium-quality mic preamp, 20-bit A/D converter, compressor/limiter, parametric EQ, downward expander/gate and de-esser) into a single, affordable unit! Clearly marked front-panel knobs and independent metering of processing functions make operation easy. List $1,249.00

610 Broadcast Profanity Delay:

The 610 is a cost-effective way to deal with on-air profanities, allowing talk show hosts to dump obnoxious callers and automatically build back 7.5 seconds of delay time. This true stereo delay features a "Cough" button for short dumps and Exit function which gradually releases memory to bring the audio up to real time at the end of the show. List $2,695.00

422 Stereo AGC Leveler:

This stereo, wide-range, AGC (automatic gain controller) amplifier and peak limiter keeps audio levels consistent by gently bringing up lower level audio and transparently limiting audio that is too "hot". Radio stations commonly use the 422 as a preprocessor to boost the "horse power" of their on-air processors. It's also an excellent remedy to correct for inconsistencies between commercials and other program material used by television stations, cable systems and automated radio stations. List $619.00

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KHFM

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might add a more suitable selection.

Bishop believes that the sound of his station is important.

"It's the integrity and continuity of the programming," said Bishop. "We don't try to hide commercials by playing them 20 dB softer or anything. We have to be honest about it and our listeners respond."

The station announcers are not a part of any union, but talent fees are paid when spots run in additional markets.

"We also get a talent fee if we ad-lib a spot live on the air from a fact sheet," added Bishop.

Albuquerque is a small city; in fact No. 72 in market size in the United States. As is the case in all towns this size, some of the so-called "talent" called upon to read commercials is less than professional.

"A lot of times the owners of small businesses want to read their own spots," said Bishop. "If they have any personality at all, we tell them to relax and be themselves. If they have no personality, we encourage them to be someone else."

Specific sound

Because the station runs anywhere from 18 to 24 units an hour, Bishop believes the sound of each ad is important. He uses no compression in his production process and the station uses almost none going to the transmitter.

"It sounds very real," said Bishop.

But not all commercials on KHFM are real.

"On April Fool's Day we go a little crazy," said Bishop. "We once made up a spot for a place we called Big Al's Used Farm Implement and Computer Store, 'the store with the manure spreader on the roof.' The mythical advertisers slogan was 'When you buy a computer, you get a dozen baby chicks free.'"

Bob Bishop calls himself a perfectionist. "I have pulled spots even after they've aired to tweak them a bit," said Bishop. "Production is like building a model. I like putting something together that's really quality."

Ken R. is a former production director from the era in which Gates cart machines were considered state-of-the-art.

KHFM Production Equipment

Shure SM7 mics
Opcode Sound Designer running on a Mac-based Workstation
dbx 1531X graphic equalizer
Korg DRV3000 digital reverb with remote
Panasonic SV-3700 DAT
Otari MTR-10 and MX-5050 reel-to-reel machines
Technics SL-1200MK2 turntable
Two Denon DN-950FA CD players

PM-64

▶ Continued from page 40

SLV settings — for master and slave, among the more quirky abbreviations.

The serial port proved to be a challenge as well. After working with some remarkable embedded operating systems, the control codes of the PM-64 seemed arcane.

Although the published PM-64 command set is complete, I had trouble building a simple message and having the PM-64 respond.

Product Capsule:
CM Automation PM-64
32-by-32 Crosspoint Router and Level Controller

Thumbs Up
✓ Undo, Save and Clear features
✓ Signal level adjustments
✓ Stereo pairing
✓ Metering and fine metering modes

Thumbs Down
✓ Small buttons
✓ Serial commands difficult

For more information contact the company in California at (888) 588-6434 or check out the Web site at www.cmautomation.com

Perhaps it was my own unfamiliarity with the commands, but many users would welcome additional technical documentation and examples of the serial and MIDI command set. I hope CM Automation would be able to post these documents on its Web site.

Because there are many subtle settings such as level and balance that can be set improperly, the operations manual discusses all aspects of locking the PM-64, especially as there are users who twirl knobs and push buttons when a device appears recalcitrant.

After inadvertently tweaking a stereo balance while setting up the PM-64, I understand why the manual is insistent on locking.

For small operations, the PM-64 is a good performer, especially if it can be applied toward routing tasks that can be reloaded from memory.

Rich Rarey is the master control supervisor at NPR. Reach him at rrarey@npr.org

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Analog Audio Compression Tips

Mike Sokol

Twenty-five years ago, I had my first encounter with an on-air compressor/limiter when my band made a deal with a local radio station to promote our act.

I had a small project studio that we used to make demo recordings, so our band insisted on artistic and creative control of the spots. After agonizing over the text and production mix for several days, we finally had a spot ready to go.

Awesome sound

Because the band was a cool techno-rock act, we used lots of flanging, out-of-phase bass and a big "whip crack" throughout the spot.

While it sounded awesome over the studio monitors, hearing the much-anticipated spot on the radio was a real shock — it sounded awful. The stereo image shifted in all directions and the level of the narration ducked on every whip crack.

I called the radio station and complained about how they messed up our spot. However, they claimed their transfer to cart was fine. It was my problem, not theirs.

After talking to the station engineer, I found out what really happened. The compressor on the station transmitter did not like the out-of-phase bass, plus the brick-wall limiter jumped into action on every whip crack, causing the whole program to duck down every few seconds.

dbx 160A compressor

A few days of remixing experiments fixed the problem, but not without having put up with a great deal of abuse from the station engineering staff.

This situation was the beginning of my love-hate relationship with various level controllers or "compressors," which are often referred to as dynamic controllers.

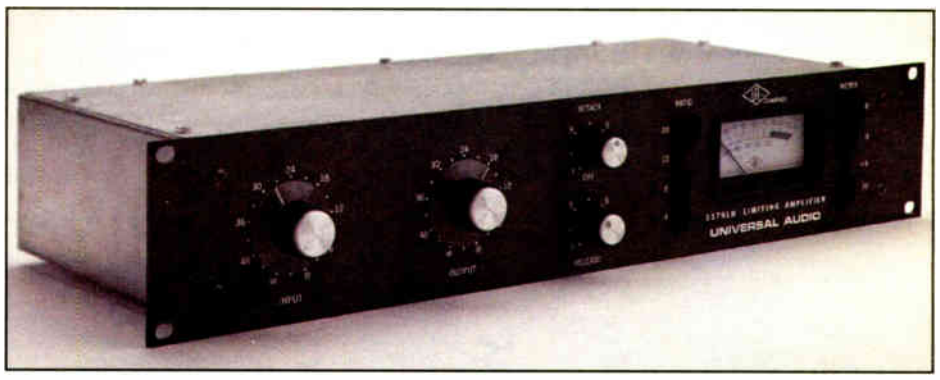
Great variety can be found in gain-controlling devices. Some sound great, while others sound terrible — but nothing sounds worse than a compressor used by someone who does not know how to operate it.

For most broadcasters, the primary use of dynamic compressor/limiters is at the transmitter. But, lots of different ways can be found to include dynamic control within the mixing path itself, which is the best way to avoid stressing the brick-wall limiters that keep the station transmitter from over-modulating.

In a perfect world, compressors would not be used. In fact, using compression in symphonic recording is a major *faux pas*, as it is viewed as altering the reality of the performance.

Compressors and radio

Radio stations started compressing the audio as a way to raise the average volume levels, and hence the perceived volume of the music without over-modulating the transmitters and bringing the wrath of regulators upon them.



Universal Audio's 1176 compressor

Basically, compressors and limiters perform the same processing, just to different degrees.

Both units have a common signal path. A detector stage "listens" to the audio signal, controls set the attack and decay rates, and a variable-gain amplifier is used to change the gain dynamically.

The compression ratio is the rate at which the output will change once the threshold level is reached. For instance, a 10:1 compression ratio will allow the output level to increase by only 1 dB for every 10 dB of input increase. Likewise, a 3:1 compression ratio will allow the output level to increase 1 dB for every 3 dB of input increase.

A ratio of infinity (∞) is a brick-wall limiter, where the output level never rises above a specified level, no matter how much the input increases.

Traditionally, dynamic ratios from about 2:1 to 10:1 are referred to as compression, while ratios from 10:1 to infinity are called limiters.

Compression is normally used to "tighten up" the dynamic level of an instrument or voice, while limiters are used as safety stops to keep the level from getting out of control. Compressors act over a wide range of audio dynamics, while limiters are generally set to avoid going above a specific level.

Examples of a limiter include being a safety net to prevent digital splatter in A/D converters or keeping transmitters from over-modulating.

"Sidechain" is an insert into the detector circuitry of the compressor. Placing an equalizer into this loop makes the compressor react to a specific group of frequencies while ignoring the rest of the spectrum. This does not affect the EQ of the signal that is compressed; it only changes how the compressor detects the signal.

Removing sibilance

When boosting the equalizer by 6 dB at 5 kHz, it essentially compresses anything with 5 kHz content by an extra 6 dB. This sort of processing is useful for removing sibilance from a vocal.

If a stereo compressor or two mono units are available, it may be necessary to link the channels together, if the compressor is used to process the final stereo mix. This cross-connects the two detector circuits so that compression on one channel is matched by the second channel, ensuring that the stereo image remains stable and does not dance from side to side.

Conversely, if one side were used for vocals and the other side for an instrument, then engaging the link button would have unpredictable and unmusical results.

The *attack* setting is how fast the compressor recognizes a level increase and does something about it. Too slow a setting lets peaks through, which can defeat the reason to process the signal, while too fast a setting will flatten the dynamics and sound artificial.

Start with an attack of one to five milliseconds (ms) for voice and a little longer for percussion. Watch the peak level meter and adjust the attack time to trim back the peaks shown on the LED meter while keeping the character of the sound.

Return to normal

The *decay* setting is how quickly the compressor returns the signal to normal. This can usually be set from 50 ms up to several seconds or more. A very short decay can cause pumping, where the signal level goes up and down with each beat, while a long decay acts more like an auto gain control.

For radio voice work, I use about 100 ms to 300 ms decay to start, which is quick but helps to keep the talent from clipping his or her next word.

Bass guitar is tricky because low-frequency notes can modulate the compressor if the decay is not set long enough. Usually around 300 to 500 ms

See COMPRESSION, page 45 ▶

Compression

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works for most applications, but let your ears be your guide.

For a general overall compression, up to one second or more of decay time can be used, as this will simulate careful use of the faders on a final mix.

Serial connection

The first step is to hook up the compressor correctly in the audio chain.

Unlike parallel processors such as reverbs, compressors need to work serially or in line with the audio. This requires an insertion within the signal path.

A quarter-inch TRS plug can accomplish this. A "Y" cable is plugged into the I/O jacks of the compressor and the TRS end is connected into the board.

Note that some compressors have two selectable operating levels; a -10 setting for channel inserts in prosumer boards, and a +4 setting for the line-level outputs and channel inserts on professional boards.

The first place an insert can occur is within the channel strip in the board. This point in the audio chain is generally located after any pad or trim controls on the channel strip but before the fader.

Nothing
sounds worse than a compressor used by someone who does not know how to operate it.

The levels feeding the compressor are kept constant even though the operator may be moving the fader. In this mode, it is one compressor per channel, so it is normally used for individual mics, like an announcer or an instrument.

Another possibility is inserting the compressor into the subgroup buss, so that various but similar sound groups are assigned to a buss and compressed together as a group.

For instance, buss one could be assigned as a vocal subgroup. Any vocals that need compression are sent to buss one first, where they are processed by the compressor and then sent to the output buss; buss two could be for musical instruments; buss three for crowd or field mics and so on.

This method solves the problem when there are fewer compressors available than what is needed. For example, there are five vocals but only four compressors. Mix all the vocals to one buss and use only one compressor.

Another place to put a compressor is on the stereo output buss. In a broadcast situation, a safety limiter is typically placed at that point. Either use the stereo insert, if the board has one, or hook it up between the stereo output of the console and the device that is fed with the board.

The LA-2A by UA

To learn how to hear compression, a peak response meter is required. You will need an LED array, either on a mixing board or on a DAT recorder works fine, a regular mechanical VU meter that shows the average level, and your ears. Insert the compressor so that it affects what is going to both monitors and the meters.

With the compression set at minimum, play a CD that has little or no compression, such as a recording of an orchestra, a live Celtic act, percussion group or unprocessed narration.

All the meters should be dancing. Notice that while the peaks can be hitting close to 0 dB on the LED display, the slower-acting VU meter is very low, maybe -20 VU to -30 VU.

As the compression is increased, the peak levels shown by the LEDs will be reduced, while the average levels on the VU meter will rise.

If a correct amount of compression is done properly, it will be unnoticeable by most listeners.

Mike Sokol is an audio engineer, musician and communications integrator with 30 years of experience in professional audio.

◆ PRODUCT GUIDE ◆

Products for Radio Air & Production Studios

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

Gold-Line's Measurement and Recording Mic

Gold-Line introduced the MK 10 microphone, which retails for $250.

The capsule has a one-half inch condenser element with an omnidirectional pattern.

The mic is designed to deliver a flat frequency response of 20 Hz to 10 kHz ±1 dB. or 10 Hz to 20 kHz, ±2 dBwith a dynamic range of 102 dB. It can handle a maximum 128 dB SPL.

It comes with an individual frequency plot, foam padded carry case and clip. Housings are machined brass with matte silver finish. The mic will be included in the Gold-Line Prokit Measurement System.

For more information contact the company in Connecticut at (203) 938-2588 or visit the Web site at www.gold-line.com

Promusic Inc. Features Do It Yourself Soundtracks

Promusic Inc. production music and sound effects libraries offers the Editor's Construction Kit.

The design enables sound engineers, designers and editors to create soundtracks unique to each production.

It consists of four production CDs from the Cavendish library, with each track in keys and tempos so that all cuts work together.

The Editor's Construction Kit

With this library, production can choose atmospheric beds and add elements to build tracks that are in sync with action. Therefore, each track is unique to the production and tailored similar to a score composed specific for the scenes.

For more information contact the company in Florida at (800) 322-7879, in California at (888) 600-8988 or visit the Web site at www.promusic-inc.com

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SPECIAL REPORT

Kintronic Assembles a Portable Trio

Engineer Reports on a 3 by 12 kW Mobile AM Triplexer Built by Kintronic Labs for U.K. Broadcaster

by Bobby Cox, Ph.D.
Staff Engineer
Kintronic Laboratories Inc.

BRISTOL, Tenn. As an engineer in AM (MW) broadcasting, encountering unique customer requirements is not an unusual occurrence. However, a customer in the United Kingdom approached me with a requirement that topped most of my previous unusual system requests.

The customer has a number of stations in the U.K. that are operating on aging towers that need refurbishing. The sites are all diplexed and triplexed and operate on a subset of five distinct frequencies.

The customer wanted to operate three separate 12-kW AM stations onto a single mast. The triplexer had to accommodate any set of three frequencies chosen out of the set of five possible station frequencies. This would require a large degree of flexibility in the triplexer design due to the various combinations of possible frequencies involved.

Both matching networks and filtering networks would have to work no matter which three frequencies were chosen. The final kicker was that the whole system had to be mobile, mounted on small trailers that could be towed by the company Range Rover SUVs. This was not going to be an everyday job.

Photo 2: Mobile triplexer installed at tower base

Surmount the mast

The first challenge was to select a suitable tower — or mast, as the British prefer to say. It would have to accommodate being set up on a relatively level field without the requirement of grading or concrete work.

We chose a 170-foot standard Rohn 25G mast. The mast would be stacked by trained tower riggers on a heavy, four-foot-square steel base plate placed on the ground. A ball-and-socket base fixture was custom-fabricated for use on a tapered base section permitting installation on slightly uneven soil. Screw anchors are used to anchor the tower guys.

Frequencies ranged from 693 kHz to 1215 kHz. With this in mind, a variation on a folded unipole antenna was designed for installation on the tower.

The skirt kit was custom-designed to give broadband performance of the 170-foot grounded mast.

Photo 1: Interior of one triplexer unit

The antenna has a slowly varying impedance sweep with respectable base impedances over the required frequency range. A ground radial system placed on the surface is used to ensure reasonable efficiency and stability with weather variations. A pair of tower riggers can erect the mast and antenna kit in approximately two days.

The next challenge was to design the triplexer and make it mobile. The design arrived at uses a common "L" prematching network across the mast, series and shunt trap filter networks for each station and a full matching "T" network for each station. The triplexer was built in seven separate aluminum cabinets, which were mounted on two separate flatbed trailers.

The cabinets were tied together and all internal component mountings were constructed of fiberglass to make the system sturdy enough for road travel. Interconnects between cabinets and between the two trailers were flexible straps.

The outputs were all placed in the top to satisfy a safety requirement that all hot RF conductors be no less than

See KINTRONIC, page 53 ▶

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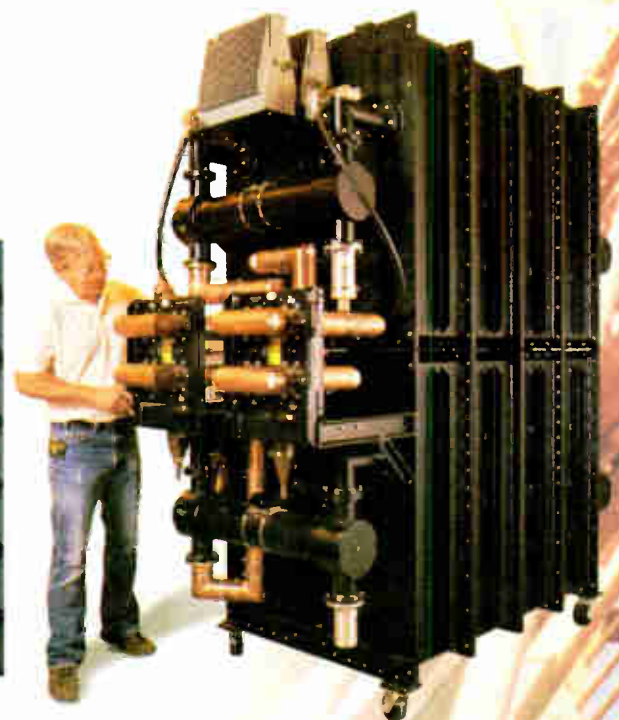

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USER REPORT

Dielectric Supplies Solution

by Steve Fluker
Director of Engineering
Cox Radio, Orlando

ORLANDO, Fla. Competition between radio stations can become fierce.

Stations will boast having the best music, the best talent, the least number of commercials and the best contests. Behind the scenes, program directors are pushing for the engineers to have the best yet loudest audio on the dial.

Antenna installation for WMMO(FM)

For urban stations, they want the most "boom" in the bass. When the station loses ratings, fingers point to the station's signal and sound.

Engineers take on the challenge by upgrading to new digital editors and storage devices, audio processors, digital STLs and exciters. While all of these make a difference, too many people overlook one important thing — the antenna system.

Beaming it out

Here in Orlando, I got the pleasure of finding signal solutions for four of our five FM radio stations. Through my years of experience, I knew where to turn to and that was **Dielectric**.

The first FM needed to get off of the roof of a downtown high-rise where the building was shadowing the signal in the direction of a key demographic area. The solution was a new tower, which I had built just to the west of town.

I was able to eliminate a short spacing problem, which allowed me to increase the power of the radio station by 12,000 watts, as well as gaining nearly 100 feet of antenna height. The results were excellent and the station now enjoys interference-free coverage in all of its targeted areas.

The second station was a Class A FM that barely reached Orlando. After researching where the tower could be relocated, I discovered that I could use the same tower just built for this station as well.

Dielectric was my choice again and they worked with me for days to determine the best way to mount the antenna on the tower to get the best coverage with a lower-power radio station.

Because this is Florida and the land is relatively flat, I chose to raise the antenna height from 328 feet to 472 feet. To do this, I had to reduce the power of the radio station, but the results were dramatic.

With Dielectric's help, what was once an "out-of-market" radio station, now blankets the entire Orlando Metro area and the ratings skyrocketed in the very first trend on the new tower.

Both of these radio stations are using the Dielectric DCR-M model antennas. Antenna mounting has to be planned; it cannot be just mounted anywhere on the tower with good results expected. The signal might be great over the ocean, or over a swamp, but can't be heard a few miles out in the heavily populated areas.

Get maps to show where the tower is located and determine the key areas you are trying to reach. I did this with both of these radio stations and sent the information to Dielectric for a pattern study.

The staff spent days working with me to optimize the antenna to get the best possible coverage for our area. One of the stations took a lot of work and a customized mounting system, but the results were well worth the extra effort.

This Class A FM radio station now is taken seriously by other broadcasters — and with good reason. The station ratings are nearly tied with those of its 100 kW competitor.

Another issue that I had to consider was that this tower is located in the middle of a residential area, surrounded by houses and apartments. I didn't want to spend my days trying to get the radio station out of neighbors' telephones, computer speakers and toasters, so I had the antenna designed to reduce the downward radiation.

Half-wave spacing has become common, but at a dramatic loss of efficiency. For this site, I chose a five-sixths wave spacing, which was a good compromise between reducing the signal levels in the neighborhood, while keeping the efficiency up. The results speak for themselves. After over a year of operation, I have yet to receive the first complaint call.

Did we stop there? No! The next goal was to get a network analyzer and have a competent tower crew to climb the tower to tune the antenna.

While Dielectric completes a rough tuning for the antenna at the factory, it's necessary to use the fine matcher on the antenna to overcome the effects of the tower on the antenna. This will make a difference in the sound of the radio station.

On my urban station, the low "boom" became much more defined and with a much better punch after tuning the antenna. A mistuned antenna can lose the symmetry of the carrier and cut back on your bandwidth, which will degrade your audio.

Clear signal

A mistuned transmitter also can inject AM noise, which translates into more noticeable multipath noise while driving. Think back on your old TV. Sure, you could just turn the dial to the station and watch, but if you adjusted the "fine tuning," that picture crisped up and looked great.

Don't cut corners and skip the final tuning steps. Crispen up your signal. The difference will make you proud every time you listen.

I am now moving two more of our Class C FM stations to a new tower currently under construction. Again, I turned to Dielectric for help.

This time we're designing an antenna system, which will allow us to combine up to six FM radio stations on the same antenna. We will be using the Dielectric CBR panel antenna.

I have specified that the antenna's eight bays be split and each four bays fed by a separate transmission line. This will allow us to patch to either half of the antenna in an emergency — sort of a built-in auxiliary antenna.

The Dielectric combiner system at American Towers, Blitho tower in Blitho, Fla.

In the tower building, we will be installing the Dielectric combiners and filters. The specifications are excellent. They have a broad and flat bandpass, broader than others, which gives a good, flat frequency response. I have used the company's combiner at another tower site with excellent results.

Bottom line, take the time to examine the antenna system. Even if the site is not moving, check to be sure the antenna is properly tuned.

Hire a consultant with a network analyzer and find a good tower crew to be sure that the antenna's performance is optimized. A little tuning error can create headaches in the field.

For more information contact Dielectric in Maine at (800) 341-9678, fax (207) 655-7120 or visit the Web site at www.dielectric.com

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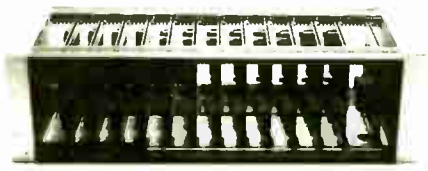

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USER REPORT

Skytiller Braves Ithaca Winters

WYXL(FM) Finds Good Service, Reliability With Harris and Installs SKM4C in Upstate New York

by Ken Cowan
President/General Manager
WYXL(FM)

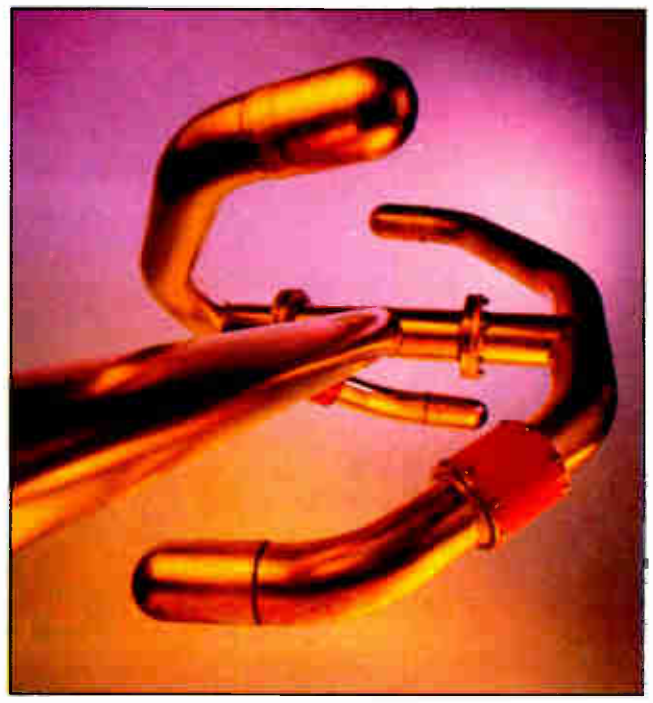
ITHACA, N.Y. The No. 1 adult contemporary radio station in Central New York — WYXL(FM) — is still going strong, thanks to our recent installation of the **Harris** Skytiller medium-power, circularly polarized FM antenna.

In fact, our signal is even better than ever, because of the SKM4C Skytiller model. What most people don't know about the Ithaca area is that we have lots of hills and deep gorges.

No rain, sleet or snow

With the old antenna, we had problems covering downtown Ithaca. It fell into a shadowed area. Harris fine-tuned the antenna at the factory to minimize any VSWR-related signal degradation giving us maximum signal performance and now our coverage is virtually solid as a rock. The difference is dramatic.

The station ordered all the "bells and whistles" for the antenna including radomes for our rugged upstate New York winters. Old Man Winter can blow and bluster, but the antenna is constructed to withstand the most severe weather, as well as wind velocities of up to 150 miles per hour. Harris pressure-tested the antenna to make sure it was leak-free.



Harris Skytiller SKM4C

Trouble-free

The Harris Sky-tiller has a heavy, brass-walled tubular construction and a bronze element mounting block. These features increase mechanical strength and reliability, ensuring a long, trouble-free life. That's a big plus for our station's bottom line.

The Skytiller antenna installation came off without a hitch. We didn't have to reinvent the wheel on this installation. The tower has been here for 30 years and our consultants did all the advance measurements. The equipment was packed properly and delivered to the tower in excellent condition. Alpha Antenna Inc., our installation partner, did a great job of getting the Harris Skytiller antenna up on the tower. The down time was just hours. It really was painless and problem-free.

When we started looking at FM antennas, we did some comparison shopping, but the price difference between the Skytiller and competing antenna was negligible. So we went with Harris because of their equipment backup, service and stability. I can't say enough good things about the Harris district sales manager for radio, Brian Szewczyk, and the amount of help he provided with our order. Harris has been making good, solid stuff for many years and has been in the business since 1922. We know that they aren't going anywhere.

We were so impressed with the Skytiller that we also purchased a Harris FM HT-20 transmitter, which is up and running now. We're also taking delivery on an AM Gates 5 transmitter for our AM sister station, WHCU(AM). We are definitely sold on Harris quality.

Skytiller antenna products are manufactured exclusively for Harris by Dielectric.

For more information contact the Harris Broadcast Center in Ohio at (800) 622-0022 or (217) 221-7399 or visit the company Web site at www.harris.com

Kintronic

▶ Continued from page 48

about eight feet above ground level. The interior of one of the triplexer units is shown in Photo 1. Photo 2 shows the cabinets installed at the base of the antenna.

Photo 3: Hand crane lifting custom aluminum cargo boxes

The next challenge was to package the tower for mobility. A 20-foot by seven-and-a-half-foot flatbed trailer was fabricated for the tower package.

The tower trailer stores the 17 tower sections in a storage rack, the tower base plate on the deck, all tower hardware in a pair of custom aluminum crates and the guy cables and AM skirt kit cables on a custom aluminum spool. The trailer also contains the three 1-1/4-inch foam Heliax feeder cables on a custom aluminum spool, the ground radial spools and antenna skirt tensioning winches, etc.

A small hydraulic hand crane was included to help in the loading and off-loading of the heavier items. Photos 3 and 4 depict the tower trailer being loaded and ready to move out.

The system was fabricated and fully constructed on the Kintronic Labs antenna test range. The customer and I performed the field tuning of the triplexer in two modes of operation (that is, two separate sets of three frequencies). The system performed as anticipated with more than 50 dB of port-to-port isolation between any two stations and good input bandwidth.

For the first mode, the three frequencies being 909, 1089 and 1215 kHz, the plus-or-minus 6 kHz sideband input VSWR figures ranged from 1.15/1 to 1.32/1. For the second mode, the three frequencies being 693, 1053 and 1215 kHz, the VSWR figures ranged from 1.48/1 to 1.62/1. The results were well within what was required for operation with the three Nautel XL12 transmitters.

The customer was particularly pleased in that he was able to tune the triplexer himself in approximately one day's time having never tuned an AM multiplexer of any sort previously.

Bobby Cox can be reached at bcox@kintronic.com

For further information contact Kintronic in Tennessee at (423) 878-3141, fax (423) 878-4224 or visit the Web site at www.kintronic.com

Photo 4: Antenna trailer loaded for travel

Products & Services Showcase

USER REPORT

Nicom Antennas Reach Peaks, Valleys

by Bill Zawila
Owner
Western Pacific Broadcasting

GARDEN GROVE, Calif. In 1999, we had a series of FM construction projects that required quick response time from equipment vendors in order to meet rapidly approaching construction deadlines.

As a result, we could only deal with the most responsive and helpful companies to get this done. We needed a full range of low-, medium- and high-power antennas for our various sites.

The antennas needed to be able to handle high elevations with icy conditions and lower elevations in remote areas that could provide excellent coverage. **Nicom** met all of our antenna requirements in a prompt and efficient manner with superior follow-up customer service.

Setting up coverage

The company produced the required products within our time constraints. This feat included producing and shipping some of the antennas within a week of the time they were ordered to meet construction deadlines.

The price was right — very competitive based on our market research. Our considerations included a comparison of quality, specs, price, immediacy of delivery, level of interest in servicing our needs, willingness to provide technical support in connection with installation of products and follow-up customer service.

We used a wide range of Nicom products including the low-power BKG 88 two-bay and four-bay circular polarized, omni-directional, narrow-band antennas. We also installed the low-, medium- and high-power two-bay and four-bay models of the BKG 77 broadband omni-directional circularly polarized antennas.

The antennas feature stainless steel construction with Teflon insulation for corrosion resistance in ranging weather conditions and altitude levels, including corrosive salt air at sea level. This was important because our projects included use of the products at both high elevations and at lower terrain levels.

On one of our higher elevation projects — 5,700 feet — we installed the BKG 77/2L with mini-radomes. The setup handled the site's icy conditions and potential VSWR problems without creating excessive wind loading.

The half-wave spacing on this antenna meant that we had minimum downward radiation at a site covering no immediate population and a narrow enough beam to reach our target area of coverage.

The BKG 77 is flexible because it is a broadband antenna. If, for any reason, the requirements include broadcast of more than one signal, this antenna can handle it.

Moreover, these antennas break down for easy and inexpensive shipping. This feature was very important in getting the units to some of our less accessible sites. Its skewed V design with its external feed makes for easy adjustment and field repair in case of damage to the system.

The models come in low-, medium- and high-power ranges able to handle power levels as little as 1 kW or less and up to 50 kW ERP.

On our projects, we installed the BKG 77/2L half-wave spaced with mini-radomes for a 500 W site, the BKG 77/4Mat a site with a 3.5 kW transmitter and the BKG 77/4H at yet another site with a 10 kW transmitter.

The BKG 88 two-bay and four-bay antennas were used for sites with 1 kW and 500 W transmitters. The BKG 88 low-power omni-directional narrow-band antenna was able to handle our low-power, lower elevation sites and provided excellent coverage.

All units met our technical requirements, performed in an outstanding manner and reached all of our desired population areas.

The Nicom staff was helpful with setup and installation advice. They were knowledgeable about their products and how best to deal with our special needs. We are pleased with their continuing interest and support of our projects.

Nicom BKG 88

The author's consulting firm, Western Pacific Broadcasting, is based in Garden Grove, California. He has been involved in all phases of broadcasting including ownership, management, and general station operations in Oregon and California since 1981.

For more information call (619) 477-6298, fax (619) 477-6296 or visit the company Web site at www.NicomUSA.com

USER REPORT

Shively Labs Rescues Station

by Tom Yates, GM and
Vicky Watts, CFO
KOZT(FM)

FORT BRAGG, Calif. When KOZT(FM) "The Coast" received its CP for a full "B" upgrade, we had a lot of considerations in choosing an antenna.

Our transmitter site is not the highest in the area and we needed coverage while protecting another B in the San Francisco area. All factors had to be accomplished without spending a fortune.

We were heading to the NAB show as a Crystal Award finalist and, based on five years experience with a Shively 6813-4, we knew our first stop would be the Shively booth. It was also our final stop.

We took a look at everything there was out there and got some expert advice on what we really needed. It was no contest. We had been very satisfied with our four-bay Shively and after talking with many vendors, we knew we would stick with Shively and a new 6813-8 bay antenna.

Brimstone and towers

Our CP included an increase in tower height, which triggered what we call the "Tower Project From Hell," an appeal on our building permit. This was just the start of the T.P.F.H.

We prevailed in the appeal, got the new tower up six months late and took shipment of the new Shively 6813-8. Fortunately, through all the delays, Edd Forke of Shively was — and is — incredible. He was with us every step of the way, helping with any problems that arose that would affect the antenna output.

We found out that the base of the tower was going to be larger giving the tower a different angle, which could affect our new antenna pattern. Edd worked with us to determine everything we needed, pattern studies and talking with Shively engineers — who all seem to share a great sense of humor.

Every time something went awry on our end, Edd was there to help make sure we got the results we wanted, in spite of several self-inflicted wounds, like forgetting to order a fairly vital part.

Shively 6813-4 FM antenna

Our chief engineer, Bill Rett, was laying out the antenna pieces, checking all of the parts as the tower project proceeded. We figured on having the tower completed and the tower climbers installing the antenna up the next day.

On Friday at 4 p.m. Pacific time, there was a big "oops."

Bill had left us a list to order all the needed parts and we somehow overlooked an adapter for the main cable to the antenna. No order — no adapter and this was not an item found at the local Radio Shack.

By now, I'm sure Edd regrets giving me his home phone number, but that meant at 7:20 p.m. Eastern he got a call at home. "Help, Edd. No adapter! What are we going to do, the tower people are here!"

Actually, I think he was happy to get out of dry-walling his basement. He went to work and, taking advantage of the three-hour coast-to-coast time difference, called Jerry Hill, RF Specialties of Washington. Jerry found the proper adapter at a local radio station in Seattle and had it on the FedEx plane at 7:05 p.m. That is service!

Sean Edwards of Shively came to our site after the T.P.F.H. was finished and all the equipment was installed. Sean is remarkably gifted at fine-tuning antennas. We had a little more reflected power than we liked and with his expertise, equipment and, again, sense of humor, we've got VSWR so low it's almost immeasurable.

Result? Our signal has improved with incredible clarity and spectrum integrity. In addition, we've gained some talented and dedicated new friends. If you want professional results, zealous service and a few moments of humor, even during your "Tower Project From Hell," The Coast unabashedly recommends Shively.

Tom Yates and Vicky Watts are a husband-and-wife team who own KOZT(FM). It was one of five finalists for the 2000 Marconi Award for Rock Station of the Year and for Small Market Station of the Year. The station also was a Crystal Award for Community Service finalist in 1999.

For more information contact Shively Labs in Maine at (207) 647-3327, fax (207) 647-8273 or visit the Web site at www.shively.com

Products & Services Showcase

TECH UPDATES

ERI Reduces Downward Radiation

Electronics Research Inc. Roto-Filler antenna is a standardized version of the half-wave spaced sidemount antenna, modified to exhibit reduced sidelobe levels.

The antenna system combines the engineering of an internally fed, pressurized system with welded feed connections and brass construction.

Other features include reduced vertical plane radiation at downward elevations to help comply with FCC regulations for downward radiation; a reduction in interference to ground-level studio and telecommunications systems; reduced possibility of ground reflections that can cause multipath interference and an increased percentage of radiation in the main beam.

For more information contact ERI in Indiana at (812) 925-6000, fax (812) 925-4030 or visit the Web site at www.ERIinc.com

Antennas Go Smart for Broadband

ArrayComm has developed "i-BURST," a wireless Internet access system that is designed to deliver 1 Mbps to users in a portable environment. The technology will be used for WAP and Web broadcast applications.

The system is not optimized for full mobility because it not is focused on voice/mobile phone applications. However, i-BURST will deliver high data rates portably.

In June, the FCC granted the company a commercial license to deploy i-BURST in San Diego in mid-2001. After the trial, the service will be offered to several United States cities.

i-BURST is an application of ArrayComm's patented smart antenna technology IntelliCell. Unlike other wireless technologies like CDMA and GSM that broadcast signals unidirectionally throughout the cell network, smart antennas aim signals directly at the user.

The company says the net effect of IntelliCell is a reduction in noise and a corresponding increase in magnitude with respect to network capacity.

The smart antenna is used in Japan under the DDI PHS network.

For more information contact ArrayComm in California at (408) 428-9080, fax (408) 428-9083 or visit the Web site www.arraycomm.com

Antenna Concepts, on Track

Ultra Tracker and Ultra Tracker II from **Antenna Concepts** are designed to deal with ANSI, OSHA and FCC regulations regarding RF radiation limits.

The antennas are able to meet these requirements through suppressing side lobes. As a result, variations in signal strength over short distances are typically only +/- 1 or 2 dB, at most. Signal strength can therefore be up to 10 dB higher at any specified location.

The units are designed to reduce coupling between stations by as much as 60 to 80 dB.

For more information contact Antenna Concepts Inc. in California at (530) 621-2015, fax (530) 622-3274 or visit the Web site at www.antennaconcepts.com

New Calendar, New Topics

In 2001, the editors of *Buyer's Guide* will offer several new or revised topics, aimed at providing the most useful information to help you do your job.

Radio World Buyer's Guide 2001

Jan. 17:	Internet and Audio Streaming Tools
Feb. 14:	Remote Broadcast
Mar. 14:	Digital Audio Production
April 11:	Mics, Monitors and Amps
May 9:	Transmitters
June 6:	Audio Processing
July 4:	Automation and Digital Storage
Aug. 1:	Cabinetry, Cables and Switching
Sept. 1:	Codecs, Telco and STL
Sept. 26:	Audio Sources
Oct. 24:	Consoles and Mixers
Nov. 21:	Test, Monitoring and Remote Control
Dec. 19:	Antennas Towers and Transmission Support

Companies with new products that fit these categories should contact Bernie Cox at *bcox@imaspub.com*

An editorial calendar with deadline dates is available. Stories for this section are prepared well in advance of the publication date.

And if you use a new product in a radio setting and would like to write about it, please let us know.

Radio World

Broadcast Equipment Exchange

"Broadcast Equipment Exchange" accepts no responsibility for the condition of the equipment listed or for the specifics of transactions made between buyers and sellers.

ACOUSTICS

Want to Sell

ADVERTISING

AMPLIFIERS

Want to Sell

Marantz 16 amp, used in large Nashville recording studio, works great, $1000 +shpg; Marantz 7T pre-amp also used in recording studio, works fine, $500 +shpg; Pioneer QA-800-A integrated amp/preamp w/wood case, will reproduce all forms of Quad stereo, works great, $150 +shpg. John Deering, CCCA, 1206 Cartwright Cir North, Goodlettesville TN 37072. 615-855-1068.

ANTENNAS/ TOWERS/CABLES

Want to Sell

4 Bay VHF repeater/base station antennas (2), BO. Ken Diebel, KHMB, 414 Ineichen St, Rayville LA 71269. 318-728-2370.

Andrew 1-5/8" Air Dielectric, 200', $750. Ken Diebel, KHMB, 414 Ineichen St, Rayville LA 71269. 318-728-2370.

Andrew 1-5/8" foam dielectric 200'+, $900. Ken Diebel, KHMB, 414 Ineichen St, Rayville LA 71269. 318-728-2370.

Andrew L44-N 1/2" connectors (8), new in boxes, $20 ea; Andrew 87-R 1-5/8" connectors, $125 ea; Bird 460 wattmeter line section 4600-000 thruline, 3-1/8", BO; various Jenning vacuum capacitors, fixed & variable, call for values, BO. Cliff Bryson, 93 Robinhood Dr, Cranberry Twp, PA 16066. 724-776-5204.

Cablewave CP-1000-3 3-bay circular FM antenna tuned to 106.7 MHz, gd cond, $500. Bill Barry, WAMB, 1617 Lebanon Rd, Nashville TN 37210. 615-889-1960.

Phelps Dodge LP-3 low power 3 bay circ pol antenna, $2500. Ken Diebel, KHMB, 414 Ineichen St, Rayville LA 71269. 318-728-2370.

Dielectric 3-5/8" motorized four port coaxial switch . Continental Communications, 314-664-4497. Email: contcomm@fiastl.net.

Want to Buy

200' Rohn 45 or Rohn 55 tower. Ken Diebel, KHMB, 414 Ineichen St, Rayville LA 71269. 318-728-2370.

AUDIO PRODUCTION

Want to Sell

SONIC SOLUTION NUBUS EDITING SYSTEM. Includes all components. Host CPU excellent basic editor. $800. Bob Green, 321-783-0211. pgreen@cfl.rr.com.

Fidelipac On-Air lights, BO; CRL PMC 300 peak mod controller, APP 300 audio preparation processor, BO; Radio Systems TM611, BO. Cliff Bryson, 93 Robinhood Dr, Cranberry Twp, PA 16066. 724-776-5204.

Orban 424A professional stereo broadcast limiter, excel cond, $550. Mark Schackow, Mark Schackow Recording, 307 4th Ave, E., Lemmon SD 57638. 605-374-3424.

Want to Buy

Yamaha BP-2 bass generator unit. Need schematic and/or any info avail for this unit, electronics also desired. Bob Meuse, Muse Audio Arts, 191 E El Camino Real #209, Mtn View CA 94040. 650-969-2433.

AUTOMATION EQUIPMENT

Want to Sell

Arrakis Digilink II on-air system w/(2) 7-channel audio switches, CD controller & trakstar workstation, BO. Tim Zeimann, KTAA, RR6, Box 6000, Big Sandy TX 75755. 903-636-2000.

Scott Studio system, never used, still inboxes, call for details & prices. Mr. Cobb, WLRX, POB 370, Nappanee IN 46550. 219-773-7989.

CART MACHINES

Want to Sell

ITC SP & WP, 4 PB units & 2 recorders, gd cond, real work horses, $300/BO. Joe Garcia, WGNO, 265 Union Blvd, St Louis MO 63108. 314-4544-6660.

CD PLAYERS

Want to Sell

Technics SLP-1200 (2), hardly ever used, both in excel cond, $750 ea +shpg. John Deering, CCCA, 1206 Cartwright Cir North, Goodlettesville TN 37072. 615-855-1068.

COMPLETE FACILITIES

CONSOLES

Want to Sell

Harris Executive 10 pot rotary 10 channel w/expandable capabilities, power supply & audio amps, gd cond, $350. Joe Garcia, WGNO, 265 Union Blvd, St Louis MO 63108. 314-454-6660.

Gates/Harris Executive, 10 stereo channels, large VOA knobs, few modifications, fair to gd shape, $1250 +shpg. Lyndon Snyder. Fax only to 718-962-7003.

RCA BC-18 stereo bdct console w/8 faders, 32 inputs, 2 mic-preamps, in gd cond, includes manual, $500. Jay Towne, KOLU, 4921 West Wernett, Pasco WA 99301. 509-547-2062 or fax 509-544-0340.

Topaz Project 8 studio console with meter bridge, 24x8x2, excellent shape, $975 +shpg. Joel Block, Production Block Studios, 512-472-8975.

FINANCIAL/ LEASING SERVICES

LIMITERS/ AUDIO PROCESSING

Want to Sell

CBS Lab Audimax 4440, $175 or 2/$300. David Senzig, WJQ, 5658 143rd Ave, Holland MI 49423. 616-394-1260.

Soundcraftsman 10 band stereo graphic EQ with wood case, used in production studio, $100 +shpg. John Deering, CCCA, 1206 Cartwright Cir North, Goodlettesville TN 37072. 615-855-1068.

Want to Buy

Teletronix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST, 972-271-7625.

MICROPHONES

Want to Sell

Neumann U87 (2) w/shock mount & phantom power, $1650 ea; RCA 99 (3), classic ribbon mics, $1750 ea. Roger Rhodes, POB 1550, New York NY 10101. 212-245-5045.

EV 635, $40 or 4/$100. David Senzig, WJQ, 5658 143rd Ave, Holland MI 49423. 616-394-1260.

Shure Unidyne S-55 unidirectional mic, adjustable impedance, with stand adaptor & cable, $150; Sennheiser MD421-U-5, case cracked in back & repaired, works fine, $125; EV 645TR noise canceling mic, screws into telephone mouthpiece, $10. Elliott Ribner, 3532-A Wyoming St, St Louis MO 63118. 314-771-2155.

Telex V-220 sportscaster headers (2) w/mule xlr plugs & cough button, $100 ea or $175/both. J Wilsbach, WMSS, 214 Race St, Middletown PA 17057. 717-948-9136.

Want to Buy

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

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

MISCELLANEOUS

Want to Sell

Digicord by Henry Engineering, new, never used, $150. Mr. Cobb, WLRX, POB 370, Nappanee IN 46550. 219-773-7989.

MISCELLANEOUS (cont.)

Aluminum rack spacer, 1 rack unit deep, $10; Zonex metal stop-watch, cracked cover, but works fine, $10. Elliott Ribner, 3532-A Wyoming St, St Louis MO 63118. 314-771-2155.

Lincoln 30kW roto phase converter. Converts single phase 240V to 3-phase power, BO. Lloyd Mintamyer, KOOD, POB 9, Bunker Hill KS 67626. 785-483-6990.

ROTRON BLOWERS AND PLATE BLOCKERS, new & rebuilt for Elcom, Harris, CCA, CSI, McMartin. Goodrich Ent. 11435 Manderson St. Omaha, NE 68164 402 493 1886 FAX 402 493 6821

Panafax UF-300 office fax, BO; Qenlis SP2 color page scanner, BO. David Senzig, WJQ, 5658 143rd Ave, Holland MI 49423. 616-394-1260.

ProTools Digidesign 001 24-bit audio production system, almost new, with D-Verb and AudioSuite, $695 +shpg. Phil Mezzetti, Production Block Studios. 512-472-8975.

MONITORS

Want to Sell

Used Mod Monitors, McMartin & Belar. Many to choose from, tuned & calibrated on your frequency, full guaranteed. Goodrich Ent. 402-493-1886.

RECEIVERS/ TRANSCEIVERS

Want to Sell

Marti UHF rack mounted receiver for 450.925/455.925 MHz receive frequency, $750. Ken Diebel, KHMB, 414 Ineichen St, Rayville LA 71269. 318-728-2370.

Wegener DR96 digital receivers (2), used to receive satellite signals for automation system, in excel cond, one unit still in original box, the other has been used very little, $1500 ea or BO. Ken Diebel, KHMB, 414 Ineichen St, Rayville LA 71269. 318-728-2370.

Buying or selling used equipment? Advertise here!! *Radio World's* Broadcast Equipment Exchange For details, call 703-998-7600, ext. 154.

RECORDERS

Want to Sell

BE Series 2100C stereo cart record/PB deck, excel cond, $850/BO. Tim Zeimann, KTAA, RR6, Box 6000, Big Sandy TX 75755. 903-636-2000.

Panasonic SV-3700 professional DAT recorders (3), excel cond, $750 ea. Tim Zeimann, KTAA, RR6, Box 6000, Big Sandy TX 75755. 903-636-2000.

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Tanberg 15-21 Series 15 reels (2), like new, need belts, $75/pr. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

Ampex 600 portable tape recorder, tube type in Samsonite case, 1/4" FT heads in gd shape, $250/BO +shpg. Lyndon Snyder. Fax only to 718-962-7003.

Revox A-77 rack mount kit, $35; Revox A-77 shorting plug, $10; Revox A-77 power cord, $10; (2) rubber hold-down plugs to keep 7" reels on the hub, $5. Elliott Ribner, 3532-A Wyoming St, St Louis MO 63118. 314-771-2155.

Sony T-C 850, $200. David Senzig, WJQ, 5658 143rd Ave, Holland MI 49423. 616-394-1260.

Wollensak 1500SS portable tape recorder. Records & plays 1/4" tape up to 7" reels, 1/2 track heads have no wear on them, machine in excel cond, $149 +shpg. Lyndon Snyder. Fax only to 718-962-7003.

REMOTE & MICROWAVE

Want to Sell

Marti Electronics remote control system, RMC-2AXS & RMC-2AXT (A), $100. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

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internet: silverlakeaudio.com

Marti VHF remote xmtr on 161 MHz 40W, $450. Ken Diebel, KHMB, 414 Ineichen St, Rayville LA 71269. 318-728-2370.

Moseley PCL 505C microwave STL xmtr & rcvr tuned to 949.500 MHz, recently tested & aligned, $2500/both or will sell separately. Ken Diebel, KHMB, 414 Ineichen St, Rayville LA 71269. 318-728-2370.

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Marti M30B, BO. David Senzig, WJQ, 5658 143rd Ave, Holland MI 49423. 616-394-1260.

SATELLITE EQUIPMENT

Want to Sell

Fairchild Dart 384 15 kHz DAT card, BO. Cliff Bryson, 93 Robinhood Dr, Cranberry Twp, PA 16066. 74-776-5204.

KU Band satellite dishes, brand new, still in original packing, never used, BO. Ken Diebel, KHMB, 414 Ineichen St, Rayville LA 71269. 318-728-2370.

Want to Buy

Comstream ABR 200's, wanted dead or alive!. Alan Guthrie, Educational Media Foundation, 1425 N Market Blvd, Sacramento CA 95834. 916-282-1538 or aguthrie@klove.com.

SOFTWARE/ DATABASES

Want to Sell

Computer tools by Ron Balonis at www.computer-toolboxes.com.

STATIONS

Want to Buy

AM or FM station located in RI, MA or CT area, non commercial or commercial, no station to small, will consider partnership. Michael Cardillo, 151 Morgan St, Cranston RI 02920. 401-942-8341.

TAPES/CARTS/ REELS/CD's

Want to Sell

Fidelipac Grey carts (1500), various lengths, spare pressure pads, BO. Joe Garcia, WGNO, 265 Union Blvd, St Louis MO 63108. 314-454-6660.

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Ampex 406 & Scotch 206 (20 reels), 1.5mil, back-coated on 10.5" reels, in boxes, used but not worn, with an occasional splice, $60; (22) empty 10.5" reels, mostly plastic, some metal, $30; (5) assorted r-r tapes, $15. Elliott Ribner, 3532-A Wyoming St, St Louis MO 63118. 314-771-2155.

TELEPHONE EQUIPMENT

Want to Sell

Older model Emcee 20W xmtr & a 100W amplifier. Has been in storage for over 20 yrs, unsure of condition. Operates at 2.156-2.162 GHz & is used in the wireless cable/ITFS band. Will donate to any school, church or appropriate entity for donation receipt. Ken Diebel, KHMB, 414 Ineichen St, Rayville LA 71269. 318-728-2370.

TEST EQUIPMENT

Want to Sell

Allen Dumont Labs oscilloscope made for WE type 2577 –KS 15586, $30; **Ampex 300E** vacuum tube voltmeter, $45; **B&W Nidek 400** distortion meter, $30. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

Belar FM RF amplifier, AM RF amplifier, BO. Cliff Bryson, 93 Robinhood Dr, Cranberry Twp, PA 16066. 724-776-5204.

Beta Scope non destructive thickness gauge/Twin City testing Co/Lionel electronic, $40; **Elco 250** AC VTVM & amp, $30; **Electronic Designs** 100 electronic voltmeter/ohmmeter, $35; **General Radio** 1564-A sound & vibration analyzer, $50. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

HP 201B audio oscillator, rack mounts, cable cut, $25; **HP 330B** & 330C distortion analyzer, $35 ea; **HP 400D** vacuum tube voltmeter (4), $25 ea. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952. 573-998-2681.

SERVICES

QEI 691/01 modulation monitor/test unit, excel cond, $3800/BO. Stee Kneprath, KBHZ, 311 West 4th St, Wilmar MN 56201. 320-894-7828.

TRANSMITTERS

Want to Sell

CSI T-25-A 25 KW AM xmtr tuned to 1150 kHz, less than 10,000 hrs use, gd cond w/gd tubes, BO. Bill Barry, WAMB, 1617 Lebanon Rd, Nashville TN 37210. 615-889-1960.

CSI-T-25-A1, 25kW, early 1980's model, gd cond, $30,000/BO. Angie Sugalski, WCN, POB 444, Spartanburg SC 29304. 888-989-2290.

EF Johnson 145-102-13 40 amp, AM antenna systems, BO; various silver Mica doorknob capacitors, call for values, BO; Moseley SCD-8 185 kHz subcarrier demodulator, new, BO. Cliff Bryson, 93 Robinhood Dr, Cranberry Twp, PA 16066. 724-776-5204.

RCA BTA-10U, 10 KWAM xmtr for parts, free to anyone who'll pick up. Bill Barry, WAMB, 1617 Lebanon Rd, Nashville TN 37210. 615-889-1960.

QEI 1kW 695-T with 675 exciter, excel cond, $6500. Robert Beller, XKIT, North Highway 385, Dalhart TX 79022. 806-249-4747.

BEXT TRANSMITTERS – Call for demos, closeouts, full warranty. 619-239-8462.

Continental 315-R "Power Rock" pulse modulated five KW AM xmtr. Continental Communications. 314-664-4497. Email: contcomm@fiastl.net.

Continental 831-D2 2.5KW FM xmtr. Continental Communications. 314-664-4497. Email: contcomm@fiastl.net.

Harris MW-5-B five KW pulse modulated AM xmtr. Continental Communications. 314-664-4497. Email: contcomm@fiastl.net.

McMartin BF-10K 10 kW FM, factory rebuilt, in perfect, like new cond, includes new tubes, tested & tuned on your freq. Guaranteed. Adjustable from 5.5 kW to 15 kW, FCC type accepted. Goodrich Ent, 402-493-1886.

McMartin BF-5K 5 kW FM, factory rebuilt in perfect, like new cond, includes new tubes, tested & tuned on your freq, guaranteed, fully adjustable from 0 to 5.5 kW. Goodrich Ent, 402-493-1886.

RCA BTF-20-E1 20KW FM xmtr. Continental Communications. 314-664-4497. Email: contcomm@fiastl.net.

RCA BTF-5-E1 5KW single phase FM. Continental Communications. 314-664-4497. Email: contcomm@fiastl.net.

Want to Buy

McMartin AM/FM xmtr, any model, exciter or stereo modules. Goodrich Ent., 11435 Manderson, Omaha NE 68164. 402-493-1886.

TUBES

Want to Sell

4CX250B (2); 828 (6); 810 (2); 813 (2); 807 (2), all new in boxes, BO. Cliff Bryson, 93 Robinhood Dr, Cranberry Twp, PA 16066. 724-776-5204.

AMPEREX, EIMAC, SVETLANA 3CX400A7/8877, 3CX3000A7, 3-500ZG, 4CX250B, 4-400, 4CX400A, 807, 833C, ETC. Westgate 800-213-4563.

TUBES, Eimac, Svetlana

EMPLOYMENT

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Candidates for this position will need a minimum of a two-year Associate degree in Electronics Technology and at least five years experience in a broadcast facility working on AM and FM broadcast equipment. Background with high power transmitting systems is essential. Candidates should also be proficient at installing, troubleshooting and maintaining studio equipment such as cart machines, tape recorders, consoles, routing switchers and other common equipment. Experience with computer systems is a plus but not a requirement. Submit resume to Engineer Search, c/o Lisa Shannon, Infinity Broadcasting, 651 Holiday Drive, Pittsburgh PA 15220. Infinity Broadcasting is an equal opportunity employer.

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POSITIONS WANTED

Attention PD's in the radio world, broadcasting school graduate looking for work. Wet in the industry, production & on-air personality talent, willing to travel. Chris, 405-459-6318.

Hardworking, ambitious disk jockey, broadcasting school grad, creative, energetic, dependable looking for on-air announcer, news or production. Joshua, 918-485-5832, madarua@aol.com.

Honest & fun to work with broadcasting school grad looking for a job that will exercise my skills & training. Experience as remote technician. Nathan, 405-396-4701.

Radio job wanted. Driven to succeed. Fresh talent seeks place to grow. Good voice, strong writing. Willing to work any format. Larry, 918-446-2196.

Talent, motivation, ambition & intelligence is what I have to offer. All I want is the opportunity to prove it. Radio rookie willing to travel. Brandon, 817-561-1580.

20 years experience. Highly skilled, sales & management. Start up or help. From pounding the street, to creating an aggressive sales force! Will bring my knowledge to you! Relocation available. 954-294-9711, bkorngold@aol.com.

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Attention program directors! Broadcasting school grad interested in on-air, new or production. Willing to relocate & can work any shift. Jeremy, 918-627-9976.

Beginning announcer looking for work. Experienced pilot, truck driver, varied background. Prefer Country or Pop Rock. Northeastern Oklahoma. James, 918-253-4593.

Broadcasting graduate full of energy ready to work in any area of your station. Prefer sports! Eastern Oklahoma, Western Arkansas. Wesley, 918-868-3527.

Broadcasting school grad ready to start a career in television or radio. Jarrod, 918-446-0619.

Broadcasting school grad seeks position in radio or television. Interested in on-air, production and copywriting. Mature, dependable & ready to begin. Danny, 918-838-8576.

Friendly, industrious, FCC Commercial/Amatuer radio licensed 46 yr old CE seeking FT, PT, contract work, AM/FM/Cable/TV, within a 75 mile radius of metro NYC. Guarantee you won't be disappointed. Mitchell Rakoff, 81-12 Roosevelt Ave #702, Jackson Heights NY 11372. 718-969-5224 or email: mitchell-rakoff@yahoo.com.

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Recent graduate from American Broadcasting School seeking position in the broadcasting industry where my professional & ambitious work ethic can become an asset to your company. Carlos, 405-688-9692.

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◆READER'S FORUM◆

ARP fan

Dear RW,

Alan Peterson's *Radio World* stories just crack me up. The column is one of the highlights in the newspaper.

I currently run a station (that broadcasts) about a block on 1680 and less than a mile on 99.5 called Radio Vato. I run it now and then when I want to play some good tunes.

Yes I work part time in real radio for pizza money.

Keep up the good work, Al, and hope to see you back on the real airwaves. It is getting tough getting a full-time radio job these days.

Allen Ogrizovich
Jacksonville, Fla.

Voice-over contact

Dear RW,

I have long received Radio World and find it to be *the* premier information publication for the fast-changing world of radio. I congratulate you and your staff for an excellent and "anticipated" publication.

I seem to remember columns I have seen written by "the voiceover guy" and am looking to contact the author. A friend of mine is thinking of getting into voice-over work and I wanted to put him in touch with the author.

James Paul
Germantown, Md.

Ed. note: Contact Travis the V/O Guy via e-mail to travis@voice-guy.com

Online squatting

Dear RW,

I've enjoyed your articles on "online squatting." In my case, I cannot get the URL address for my flagship station, WDTL-FM, because of the Washington Defense Trial Lawyers. Yep, they have wdtl.com.

I don't know who would think to look them up under their initials, but I can't get it because they have it. And I'd sure hate to take on a bunch of ambulance chasers in a court battle — it would be certain death.

Larry Fuss
President, General Manager
Delta Radio Inc.
Cleveland, Miss.

Rebuttal

Dear RW,

In defense of my original petition against what Kelly Alford said (Radio World, Sept. 13), was it consumer interest that drove FM receiver makers to bring us stereo? No — it was the struggling FM stations that had the FCC mandate it for receivers over a certain price level.


Scott Todd

The reason AM stereo was never added was due to bean counting and the FCC not stepping in. UHF tuners weren't brought to us by the generosity of TV manufacturers.

Even if everything Mr. Alford said was true, there's no reason on earth AM stereo couldn't be mandated tomorrow for any radio made with a DSP chip for decoding as the code already exists and the added cost is $0.

Narrow-band mono AM receivers (with less sensitivity than the wide-band sets he decries) are the nails in the AM coffin. People don't listen to AM because they don't like the sound and they don't know there is even something to be demanded.

Using his own demand argument, why not just eliminate the AM sections of radios now?

And IBOC is somehow to be the savior of the AM band? Not a chance. I used to be bullish on IBOC, but now I believe it is just bull.

The only way is for a new digital band like the Europeans have. Sure his 100 kW FM is now on par with the former 250 W AM peanut whistle — that's something he'll have to deal with . I know the stations I work for will. The AM stations in our group carry mostly satellite-delivered block programs. While you can't usually hear artifacts in the voices, you can hear it in the theme music of some of the programs.

Truth is, the audio is so compressed now it won't survive the low bit rate AM IBOC transcoding without destroying it. Better radios are the only thing that will give some sense of life back to the AM band (plus better programming, of course) till a new *all* digital service is implemented.

I don't know what AM stereo stations he was referring to in regard to poor audio and loss of coverage. Some of the older exciters did have their problems, but the latest generation allows for 120-percent modulation, and have separation as good as any FM station on the dial.

I remember hearing music on WJR(AM) some years ago, and even with the static of a distant thunderstorm in the background and being 500-plus miles away, I could tell just how sterling the audio was! Loss of coverage is far less than going FM stereo, and modern AM stereo sets have mono/stereo switches or blend to mono functions like their FM counterparts for areas where reception is marginal.

As for stations recovering costs of equipment, the added expense of AM stereo isn't all that great. All of 20 grand, maybe? If they didn't make back their investment it was because of lack of cooperation from the radio manufacturers. And the difference between 10 KHz audio (AM) and 15 KHz audio (FM) — half an octave.

Let AM stereo rest in peace? Not with IBOC threatening to destroy what little audience AM still has.

Scott Todd
Cambridge, Minn.

May It Be Happy And Safe

Happy holidays to all the folks who make up our wide and wonderful world of radio.

Season's Greetings to the midday jock, the operations manager and the station receptionist.

Merry Christmas to the tower monkey with the toolbelt who dangles from the cold new steel 1,400 feet above the ground in Oklahoma, and to the GM who signs his paycheck.

Joyful Yuletide to the late-night host who keeps company with all those lonely hearts in the hardest hours, and to the morning crew without whom we couldn't start our day.

Festive Hanukkah greetings to the production wiz, the manager of the streaming media supplier and the old-fashioned cabinet maker who puts the oak trim on our new studio furniture.

The finest first fruits of Kwaanza to the IT manager, the network engineer and the regional sales manager trying to make goal this month.

Greetings to the consultant, the voiceover guy and the CEO observing a contemplative Ramadan.

A Tip of the Yule Log to Mel, Lowry, Dick, Dan, Bruce, Eddie and all those who own and operate the stations that keep us employed.

Feliz Navidad to Bill, Susan, Harold, Gloria, Michael and everyone who toils at the FCC, keeping watch.

Happy Undisputed New Millennium to the person with the telephone headset who makes the survey calls at Arbitron, the consultant who plots our station coverage, the freshman college student just getting started, and the lawyer who files our briefs at the commission.

A jubilant New Year's wish for the farm reporter, the promotions director and the person at the factory who engraves the switches for our new console.

Happy holidays to the news woman in Nashville, the PD in Podunk, the AE in Akron and the owner in Olympia.

And most of all, warm wishes to those Titans of the Trenches, our engineers, the men and women who keep our transmitter fans turning, our satellite dishes aimed, our hard-disk systems from crashing, our feed lines filled with nitrogen, our generators fed with fuel and our stations on the air.

To our engineers, quiet heroes of the radio industry, we send heartfelt hopes for a happy and *safe* holiday season, unburdened by the buzz of the pager or the phone call in the dark of night.

To all who make up the world of radio, happy holidays from the staff of Radio World.

— RW

Write to Us

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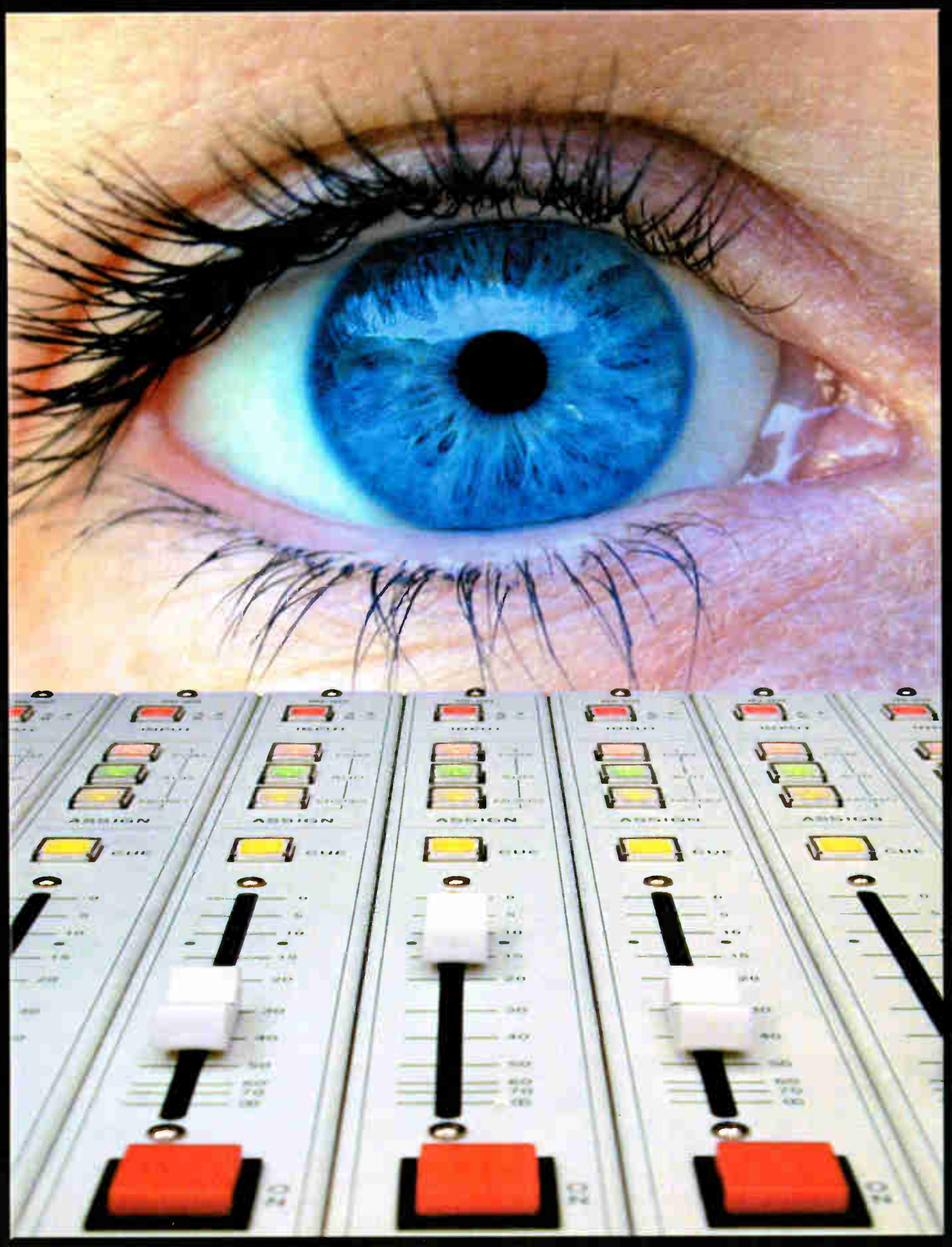

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