Success With InXsys

Radio veteran Laurence Norjean is piloting InXsys Broadcast Networks to NTR success through online partnerships.

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Crossed-Field Questions

Ron Rackley considers the promise of the controversial Crossed-Field Antenna.

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Radio World®

The Newspaper for Radio Managers and Engineers

June 23, 1999

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STUDIO SESSIONS

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USADR, Kenwood Approve Pact

by Leslie Stimson

COLUMBIA, Md. USA Digital Radio and Kenwood Corp. have signed a technology and marketing agreement to develop receivers capable of receiving an in-band, on-channel digital audio broadcasting signal.

The agreement makes USADR the first developer of IBOC technology to publicly announce an alliance with a receiver manufacturer, seen as an important step toward launching IBOC DAB technology into the consumer market.

Jeff Jury, vice president of operations and business development for USADR said, "USA Digital Radio's IBOC DAB alliance, comprised of broadcasters, transmission equipment manufacturers, and now, Kenwood, one of the top three receiver manufacturers worldwide, demonstrates both the broadcast and audio industry's commitment to bringing digital radio services and products to consumers everywhere."

Retailer education

Bob Law, vice president of mobile electronics for Kenwood USA, said Kenwood and USADR would cooperate in marketing IBOC DAB concepts to consumer electronics retailers and consumers.

He said retailers are more aware of satellite-delivered digital audio broadcasting, because that technology has received more consumer press than IBOC. "Many retailers will require some education as to what IBOC is," Law said.

Kenwood has talked to two satellite digital radio proponents, CD Radio and XM Radio, but has not signed an agreement with either to design, build or market receivers, Law said.

Once an IBOC DAB standard is chosen, Law said IBOC receivers intended for after-market sales could be available

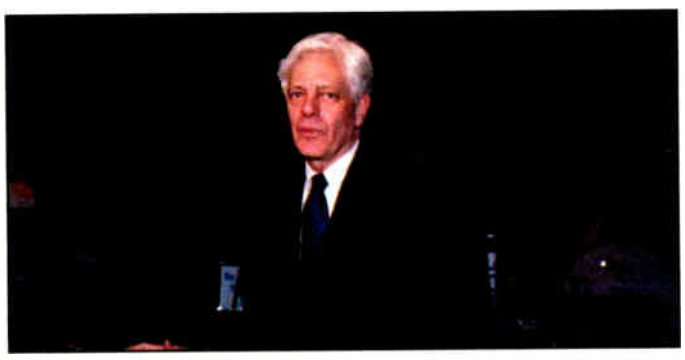
See RECEIVERS page 6 ▶

NPR Chief Sees Promise In Technology, Cooperation

by Kathy Merritt

WASHINGTON The new president and chief executive officer of National Public Radio has vowed that technology will unite his organization and its member stations, not divide them. He's already securing the tools stations need to provide more audio programming on the Internet.

Kevin Klose, who joined NPR in November 1998, recognizes that technology such as digital satellites could allow NPR to bypass the more than 600 member stations and go directly to listeners, ensuring NPR programming would not be interrupted or pre-empted by the stations. But he said, "We're not in this for NPR versus anybody." Klose wants to find a way for the



NPR's Kevin Klose

See NPR, page 11 ▶

NEWSWATCH

Merger Review Bill Introduced

WASHINGTON Sens. John McCain, R-Ariz., chairman of the Senate Commerce Committee; Orrin Hatch, R-Utah, chairman of the Judiciary Committee and John Ashcroft, R-Mo., have introduced a bill to shorten and simplify the government's review of telecommunications industry mergers. The Telecom Merger Act states that if either the Department of Justice or the Federal Trade Commission has reviewed a proposed telecom merger, and "stated in writing approval or no intent to intervene," the FCC must transfer the licenses without delay. The FCC would be permitted to file comments in DOJ or FTC merger review proceedings. Under the legislation, the FCC would review proposed deals only if the DOJ or the FTC do not intend to intervene, and the FCC's review would be held to a 60-day deadline.

"We need to restore integrity and professionalism to federal review of telecom industry mergers by setting up an efficient system without needless duplication," McCain stated.

The FCC has said its merger reviews do not duplicate the work of the other agencies.

Public Radio Wins Satellite Money

WASHINGTON Public radio can breathe easier about the future of its satellite service.

The U.S. Senate has OK'd a spending bill that includes $48 million for a satellite replacement fund for National Public Radio.

The House passed a similar bill a few days earlier; the president was expected to sign the measure.

The Corporation for Public Broadcasting would administer the fund, which will assure that public radio has transponder space on a new satellite.

The presidents of NPR and CPB said the funding comes at a critical time and will ensure the uninterrupted delivery of public radio programming.

Chancellor to Become AMFM

DALLAS Chancellor Media is changing its name to AMFM Inc., if Chancellor shareholders approve. The name change is to reflect the company's new broad-based Internet strategy. The

See NEWSWATCH, page 3 ▶

Index

Mackie, Samson, Sam Ash Settle

by Randy J. Stine

WOODINVILLE, Wash. Settlements have been reached in lawsuits filed by Mackie Designs Inc. against Samson Technologies and Sam Ash Music. No terms of the agreements were disclosed.

The settlements bring an end to a series of lawsuits and counter suits filed by the parties beginning in June 1997.

Mackie filed suit in federal court against Behringer Spezielle Studio-Technick, alleging patent and trademark infringement. Samson Technologies of Syosset, N.Y., and New York-based music/pro audio retailer Sam Ash Music were also named in the suits.

Mackie's trademark infringement lawsuit against Behringer remains.

According to court papers, Mackie alleged the three companies conspired to produce a copy of the Mackie 8-Bus mixer line. Mackie claimed Sam Ash Music and Samson gave the mixer to Behringer to duplicate. The mixer in question is Behringer's Eurodesk MX8000. It has stopped making that model.

Mackie claimed "uncanny similarities" between the two mixers. It originally sought $327 million in damages.

Mackie also brought claims against the chief executive officers of Samson and Sam Ash, Scott Goodman and Richard Ash, respectively.

The case bounced back and forth between U.S. District Court for the Western District of Washington and U.S. District Court for the Eastern District of New York.

Mackie refiled its suit against Sam Ash Music and the two chief executive officers in New York state in February 1997, after the Washington judge threw out the claims. The judge ruled Sam Ash Music had not conducted business in the state.

Ash resumes line

Subsequently, a November 1998 ruling reduced the number of claims remaining against Samson Technologies in Washington, from six to four. Only trademark and trade dress infringement suits remained.

Sam Ash Music has resumed selling Mackie products through its retail outlets.

Roy Wemyss

In response to the out-of-court settlement of the claims, Roy Wemyss, chief operating officer for Mackie, stated in a press release, "As a designer and manufacturer of pro audio equipment, it is important that Mackie products be available in all retail markets. This settlement will increase access to Mackie products."

Richard Ash stated in a press release, "We are pleased to be a Mackie dealer again."

Samson and Sam Ash attorney Kenneth George, of Amster, Rothstein and Ebenstein, said, "The fact that Sam Ash Music has resumed selling Mackie products speaks volumes on the satisfactory outcome of this case."

George declined further comment.

We are pleased to be a Mackie dealer again.

— Richard Ash

◆ NEWSWATCH ◆

▶ NEWSWATCH, continued from page 2

company has formed three new business units: AMFM Interactive Inc., AMFM.Com and AMFM Equities. Respectively, those are intended to position AMFM's e-commerce Web sites as highly trafficked Internet destinations, stream online broadcasts of AMFM's on-air programming and other media, and promote emerging Internet and new media concerns.

The shareholders are expected to meet on July 13 to vote on the name change as well as the proposed merger with Capstar Broadcasting Corp.

CES Attendance Verified in Audit

ARLINGTON, Va. An audit has verified the attendance of January's Consumer Electronics Show at 97,370. That's close to the original estimate of 97,334 by the Consumer Electronics Manufacturers Association, which produces the event.

"We are one of the very few in the high-tech trade show industry who can prove to exhibitors how good our attendance really is," said CEMA President Gary Shapiro.

Expomark, the exhibition auditing unit of the Audit Bureau of Circulations, verified CEMA's registration procedures and record-keeping systems. The audit provides third-party verification of show attendance and demographics.

Chancellor to Sell Billboards?

DALLAS Chancellor Media has hired two firms to explore a possible sale of its billboard operations. Chancellor is looking to improve its return on billboards and a sale is one option. While radio and billboard in overlapping markets make attractive combo packages for advertisers, only about half of Chancellor's billboards overlap the company's radio stations.

"We've said we're not excited about the current platform," said James de Castro, president of Chancellor's radio and outdoor group.

Capstar Closes Triathlon Buy

AUSTIN, Texas Capstar Broadcasting Corp. has closed on its purchase of Triathlon Broadcasting Co. Capstar executives valued the deal at approximately $200 million, including equity and the assumption of about $60 million in debt.

"Triathlon's stations are well-clustered and complement Capstar's portfolio of leading mid-market stations," said Capstar President and Chief Executive Officer R. Steven Hicks.

Radio in the Woods, on the Web

Welcome to summer.

As usual, we have plenty of interesting stories in this issue of **RW**. One in particular that caught our eye was the experience of Jack Layton.

One day while driving around northern California, Jack came across a site that he calls "the most unusual AM broadcast transmitter site I have seen in my 40-plus years in the business." Seven miles from the highway, accessible only via four-wheel-drive vehicle, sits a shelter that Jack almost took for a portable commode.

I'll let him tell the story from there. But it reminds me of the old saying: If you want to enjoy eating at a restaurant, don't look in the kitchen — or in this case, the transmitter shack.

RW is fortunate to have some of the most recognizable names in the business contributing to our pages. In addition to Jack Layton, we have Harold Hallikainen in this issue. He completes his three-part series summarizing the history and rules for transmitter control. The series is based on his chapter in the new edition of the NAB Engineering Handbook.

Traffic and billing systems are critical to the mission of radio stations. In *GM Journal*, writers Ted Nahil and Kelly Orchard talk to the suppliers and users of these business systems, to learn where the technology is going and what pitfalls the careful buyer should expect. Our coverage starts on page 31.

★ ★ ★

Speaking of handbooks, I'd like to ask engineering readers to send me a reply to an informal survey question:

What are your three most important engineering information resources? In other words, where do you turn when you have a technical radio question?

Send me an e-mail to *radioworld@imaspub.com*, and I'll share your answers with our readers.

★ ★ ★

I recently talked with Laurence Norjean, a long-time radio veteran who is now president and COO of InXsys Broadcast Networks.

Expect to hear more about this company, which wants to be your partner in the business of developing non-traditional revenue through online opportunities.

Jack Layton said the ATU seems to sit atop an old fridge.

Norjean himself is a veteran drum-beater about the benefits of radio, having worked extensively with agencies and at the RAB, among other places. You can detect the same boundless enthusiasm when he talks about the opportunities that the Internet offers for radio stations.

"Broadcasters are waking up and realizing they have an incredible asset here, if they develop it," he told me. "The best way to do that is not by creating stuff, but by partnering. That's what we do ...

"You've got to give them content. Take a look at that recent Arbitron study. Yes, listeners all want to see the jocks (on your Web site), but they want to buy something, they all want to know something more about the advertisers that are on the air."

Norjean said stations should follow this angle.

"They listen to you already. They believe you, you're credible," he said. "Why not extend that franchise and that brand with products and services that you can make money from, and keep your listeners from going to other people's sites?"

Our interview appears in *GM Journal*.

★ ★ ★

Some important staff changes:

Technical Editor Alan R. Peterson has moved into a career opportunity that lets him put his hands where he likes them best: on the equipment.

I'm happy to report that Al, who has been on staff here for four years and contributed to **RW** a lot longer, will continue that association as a columnist, product reviewer and technical adviser. He has been a part of the success of **RW**, and I'm delighted that he will remain on the masthead.

Brian Galante is leaving to pursue other interests. His enthusiasm and hard work as editor of *Buyer's Guide* have been obvious to all who work with him.

His duties as editor of the *Buyers Guide* section will be handled by Bernard Michael Cox, who is already a member of the IMAS team as associate editor of our sister publication Pro Video Review. If you have a story to tell us about a piece of equipment you purchased, or if you are a supplier who makes a new product for radio, let Bernie know via e-mail to *bcox@imaspub.com*

And Business Editor Laurie Ann Cebula is leaving to pursue other opportunities closer to her Maryland home. You'll still see her byline, though, on future articles, particularly in the area of the Internet and online radio.

★ ★ ★

From the Editor

Paul J. McLane

Several issues back, we moved the popular *Readers Forum* feature to the last inside page of **RW**. Are you finding it there easily?

Letters to the editor of **RW** are a vital part of the industry conversation. We hope you'll turn there in every issue, to see what your colleagues have on their minds.

★ ★ ★

Last, we have plenty of interesting stories and features coming up in the next couple of months.

If you are in the market for an on-air console, studio cabinetry, STL or codec, we have several *Buyer's Guides* to help you choose. Also, our July 21 issue features a special look at mixers for radio production, appearing in *Studio Sessions*.

And it's hard to believe, but the NAB Radio Show is coming up fast. We'll run down the sessions and exhibitors for you in our Aug. 18 issue. Do you plan to attend? Why or why not? Drop me a line at *radioworld@imaspub.com* and we'll share your story with our readers.

Stay cool!

Broadcasters are waking up and realizing they have an incredible asset here, if they develop it.

— Laurence Norjean, InXsys Broadcast Networks

GUEST COMMENTARY

The Crossed-Field: Worth Watching

Engineering Consultant Ron Rackley Considers The Promise of the Crossed-Field Antenna

by Ronald D. Rackley, P.E.

The presentation at this year's NAB99 convention by the two gentlemen who developed the Crossed-Field Antenna has created quite a stir in the radio industry here in the United States.

The new antenna technology they described, which was also reported in the March 31 issue of **RW**, promises to make it possible for AM stations to transmit without using towers — something that looks like an oversized oil drum with a decorative lattice ring on top, on the order of 20 feet high, is used instead.

Higher radiation

The developers claim that a small Crossed-Field Antenna will produce considerably higher radiation (more field strength) than the much taller tower that it replaces. It is also claimed to have broader input impedance bandwidth characteristics than a tower. Whether or not all of the claims are justified, it will definitely solve a lot of broadcasters' problems with obtaining local permission to construct towers for AM stations if the FCC approves the technology.

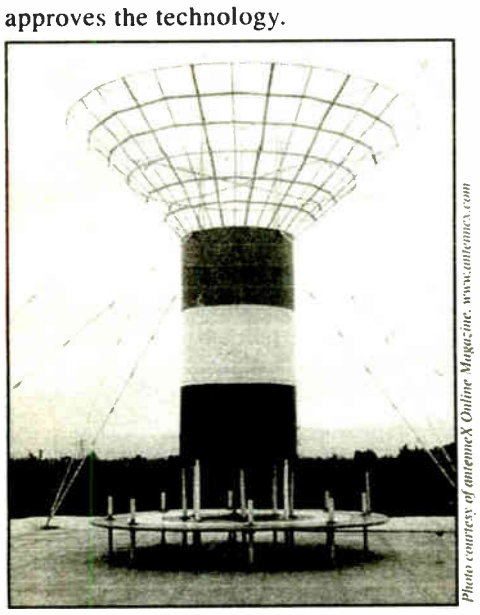


Photo courtesy of antennaX Online Magazine, www.antennex.com

The Crossed-Field Antenna

From the calls my office has received, there appears to be a lot of interest in the Crossed-Field Antenna. Many assume that the Crossed-Field Antenna will be a low-cost alternative to a conventional tower and that two or more might be employed to produce a directional antenna pattern on a much smaller piece of property than is required when towers are employed. The general impression seems to be that the Crossed-Field Antenna is an all-purpose "good for what ails you" kind of development for AM broadcasters.

Is the Crossed-Field Antenna the panacea that it appears to be, or is it just another of those attractive ideas that come along promising to solve the problems of AM radio, such as the "anti-skywave" antennas and the "noise-free AM" modulation system of the 1980s, that are presented at conventions and then soon forgotten?

Is the antenna a panacea, or just another attractive idea promising to solve the problems of AM radio?

There is simply not enough known about it at this point to say. Before it can receive FCC approval, it will have to be tested according to the FCC's prescribed methods to determine its radiating characteristics. This means that an eight-radial proof of performance with both close-in and distant field strength measurements out to approximately 20 miles will have to be run and the data analyzed, taking into account the electrical characteristics of the soil over which the measurements were made, in order to establish its radiation efficiency.

Measure twice ...

Additionally, measurements will have to be made and analyzed to determine its vertical radiation pattern. So far, the data presented on the Crossed-Field Antenna since it was first described in international technical journals more than 10 years ago falls short of meeting these standards.

What is the likelihood that the Crossed-Field Antenna will be found to perform acceptably and receive FCC approval if it is tested according to their standards? The opinions of North American antenna experts are generally negative. While I am skeptical about the high radiation efficiency claimed by its developers, I remain open-minded on the question of whether it still might be a very good antenna for its physical size.

I doubt that all 10 of the Crossed-Field Antennas that were built between 1988 and 1998 in Egypt would have been placed in service if the first ones hadn't performed acceptably. The antenna's developers, a college professor from Scotland and a former student of his who is now a radio engineer in Egypt, appear to be very credible.

The idea behind the Crossed-Field Antenna is an intriguing one and I very much want to see one tested in accordance with the FCC Rules so that its applicability for AM broadcasting within the United States can be determined.

Everyone agrees that the concept upon which the Crossed-Field Antenna is supposed to work is a radical departure from conventional antenna theory. Normally, a tower that is close to a resonant fraction of a wavelength in height is used to radiate an AM signal and its far-field radiation properties are determined from the distribution of current along its length by well-known mathematical processes.

The characteristics of AM tower antennas are well understood; graphs and formulas that appear in the FCC Rules and international agreements on radio matters serve to standardize the procedures for analyzing them.

The Crossed-Field Antenna works on an entirely new principle. In theory, it forces far-field radiation into existence by exciting two very small elements that would normally produce only near fields that die out within a few feet of themselves in just the right way to cause their associated electric and magnetic near fields to behave like components of far-field radiation.

According to the concept described by the developers of the Crossed-Field Antenna, the type of phasing and coupling system that is required for a conventional two-tower directional antenna system is used to drive the two small elements with the power and phase relationships needed to cause their electric and magnetic fields to take the form of a far-field, outward-propagating wave.

I can envision a scenario under which the multiple-feed approach could lead to the type of input impedance bandwidth improvement claimed for the Crossed-Field Antenna.

I think that differences in terminology might be responsible for some misunderstanding between the antenna experts in North America and the

See RACKLEY, page 7 ▶

Corrections

The May 26 issue of **RW** listed an incorrect price for the Broadcast Electronics FM-10S FM transmitter, which earned a Cool Stuff Award. The correct retail price is $62,500.

The photo on page 8 of the April 14 issue incorrectly identified the speaker as Alan Keyes. The photo is of T.D. Jakes.

IBOC Receivers on the Horizon?

▶ RECEIVERS, continued from page 1

about 12 months later. The timetable depends on how different the new receivers will be from current designs, he said.

To design IBOC receivers into cars as original equipment, rather than after-market, would take about 24 months, he said.

Price points would depend on variables such as the cost of designing and manufacturing the chip sets and consumer acceptance, he said.

"Many of the after-market radios we sell now have the capability to plug a DAB box into them," said Law. In Canada and Europe, where Kenwood sells Eureka-147-cabable DAB receivers, the DAB unit is a black box that plugs into the receiver bus under the dashboard. Retailers and consumers can install the box, he said.

USADR said it was not prepared yet to select a single chip manufacturer with which to work. Discussions continue with several, including Motorola.

Lucent is developing its own chip technology for IBOC, and similar technology for chip sets for CD Radio satellite receivers.

Digital Radio Express said it is working with and receiving resources from a chip manufacturer, but declined to name the company. Since DRE moved into new headquarters (**RW**, March 31), DRE's alliance with TriTech Microelectronics has ended.

Derek Kumar, DRE vice president of engineering, said, "TriTech makes audio codecs for PCs. They were there for us at a time when we needed them, but ... they never would have been a manufacturer for automotive radios."

He said DRE's unnamed new partner "is a much better fit to the automotive radio market."

The agreement with USADR does not prevent Kenwood from working with another IBOC proponent. Both Kenwood and Lucent Digital Radio confirmed ongoing talks.

Law said it was premature to comment on how long it could take to get receivers on the market if the designs from two or more IBOC proponents were combined in a single receiver.

In related news, since NAB99, USADR has announced joint technology and marketing agreements with Broadcast Electronics, QEI Corp. and Nautel Limited, three of five companies that have passed USADR's IBOC waveform through their transmitters. USADR has testing agreements with the other two companies, Harris Corp. and Energy-Onix. USADR has also begun discussions with Continental Electronics Corp.

In its effort to connect broadcasters with the equipment manufacturers developing IBOC-compatible equipment, USADR said it had 500 stations signed up for station assessments.

Many retailers will require some education as to what IBOC is.

—Bob Law
Kenwood USA

DIGITAL NEWS

Lucent Begins Field Tests

LINCROFT, N.J. Lucent Digital Radio began testing the single-stream version of its FM IBOC system on noncommercial 11 kW WBJB-FM, Lincroft, N.J., in May.

LDR was transmitting its hybrid IBOC waveform, using a combiner from Electronics Research Inc. and a prototype exciter.

In the initial tests in mid-May, LDR was transmitting an analog and digital signal for periods of approximately two hours. LDR Vice President of Business Development Nick Karter said, "The digital signal had no audible impact on the analog signal."

LDR next planned to test its newer, multi-streaming version of its FM IBOC system (**RW**, April 14).

LDR also announced a testing agreement with Nautel Ltd. LDR has tested Harris Corp. equipment too, but has not announced a pact with Harris.

Meanwhile, Digital Radio Express was testing its AM system on KBPA at 1220 kHz in Palo Alto. Derek Kumar, DRE vice president of engineering, stated, "The signal was left on for several days, including daytime/nighttime (power) switching, and there were no complaints regarding host compatibility."

After tests in the Bay Area, DRE planned to conduct additional testing in southern California.

Kumar said that DRE was able to use the station's Nautel transmitter with no modifications to either the transmitter or to the nondirectional antenna.

By this month, USADR had planned to begin testing its IBOC systems on several stations in the Washington, D.C., area.

— Leslie Stimson

GUEST COMMENTARY

An Open Letter to FCC Chair Kennard

Dear Mr. Chairman,

We are writing to express our concern about the Notice of Proposed Rulemaking that the FCC has begun on the issue of low-power FM radio (LPFM).

It seems that standards for this service have been made without any scientific research into the interference that would result on present FM radio service. In the Albuquerque, N.M., area, the FM band is saturated with stations and in order to allow any new stations, interference limits on second- and third-adjacent channels would have to be relaxed. We are concerned that our community-oriented public broadcasting would be compromised.

Right now, in-band digital broadcasting systems are being developed which will need the interference-free spectrum that present FM stations have been granted. These systems, when introduced, will eliminate much of the present noise and give our signal greater clarity. The proposed LPFM stations may prevent this from happening by the new interference.

We have seven translators that serve small communities on the perimeter of our signal area that would not be able to receive public broadcasting because of the mountainous terrain in northern New Mexico. We are concerned that these translators will be knocked out of service by LPFM signals that will interfere with them. These translators are already being encroached on by full-power stations being established on their frequencies by organizations wanting to license full-power stations in small communities where they can get signals into larger cities.

These new LPFM stations are being proposed to allow opportunities for individuals who could not otherwise get into broadcasting because of the expense of a full-powered station. We are concerned that they will be used to broadcast programming from large satellite networks already being broadcast over hundreds of translators and full-powered stations across the USA instead of allowing more diversity and freedom of expression by individuals. This would seem to us to be totally against the purpose of the establishment of this service.

We are also concerned that little thought has been given as to how these limited frequencies for low-power FM would be allocated in the case of conflicting applications.

We would urge that a low-power FM service not be instituted until serious consideration has been given to the issues that we have raised above. Thank you for considering our views.

Richard S. Towne, General Manager
Ronald Cowell, Chief Engineer
KUNM(FM)
University of New Mexico
Albuquerque, N.M.

Promise of the CFA Antenna

▶ RACKLEY, continued from page 5

developers of the Crossed-Field Antenna.

For example, a brochure that was handed out at the NAB99 convention states that the Crossed-Field Antenna radiates with 90 percent efficiency while, by comparison, a conventional half-wave antenna radiates with only 35 percent efficiency.

With the definition of efficiency that is used here — the relationship of radiated field to antenna input power — in mind, I can not imagine what they are talking about.

For one thing, no engineer I know would agree that half-wave antennas radiate with 35 percent efficiency. I suspect that the Crossed-Field Antenna's developers may be using a different definition of efficiency than we use here.

Perhaps they are viewing the radiation produced by an antenna in terms of the total energy in its near field, including stored energy in the near-field components that is not radiated, instead of in terms of the actual power input. That could explain some of the controversy that surrounds the radiation efficiency issue.

What does it mean?

What does this all mean for the broadcaster in the United States?

Right now, the Crossed-Field Antenna is an interesting concept for us, but it is not a product that can be purchased and used to transmit AM signals here. The broadcasting community should encourage its developers to conduct a test program using FCC-accepted methods to determine its radiating characteristics, because many stations that cannot construct towers where they wish to move their transmitter sites, because of local land-use restrictions, may be able to benefit from using them.

The Crossed-Field Antenna will not be an inexpensive alternative to towers; the complicated circuitry that must be installed and carefully adjusted to feed RF power to it and the royalties that its developers will expect for its patented technology will likely push its cost much higher than a conventional tower. It will not be possible to build directional antennas on tiny transmitter sites, either. The same spacings are required to produce pattern nulls in the required directions without respect to what type of antenna element is used to produce the radiation.

The Crossed-Field Antenna will not be an inexpensive alternative to towers.

While I don't think that the present state of affairs with regard to the Crossed-Field Antenna should encourage AM broadcasters to start selling off their transmitter sites, those that might benefit from moving to areas where towers are not allowed should keep an eye open.

If it is ultimately found to meet the requirements of the FCC, the Crossed-Field Antenna could become a product for them to use. I doubt that it will ever be a low-cost alternative to the venerable radio tower, but there will be instances where the cost is justified. The Crossed-Field Antenna promises to be a very interesting new development to follow until much more is known about it.

■■■

Ronald D. Rackley, P.E., is a partner with du Treil, Lundin & Rackley Inc., in Sarasota, Fla. Reach him through ***RW****.*

RW *welcomes other points of view. Send e-mail to* radioworld@imaspub.com *or write to the address on the last inside page.*

The Crowded 'Spectrum Inn' of NCE

by Fred Krock

WASHINGTON If the FCC passes several proposals that could raise interference levels on the FM band, stations may lose many listeners outside their 60 dBu (1mV/m) contour.

That's the view of consulting engineer Doug Vernier, the president of V-Soft Communications and broadcasting director and general manager of KUNI(FM)/KHKE(FM) at the University of Northern Iowa in Cedar Falls.

Vernier issued this warning during the recent NPR Public Radio Conference in Washington, D.C., at a session titled "Any Room at the Spectrum Inn." Vernier has worked on FM signal coverage problems for many years. His tone was in stark contrast with the generally optimistic mood of most of the other presenters at the PRC.

Interference potential

Proposals now before the FCC on streamlining FM technical rules and on creating a new low-power FM service have the potential to create more interference on that band, according to many engineers.

In the streamlining proposal, under certain circumstances, the FCC proposes to allow second- and third-adjacent contour overlaps for full-service FM stations as well as to allow engineers to submit showings using the undesired-to-desired (U/D) signal-strength ratio-analysis method. This is coupled with a proposed reduction of six kilometers in the minimum distance short-spacing distances provided in Section 73.215(e) and the declaration of all new construction permits as 73.215 (shortspace) proposals (**RW**, April 14).

Protected contour

These proposals provide stations with more flexibility in locating their transmitters, but they would also increase the use of directional antennas and additional shortspacing that will elevate interference, Vernier said.

He said these proposals could affect a station's protected contour, the 60 dBu for NCE, Class A and Class C stations. The FCC typically uses this contour to define the service area of an FM station. This is also the contour that many stations use for coverage maps for promotional purposes. Even within the protected 60 dBu contour, stations could lose additional listeners from new sources of interference.

"Without coverage we don't have anything," Vernier said. "Quality coverage is a key ingredient in reaching people."

A sizable number of public radio listeners are located outside the 60 dBu contour of their nearest public radio station. According to Vernier, these people stand to lose their only public radio service.

Even within the protected 60 dBu contour, stations could lose additional listeners from new sources of interference.

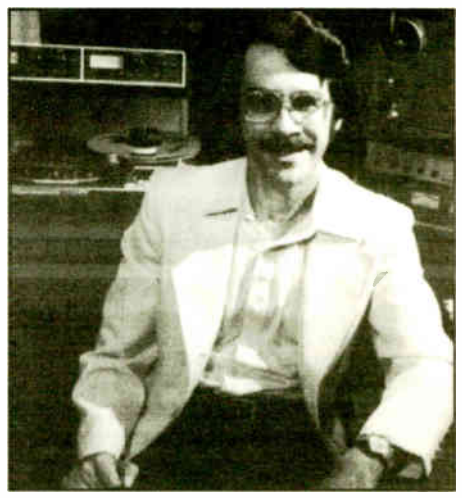
Rural stations

"Certainly rural stations will suffer more of this problem because in such areas there are many listeners beyond the 60 dBu signal," Vernier told **RW**. "About one-third of the state of Iowa, for example, receives public radio from outside the nearest station's 60 dBu signal."

The 60 dBu contours of existing stations are already receiving interference contour overlap in some cases from FM translators, said Vernier. The FCC, he said, has been issuing construction permits for FM translators that create prohibited overlapping interference in areas where the FCC believes no permanent population is affected.

Translators are licensed as secondary services, and can be turned off if they interfere with existing stations. But the existing stations have to prove the translators are causing the interference before the translators would be shut down, creating a burden on station licensees, said Vernier.

The FCC is allowing applicants to show that a proposed translator will not create interference by using the U/D signal strength ratio method rather than by using standard overlapping contours. The U/D method allows interference predictions to be made at signal strengths other than 60 dBu. Vernier said, "The only problem is that no one knows if these determinations are valid."



Doug Vernier

Vernier noted that U/D ratios in the FCC rules grew out of a project in 1947 in which the FCC measured the performance of different FM receivers. This data led to the protection rules adopted in 1951.

Thus today, he said, the FCC is using information determined from a

See SPECTRUM, page 10 ▶

How Much Room for LPFM?

This chart shows the number of LPFM stations possible with different channel protections. Source: Doug Vernier.

	Co-channel, 1st, 2nd, 3rd adjacent	Co-channel, 1st, 2nd adjacent	Co-channel, 1st adjacent
Seattle Commercial			
LP-1000	1	1	1
LP-100	1	3	18
LP-10	1	3	19
Seattle NCE			
LP-1000	0	0	2
LP-100	0	0	2
LP-10	0	0	2
Washington, D.C., Area Commercial			
LP-1000	1	1	2
LP-100	1	3	17
LP-10	1	3	17
Washington, D.C., Area NCE			
LP-1000	0	0	0
LP-100	0	0	3
LP-10	0	1	4
Milwaukee Commercial			
LP-1000	0	4	7
LP-100	3	7	14
LP-10	4	8	15
Milwaukee NCE			
LP-1000	0	0	3
LP-100	0	0	3
LP-10	0	1	4

One Loves to Travel, The Other Prefers to Stay Home

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NCEs Wary of Spectrum Plans

▶ SPECTRUM, continued from page 8

50-year-old receiver design.

Also as part of the FM technical streamlining, the FCC is proposing to replace existing methods of predicting coverage with a point-to-point method which the FCC hopes will be more accurate and allow interference calculations to consider hills and mountains (**RW**, Nov. 25, 1998). Like other methods, the proposed PTP method has flaws. According to Vernier's analysis, under certain conditions, changing power slightly using the proposed PTP method can produce a large change in the predicted size of a coverage or interference contour. In another case, increasing transmitter power resulted in decreasing the size of a predicted contour with the antenna height being held constant.

LPFM produces another set of potential interference problems for the FM band as the commission has proposed removing or relaxing second-adjacent and eliminating third-adjacent channel protection requirements and has asked whether there is a need to protect FM translators.

Potential problems

Many public broadcasters operate extensive networks of translators. The FCC notice discusses the possibility of some LPFM stations protecting translator output frequencies. Nowhere does the proposal discuss protecting translator input frequencies. Vernier said that interference on the input frequency can kill a translator as effectively as interference on the output frequency.

Some observers from commercial stations have suggested locating the LPFMs in the noncommercial educational reserved part of the FM band. The NCE band is more densely populated than the commercial band. Commercial band protection was based on minimum distance spacings assuming stations were operating at maximum power. NCE authorizations considered the impact of terrain and were based on predicted coverage contours and interference contours of a stations' actual operating power. This allowed more stations into the NCE portion of the band.

The NCE portion of the band is from 88.1 MHz (87.9 in special circumstances) to 91.9 MHz and the commercial portion is from 92.1 MHz to 107.9 MHz.

Vernier conducted analyses showing how many LPFMs potentially could fit in the NCE and commercial band in three markets: Seattle, Milwaukee and Washington, D.C., (see chart on page 8).

Spacing schemes

The FCC has proposed two spacing schemes to predict interference and plan LPFM allocation. In one, which results in a larger separation, the LPFM station would not receive nor cause interference. Under the shorter distance proposal, the LPFM station could receive but not cause interference. Vernier used the second proposed spacing scheme to identify the maximum number of LPFM channel drop-ins.

Many public broadcasters operate extensive networks of translators.

In his model, Vernier determined how many 10 W, 100 W, and 1,000 kW LPFM stations could be built under three separate conditions:

- Protecting co-channel, first, second and third-adjacent channels.
- Protecting co-channel, first- and second-adjacent and,
- Protecting co-channel and first-adjacent only.

Using the Washington, D.C., area study as an example, Vernier could not identify any new NCE LPFM drop-in channels unless both the second- and third-adjacent channel protections were eliminated, in which case there could be two LP10 stations. The same study showed that in the commercial band there could be one new LP1000 under the current spacings, three LP100 if the third-adjacent protections were dropped and two LP1000 or 17 LP100/LP10 stations if both the second- and third-adjacent protections were dropped.

In another example, Vernier used an existing Colorado Class A FM station. He created a hypothetical 100 W LPFM station on a first-adjacent channel complying with all the proposed FCC spacing rules. A computer study showed that because terrain is not considered under the LPFM spacing method, that approximately one-third of the area within the 60 dBu contour of the existing station would receive interference from the LPFM station.

■ ■ ■

Leslie Stimson contributed to this story.

Klose Meets With NPR Affiliates

▶ NPR, continued from page 1

network and public stations to work together on such issues.

Klose made his first appearance before the NPR membership at the annual Public Radio Conference last month in Washington, D.C. The annual conference was his opportunity to introduce himself to about 1,500 general managers, program directors and other assembled public radio personnel.

In his keynote address, Klose announced that NPR had reached agreement in principle with the American Society of Composers, Authors & Publishers and Broadcast Music Inc. to allow experimental licenses for Internet streaming.

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West Virginia Public Radio — Mountain Stage
WFIU(FM), Bloomington, Ind.
WFMT Radio Networks
WGBH Radio Boston
Wheatstone Corp.
WNYC Radio
WXXI Public Broadcasting

No fear

The agreement will allow public radio stations to send their locally produced music programming live over the Internet without fear of reprisal from the music licensing organizations. Klose said details on what the agreements would entail and how long they would last still needed to be worked out, but that NPR would move quickly to implement Web music-licensing procedures.

General Manager Doug Vernier of KUNI(FM)/KHKE(FM) in Cedar Falls, Iowa, said stations had encouraged Klose to work out an agreement. Within six months of Klose's arrival at NPR, the agreement was completed.

"I'm very excited and pleased," Vernier said. "Our station wants to begin to implement Internet streaming, and we realize that NPR is a significant part of that. We want to work as a partner in the development of content."

Partners

Partnership with member stations was also a key theme for Klose. "We are going to move forward together," he said. "We're going to build better relations with you all ... and we're going to find new audiences together."

Vernier was impressed by Klose's statements, and said that a cooperative attitude has not always been demonstrated by NPR executives in the past. "I thought I couldn't be reinvigorated about public radio," Vernier said, "but I'm excited to see his willingness to work with stations and understand our needs."

Station Manager Tom Godell of WSIU-FM in Carbondale, Ill., also praised Klose for embracing member stations. He compared Klose to his predecessor, Delano Lewis. "I always thought Del saw NPR as a corporation and that he tried to make it more of a central organization and not cut the bureaucracy."

In his keynote address, Klose described his life as a journalist and broadcast administrator. He spent 25 years at The Washington Post, including stints as a reporter, editor and Moscow Bureau Chief. He left the print world in 1991 and made the move to radio by becoming director of Radio Liberty in Munich, Germany. Klose then served as president of Radio Free Europe/Radio Liberty Inc. and as director of the U.S. International Broadcasting Bureau in Washington, D.C. In that post he managed the U.S. government's global radio and TV services.

Now, Klose is thinking of station needs. He told the audience of about 600 attendees that he would not repeat what many west coast stations saw as a huge blunder last election day Nov. 3, 1998. On that date, NPR stopped live election coverage at 10 p.m. Pacific time, leaving the stations on their own to provide coverage of Senate and Congressional races in other states and analysis of national trends.

"I guaran-damn-tee you that won't happen again," Klose said.

Klose spoke with great enthusiasm about his new post. He said coming to NPR was "for me, like going to heaven, early." He was effusive in his praise for the public radio system. "You have created the most extraordinary, interactive national and local mosaic of community contact, of intellectual meaning, of values for our democracy that has ever been created in the history of the mass media."

Klose made it clear he wants to take the NPR programming, which he called "a national treasure," to even bigger audiences using new technology. He said the digital world will allow public radio to create a whole new universe of information. "We can do it in video, in audio, in text." He encouraged member stations to master these technologies. "We are going to be major players in the 21st century in this country."

Funding concerns

Public radio funding was one topic Klose didn't address. Funding concerns have eased recently as efforts in Congress to cut funding have waned and corporate underwriting support has increased for many stations. "We always have to be vigilant," said station manager Godell. "I didn't hear Kevin Klose telling managers to go to Capitol Hill to talk to their members of Congress. We can't take funding for granted."

But overall, Klose won high marks for his debut with member stations. "I liked the idealism in his remarks," said D. Cameron Lawrence of the Public Radio Partnership, which operates three noncommercial stations in Louisville, Ky. "You could expect someone in his position to be jaded, but he was refreshing and inspiring."

Radio World, June 23, 1999

Avoid Too Much Strain on the Jack

John Bisset

Aaron Bishop is a production engineer at WBUR-FM in Boston. The station has several Sony MZR-50 MiniDisc portables for their noontime news show. The first MiniDisc the station bought when the show started back in October developed the same mini-plug intermittent problem that was described in an earlier *Workbench* column.

Figure 1: Use some of that good ol' engineering ingenuity!

Aaron said that the Sony units use a metric 3.5 mm jack, whereas the Radio Shack is an imperial 1/8-inch plug. It's very close, but not perfect. As the mini-plug design puts a lot of strain on the jack, it will quickly wear loose, and you'll start getting the crackle-pops.

In Aaron's case, the problem didn't even take six months to develop!

Aaron passed on another tip for users of the older home units, like the JE510 or 520. When you are finished recording, you must hit the Pause button, wait for the deck to reset and default to a new track to record, then hit Stop. If you depress the Stop button in the midst of recording, the deck could lose the last few seconds of audio. Recording extra silence often doesn't work, since the more you record, the more you will lose. Aaron suspects that's due to the RAM memory buffer.

When you hit STOP, the buffer dumps before all the data can be written to the disk. By pressing Pause and waiting, the buffer will finish writing. Aaron can be reached at *pulse@bu.edu*

★ ★ ★

Edd Monskie from Hall Radio enjoyed the way Hal Kneller described pumping water out of a transmission line. His company bought a station in Florida where the transmission line ran out of the transmitter and down into a trough in the floor before going outside to the tower. The staff told him the line would occasionally fill with water, but their solution was to stand at the old Wilkinson transmitter control panel and just hold the Plate-On button until the transmitter stayed on!

Edd's story reminded me of going to a client's site to find the transmitter repeatedly turning on, overloading, then turning on again — over and over, *kerchunk, kerchunk* — you get the picture. When I got to the studio, the jock had wedged a toothpick into the Raise pushbutton of the Moseley TRC-15, because he got tired of pushing the button himself!

★ ★ ★

Walt Jamison is a PE who wrote in with some reservations about wrapping a "wall rat" in rubber. You'll recall this was done to keep the AC adapter from shaking loose in a remote kit and destroying itself and other equipment. The adapter was wrapped in a sleeve of rubber inner tube and secured with a hose clamp. The rubber prevented the hose clamp from cracking the plastic body.

Walt's concerns have to do with ventilation, stating that some of these adapters run rather hot, and wrapping them in a piece of rubber inner tube might cause premature failure. An alternative suggestion is to use a plastic ty-wrap to hold the adapter in place; it's usually more readily available than a hose clamp.

If you're worried about heat, you could split the difference by using a strip of rubber tubing, or even a large piece of heatshrink, with the hose clamp inside.

★ ★ ★

It's time for another **Radio World** *Workbench* Card File entry.

From time to time, readers send in the names of unique companies that are useful for broadcast engineers. We've included addresses of companies that sell clean rags (for cleaning transmitters) to specialized component companies.

This month's entry comes from Clif Glasgow, Chief at KSIQ(FM) and KKSC(AM) in Brawley, Calif. Clif ran across this company at the recent NAB99 in Vegas. They are a supplier of connectors, headers, pots, caps, transformers, inductors, switches, and very neat colored switch caps — including purple! Contact them for catalogs and samples, and tell them you heard about the company from **RW**'s *Workbench!*

★ ★ ★

If you have the name of a company that you just can't live without, share it with other *Workbench* readers. Fax the information to my attention at (703) 323-8044 or e-mail *jbisset@harris.com*

★ ★ ★

We'll wrap up this issue with a trivia question, dealing with the picture in Figure 1. The vehicle shown in Figure 1 belongs to: (a) a general manager; (b) a station owner; (c) a duct tape salesman; (d) either a or b if also an engineer; and (e) all of the above.

Of course "e" is the most logical answer, but the correct answer for *this* picture is "d." Seems a station owner *and* GM (who's also an engineer) had a little run-in with a deer on the way to the transmitter site. The mirror got smashed, so he picked up a little cosmetic mirror for a couple of bucks at the drug store, along with the duct tape. Talk about pleasing the bean counters!

■ ■ ■

John Bisset has worked as a chief engineer and contract engineer for more than 20 years. He is a district sales manager for Harris Corp. Reach him at (703) 323-8011.

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

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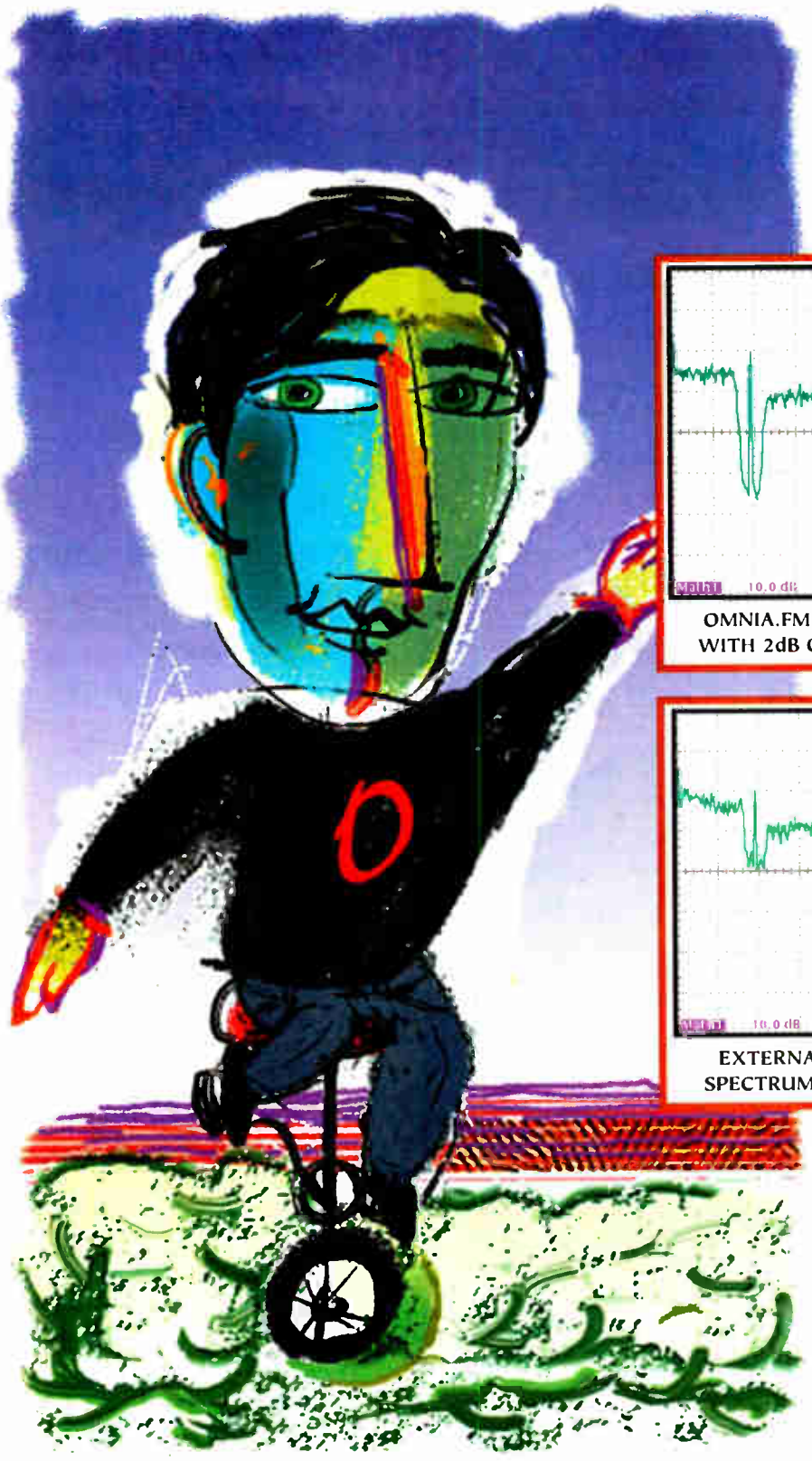

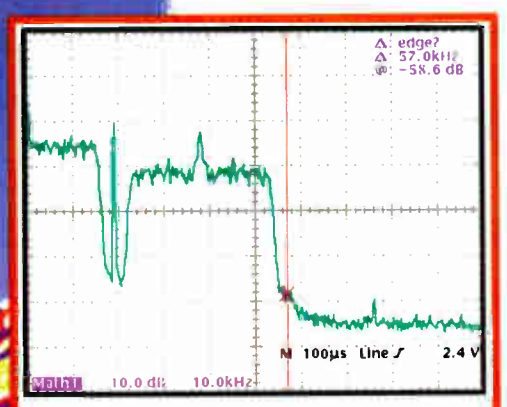

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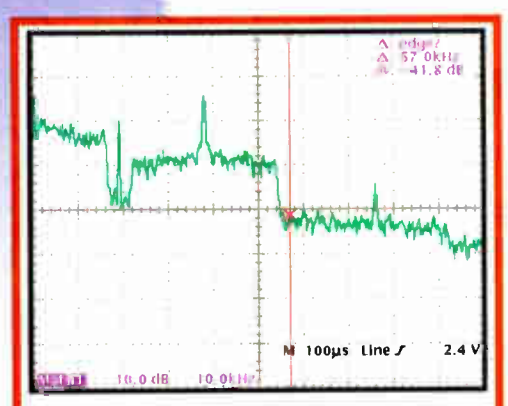

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Here's how: *The test signals were generated by a Delta Electronics SNG-1 (Stereo Noise Generator); spectrum analysis was performed with a Tektronix TDS-744A Digital Scope in the FFT mode. The top graph shows the spectrum out to 100kHz of the Omnia.fm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

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

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FEED LINE

AM Power, Operation and Coverage

W.C. Alexander

In the April 28 issue, we began a special series on radio basics. The intention of this series is to help anyone who works in radio to have a working knowledge of the very basics of radio propagation and allocations, among other aspects.

Station managers, sales people, air talent — everyone who works in radio — is invited to sit in and pick up on some of these basics. It is my intention that, with a better understanding of how the signal gets from *here* to *there*, you will be better able to service your clients and audience.

We started with AM propagation — how AM signals get from the transmitter to the receiver and what affects them en route. This month, we'll look at why AM stations are what they are in terms of power, hours of operation and coverage. Perhaps this is something you have always wanted to know but have not had the opportunity to ask. Here is your big chance.

As part of this discussion, we'll mention signal strength measurements. Signal strength usually is measured in millivolts, or thousandths of a volt, per meter, abbreviated as "mV/m." This is a measure of the strength of your station signal at a given distance from the antenna. *Groundwave* field strengths are predicted using ground conductivity data. *Skywave* field strengths are predicted statistically using a mathematical algorithm for applications in the United States, and a table for foreign calculations.

Station classes

In the early days of broadcasting, different classes of service were established by the government in order to provide listenable signals to the largest parts of the population. Remember, there were few stations on the air in those days and one of the primary objectives was to get a signal to as many people as possible. These service classes still exist, and although their designations have changed, that early allocation scheme affects modern-day stations.

Class I stations (today they are designated "Class A"), nominally 50 kW full time, were designed to serve large areas in the daytime with a groundwave signal, and huge areas at night with a skywave signal. These stations operated on 24 domestic "clear channels" on which no other stations were allowed to operate at night within that skywave service contour area.

These powerhouse "clears" were able to serve large geographical areas, and in the days prior to television, much radio listening took place during the evening and nighttime hours. The skywave service provided by these stations was the only signal available to many who lived in rural areas. During the day, groundwave service was protected out to the 0.1 mV/m contour, and in the absence of today's high levels of manmade electrical noise, this was a very listenable field strength.

In the early days of broadcasting, different classes of service were established by the government.

All other co-channel stations were required to protect the nighttime 0.5 mV/m 50 percent skywave contour from interference. Daytime, as well as all co- and adjacent-channel stations, had to protect the 0.1 mV/m daytime groundwave contour.

These rules remain in effect, and stations that share a frequency with a Class A station must still provide that station's day and night service contours with a great deal of protection. A great many stations are limited to daytime-only operation because they are located within or very near the 0.5 mV/m 50 percent skywave contour of a co-channel Class A station.

Do the realities of radio listenership in 1999 merit these large coverage areas and protections?

One could reasonably argue that there are few areas and a very small population within the continental United States that are not served by one or more radio signals other than a Class A skywave or groundwave signal. A case could be made that the need for such large service areas no longer exists, and even that man-made electrical noise often renders the signal within much of the protected area unlistenable anyway.

Despite these arguments, the Class A stations continue to hang on to their large coverage areas and it is unlikely this will change.

Class II stations (today part of the "Class B" designation) were set up to operate on domestic and foreign clear channels with power levels up to 50 kW. Often, these stations were located on the opposite side of the country from a domestic clear channel.

Although not entitled to the same protections as the "clears," they were

See FEEDLINE, page 28 ▶

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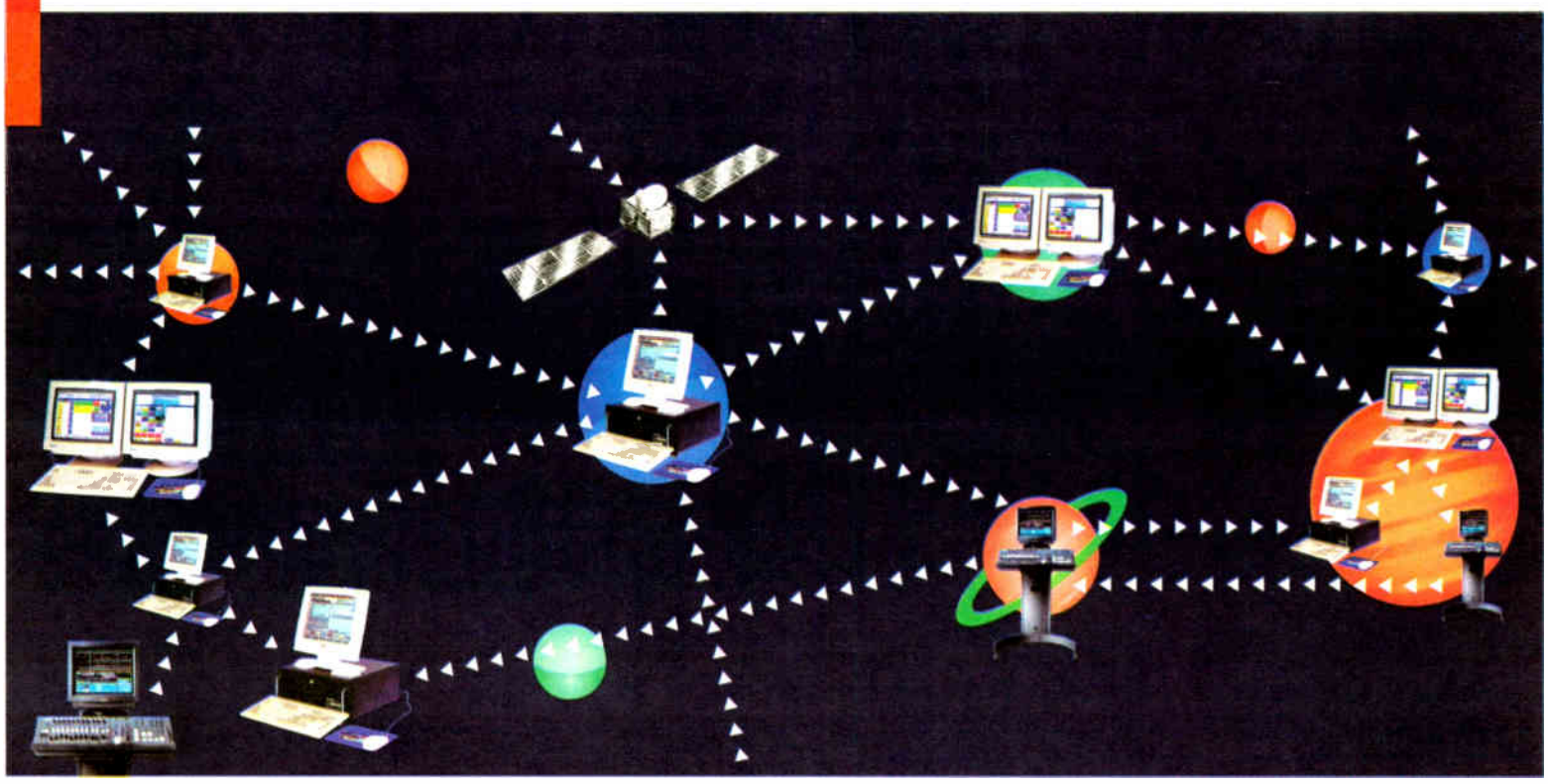

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PRODUCT EVALUATION

Extra Life With Aiwa MiniDisc

Carl Lindemann

What would make for the perfect "Pro" MiniDisc recorder? It should be small and light, but still have XLR connectors. Recordings should be DAT quality with a battery life several times that of a DAT recorder.

Add an optical-out connector (portables only have optical-in — you have to play back on a home unit to stay in the digital domain) and you have it all.

The Aiwa AM-F70 isn't this fantasy-realized. Manufacturers still have a chance to bring the dream "Pro" recorder into reality. But the Aiwa may well be the ultimate consumer recorder. As such, it's certainly a contender for broadcast professionals. Until the pro units arrive (maybe never), this will certainly do.

Put on your jacket

The Aiwa is one of a handful of new MD recorders in the "jacket-sized" format. That is to say, it's about as big as a protective sleeve that holds a disc. It's a "clamshell" design — the top pops open

Aiwa AM-F70

to slip in the media.

Certainly not the smallest unit on the market — the Sony MZ-R55 holds that title — the Aiwa is a bit taller to accommodate a larger battery. But for most purposes, it's as small as you'll ever need.

The extra battery life is the unit's most exceptional feature. Company literature claims that the "gum stick" lithium-ion battery gets some 10 hours playback/four hours recording time. My tests showed that these figures were not only realistic, but conservative! Plug in the included external battery pack that holds three "AA" cells and you get 16 hours recording/40 hours playback. Those tired of toting external battery packs for their DAT will find this to be nothing less than a revelation.

Big buffer

Despite the unit's petite package, the controls are easy to use. It's not much harder to figure out than a cassette, and there's no tape bias to set or noise-reduction scheme to combat. Mic levels can be set manually or automatically, and you can switch between these or adjust levels while recording. This is a welcome functionality; not all MD recorders allow you to set levels on the fly. Also, there's a mic attenuation switch on the back to compensate for the mic's sensitivity.

The usual assortment of MD features abound, such as the ability to index passages and to edit and rearrange tracks. You can also opt for mono recording mode, which doubles the recording time to 148 minutes per disc.

Like most consumer units, the Aiwa comes with a bunch of accessories that you'll probably toss. The remote control, headphones and optical cable are nice for your listening pleasure, but clutter the field kit. What is useful is the 40-second EASS (Electronic Anti-Shock System). Like portable CD players, MDs are prone to skipping. An electronic memory buffer placed into the loop will keep annoying glitches out. I've tested most all of the consumer units on the market for "skippability," and the Aiwa is the best. My arm got tired shaking it before I finally generated a glitch.

Mic levels can be set manually or automatically, and you can switch between these or adjust levels while recording.

So far, so good. If it was not for one small detail, the Aiwa would be the hands-down best recorder on the market. Unfortunately, that detail happens to be a crucial one.

Most MD recorders have separate mic and line-in/optical jacks. For some reason, the Aiwa rolls all these into a single 1/8-inch jack. I made and compared recordings made with a variety of electret condensers and dynamic mics (properly shielded for the phantom power that's supplied to the jack). Similar recordings made with the Sony MZ-R55 (with separate jacks) had less noise than from the Aiwa's all-in-one arrangement. This hardly rendered the recordings useless. But if you're fussy about wanting the

See AIWA, page 23 ▶

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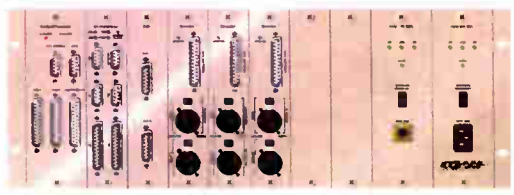

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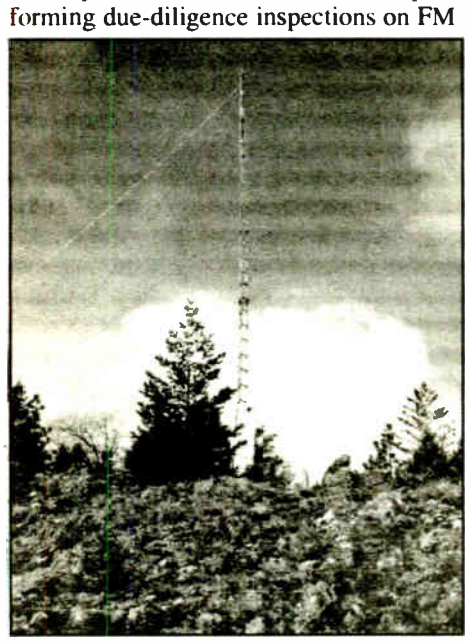
AM Radio on a Shoestring Budget

Jack Layton

While bouncing around the rugged countryside of northern California performing due-diligence inspections on FM stations, you wouldn't believe what I stumbled upon: an AM transmitter site on a mountain top at 4,000 feet above sea level. That's some 3,000 feet above the city is licensed to serve!



The station's transmitter site sits atop rugged terrain in a mountainous area of Northern California.

It was the most unusual AM broadcast transmitter site I have seen in my 40-plus years in the business.

At first glance, it appeared to be a pirate operation. However, the natives tell me it is indeed a legitimate operation. The operator holds a construction permit and installed the site just a few weeks before my accidental discovery. Its call letters are K - - - - . (On second thought, I'll let the call letters and location go unsaid as I could be accused of besmirching the character of the licensee and opening the door to possible action by not only the FCC, but perhaps also the Bureau of Land Management.)

The location is seven miles from the nearest paved highway, accessible only with a four-wheel drive vehicle by way of a twisty, single-lane unpaved roadway through some of the most breathtaking scenery in the United States. At times you are traveling upward at nearly a 45-degree angle while navigating hairpin turns.

This most-unusual AM transmitter site sits in the midst of several substantial FM broadcast, paging, microwave and two-way buildings and towers. The tops of these steel structures, with their large dish antennas, rototiller FM antennas and stacked folded dipole antennas, peek out above the needles and pine cones of the mighty Douglas Fir trees that dominate the landscape. Some of these behemoths claimed their places on this mountain top long before Marconi closed the key on his spark-gap transmitter for the first time.

Indeed, the site is a sight to behold! The K - - - transmitter shelter appears to have been dumped alongside the road. At first glance it could easily be mistaken for a Johnny-on-the-Spot portable commode! Public use and/or browsing is discouraged by the big padlock on the door. No one was available to open the door and give me a tour of the transmitter building.

From what could be seen from the outside, one could only imagine what was inside. All that could be heard among the silence of the forest was a boom box radio monitor inside the plywood shack spewing out — what else — satellite talk radio! An AC power feed to the building and a piece of RG-8 coax to the antenna was readily visible. A telephone line or STL antenna for program feed and remote control was conspicuous by its absence. In jest, a colleague suggested that perhaps the remote control and program feed was via cellular telephone!

While it may look like an outhouse, this is actually home to an AM transmitter.

Fridge on the ridge

About 30 or 40 feet away from and above the plywood shanty, on the peak of the ridge, is an 80-foot, not-so-vertical crank-up tower. It is the AM radiator! The guy wires did not appear to have insulators in them. They consist of some #12 bare copper, some insulated #16 or #18 wire and even a piece of romax power cable. The longest is 50 feet or so in length. The antenna coupling unit seems to sit on a box that appears to be an old refrigerator.

The base insulator could not be seen as there are 6-foot plywood panels installed on the tower; its function appeared to be an anti-climb device. There was a fence around the tower.

See SHOESTRING, page 25 ▶

New Facility for NPR Member College Station

Brian Galante

Southwest Missouri State University in Springfield, Mo., recently moved its radio station, NPR member station KSMU(FM), into a new facility, complete with six studios and newly designed furniture.

Planning and layout

The new building, at 5,500 square feet, provides a much more comfortable environment in comparison to the approximate 4,000 square feet in the old facility. RDA Systems, a provider of consulting and systems integration for radio, television and cable industries, was hired to design the furniture and assist in planning the layout of the facilities.

The Panel Discussion Studio is home to various KSMU talk programs.

According to KSMU General Manager Arlen Diamond, lack of functionality and studio space in the old facility were the main forces behind the move. Acquired by the university in 1972, the old building was modified for broadcast operations, but didn't quite have what the staff of ten full-time professional employees and ten students deemed necessary.

"We have especially gained in the efficient use of the new space," said Diamond. "We have more studios, more offices, and a very nice engineering workshop."

When it came time to design and install the six studios, the station launched its search for the right company to assist with the job.

"With so many university departments involved in the building, some construction items moved faster than our ability to make corrections," said Doug Waugh, chief engineer. "Before we could contact an installation company, we found ourselves in a situation where conduits had been laid in the concrete floor in a more or less random fashion."

Options abound

After looking at several options, KSMU decided on RDA Systems.

According to Waugh, the studio furniture had to be designed to fit with the existing conduits, and RDA was the only firm that could meet the station's needs.

"RDA really did a good job of planning the studio furniture and equipment configurations within (the) studios," said Diamond. "They designed the furniture for each room;

See KSMU, page 24 ▶

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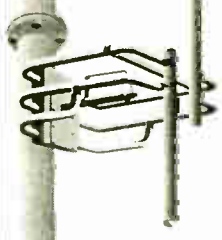

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ROOTS OF RADIO

Instantaneous Disc Recording

Ronald Pesha

How did radio station personnel function in the days before tape recording, not to mention the digital audio workstations of today?

Just about all program material was live in the earliest days of radio broadcasting, as in the pre-videotape days of television. But by the second decade, the "golden age" of the 1930s, "instantaneous" disc recording on "acetates" was established. It was *instantaneous* because, unlike the wax-like masters used in the commercial record business, they could play back immediately, and *acetate* because recordings were cut on aluminum discs surfaced with shiny black cellulose acetate.

The chisel-like stylus did just that — it cut the groove, more or less V-shaped, which emanated in a woolly thread that migrated toward the middle of the rotating disc. The person recording urged the thread along with a small brush or (horrors) a finger.

Old timers will remember that the cellulose acetate coating replaced the earlier cellulose nitrate, supplying a thread burned with violent fury and acrid smoke.

The soft acetate cut smoothly and produced a remarkably quiet groove, blessedly silent for ears accustomed to the abrasive shellac compound of commercial 78-rpm records. But the very softness resulted in grooves vulnerable to a playback stylus. The noise level built up rapidly under multiple passes.

Single use

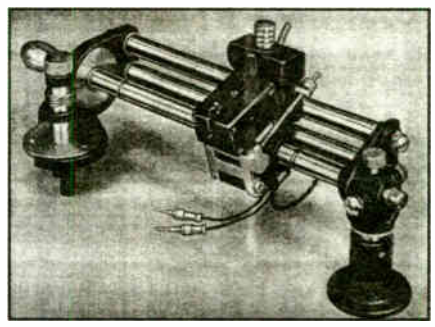
Originally, stations used disc recorders for time-delay, recording a network show for a later single playback. We then discarded the discs — no bulk erasing for reuse. We did strip the coating and use the aluminum to fold as the chassis for a small construction project now and then. The 16-inch diameter discs, good for 15 minutes a side, were best for this purpose.

We recorded using a "cutting lathe," a machine driven by the turntable itself to move the cutting head carrying the stylus slowly across the disc's surface in a spiral manner. The Presto Recording Corp. of New York City supplied complete disc recorders, both portable and console, as well as turntable/lathe combinations and lathes by themselves to affix to any radio station turntable provided with a drive pin. This pin (sometimes triple pins), offset from the center spindle, kept the blank disc rotating against the cutting stylus.

Evidence of the drive pin remains imprinted in the label area of many old 78-rpm recordings.

The stylus fit into a magnetic cutting head driven by a conventional amplifier, preferably with appropriate equalization. It slid smoothly along its rails, and when lowering the head rode in the feed screw grooves, it was forced to cut that spiral groove. I began working in broadcasting after the introduction of consumer microgroove discs (Columbia's Long Playing and RCA's 45-rpm records). Microgroove cutting styli had become available, so I removed the feed screw, took it to a local machinist, and said, "Duplicate it, except double the number of threads per inch." Back at the station, we started cutting LPs!

We used our "instantaneous acetates" for spots — one 12-inch disc per sponsor.



The Presto Overhead Cutting and Recording Mechanism

When an updated 30- or 60-second spot came in, we recorded a new band on the disc, the DJ always playing the innermost cut. Awkward? Yes, but these were the days before cartridges. The disc was much easier to spin-cue on the turntable felt than to thread an open-reel tape spot on a Magnecord.

Woe to the salesperson who didn't service the account. Ten, even 20 plays left the disc surface acceptable. Fifty plays, and groove noise becomes excessive. One hundred spots and listeners complain.

While each disc accepted only a couple of dozen cuts or so, they only cost around a dollar — not bad for the late 1950s. Sapphire cutting styli cost several dollars each, but lasted only a few hours. When the groove became noisy, it was time to change the stylus. But we saved the styli, and shipped half a dozen or so at a time for inexpensive resharpening.

Tape recording doomed the instantaneous disc, especially with the cartridge so convenient for spots, but the legacy of disc recording remains. We still call separately recorded spots on tape, and even in digital files, "cuts."

Thanks to John Landry of WALK(AM), Patchogue, New York, for background information and the photo for this article.

■■■

Reach the author at (518) 743-2200, x 567 or e-mail peshar@acc.sunyacc.edu

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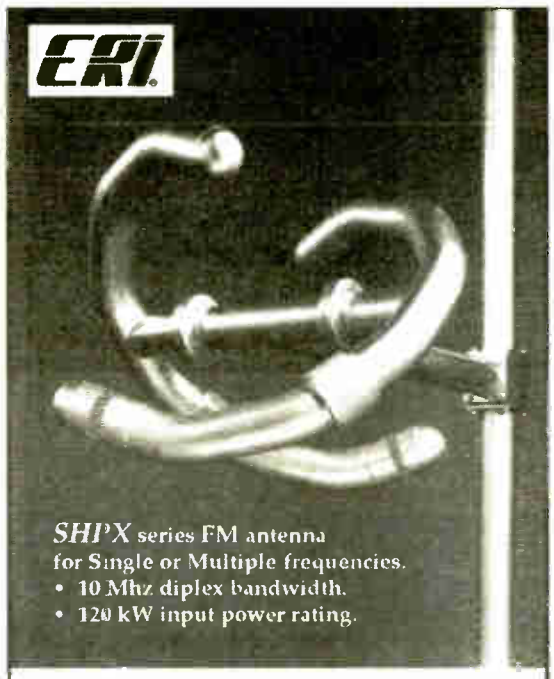

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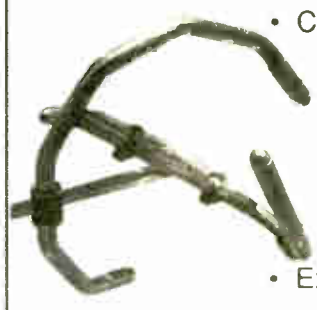

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READER SERVICE NO. 109

Skips Are Few With AM-F70

▶ AIWA, continued from page 17

best that MD can deliver, you'll want to do the same "A/B" comparison with your favorite mic.

That said, I secreted the Aiwa along to catch crowd reaction at the midnight premier of "Star Wars: The Phantom Menace." Already, the movie's "trailer" had become an Internet phenomenon from a surreptitious recording of it posted online. That recording's quality is poor. Even so, the crowd's reaction to the characters on-screen is fascinating (Yoda got the biggest applause).

My goal was to capture something similar, a piece of social history. I used an inexpensive "Radio Shack" electret lavaliere ($30) that I've found to do just fine for spoken-word recordings. I set the Aiwa to mono recording mode, and settled in to enjoy the movie.

As it happened, the covert operation was a bust. The late-night crowd (mostly high school students) wasn't very vocal about the movie. The audience sat attentive, but silent. At the end, they smiled, but didn't applaud. With no cheers or catcalls, there wasn't anything worth capturing.

Perhaps the most astounding part of the evening was that the Aiwa's power meter had dropped less than a third from full charge. Even after two hours of recording on the internal battery, there was plenty of power left for playback or other events.

If you've ever wished you could stop worrying about your field recorder's battery life, the Aiwa is nearly irresistible. It is not the best MD imaginable, but it may be the best for your needs given what is available at this time.

■■■

Carl Lindemann produces "CyberScene: The Socially Significant CyberSpace," and is based in Maine. He can be reached at www.cyberscene.com

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ATRAC Continues To Improve MD

When MiniDiscs first hit, they were a miss. The first-generation recorders and players were bulky, and the sound quality was marginal — just slightly better than cassettes. They were also rather expensive.

In the eight years since, MiniDisc has evolved dramatically. As the units have gotten smaller (now barely larger than the MD discs themselves), their sound has gotten bigger.

In terms of data storage, a MD disc holds about 140 megs of data. That means squashing a CD's worth of audio into the MD format demands a 5:1 compression. Early versions of ATRAC (Adaptive Transform Acoustic Coding) seemed watery — muddy bass, thin high end and a weak stereo presence.

Today's sixth-generation ATRAC makes good on the promise of replacing the cassette and giving DAT a major challenge as the media of choice for field recording.

How good can ATRAC get? It's rather good already. After all, engineers have been refining it for almost as long as it took the Space Program to land a man on the moon.

What's next? According to the original paper presented by Sony Engineers in 1991, "Transform coefficients are grouped into non-uniform bands to reflect the human auditory system, and then quantized on the basis of dynamic sensitivity and masking characteristics." The idea is that sound is more than just sound waves. What we hear is shaped by how we hear. We don't just intercept sound waves; listening is an active experience. Often, the coloration and intonation — the "musicality" of a recording — won't show up on any oscilloscope. Ask musicians with a taste for tube amps — there's a "fat" quality to vintage tube gear that the current solid-state stuff can't touch.

ATRAC throws these factors into the mix rather than just focusing on the statistics. So this raises the question: do you want a system that sounds good (on paper), or one with good sound?

Audio purists are sure to scoff at the idea that any compression scheme can match uncompressed audio. But hearing is believing. It's even possible that next-generation ATRAC recordings won't just sound as good as CDs — they might even sound better!

— Carl Lindemann

RDA Assists Relocation

▶ KSMU, continued from page 19

not only is it good-looking and functional, the pedestals fit over the conduits in the concrete floors." Diamond also said that the RDA staff was helpful, on-time and on-budget.

Before installation, RDA provided a mock-up session, which turned out to be valuable to the KSMU staff. According to Diamond, RDA brought cardboard mock-ups of the proposed studio furniture to the studios, which were still under construction.

"We were able to place the mock-ups in their respective studios, check ergonomics, sight lines to master control, and overall fit within the studios," said Diamond. "We were able to make changes to the dimensions right on the spot and know the effect immediately. No guessing about how it would look or work."

While the old facility certainly had the necessary ingredients to run a smooth station, the new digs are much more inspiring. The previous KSMU building featured a master control/main studio, one production studio, and as Diamond called them, "two semi-adequate control rooms." Adequate, yes, but not necessarily impressive.

The master control in the new facility serves as the station's main operational studio. KSMU controls all on-air programming from this studio. It also serves as the point of origin for station breaks. Rounding out the structure is an alternate control/production studio, a news production studio, a production and interview studio, a panel discussion studio and a music studio.

The KSMU Production Studio

According to Diamond, the news production studio is seeing plenty of action. "The second-most-used studio will be the news studio," said Diamond, adding that all the news production and live newscasts happen there.

"We run five local newscasts a day, produced by a news producer and three or four student news assistants."

As far as the other studios are concerned, they, too, are being put to use. The production studio is used for single-person interviews, station promotional production and automation purposes, while the panel studio handles multiple party interviews, which can be produced live, taped, or made for Internet distribution.

Playing in the band

Another studio which sets the new structure apart from the old one is the music studio, which is used for live and taped performances.

"The performance space is between two control rooms, one for our station's use and one for use by students in the electronic media production program," said Diamond. "The studio space is approximately 16 by 18 feet, large enough to accommodate a band, string quartet or choir."

An advantage of the new setup for KSMU is that the station now has the ability to go on the air from master control and all four studios, a benefit which the old studios were incapable of providing.

"(The new setup) will assist us in two ways," said Diamond. "One, we will be able to do more local production for broadcast use, and two, we will be able to support the University's instructional mission by producing public affairs programming for Internet access and distribution."

The new home of KMSU is highly computerized, propelling the entire facility to another level. Featured in the studios are seven SAW digital audio workstations; an NPR SOSS satellite system; computerized logging (DARTS) and computerized membership (MEMSYS).

The old aircheck recorders will be replaced with a computer-based skimmer, and engineers have access to all computer systems locally and from outside the station through a dial-up modem.

According to Diamond, KSMU is not the only station that benefits from the new facility.

"Our main channel programming is repeated by three other transmitters (Branson, Mountain Grove and West Plains) in southwest and south central Missouri," he said.

The station broadcasts NPR news, classical music, BBC world service, and other popular NPR programs 24 hours a day.

◆ MARKETPLACE ◆

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

HHB Offers 80-Minute MD

Need a longer MiniDisc?

HHB offers the MD80, which it says is the first 80-minute MiniDisc available outside Japan and the first of its kind for the professional audio industry.

The 80-minute stereo recording time (160 minutes in mono) is achieved by a reduction of 0.1 microns in the groove width, from 1.2 to 1.1 microns. A similar reduction in pitch, from 1.6 to 1.5 microns, assists in creating the expanded recording time.

Performance specifications for the MD80 are the same as the HHB MD74, including the critical area of block error rates. The unit is compatible with all MiniDisc recorders and players.

For more information contact HHB in Los Angeles at (310) 319-1111, fax (310) 319-1311 or circle ***Reader Service 15.***

ToolVox Processor

Cutting Edge, familiar for its line of on-air processors, plans to introduce the ToolVox microphone processor later this year. It is a digital unit tailored for interaction with on-air processors for a smooth, powerful voice presence for on-air talent.

ToolVox has specialized AGC and compressor sections designed around ratios and time-constants that complement those in the on-air processor. Additionally, a de-esser built around advanced FFT analysis techniques prevent the on-air processor from creating harsh sibilant splatter.

The unit also incorporates phase rotators; broadcasters can turn off phase rotation in their main processors to preserve music quality while reducing voice clipping.

A reference-quality microphone preamp with 24-bit A/D converters and phantom power is included. Stereo analog and AES/EBU outputs are provided.

Custom presets for each talent can be stored for instant retrieval via the front panel. TCP/IP and RS-232 remote control inputs allow operation from a computer or automation system.

For more information contact Cutting Edge in Ohio at (216) 241-3343, fax (216) 241-4103 or circle ***Reader Service 18.***

Prewired Console Harnesses

Broadcast Richmond offers its line of Prewired Console Harnesses to complement the acquisition of any console. Preconnectorized harness assemblies make on-site console installation much simpler, taking a few hours as opposed to several weeks.

In all cases, the company makes the required crimped connection on the console, be it Molex or a different interface, and then solders each crimped connection into place. The console is utilized by the company to test all preconnectorized cables for continuity of signal flow. Cables are cut to specified lengths. Each harness is delivered with a custom instruction book.

For more information contact Broadcast Richmond in Indiana at (765) 966-6468, fax (765) 966-5505 or circle ***Reader Service 16.***

Marti Remote Mixers

Marti Electronics has updated the GX-440 remote mixer and will begin shipping the new model, the GX-500, later this year.

Additions include an analog cellular phone adapter and power cord that will enable the GX-500 to use popular models of analog cellular phones for remote broadcasts.

Other features include four mic channels and two auxiliary inputs, four headphone jacks, a peak limiter, a squelch/mute switch, tone/pulse dialing and an electronic ringer, second phone line capability and an external AC supply.

The GX-500 comes with rechargeable batteries for up to 10 hours of use. A plastic carrying case is included.

For more information contact Marti in Texas at (817) 645-9163, fax (817) 641-3869 or circle ***Reader Service 22.***

Inexpensive AM Radio

▶ SHOESTRING, continued from page 19

Four pound-in-the-ground, three-foot high fence posts a few feet out from the tower secured a three-foot high metal fence.

I limited my moments of standing within 80 feet of the 80-foot tower. I had fears of my colleague having to call my wife to come and claim my beat-up remains under the collapsed structure on the top of the mountain. She's afraid of airplanes and it would have taken several days for her to traverse the 2,300 miles between McMurray, Pa., and Mount - - - - -. (No. I won't tell you the name of the mountain either as that too would identify K - - -.) By the time she would have arrived, what was left of me could have easily been eaten by a mountain lion.

AM radio on a tight budget? Obviously it can be done on a shoestring budget.

■■■

Jack Layton is owner of Layton Technical Services in McMurray, Pa. His company does due-diligence inspections, facilities evaluations and directional antenna field work. He can be reached at (724) 942-4054.

It appears the ATU is stationed on top of an old refrigerator.

OPTIMOD-6200

The future is sounding better already.

Even if you're still wondering where to go with digital broadcasting and webcasts, one thing is clear. To attract and keep a wider audience, DAB, DTV, and Web broadcasts need to overcome the limits of listener environments and deliver a clean, crisp, consistent sound.

The OPTIMOD - 6200 was created to solve the special needs of digital broadcasting—from punching through the noisy confines of cars to keeping loud commercials in check on TV broadcasts. Even on the Web, the 6200's multiband processing greatly enhances intelligibility,

and delivers a clean, consistent sound that keeps users logging onto your site.

Which means that you can go wherever digital broadcasting opportunities knock, and not worry about the future. The OPTIMOD - 6200 has it under control.

THE SCIENCE BEHIND THE SOUND

In the real world, digital standards are still evolving. New encoding schemes may develop. New services like IBOC digital shortwave may need narrow bandwidth. That's why Bob Orban's team built exceptional flexibility and future-proof features throughout the 6200. Its unique "look-ahead" limiter precisely controls peaks while optimizing the performance of your transmission codec—there's no clipper hash to waste precious bits. Whether your audio bandwidth

is 5HZ or 20kHZ, the OPTIMOD - 6200 sounds better in the real world where it counts.

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Chronicles of Transmitter Control

Harold Hallikainen

This is the final part of a three-part series summarizing chapter 4.8 of the NAB Engineering Handbook, Eighth Edition. The book can be ordered through www.nab.org/nabstore *or by calling (800) 368-5644. 33 pages of the Handbook are condensed into these three articles, so the articles are quite abbreviated. The chapter (and this series) "starts at the transmitter" and works its way back to the control point. In this part, we'll look at the user interface.*

User interface

The FCC requires broadcast transmission systems to have certain "indicating instruments." When a station operates attended, a "designated person" (previously a licensed operator, and, for simplicity, we'll call this person an operator) can observe these instruments and make adjustments necessary to maintain compliance with the rules and the station authorization. When operating attended under direct control (as defined in *www.hallikainen.com/cgi-bin/section.pl?section=73.1400* of the rules), the operator observes a set of meters and other indicators directly.

Transmitter remote control was first authorized in 1950 for class D NCE-FM stations and in 1952 for non-directional AM and FM stations with powers of 10 kW or less. For relatively short distances, all the transmitter meters and controls could be extended using multiple conductors.

From 1974 to 1995, the FCC specifically authorized extension metering and set various restrictions on such systems. Since extension metering systems were not required to have extended control, the operator was required to be within 30.5 meters of the transmitter, allowing quick access to the controls. At this point, it would be perfectly permissible to run extension metering and control over any desired distance. However, it would not be economical over large distances due to the large number of conductors required.

Transmitter control manufacturers immediately recognized that an operator only views one parameter at a time, and only makes one adjustment at a time. It was thus possible to have a single control circuit and a single telemetry circuit. The control circuit could select which parameter would be viewed and adjusted. Early systems utilized a metallic pair (a telephone company provided cable pair with DC continuity) for control and another for metering. Control consisted of stepping through channels, resetting to the first channel, and raising or lowering a parameter. Raising a parameter might directly affect that parameter (raising transmitter power while viewing antenna current), or perform some function that (ideally) is indicated on the telemetry channel (such as switching between day and night power while observing final amplifier DC input current).

This "channel-raise/lower" user interface continues as the most common interface. Early systems used a telephone dial or other circuitry to generate step and reset pulses to select a channel. Telemetry was read on a single analog meter (though some systems demultiplexed the readings out to several meters at the control point). In the 1970s, the analog meter was replaced with a digital display. Status displays were also added to show on-off conditions at the transmitter site (such as fault indicators, pattern select, etc.).

In 1984, the FCC modified the rules to permit continued operation on loss of transmitter control.

In 1984, the FCC modified the rules to permit continued operation on loss of transmitter control (though only three hours operation on loss of telemetry were permitted). In this amendment to the rules [49 FR 47608], the commission dropped the "fail-safe" requirement that transmissions cease immediately on interruption of the control circuit. This allowed the use of non-continuous control circuits, and the era of dial-up transmitter control arrived. The familiar "channel-raise/lower" user interface remained, though the telephone dial was replaced with a TouchTone keypad, and the meter or display was replaced with synthesized or recorded voice. The "channel-raise/lower" user interface continues to serve us well almost 50 years after its introduction.

Full-screen display

When a large number of parameters are to be displayed, a "full-screen display" (typically on a CRT monitor or display) is more user friendly than a single channel display. Systems with CRT displays were introduced in the 1980s. The display typically included a channel number (a throwback to channel-raise/lower), a label (such as Icp for

See CONTROL, page 30 ▶

AM Allocations Explained

▶ FEEDLINE, continued from page 14

able to provide large areas with service, both day and night. Directional antennas were often required for nighttime operation to protect the Class I station's skywave service area.

There were several sub-classes of the Class II designation, including the Class II-D (now simply "Class D"), which were the daytime-only stations operating on clear channels. There was a special subclass, Class II-A, on 12 of the 24 domestic clear channels, which were entitled to more nighttime protection than other Class II stations.

'Regionals'

Class III stations (also part of today's "Class B" designation) operated on 41 "regional channels" with 5 kW maximum. These stations were designed to serve a smaller area than Class I stations, but more than simply a local area. Many "regionals" operated with 5 kW full time, but some had to reduce power at night to protect co-channel stations.

There were not very many Class III stations that operated nondirectionally; most of them used a directional array at night, and many did so during the day as well.

Class IV stations (today "Class C") operated on six "local" channels, originally with 250 watts. These "locals" were designed to serve smaller communities than the "regionals," "clears" and most Class II stations. At some point, the FCC allowed all Class IV stations to increase power to 1 kW full time without regard to co-channel interference. As a result, while field strengths increased within the Class IV stations' service areas, so did the interference, so little was gained. Class IV stations typically had very small night coverage areas because of the high interference.

Today, as I have mentioned above, AM allocations are: Class A, with 50 kW unlimited-time operation on clear channels; Class B, with up to 50 kW unlimited-time operation on clear and regional channels; Class C, with 250 W to 1 kW unlimited-time operation on local channels; and Class D, with up to 50 kW daytime-only operation on clear and regional channels.

The power and directional pattern of any given station are determined by many factors, including frequency, proximity to co- and adjacent-channel stations, ground conductivity and even nighttime interference levels at co- and adjacent-channel stations.

The reason that a particular station is licensed with a particular power level, directional pattern and the like can generally be determined by considering its history. For example, a station may operate on 1360 kHz with 5 kW day and 1 kW night. From that information alone, one could conclude that the 5 kW daytime power came from the old Class III 5 kW limit (1360 is a regional channel).

By looking at co- and adjacent-channels day and night, it would not be too difficult to determine where the significant protections are and whether any improvement can be made to the station's facilities. In some cases, a significant power increase may be possible (the old Class III 5 kW limit is now 50 kW), but in others, the new first-adjacent channel protection requirements may have the current power and pattern locked in (grandfathered).

Everyone who works in radio
is invited to sit in and pick up on some of these basics.

There are several significant contour values of which anyone working in AM radio should be aware. These contour values represent signal strength levels that define the limits of coverage or interference protection zones.

For all station classes except Class A, the 0.5 mV/m groundwave contour is protected from interference from other stations during daytime. This is the signal contour most often shown on station coverage maps and it represents the signal level that should be listenable in most rural locations.

It should be noted, however, that the entire area within a station's 0.5 mV/m contour, although entitled to protection from interference, may not be interference-free. Over the years, the FCC rules have changed several times. Additionally, special waivers have been granted over the years, and both of these and other factors may have resulted in different heights of encroachment. Whatever interference now exists within this contour is grandfathered.

Perhaps more important from a sales/management perspective, that noise may limit a station's coverage to a smaller area than the 0.5 mV/m groundwave contour would otherwise indicate.

Critical hours

For Class A stations, the 0.1 mV/m groundwave contour is protected from other stations during daytime. This daytime protection affects many Class B stations during the "critical hours," or two hours after local sunrise and two hours before local sunset, when some skywave propagation is beginning to take place. These Class B stations may have to reduce power or use a different directional pattern during critical hours to ensure that the skywave signal from their stations does not interfere with the 0.1 mV/m groundwave contour of the co-channel Class A station.

Again, in many cases, the 0.1 mV/m daytime groundwave contour of a Class A station will likely not be listenable in many locations because of manmade and natural noise.

For all classes of stations, the 5 mV/m daytime groundwave contour is considered "city-grade," or the signal level necessary to overcome manmade noise sources in an urban environment. An even higher field strength may be needed in many locations because of high noise levels, but in relatively quiet locations, a lower field strength may suffice. A signal with a field strength of 5 mV/m or more will generally allow acceptable reception on mobile, portable and fixed receivers within homes, offices and urban canyons.

As discussed above, Class A stations are protected at night to the 0.5 mV/m 50-percent skywave contour. This contour area will vary greatly with changing ionospheric conditions, but a fixed distance for allocation purposes can be computed using the formula in the FCC's rules.

For Class B stations, the nighttime interference-free contour (sometimes called the "night limit" or "RSS night limit") determines the effective coverage area. This contour is determined on a case-by-case basis and varies widely in value from station to station.

Generally speaking, the older the station, the lower the nighttime interference-contour (and thus the larger the nighttime coverage area) will be. Stations that came on the air first were entitled to protection from stations that came on the air later. This is not always the case, but it is a general rule that applies in most cases. This is why the really old Class B stations tend to have better coverage.

A couple of old Class B stations that my company owns have night limits of less than 3 mV/m. These stations have very large nighttime coverage areas, in some cases equaling the daytime city-grade coverage. Others have night limits in excess of 20 mV/m. The nighttime coverage of these stations is much smaller than the daytime coverage.

One question that frequently comes up in discussions of nighttime coverage has to do with why in some cases, when the power remains the same, does the coverage shrink so much at night? The answer is simple: skywave interference.

During the day, there is no skywave interference, but at night, distant signals propagate and cause interference so that a much stronger signal is required to overcome them. All other things being equal, it is better to have less power and less interference than more power and more interference. Stations that have to reduce power at night to protect other stations and that have high levels of nighttime interference suffer a double whammy.

This wraps up the discussion of AM-specific issues in this special series on radio basics. If there are specific questions, address them to me at *cbceng@compuserve.com* and I will do my best to see that they are answered.

In the next part of this series, we will begin dealing with FM issues.

■■■

Cris Alexander is director of engineering for Crawford Broadcasting and a regular contributor to ***Radio World****.*

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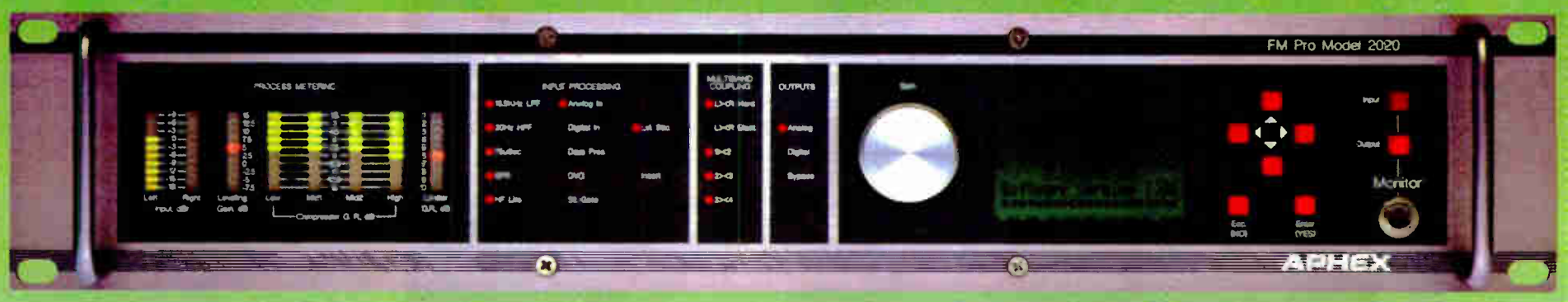

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History of Transmitter Control

▶ CONTROL, continued from page 27

common point current), the parameter value and the units (such as A for Ampere).

Status was similarly displayed with a channel, description, and status (sometimes fixed, sometimes different strings were allowed for true and false status).

Display characteristics

The format of the display was fixed by the manufacturer of the system. Any variable data (such as labels and units) were supplied through filling in forms. While relatively simple to configure, these systems lacked flexibility.

Early transmitter control systems had a calibration pot for each channel. No other "programming" of the system was required. As displays got fancier, it was necessary to describe to the system how the display was to appear. Besides labels, parameter, and units, display programming might include limit checking so the display puts up messages or changes color should a parameter be out of tolerance.

Some parameters are calculated based on measured parameters. For example, indirect power is calculated based on final amplifier voltage and current. Directional array loop current ratios are calculated from antenna monitor loop current indications (though some monitors output the ratios directly).

Description of the log format and describing what conditions cause a log entry to be generated can be a challenge.

Some parameters are not linearly related to the sample voltage, thus requiring calculation to linearize the sample (such as squaring for power indicators). Describing these display characteristics to the system can, again, take the form of tables of data, or could take the form of a programming language. Tables are generally easier to use. However, once a manufacturer allows the data tables to be used to fully describe widely diverse stations, they pretty much end up with a programming language.

Along with displaying transmitter data, many systems "log" transmitter data, either to a printer or to disk. Description of the log format and describing what conditions cause a log entry to be generated can be a challenge.

Finally, transmitter control systems have moved well beyond being telemetry and control systems, which merely extend the metering and control. These systems are "taking control." Transmitter control systems are handling routine power adjustments, day/night power/pattern changes, transmitter swaps on failure of the main transmitter, and many other functions previously performed by an operator. Once again, transmitter control manufacturers must provide an easy-to-program system while not limiting the capabilities.

Embedded Web servers

I see future transmitter control systems as "embedded Web servers." These servers will provide transmitter data in response to requests from "browsers." The servers may also "push" data to the browser when an important change occurs. User programming of screen displays and log formats will be done in HTML. This allows the use of fancy color and graphics to make the system operation more clear. A "home page" might show all the transmitter sites operated by a licensee. A site with a problem could flash red. Clicking on any site brings up another page showing a block diagram of the site along with certain important parameters and controls. Clicking on a particular piece of equipment brings up detailed information on that piece of equipment. Controls can be handled through CGI (Common Gateway Interface) scripts. Clicking a link sends a command to the CGI to perform some function at the site.

Back where we started

Transmitter control started with the operator viewing all the transmitter parameters simultaneously (early arguments against authorizing remote control of transmitters stated that it was also necessary for the operator to smell the transmitter to sense impending problems). With full-color programmable screens on transmitter telemetry and control systems, the operator once again can view all transmitter parameters simultaneously, just like being there, except for the smell part.

■■■

Harold Hallikainen is president of Hallikainen & Friends. He can be reached at (805) 541-0201 (voice/fax) or via e-mail at harold@hallikainen.com

Hallikainen currently spends his time writing, designing products for the broadcast and entertainment industries, contra dancing, teaching, and yachting (in his new El Toro).

GM Journal

Radio World | Resource for Business, Programming & Sales | June 23, 1999

Webcasting: A World Wide Wait? Page 39

FOCUS ON TRAFFIC & BILLING

Traffic Gets High-Tech Boost

Ted Nahil

Remember the days when the traffic manager had a large board hanging on the wall with color-coded pins sticking in it? If you've been in radio long enough, you know that the color of the pins represented the client and the pin head size represented the length of the spot.

Traffic and billing has come a long way.

Anyone who attended this year's NAB99 convention and was shopping for a business system already knows where the future of these systems lies: on the Internet.

High-power packages

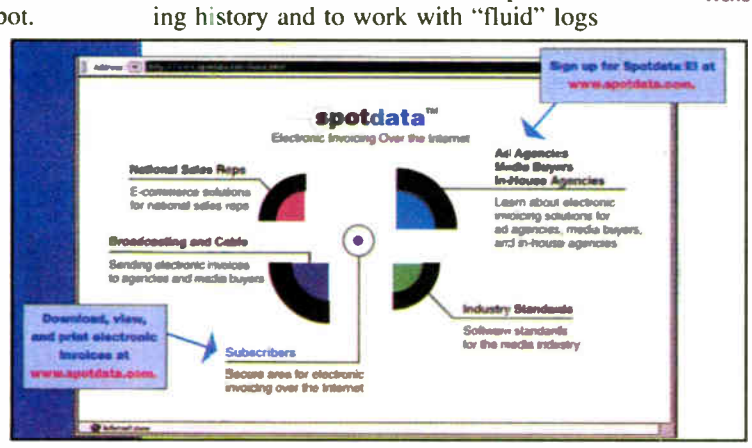
The lower cost of powerful computers, easy access to the Net and the creation of private company networks have combined to make the information used by traffic systems accessible from almost anywhere in the world, instantaneously.

The future of storage and access rights is on the Internet.

Large groups now have the ability to benefit from central databases and from quick, secure access to that data.

Experts say this trend will become more prevalent as companies move to high-powered, 32-bit networkable traffic and billing software packages that are available to radio station operators.

Traffic and billing software, typically sold by the vendor directly to the end user, has evolved into a powerful tool for the sales department. The ability to have access to avails, to review client purchasing history and to work with "fluid" logs mean sales departments can work with current data to maximize their avail load and ultimately their revenue.



The Spotdata System from Columbine JDS

Sales managers are looking for more power in the reporting features of software packages. They seek software that is powerful enough to allow them to isolate significant trends, generate customized reports, have remote access and make their data available at the corporate level. Managers also want to make data available to ad agencies so they can place buys, obtain affidavit information and reconcile from remote locations.

Gigabytes of data

Most facilities already have local-area networks in place. This technology is almost a requirement, given today's digital automation systems. Wide-area network implementation for traffic is relatively new, although many larger corporations have used WANs to move financial data for years.

COLUMBINE JDS
World Wide Media Solutions

The real trend in these systems is centralized data storage with access from the Net. The suppliers that have adopted this approach say they have implemented the security measures necessary to protect a station's data while allowing access to it by authorized users.

Internet access means a change in the user interface. Many companies are moving to a browser-type interface, which allows traffic managers, sales managers and ad agencies to use a familiar tool to access gigabytes of information.

Jackie Parker, senior marketing analyst for supplier Columbine/JDS, said, "A browser-based traffic and billing system lets a radio group consolidate operations by running several stations on one centralized CPU via the Internet, a LAN or a WAN.

"In the ideal system," she said, "information management activities and day-to-day station operations are integrated, and the architecture should ensure that the technology will keep pace with the station needs for fast, efficient and economical software."

The challenge for vendors is that this new technology means that they must take a "ground-up" approach in producing new software for the industry.

See SPECIAL FOCUS, page 47 ▶

NEWS MAKER

Norjean: It's About Content

The frenetic growth of the Internet has brought an enthusiastic crop of entrepreneurs who offer their services to radio managers and hold out the promise of huge reward.

Among the most outspoken — and radio-savvy — of these business people is Laurence W. Norjean.

Laurence W. Norjean

Norjean is known in radio thanks to his work at the Radio Advertising Bureau and Metromedia Radio, among others. He is president and COO of InXsys Broadcast Networks, which seeks to be "the total one-stop source and solution for traditional media in its transfer to the Internet with advanced multimedia classifieds, auction, e-commerce, personals and content systems and programming."

The offerings of the company include The ClassiFIND Network, Datechannel.com, RadioDate, BuySellBid.com, Micro-Sites and Micro-Malls. Its strategy is to integrate these offerings, and to "private-brand" them under the logo of a media partner, meaning your radio station or other media outlet.

InXsys says it has more than 1,600

See NORJEAN, page 44 ▶

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PROMO POWER

Take Radio Out to the Movies

Mark Lapidus

Radio went berserk over the latest incarnation of "Star Wars" last month. In many markets, five or more stations were doing some sort of contest, stunt or promotion at the same time, even though George Lucas made it clear to all of us that he didn't want to "cheapen" his movie with our pre-promotional antics.

The Force

As an industry, we ignored him and figured out clever ways to show our audience that we felt The Force as much as they did. I loved it: program and marketing directors were aware that movies, especially big ones, are important — sometimes vital — to our audience.

You're in the entertainment business and you must constantly look for ways to entertain both on and off the air.

But most of the time, radio stations choose to ignore the popularity of films.

If you doubt the weekly significance of movies to your audience, open your eyes! Look at the weekly revenue and attendance figures. Take a gander at the lines at your local video rental joint and check out the number of movie channels and pay-per-view options on your local system.

Movies provide terrific promotional opportunities for radio stations but are almost always ignored even though new ones are released weekly.

This is especially silly since, regardless of your target demo, there are several movies per month that your audience will find appealing — either on their first runs in the theater, on pay-per-view or even on video. Another appealing element is that movie promotions on radio are cheap.

If done properly, they're either free, or you can make money off movie promotions. Worst-case scenario is having to purchase tickets. But even when you fork over the green, you win. Look at the price of a movie ticket as compared to a concert ticket. No contest. You get a lot more bang for the buck.

Let's look at a few quickie movie-promotional opportunities that allow you to have some fun, make money and perhaps squeeze a little extra time spent listening out of your audience.

Movie Idea #1: Movie Ticket Raids. Buy out a movie theater for a flick that fits your audience. No, it doesn't have to be the premiere. Radio movie promotions are even better with movies that are proven hits.

Let's say the cost is $7 a ticket and the theater holds 200 people. The total cost is $1,400. The sales department takes the "WXXX Special Showing of Titanic VII" and sells three client locations for $800 a pop.

Movies provide terrific promotional opportunities for radio stations.

For their $800, the client gets on-air liners promoting a van appearance where a promotion person shows up for an hour for an announced "movie ticket raid."

Don't use any spot inventory. During the 60 minutes you're there, the station will give out 50 tickets. People come by, register and every 15 minutes you do a drawing for six pairs of tickets.

People must be present to win, which keeps traffic in the store. The station makes a thousand bucks and you have another 25 pairs to give away on the air. You may wish to supplement this concept with movie soundtrack giveaways provided by a local CD retailer. (I got a million of 'em.)

More movie ideas

Movie Idea #2: Gift with purchase. Do this as a 10-second tag on spots where you marry a client to the movie with you.

Don't use liners or spot inventory. Instead, have them use their regular schedule or a new one with that tag and charge 'em for it!

The cue would go something like this: "The first 100 people who get a large pizza today from Joe's Pizza get a pair of movie tickets to see the WXXX presentation of 'Dracula VI.'"

Movie Idea #3: Do movie ticket weekends where you take whatever

See PROMO, page 49 ▶

Internet Radio: Still in Diapers

Ken R.

Remember when Arlo Guthrie sang about Alice's Restaurant? You could get anything you want.

Internet radio stations offer a similarly varied menu. At one extreme you'll find entire radio stations that exist solely on the Internet, while at the other end you can find traditional stations that simply run their broadcast signals through their Web pages and call it a day.

Internet Radio Daer (*www.daer.com*) is a station with an air staff and sales department, as well as an extensive jingle package (created by Ken R. Inc., coincidentally). Its studios are located in the bedroom of an energetic, red-headed 15-year-old near Cleveland.

I spoke with Daniel Anstandig, program director of Internet Radio Daer. He's still in school and too young to drive, but that hasn't stopped him from creating a total radio universe, combining traditional radio with graphics, audience/DJ interaction and the station's Web site.

With a loan from his grandfather, he hired personalities, such as Nancy After Dark, Tony Thomas and Kevin Coan, and began broadcasting. He partnered with Lakenet Inc. of Cleveland to staff a sales department. With experience gleaned at WJCU(FM) on the campus of John Carroll University in University Heights, Ohio, and with the help of an engineering friend, Daniel built an all-digital studio. If the number of "hits" he's getting daily is any indication, Internet Radio Daer is a big success.

I was contacted by Jack Radisch and his partners at Flashback Forest Hills, named after their town in New York. These gentlemen wanted to set up an Internet radio station that would serve their local community. After doing the research, they thought they would be better able to make money by waiting for the FCC's approval of a low-power license.

As **RW** readers know, the commission has received tremendous heat from owners of traditional AM and FM stations about this proposal, so Flashback Forest Hills may have to wait to be heard.

Radisch has already been in contact with local advertisers. A signal in that area would provide hundreds of thousands of potential listeners, even with a low-power transmitter. But Radisch is aware of the revenue opportunities of Web advertising as well, and the possibilities of combining programs through barter.

The new combo

Dave Richards at WOON(AM) in Woonsocket, R.I., has taken an ambitious approach to the Internet.

His small stand-alone AM in the shadow of Boston offers audio and lots of video on his Web page, O-N Worldwide. What's interesting is that his Web audio only simulcasts his AM station one-third of the time.

Check out *www.onworldwide.com* and you may see a weather feed from its live "Web cam," perched 75 feet above the studio. (Its weathercaster has been with the station since 1953 and people around the world view the Woonsocket weather daily.)

O-N Worldwide has featured live pictures of the air personalities in the studio, a condemned downtown building imploding in real-time, a Kiwanas live auction, the local PBS auction and those ever-popular city council meetings. Dave is a man who believes in super-serving his small community.

Richards said there are many opportunities for advertisers on his Web site — they can participate in banners, audio commercials or custom-produced video spots. One client (a clock repair shop) puts its entire catalog online through O-N Worldwide.

A number of enterprising young guys have developed "tribute" sites to classic '60s radio stations. These include WFIL(AM) (www.famous56.com), and *http://radioville.mainpage.net* which will take you back to the illustrious pasts of KQV, WLS, CHUM and other top-40 legends.

Most of these are not "commercial" operations but are done largely as labors of love. These sites are not broadcast live, but feature downloaded audio.

Others are definitely money-making enterprises and have entire live sites dedicated to other aspects of radio, such as *www.comedyradio.com*

Then there's the case of Richard Kaufman, or "Ricky the K," proprietor of *www.60sradio.com*. This Plano, Texas-based ex-DJ provides a subscription service for authentic shows reminiscent of the glory days of WABC(AM) in New York. After paying a monthly fee, the listener can attend to hours and hours of oldies not heard elsewhere, along with jingles, screaming, drop-ins, massive compression and reverb and other attributes of the old days of top 40. Kaufman records his shows live and makes them available at his site. It's truly a hybrid: a radio station/Web site/nostalgia factory.

It's my belief that the Internet is where commercial TV was in 1947. It's technologically crude, awkward to view in some cases, offers less-than-state-of-the-art audio and no one is making much money. With time, however, this new upstart medium, much like its matured cousin television, might take over the world.

■■■

Ken R. is a frequent contributor to ***Studio Sessions****.*

RW *welcomes other points of view.*

Daniel

Anstandig is too young to drive, but that hasn't stopped him from creating a total radio universe.

VOA Names Whitworth Acting Director

Myrna R. Whitworth has been appointed acting director of the Voice of America. Whitworth has served as VOA's program director since 1998. She first joined the organization in 1965.

In her new position, Whitworth will manage the 1,100-person agency.

VOA broadcasts to overseas audiences in 53 languages.

Harris Promotes Maines

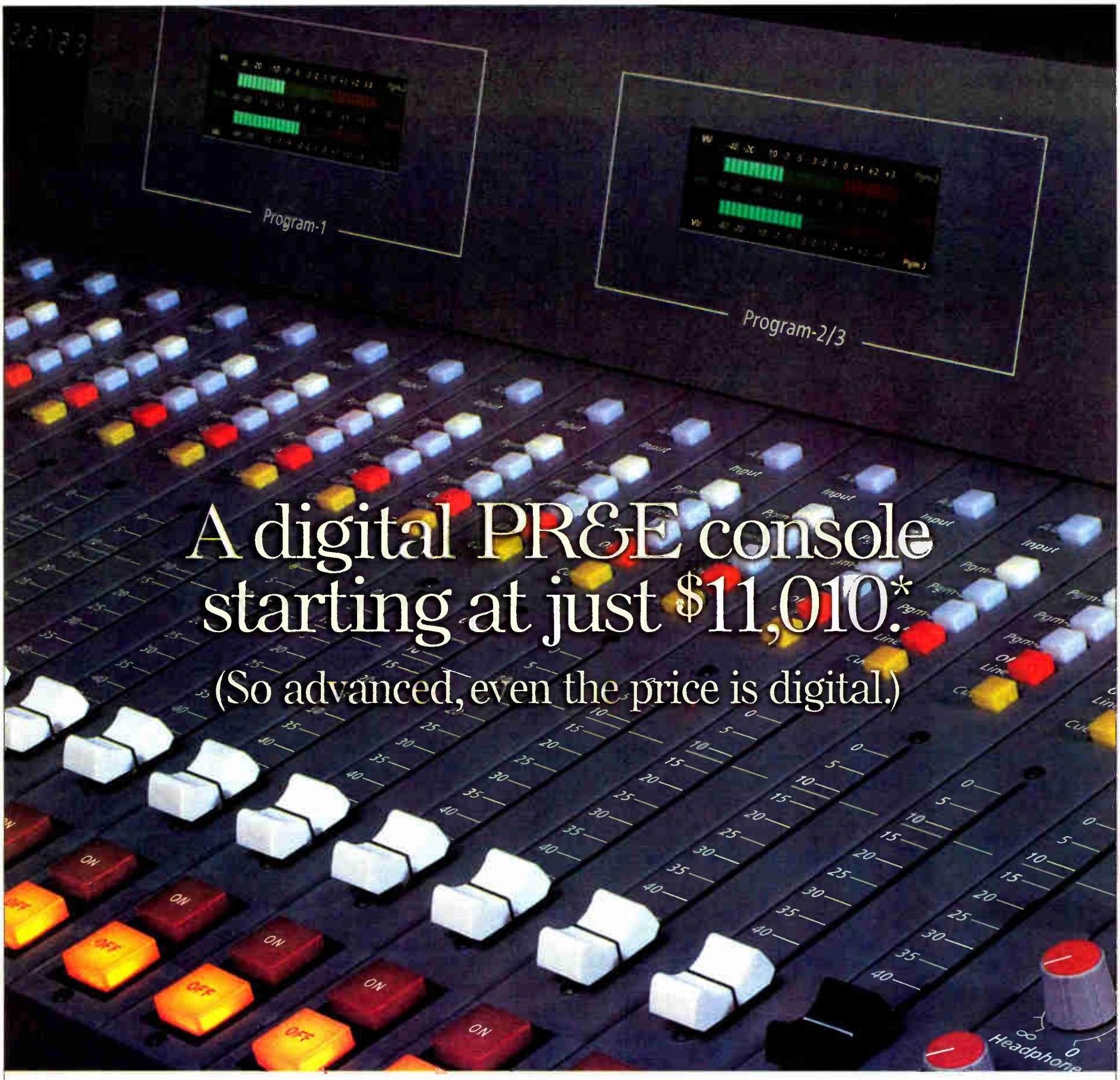
Harris Corp. has promoted Chuck Maines to the position of radio district sales manager. Maines will service Alabama, Louisiana, Mississippi, Tennessee and the northern panhandle of Florida.

Maines is a 20-year broadcast industry veteran. He began his career with Allied Broadcast in 1978 when he joined broadcast sales. In 1987 he was promoted to the senior sales staff of Harris-Allied. Maines has also served in used equipment sales and as the first radio group sales manager.

Backus Joins ENCO

Don Backus has joined ENCO Systems Inc. as sales manager. Backus previously served as the digital systems manager at Audio Broadcast Group.

In his new position at ENCO, Backus will be responsible for interfacing with both customers and ENCO's distribution network, as well as participating in the definition of new features and functionality for the DAD product line.



A digital PR&E console starting at just $11,010.*

(So advanced, even the price is digital.)

Airwave™ Digital. Three program busses. Two mix-minuses. One remarkable board.

$11,010. Now there's a string of binary code anyone can understand. So if you're budgeting to go digital—and running tight on budget—take a close look at a 12 or 20 input Airwave Digital on-air console. Its familiar layout flattens the digital learning curve. And with 3 program busses, talent can be playing Madonna, time shifting a Dr. Laura feed, and laying down voice tracks—all at the same time. So you can squeeze more production out of your payroll.

Airwave's flexible, too. One or two telco modules and B-side logic are among a host of available options. And unlike some digital consoles, you can reconfigure input modules from analog to digital—or vice versa—at your studio, just by changing a card.

Best of all, Airwave Digital comes with that "no-need-to-rationalize-to-anyone" PR&E quality. Want to know more? Call 760-438-3911, visit www.pre.com or email sales@pre.com.

PACIFIC RESEARCH & ENGINEERING

*12 input mainframe, standard clock/timer, monitor and output modules, standard 5-mic preamp module, 3 analog inputs, 4 digital inputs and one telephone input/output module.

Circle (77) On Reader Service Card

Dot-Dot-Dot and All That Stuff

Alan Haber

Like all of the great hard-hitting, fedora-wearing, opinionated-to-a-fault columnists who came before me, I am dedicated to telling you about stuff. Okay, those other guys probably didn't call their stuff *stuff*, but this is 1999 and how about those Mets, anyway?

Yeah, I'm buried up to *here* in stuff. It's *every*where. And it's spring, so here we go with some intellectual spring cleaning, brought to you in the spirit of communication and edification — some stuff strung together by the writer's best friend (well, one of them, anyway), the dot-dot-dot. (Yes, I know it's really called an ellipsis, but who's got time for such $5 words when there's *stuff* to be passed on to you, and you know who you are.)

Dot-dot-dot. Have you played with the RealGuide Explorer Bar that you can place on the bottom of the Internet Explorer 5 screen, just above the regular old Windows 98 task bar? Do you even have any idea of what I've just asked you?

Exactly. Imagine what Joe Family Guy is thinking reading this. He's thinking the following: "What explorer bar, and just what *is* an explorer bar, anyway? And can I have a candy bar?"

Well, I know what an explorer bar is and so I thought I'd take this one for a spin. I'm not sure I like it just yet. But maybe I do. You can search for specific audio and video sites. You can choose a format and then execute a mouse click, which takes you to Real's RealGuide, where you can check out a list of stations available to listen to. Which is pretty great, I must admit. But I'm so used to going to *www.webradio.com* to link to stations ... I dunno. And it takes up so much room on the desktop. Maybe this is a good thing after all. What do *you* think?

Now Microsoft, never a company to shy away from competition, has allowed IE users to integrate a task bar of its own into its browser experience, only this doodad gets situated just above the main part of the IE screen and it is blessedly smaller than Real's. It's not bad — you can link to a radio station guide, from which you can search for stations by format, etc. You can view a pull-down menu of recent stations you've listened to, click on any one of them, and fire it up for your listening, dancing and romancing pleasure.

Dot-dot-dot. Are you as tired as I am of hearing radio people say that they don't know if there is any money to be made on the Internet? How do you know, I ask them, if you don't try?

Dot-dot-dot. Are you as tired as I am of reading columnists who think they know more than everybody else? I know *I* am. Hey, we're *all* making this up as we go along — it's just that us columnists are maybe a little too deep into this stuff to avoid telling you how we feel about stuff (stuff in general, of course). And we *do* know better than you. At least, that's what we tell ourselves.

Dot-dot-dot. So stop being a naysayer, if that's you who is telling everybody in sight that there isn't any money to be made on the Internet. There is. This I know. Maybe not today, but soon. I can feel it in my bones, and it's not my arthritis. Go out and make some money, will you? Make us all *proud.*

Dot-dot-dot. Are you as tired as I am of hearing your radio brothers and sisters complain about the quality of Internet audio? Are you as tired as I am of hearing Internet audio compared to substandard shortwave?

Enough already, and that means *you.* Please take a deep breath and ask yourself this question: "Isn't it amazing that you can listen to audio over the Internet?" And remember what RealAudio 1.0 sounded like. We've come a long way in a very short period of time. We're getting there — where everybody wants to be — and we don't have to trip over ourselves along the way.

Dot-dot-dot. And that's all she wrote, folks. Well, for this go around, anyway. You might be detecting a good-bye speech coming. I mean, isn't that what you do when you're about to abdicate your throne?

Well, indeed, a good-bye speech *is* coming. I'm getting ready to wrap up my tenure as your faithful Internet observer. You can read all about it in the next installment of Cyberhouse.

I mean, I've got to stop typing now. I've run out of dot-dot-dots.

■■■

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

SWAG From Vegas

Sure, the NAB show was two months ago. But the most important stuff on the convention floor has yet to be covered: SWAG!

What's the fun of a trade convention without some goodies to show for it? In between sessions and story research at NAB99, **RW** editors collected some fun SWAG — Stuff We All Got.

The Intel Spaceman, Harris Digi-Dog and Chattering Teeth from Yack!

MediScope provided attendees with a first-aid kit.

Squishy Stuff: A TV from Tektronix, a Lightbulb from Omnibus, a Baseball from Princeton Video Image, and a Shiatsu Ball from ECI Telcom

A Mouse Pad from Yamaha DSP Factory and a Neato-Torpedo Ruler from Ericksson

A CD Holder from Soundscape, a Wheel-O from Orban, and a Bendy Thing(?!) from Gentner

These purple hi-tops (with apologizes to Chuck Taylor) from Wam!Net were a big hit at the show.

Photos by Alan R. Peterson

Webcasting: A World Wide Wait?

James Careless

How can Web site operators — radio broadcasters among them — get enough performance out of the Web in order to deliver uninterrupted streaming of audio, video and text?

This topic was tackled at the recent "Satellite 99," an annual gathering of satellite manufacturers and service providers. This year the conference was held in Washington, D.C.

Specifically, the pitfalls and possibilities of Webcasting hit the table during the session "Data Broadcasting: New Applications for a New Era."

During the session, the snail-like data rates of today's Internet were described starkly by Gail Fell, PanAmSat's senior director of new media. According to Fell, "the average backbone speeds are no more than 40 to 60 kbps."

At a snail's pace

In other words, data is moving along the Net's main trunk lines at speeds that rarely exceed the capacity of a 56 kbps telephone modem, let alone rates that test the capacity of a multi-Megabit cable modem.

Put another way, it's enough capacity sufficient to deliver RealAudio with reasonable stereo quality, but certainly not enough for streamed video or multimedia.

This limitation, which stems from the Net's current "one user, one channel" unicast structure, results in real problems during major Web events. Citing the online release of the Ken Starr report, Fell said, "Everybody knew it was coming — everyone kept building out their backbone — and yet Keynote Systems estimated that 50 percent of people who tried to access that report couldn't get on."

Another recent example was the February '99 Victoria's Secret online fashion show. As with the Starr report, many surfers who tried to get on simply couldn't. Others reached the site, but were rewarded with a blank video window, rather than the jerky motions of the live Webcast.

Of course, this problem could have been solved to some extent using IP multicasting. In its simplest terms, IP multicasting mimics the "one to many" structure of over-the-air broadcasting. Thus, it uses far less bandwidth, and can access thousands of people with a single stream, rather than just one.

World Wide Wait

However, the cost of installing IP multicasting equipment has kept many Internet Service Providers from doing so, Fell said. Hence the current backlog, and the backbone's slow data rates. This said, the session's speakers did have some solutions to offer.

Being that this was Satellite 99, their major emphasis was on bypassing terrestrial bottlenecks using satellites. By making such direct, high-speed connections, it's possible to avoid what Ron Clifton, president and CEO of International Datacasting Corp., terms the "World Wide Wait."

However, this doesn't mean that satellite delivery is a solution for speed-strapped broadcasters. In fact, when asked if radio stations should simply uplink their signals directly to ISPs, Media4 president and CEO Jim Stratigos said no.

The reason? There aren't enough ISPs equipped with satellite dishes to receive such signals, he said. However, should this change, "I think that's a viable business (solution)," Stratigos said. Of course, "this is then a presumption that the ISP either has access to a cable modem plant, or to a DSL (high-speed telephone) plant," he said.

If they do, and their subscribers have access to high-speed modems as well, "then I think delivering broadband content though ISPs over satellite multicast networks is a very viable business opportunity. It takes the Victoria's Secret shows off the Internet backbone, and off the routers, and off the bottlenecks and congestion."

Beat bandwidth woes

So what are Web site operators to do in the meantime?

One solution is to arrange direct feeds to high-speed Internet networks, such as cable's "@Home." In this way, radio stations can at least have some listeners receiving them at a decent speed.

In addition, by promoting such high-speed ISPs, such stations might be able to expand the number of households equipped with broadband modems. This, in turn, will increase the possibilities not just for delivering multimedia Web content, but selling higher-priced advertising on radio Web sites as well.

As for reaching the rest of the world's Web surfers? The Web's experience with ongoing bandwidth woes means that the best Web sites are simple Web sites.

This doesn't mean that stations shouldn't offer RealAudio and other streamed formats — even now it's a major draw — but they should try to keep the rest of their content as low bandwidth as possible. In this way, radio stations will improve their chances of squeezing down the Net's narrow pipeline and holding onto their Web audience.

Obviously, this wasn't the best news Satellite 99 could have delivered to Webcasters. But it was realistic, and it did offer them some ways to cope with the current "World Wide Wait."

BOOK REVIEW

Underground Radio Remembered

Alan Haber

What's that old saying about the '60s? If you can remember them, you weren't there?

Ah, yes ... the magical 1960s. Arguably the best decade for popular music (especially if you grew up then), an era of drug-induced mind expansion, and an era of social change.

And an era of great radio.

But what kind? Depends on which camp you were in. If you were tuned into the fast-talking, lips-in-overdrive personalities who populated the AM dial, you were over, say, here; if you pledged allegiance to the slower, more deliberate voices who pretty much lived the music and whose consciousness might have been raised artificially, you were over *there*.

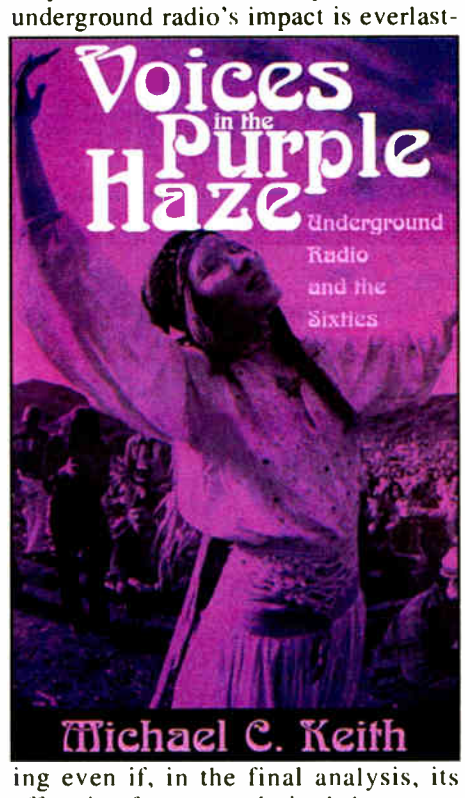
The book is an oral history of underground radio as told by more than 30 practitioners.

Michael C. Keith is a Boston College professor of communication. He has written a fascinating time capsule, "Voices in the Purple Haze: Underground Radio and the Sixties," published by Praeger.

In that world, Keith shows us, the voices of anti-top 40 radio waves ruled, and so did the music.

Flying the collective flag for peace and unity amidst social unrest and spiritual awakening, these stations and the DJs and staff who populated them were in it for the long haul.

Only the haul wasn't so long, lasting only from 1966 to the early 1970s. But underground radio's impact is everlasting even if, in the final analysis, its effect is often more desired than practiced in today's radio landscape.



All you hear today is that radio sounds the same everywhere you go — the music is the same, the voices are the same. Similarity breeds similarity.

But, of course, the reality is that there are pockets of life and innovation such as were evident in the golden days of the underground — the Internet-only eclectic oldies channel available at *www.on-air.com* freeform WFMU(FM) in East Orange, N.J., and progressive WRNR-FM in Gransonville, Md. are but a few examples.

Oral history

Essentially an oral history of underground radio as told by more than 30 of the lost art's practitioners, "Voices in the Purple Haze" weaves a fascinating tale of airwave pioneers who fought desperately to change the way of the world.

Through the words of Raechel Donahue, widow of underground radio guru Tom Donahue, former KPPC DJ Charles Laquidara, former KSAN(FM) in San Mateo, Calif., DJ Dusty Street and former WPLO Atlanta Program Director Ed Shane, among others, we relive the creative segues, the long album cuts, the carrying-the-flag-for-the-community approach of the on-air voices. But we are left wondering if the format was short-lived for a reason.

Even when you're trying to change the world, you've got to do so within some sort of structure; this is perhaps the lesson to be learned from the days of underground radio.

Even though the DJs and staff bemoaned and protested the commercial nature of their stations, it was inevitable that the dreaded commercial

See REVIEW, page 49 ▶

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

Intraplex
STL PLUS

Wondering how to handle growth? More groups have placed their trust in Intraplex than any other digital transmission solution.

The Intraplex STL PLUS T1 multiplexer transmits program audio for STLs, TSLs and intercity links, data for remote control, automation, and LANs and voice for off-premise extensions and intercom. Consolidate program audio, data and phones over one high quality digital line, with STL and TSL at any distance over any terrain. Even better, you'll be ready to handle the next station. And the next.

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Circle (61) On Reader Service Card

A challenge from the greatest critic of the OPTIMOD-FM 8200 - the guy who invented it.

ON AIR

"Version 3.0 is more than an upgrade. It can take your station's signature to the next level of competitive sound. Listen to it side by side with any audio processor in existence; then, let me know what you think. Good or bad, every e-mail sent to me will be answered by me, personally. bob@orban.com."

orban

H A Harman International Company

BOB ORBAN is known for his critical ears. In the seven years since we introduced OPTIMOD-FM 8200, perhaps no one has logged more hours listening to the best and worst in digital audio processing. Even critics have called his knack for creating louder, punchier, artifact-free sound "a gift." But make no mistake. With 30 years of experience in audio, it's Bob Orban's expertise that is written into every layer of the new Version 3.0 software. It gives you a level of audio technology that no other processor in existence can match.

NOTHING IS NEWER.

Version 3.0 software adds five new features to OPTIMOD 8200's proven digital platform. With thousands of users and millions of on-air hours to draw on, Orban's team knew exactly how to take your station's audio to the next level. 21 new presets dramatically expand your options to create a superior competitive sound. Sonic "color" controls now allow you to fine-tune tonal balance to precisely target your desired audience. Tweak the band output mix controls to add sizzle, bring vocals up front, or mellow out instrumentals. Raise the bass clipper threshold to create a more solid bass punch for urban and dance formats. Toggle Phase Rotation on/off to minimize distortion or improve music transparency. Open up the highs to effectively remove any hint of what has erroneously been called "digital grunge."

NOTHING SOUNDS BETTER.

Cut to cut, spot to spot, announcer after announcer, nothing delivers a more consistent sound than the new Version 3.0 software. Which means that hour after hour your station's signature sound remains true to your audience's preference. The dynamic, musical presentation never fatigues listeners. Every minute you're on the air, you achieve a unique sound that brands your station with a distinct presence in the market. Loud. Clean. Clear and Punchy. Side by side, no other processor delivers higher quality sound or requires fewer hassles to achieve it.

DIGITAL PROCESSING DONE RIGHT.

After seven years of listening, tweaking and non-stop critiquing, we've confirmed what you've known all along: the biggest news in FM digital processing is still OPTIMOD-FM 8200. OPTIMOD integrates perfectly into any industry-standard STL and transmitter environment—no exciter modifications or non-standard connections are

necessary. It achieves tight peak control without composite clipping that trashes subcarriers. In short, it delivers elegant, professional engineering—not junk science or marketing spin. In the words of one of the most critical ears in radio, "don't believe everything you hear." Listen for yourself.

UPGRADE NOW.

In a matter of minutes you can upgrade the 8200 to the newest, best-sounding, best-performing audio processor in radio. Call your Orban dealer for details. Visit our website for more information. And e-mail Bob to let him know what you think.

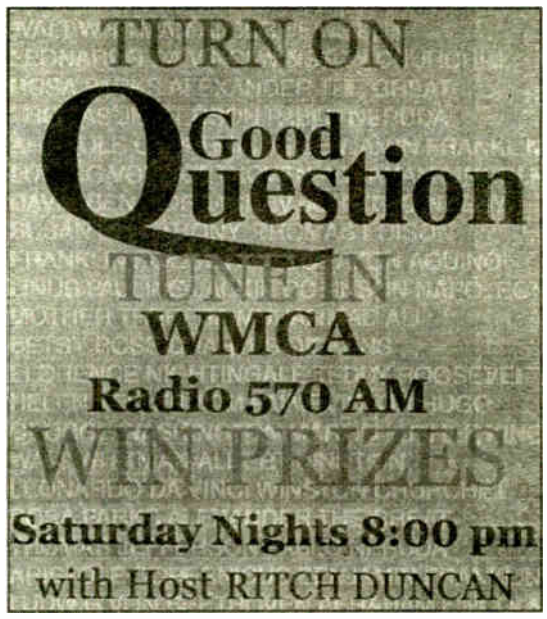
STATION SERVICES

Programs and Services for Radio Stations

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

'Good Question' Airs In New York, Miami

There's a new radio game show out there, a show that the The New York Times calls "educational and cheesy ... a quiz show that rewards its erudite listeners."



According to Philip Suraci, producer of "Good Question," the show's success is based on the idea that radio can have substance and be entertaining at the same time.

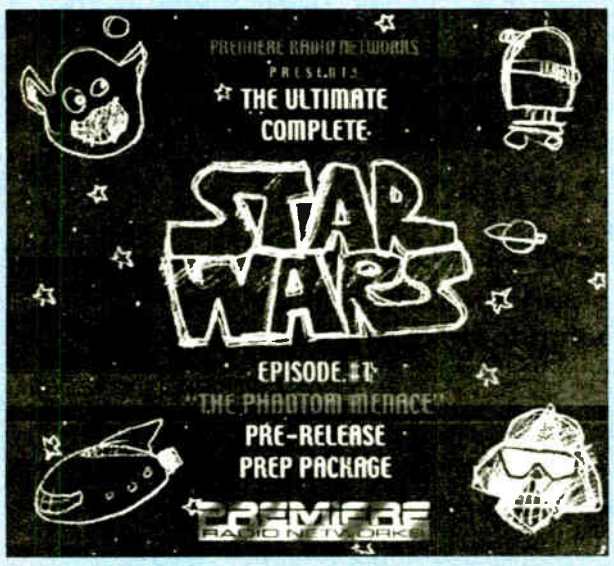
The half-hour listener call-in program, which features a mix of history and comedy, airs on WMCA(AM) in New York and on WAXY(AM) in Miami. Prizes have ranged from pizzas and massages to teeth cleanings and Torah cards.

The show is hosted by comedian Ritch Duncan and by Suraci, who calls himself Cuthbert Powell.

For more information, contact Philip Suraci in New York at (212) 228-5618, visit the show's Web site at www.netreaction.com/goodquestion *or circle* ***Reader Service 32.***

Premiere Jumps on Star Wars Bandwagon

Premiere Radio Networks is joining in the Star Wars hype with a special affiliate package called "The Ultimate Complete Star Wars." The package for episode one, "The Phantom Menace," includes exclusive interviews with featured actors from the film, Star Wars parody songs, bits, movie drops, and The Phantom Menace trailer. Although timed to the movie's release, stations can make use of the content long after, according to Premiere.



The package is available to certain morning show prep subscribers.

For more information contact Jennifer Erin Johnson in California at (818) 461-5418, send e-mail to jjohnson@premrad.com *or circle* ***Reader Service 26.***

United Stations Debuts Summer Series

United Stations Radio Networks Inc. debuted its new summer series "The Rock of the Century" on Memorial Day.

The program — hosted by afternoon-drive personality Eddie Webb from Chicago's WLUP-FM — is a weekly two-hour classic-rock showcase. "The Rock of the Century" features in-depth musical reviews of the greatest artists and album tracks in rock-and-roll history. Featured performers include the Beatles, Eric Clapton, The Who, Pink Floyd, Led Zeppelin, Bruce Springsteen and The Rolling Stones.

The 15-week series is produced by Denny Somach Productions and is available on CD on a market-exclusive, barter basis.

For affiliate information contact Rob Pierce in New York at (212) 869-1111 or circle ***Reader Service 33.***

NBG Launches Audio Prep Service

NBG Radio Network is releasing a new audio prep service for radio stations called "Tuna Helper." The program is described as an easy-to-use product for on-air personalities and was developed in association with Captive Audience Entertainment.

The package includes features and interviews from Los Angeles radio personality Charlie Tuna. Each week, service affiliates will receive "The Country News," "Tuna's Tabloids" and "Tinsel Town Trash," as well as interviews with country music's hottest stars.

The service is delivered on a weekly basis via CD through a barter-license agreement.

NBG currently produces and syndicates 32 national radio programs and products reaching more than 1,775 stations in the United States.

For more information contact Ollie Holmes in Oregon at (800) 572-4624 ext. 770, fax (503) 802-4627, visit NBG's Web site at www.nbgradio.com *or circle* ***Reader Service 36.***

InXsys Reaches Out

▶ NORJEAN, continued from page 31

radio and TV, cable company and magazine partners. It owns what it claims is the largest classified database on the Web, with more than 2 million ad listings, and predicts it will grow to more than 6 million by the end of this year. Clients include the NBC Television Network, which owns 10 percent of InXsys, and its affiliates.

The company recently announced a licensing agreement with E-vue.com, a Sarnoff corporation, involving the use of MPEG4 for the radio industry.

Norjean talked to **RW** Editor Paul J. McLane about how InXsys works, and his strong views on the risks radio managers face if they do not pursue an Internet strategy.

'Broadcasters are realizing they have an incredible asset, if they develop it. The best way to do that isn't by creating stuff, but by partnering.'

In the beginning

RW: How did InXsys get started?

Norjean: We were founded in 1996 on radio personals, on the 800 and 900 business. From the end of 1996 to mid-1997, we went from 20 stations up to 400.

We decided we wanted to be the No. 1 NTR source in the radio industry, in fact in the entire media industry, and to start merging traditional media technologies with the Internet. We went about finding the best technology, purchased it and developed it.

We bought the company ClassiFIND Network, which had been servicing hundreds of newspapers, and turned it into a radio company. It is the most advanced online search engine for classifieds. The radio industry for years has talked about how it wanted to compete with newspapers. Our goal was to give them the tools.

Consider that in 1998 the classifieds were a $19.2 billion industry, while newspaper circulation went down about 9.25 percent on a national basis. Even the New York Times lost over 6 percent of its readership, and that readership is attributed to radio's audience, those young 18-34s that make up the bulk of the Internet users.

We added Datechannel, which is now on with Jacor and is the most advanced online dating system. Considering that the focus in the radio industry is going from NTR on the telephone to NTR on the Web, it gives us both alternatives, and we can share databases between the two.

All of our systems are proprietary. We provide both audio and video streaming on all classifieds, auctions and personals.

RW: So you've moved into the auctions arena.

Norjean: It's one of the biggest trends on the Internet. We've created a system that is much the same as eBay, but we've learned a lot from their mistakes.

We've incorporated the ability to do live auctions. Radio stations can do live charity auctions, live event auctions online, plus the standard passive auctions.

We also have e-commerce shops, an integrated package for radio stations.

When people come to a Web site, they're looking for content. If that content isn't there, they're not coming back.

RW: What's your approach for building radio station business?

Norjean: Our business model was to supply a spectrum of services that could generate enormous amounts of traffic and actual revenue for the radio station, as we're doing for television stations, with NBC.

Most radio sites have been an extension of the program director. It was costing a lot of money to promote the radio station.

How many times are you going to go to a site to see what a jock looks like, what a schedule is, to see what sports is happening, or news or weather? You're just going to hear that on the air anyway. Visitors might go there for a picture or a super promotion, but you need something that's going to generate traffic, that's going to be fresh.

By supplying four, five, six different services, like classifieds, auctions, personals and shopping, you're offering a reason for people to come back again and again.

RW: You talk about value...

Norjean: It comes down to utility price. The average ad in a newspaper is about $157 a day for a 200-word ad. If you don't sell (the item), you have to put it in the next day.

In our system, you can put a 200-word ad online for $9.95 until it sells. It's not just seen in your newspaper, but can be seen and accessed coast to coast.

Radio income

RW: What's the most common question radio managers ask you? How much can they expect to make, in a real-world scenario?

Norjean: The most common question is "What's it cost us?"

The answer is nothing. How much they make depends on how much they promote it, how creative they are in their sales ability.

Real-world? They can make anywhere from a few thousand dollars a month, to $25,000 or $30,000 a month.

And you now have the franchise of that listener. Now you can offer them something to buy, trade, find, date. And because you're generating traffic on your site, you can become a mall.

You can put an entire auto dealer online, show their featured cars. If they buy a sponsorship, they click on a banner, it opens up to a microsite that shows all the cars at Bob's Ford, and plays his television or radio commercial.

You can put on a stereo store, a real estate agent, and help them sell. You can create a city employment site, and have four or five stations building a brand with it.

RW: Give us an example of a broadcaster that's doing a good job of this.

Norjean: Clear Channel is using the ClassiFINDs now, and we're rolling out the auctions. Jacor is using our personals system. We have a group deal with Jacor for RadioDate.

Radio's franchise

RW: Broadcasters have talked about using the Net for some time. Is there a risk they can get away from their core business? Instead of competing with a few owners in a limited market, now they're fighting in a pool of hundreds of thousands of content providers.

Norjean: Not at all.

You have the franchise, you have the highest media consumption of any group, and they're the same group that's on the Net.

Most stations, through consolidation, have an enormous amount of debt to pay off, and they've got to generate a lot of money.

A lot of stations are sitting in a Catch-22 situation. They're in a sold-out position in the major markets. How do they extend revenues?

Should they raise the rates? The agencies aren't going to go for that. Increase the number of units? That's risky in terms of losing audience.

But if you could extend onto the Web to take advantage of this incredible trend ...

Remember, you have 68,000 new Web users coming online in the U.S. *every day.*

RW: How would you grade the efforts of radio managers to date, in using the Internet?

Norjean: I think that, with the help of the RAB and some forward-thinking people in the business, they're realizing that this is our chance to overcome all the objections, from an advertising standpoint — first, of radio not having a picture; second, of growing the business.

If you let this medium get out of your hands, it will be a product convergence with *television.* But you have the chance of really taking advantage of this, creating a better relationship and a deeper franchise with your own audiences by getting more involved in their lives.

RW: What's your business strategy? Are

See NORJEAN, page 45 ▶

A Media Career

Laurence W. Norjean, 49, is former president and CEO of StratiComm America, a marketing and communications company, where his clients included CBS Radio, ABC Radio Network, Westwood One, Interep and other national media.

During a 20-year career in broadcasting, media marketing, sales, promotion and creative, he has worked closely with ad agencies and major Fortune 500 companies. He authored The Essential Radio Spot, a multimedia educational course in radio creative and marketing.

As a senior vice president for the Radio Advertising Bureau, he worked to increase radio advertising and authored the marketing strategy of Consumer Cycle Marketing, a scheduling strategy based on consumer product habits.

At Metromedia Radio, he was responsible for national corporate marketing and local advertising, public relations and promotion for 60 radio stations.

He is former chairman of the Legislative Committee of the Advertising Club of New York and a past member of the StarPower Committee of the Promotion Marketing Association of America. He lives in New York with his wife and three sons.

▶ NORJEAN, continued from page 44

you targeting large groups?

Norjean: I feel the Web strategy has been a purely local phenomenon for the last year and a half, which was a really terrible mistake.

Broadcasters are waking up and realizing they have an incredible asset here, if they develop it. The best way to do that is not by creating stuff, but by partnering. That's what we do: Give them the services that they promote, not in a 60- or 30-second spot, but as one-liners. It's not taking any inventory.

But you've got to give them content.

Take a look at that recent Arbitron study. Yes, listeners all want to see the jocks, but they want to buy something, they all want to know something more about the advertisers that are on the air.

Give them the services they want. They listen to you already. They believe you, you're credible. Why not extend that franchise and that brand with products and services that you can make money from, and keep your listeners from going to other people's Web sites?

***RW:** What's your take on the health of the radio business?*

Norjean: I think it's healthy as hell, but if they don't move fast and realize how important the Internet is in terms of creating a better bond, creating more avails, merchandising and marketing opportunities and generating enormous revenue ...

There was a recent Bloomberg report. By the end of 2001, the Internet will be a $1 *trillion* business. For radio, which has such a small share, there's never been a better device to increase share, to offer new services, to get back and be very entrepreneurial.

There has never been such an incredibly fast shift in consumer habits, in consumer consumption habits, even media habits.

***RW:** If radio succeeds, where is it stealing money from?*

Norjean: At RAB, we used to preach taking money away from the newspapers. With the Internet you can take money away from the newspapers, you can help your advertisers sell online at your site, you can help them get rid of non-performing inventory.

You can do vast employment systems, stream concerts, sell products from those concerts, you can find them a job.

It's almost like a Spuds McKenzie or Joe Camel scenario. Get 'em young, get 'em while they're going on the Internet. I guarantee you, they're listening to radio before they're on the Internet.

There's a move for stations to become ISPs. Bravo! That's the best way to do it.

Here's a way for radio to expand personality online, with special shows, national and local advertisers, contests online that involve them, make them interactive. You can promote events with teasers, break records. There's so many things you can do online that in no way will keep them listening to your station.

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FOCUS ON TRAFFIC & BILLING

Cluster Management Affects Traffic

Kelly Orchard

Are you grappling with cluster management and other trends that are changing the demands placed on the traffic and billing department? If so, you are not alone.

With consolidation, many group owners have concluded that they can operate a cluster of properties more efficiently by eliminating unnecessary departments, and downsizing others.

Traffic and billing is responsible for the overall proper placement of the station's paid commercials, sponsorships and promotional announcements. When this department runs smoothly and is provided with the proper tools to perform its tasks, the entire radio station can hum along quite nicely.

Poor planning in the purchase of a traffic and billing system can lead to a domino-effect disaster, as traffic directors will tell you.

Directing traffic

Consider this scenario.

An account executive for a station signs a contract for advertising on that station. It's not complicated. The broadcast order contains spots to run in specific dayparts, with 10-second sponsorships of road traffic reports. The client will use co-op dollars to help pay for the commercial air time, which means they will need affidavits of the times these commercials ran, along with a notarized script of the produced commercial.

After this order is entered into the system by the traffic director, and some of the commercials have aired, the client decides to move some of the commercials to other days, and cancel the traffic sponsorships altogether.

Accommodating the client

Of course, the station has the right to tell the client that they have to run the contract the way it was written, and some stations do. But most AEs and sales managers try to accommodate the client as best they can.

Before consolidation, owners let their traffic departments have control over this area.

— Trish Boone, Emmis

If you have done your research and have shopped traffic and billing software and services wisely, making changes like those in the example can be a smooth, uncomplicated procedure.

Such situations make an experienced traffic and billing director invaluable, and can send a less-experienced traffic director into fits of frustration.

Further, not all broadcast traffic and billing systems are alike, according to those who use them.

Certainly, the needs of the users have changed.

Before cluster management strategies were applied, a traffic director had one or two station logs to generate every day, and he or she had to perform these duties only for one manager, one program director and a small sales team. That is not the case in 1999.

Now several managers may be involved, wanting to know how much commercial inventory is left. A dozen or more account executives may be selling complicated contracts with sponsorships, non-spot orders and other non-traditional streams of revenue.

The sentiment among traffic managers who spoke to **RW** for this story is that the software industry must do a better job in keeping up with radio's changing landscape. Traffic and billing directors said their departments are often stretched to the limit in dealing with customer or advertiser needs and the abilities or shortcomings associated with their operating systems.

"I just assumed and took for granted that all programs were the same, until I used another system," said Chris Hansen of Entercom, a 14-year traffic veteran. "With non-spot and non-traditional revenue becoming a bigger part of the overall revenue stream, I've had to get creative.

"The software (suppliers) need to develop and adjust their programs for this ever-evolving area."

Commission structures for account executives fluctuate with revenue categories. This system has made the process of accounting a challenge, as stations increase the opportunities offered to advertisers.

As radio groups grow, many owners seek to standardize, to choose one system for uniformity in their management reports. When shopping for a new traffic and billing system, the buyer must know the ABCs.

User-friendly works

"Do your homework," said Janice McKenna, market controller for the CBS cluster in Sacramento, Calif. "Make sure you're buying what you need."

We were told that certain features were on the horizon. We're still waiting for them.

— Janice McKenna, CBS

One of the most important features to look for, according to traffic directors, is the inventory maintenance system, the primary function of the software. "The managing of the inventory needs to be user friendly," Hansen said.

This system should also be adaptable.

Trish Boone of Emmis, who has worked in traffic for 27 years, said different formats have different needs.

"One of our stations uses the television version of this software, because of the complicated blocks of programming," Boone said. "The sister station has different needs, so they use the radio version."

My sales manager just wants to know how many commercials we can sell today, and how far in advance.

— Chris Hansen, Entercom

What do you need?

Experienced traffic directors can get creative by manipulating product categories and revenue areas, in order to maintain their inventory and commission structures, but this often keeps them chained to their desks longer than they need to be.

Be careful that you do get what you pay for.

"Make sure what you need is currently available in what you're buying,"

See TRAFFIC, page 48 ▶

Traffic Looks to the Internet

▶ SPECIAL FOCUS, continued from page 31

Debbie Hamby, vice president of sales for Datacount, said, "Many vendors have chosen only to retrofit their products to utilize only small portions of the newly available technologies."

Simultaneous access

Companies that are rewriting their software to make it completely 32-bit, ODBC (Open Database Connectivity) compliant will have the advantage in the short term. Yet, redesigns are necessary.

Scott Slocum, western division sales manager for Computer Concepts, said, "With Windows NT-based technology, we can handle so many things simultaneously and the systems can be utilized by many different groups in a station environment."

Slocum said today's computers and software allow management personnel "to track sales and collection trends while traffic operators are entering orders, accounting people are generating invoices and statements, and the continuity director is placing new scripts into the system for smooth affidavit billing later."

Group access is an important trend. With the data stored in a central location, corporate, agency and local personnel have access to it at the same time.

For instance, Computer Concepts Visual Traffic 32 and Columbine/JDS Spotdata are available to take advantage of centralized storage and Internet or WAN access.

EXCL, based in San Jose, uses CBSI software over a WAN, allowing its stations to have logs generated at a central location and then dispersed to remote locations.

Computer Concepts users like Disney in Detroit, Perry Broadcasting in Oklahoma and Austereo in Australia use WANs for their implementations. Many larger groups are moving towards WAN and Internet access to station data.

This increased power and centralized data storage capability have come about as a result of the decreased cost of computers and related technology. A LAN is an affordable tool for almost any facility. Internet access is available to everyone at minimal cost.

In larger areas, high-speed technologies like DSL now cost in the vicinity of $30 per month for access at 256 kilobits per second. Such speed for so little cost makes full-time WAN options seem almost cost-prohibitive.

Client/server computer network systems make data storage and access extremely easy. By using database structures that are defined and implemented in a variety of common, universal database, spreadsheet and word processing programs, suppliers allow the user to import data easily and export it to off-the-shelf "office" programs.

Taking advantage of Internet access can work both ways. Clear Channel stations in Orlando, Fla., are using CBSI software, in conjunction with software from their ISP, to track Internet advertising sales. Because the data is ODBC compliant, moving and tracking it in either direction is easy.

Like other computer-based products, traffic systems are updated constantly. For instance, RDS 2000 from Register Data Systems is based on its System Six and System Seven offerings. A 32-bit Windows-based program, RDS 2000 uses the same data files as the earlier, DOS-based packages and can handle more clients, multiple printers and multiple account reps on the same order. The new System 32 will serve larger stations and markets, with data accessible via the Net.

Buying tips

With this flexibility and power, it's easy for a buyer to make mistakes when purchasing a new traffic and billing system.

Most vendors provide on-site installation and training. Experts recommend that you avoid any temptation to rush or skip the training phase. Allot enough time at the end of the installation for the vendor to train your personnel properly.

Make sure key personnel are trained on the reporting features of the software. Not only traffic and business managers will use the system. Include sales and general management personnel so they understand the capabilities of the new system.

The vendor will assist you in determining the type of network you'll need. If you have a digital audio system or a music scheduling system, make sure the traffic system you purchase can run on your existing network.

Most of the major systems can run on many different networks, but confirm that your systems are compatible. In all likelihood, your choices will be Novell or Windows NT. In some situations involving integration with a digital audio system, you may need to install a separate server to run this software. This isolates your traffic system from the network running the audio that is on the air.

Also, with today's ridiculously low prices for computer power, don't skimp on the hardware. This system will be the backbone of your station financial operations. Buy good equipment that will hold up.

Computer Concepts Corporation

Vendors still have some issues to resolve in traffic and billing software and services: Who will store the centralized data? Who will control access to it? These are among the top questions from those using the software services.

These questions will be answered by feedback from users. Remember, in the universe of computer software, traffic and billing systems essentially are huge databases. The trick comes in manipulating the data to make it useful to the station, the clients, the sales force and outside entities like agencies and corporate personnel, and storing it in such a way that people who need access to your data have it when it counts.

■■■

Ted Nahil is director of engineering for Salem Communications radio and satellite properties in Colorado.

Many vendors have chosen only to retrofit their products to utilize only small portions of the newly available technologies.

— Debbie Hamby, Datacount

Don't skimp on the hardware. This system will be the backbone of your station financial operations.

DeltaFlex TRAFFIC ENGINE III ™

DeltaFlex III is a product of CBSI.

Station Traffic Directors Speak Out

▶ TRAFFIC, continued from page 46

McKenna said.

"We were told certain features were on the horizon, and we're still waiting for them."

Evolution

Radio continues to evolve, but traffic essentially has remained the same, in the eyes of some traffic directors. They say traffic and billing can only be performed a certain way — one station at a time.

"In the automated world, software hasn't been able to keep up with the growth of clustering," Hansen said. "Each piece of revenue is designed for one station. Each station has its own set of books."

When shopping for a new traffic and billing system, the buyer must know the ABCs.

Traffic directors are unanimous on at least one thing: if you want to implement your new system successfully, include the people most affected by it.

"It's important to let the traffic director participate in the meetings when choosing a new system," Boone said. "Before consolidation, owners let their traffic departments have control over this area."

Management reports using graphs and percentages don't seem to be as important to sales managers as much as available inventory and rate management.

"This feature is a waste of time," Hansen said. "My sales manager just wants to know how many commercials we can sell today, and how far in advance."

The new media age has affected traffic and billing procedures and systems. Rapid advancements in technology make new systems tempting. Save yourself trouble later by shopping wisely and creating a specific list of needs.

■■■

Kelly Orchard is a consultant and sales executive with Entercom.

Tips From Traffic Directors

Experienced traffic managers recommend that you consider these factors when comparing systems:

1. **Speed:** The ability to get reports quickly when closing the month.

2. **Flexibility:** The ability to manipulate spots until the end of the day, which enhances the client relationship with the sales department and makes the demands of change easier for sales executives to implement.

3. **Compatibility:** Realistic compatibility with music software allows staff to manage the overall daily log.

4. **Track Record:** How long has the company been in business? How many radio users does it have? Ask each vendor for a list of stations using the product. Call several and ask them about their experiences.

5. **User-friendliness**: For example, the ability to move spots around with a simple "click and drag" feature.

6. **Clear Count**: A simple, effective inventory management program that is clearly and easily understood by all who must access and manipulate the inventory data.

Traps to avoid:

1. **Too Much or Too Little:** Be sure to purchase the power and features you need, or reasonably expect to grow into.

2. **Insufficient Control of Access:** Ask about accounting control when duplicating invoices, adding or deleting spots.

3. **Inability to Change:** Ask about the ability to change an order after it has run. Without it, the job of accommodating clients is more difficult.

4. **Inadequate Support:** Ask your supplier about service after the sale. Make sure the vendor is accessible to train your staff and answer questions *after* your station has begun to operate with the system.

Were They The Good Old Days?

▶ REVIEW, continued from page 40

cloud hanging over them turned out to be an ally, if a reluctant one. Al Wilson, an early underground radio voice, is quoted here saying that "the selling of commercials made the underground approach possible."

"Programming and sales were from Venus and Mars, respectively," said author Keith. While the underground programming people were wrapping their souls around their precious air, the salespeople were doing what salespeople do—selling time so that the programming people could continue their work. A vicious cycle? Yes, and one that continues today.

Staying afloat

"It's unfortunate," Thom O' Hair, program director in the early 1970s at KSAN, said in the book, "but hardly anybody gave any credit to the salespeople for keeping the stations afloat. In many ways, that would have to be the untold story of underground radio."

When radio big guns like Metromedia and ABC started pumping dollars into the format, the jig was effectively up. Scoop Nisker, way back when a KSAN news reporter and producer, said, "KSAN couldn't escape that basic contradiction: We were attacking the establishment while being supported by it, and worse, our rebel broadcasting was beginning to make big profits for a giant corporation."

And reaching only a select audience that was tuned into its *raison d'être*. Commercial underground radio — an oxymoron if ever there was one — seemed always to be at odds with itself and perhaps foretold its eventual demise without ever really seeing it coming.

As Laquidara said here, "Underground wasn't meant to be a success. Once it became a success it failed. So how is it going to happen again?"

Revolution

Perhaps, in some way, in cyberspace. Raechel Donahue: "The only kind of revolution comparable to underground radio today is on the Internet. People will not go out on the street to create change, so cyberspace is fertile ground, so to speak. Discounting time travel, though, I think it's safe to say it will never be as it was, but then neither will anything else."

There are lessons to be learned from radio's underground days. As former KSAN Program Director Stefan Ponek said in this enlightening book, "Some things don't change, whereas other things change completely. If anybody showed up stoned at any of our stations today, I'd can them in a hot second. How about that?"

■ ■ ■

Alan Haber writes the Cyber House column in ***RW****.*

Reach him via e-mail at zoo gang@earthlink.net

Tix to Freebie Feature Flicks

▶ PROMO, continued from page 34

percentage you've decided is reasonable to merchandise out of national buy and purchase the tickets: "Win four packs of tickets all weekend to the WXXX screening of 'Diehard IX' courtesy of Bluebeer ... the beer that's blue."

With all three of these concepts you may be able to get the movie tickets for free if the film has played for a while and the theater is anxious for free advertising. (There's value, after all, in this ad campaign that benefits the theater.)

Movie Idea #4: Partner with a movie theater who is willing to add on a time when they don't generally have a screening and then do one regularly for you!

Midnight movies are the most common, but kiddie movies can be done on early weekend mornings and even weekday mornings during the summer. For AC stations, this can make a great "Mom's Day at the Movies" each week.

Don't pass on freebies

Finally, don't forget the power of Run-of-Engagement passes.

Too often we rush to do movie premieres for unknown films but then turn down the run-of passes because they're not for something specific.

These are actually the most valuable passes, because your listeners can see movies at their convenience, not at yours! With many run-of-engagement passes you can tie your image to several movies: "This pass is good for 'Star Wars,' 'Eyes Wide Shut' and 'Midsummer Night's Dream.'"

If none of these concepts hit your hot button, invent a few of your own. The important thing is to remember that you're in the entertainment business and you must constantly look for ways to entertain both on and off air.

■ ■ ■

Send email to Mark Lapidus at lapidus@erols.com *or contact him via* ***RW****.*

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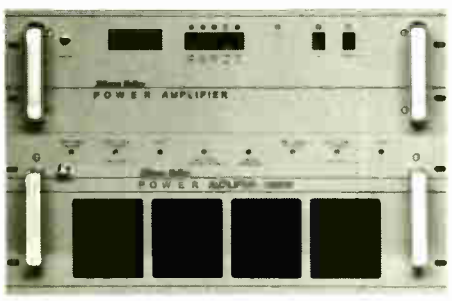

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PRODUCT EVALUATION

High Marks for Tascam DA-45HR

Tom Vernon

As I was installing our 24-bit Tascam DA-45HR high-resolution DAT machine in the World Cafe control room of WXPN(FM), Philadelphia, a number of questions were going through my mind.

Can one really hear the difference between 16- and 24-bit DAT tapes, or is this just a lot of hype? If it does sound better, will the older 16-bit technology fade away? Does Tascam have any other 24-bit machines waiting in the wings, or is this a trial balloon? Do any of the preceding questions really matter with DVD so close at hand?

So many questions

While I wasn't able to answer all of these questions, I was able to sink my teeth (figuratively) into 24-bit high-resolution DAT tape and come to some conclusions.

Tascam's DA-45HR, with its high-resolution format, is the second breakthrough in DAT technology that the company has made in recent memory. The first is the DA-302, a two-deck machine that enables users to copy DAT tapes at twice normal speed.

In addition to its high-resolution capabilities, the DA-45HR has an impressive list of features. A shuttle wheel enables users to precisely position tape using audio cues. Locations on tape may be stored to frame accuracy, and characters may be stored and edited so that program titles can be displayed while the tape is playing.

Flexible word clock options allow selection of an internal clock, external clock or the AES/EBU or coaxial inputs. A comprehensive list of menu options allows users to store regularly used functions settings for quick recall.

No matter how you want to get audio signals to and from the DA-45, Tascam has you covered. Analog signals can be balanced via XLR connectors, or unbalanced through RCA jacks. Balanced output levels can be adjusted with trimpots. Digital audio can come from AES/EBU through XLR connectors, or from S/PDIF on RCA connectors. The rear panel also has BNC connectors to loop a word clock through this machine, as well as a 15-pin "D" connector for remote I/O via a suitably equipped controller.

The Tascam DA-45HR

Part of the way that the Tascam works its 24-bit magic is through tape speed; the transport runs at twice normal speed in the high-resolution mode. This means that a 120-minute DAT will last 60 minutes, so you need to plan accordingly. Tascam doesn't recommend the use of 180-minute DATs in this machine, as the thinner tape makes accidents more likely.

Compatibility

At this time, the DA-45 is the only 24-bit machine available, meaning you will need to have one every place you want high-resolution capability. In the 16-bit mode, tapes made on the DA-45 are downward-compatible with any other DAT machine.

It's not possible to mix regular and high-resolution modes on one tape. If you want to reuse a 16-bit tape at high-speed, you need to rewind and start at the beginning.

A nice feature of the DA-45 is the ability to write start IDs with the AES/EBU input. The standard for this

See TASCAM, page 53 ▶

PRODUCT EVALUATION

A Studio to Write Home About

Read G. Burgan

In my experience, most sound cards fall into one of several flavors, with few surprises. The "run-of-the-mill" game card is the most common, with 1/8-inch stereo jacks, provision for speakers and with perhaps an average synthesizer thrown in.

Then there are the top-of-the-line professional cards with quarter-inch jacks, digital I/O, few frills and solid signal-to-noise specifications. There are also cards designed primarily for musicians featuring high-quality synthesizers.

Endless array

But here is a card that defies niches. It is more than a sound card, and has a seemingly endless array of truly useful features.

From the moment I took the EMU Audio Production Studio hardware out of the box, I was impressed.

The hardware consists of two separate components: the sound card itself, called the "E-Card"; and an outboard unit with additional inputs and outputs that occupies a 5-1/4-inch drive bay called the E-Drive.

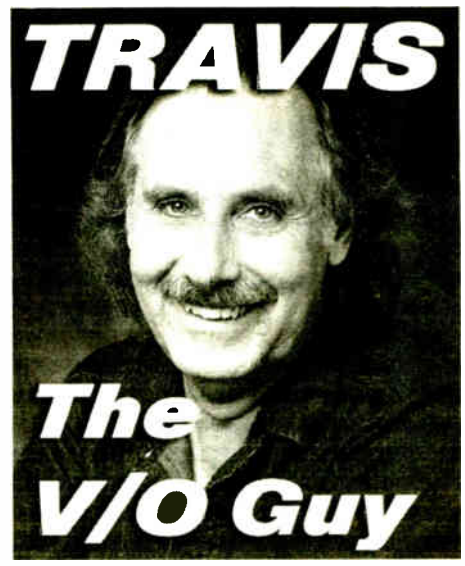
E-Card is a PCI card with two balanced quarter-inch analog inputs and outputs and one set of S/PDIF stereo digital inputs and outputs. The analog jacks provide balanced signals using the tip for the positive signal, the ring for the negative signal and the sleeve for the ground. The digital jacks are RCA phono jacks. A MIDI connector is mounted on a separate bracket that mounts behind an empty computer card slot.

The E-Control Mixer is essentially a virtual sound board.

The E-Drive has two additional analog inputs and another set of S/PDIF input/outputs as well as a headphone jack. Each of the E-Drive analog inputs

See EMU, page 54 ▶

The Voice-Over Demo Recording



Travis

Well, it's now been two years since I put together my last voice-over demo. It might seem like it was last month, but last time I listened to it, I realized that most of the material there was at least two years old.

Time to get started on a new one.

I usually put together a new demo every two years. I'm fortunate to have my own little studio, so it doesn't cost me anything, but piecing together an audio presentation that will serve as my "calling card" for the next two years is both a rewarding and agonizing experience.

Having my own studio has its disadvantages too. I always work alone when I put a demo together, but that process eliminates the presence of a second pair of ears that might provide a more objective perspective. I really have no idea how my tape might come across to others.

Of course, I do play my "work-in-progress" demo to others to get their reactions, but this usually is of limited usefulness. My girlfriend absolutely hates one piece on my tape — this is the same piece that two people who are long-time professionals in the industry, whose opinions I greatly respect, think is the best segment. Now, that doesn't mean that my girlfriend is wrong; she's been in the business a while and has good judgment.

There are several reasons I replace my demo every two years. The first is that I like to believe that my abilities have improved from where they were two years ago. I usually start production on a new tape with expectations that it will be much better than the previous one. That notion usually is dispelled about halfway through production. While I might hear a major difference from a decade ago, there really isn't tremendous improvement from the previous tape.

Second, styles change. Though I don't consider myself a cutting edge, "oh-so-cool, with-it" announcer, I do like to keep my presentation somewhat contemporary.

Third, my basic sound does change. I'm getting older. Not that long ago, I was getting requests to try to put a "youthful" sound into my work. They don't ask me to do that anymore. That's not all bad — I'm getting hired a lot more these days because I have a "mature, sophisticated" sound.

Quantity vs. quality

It's interesting that the longer I'm in this business, the shorter I want my tape to be. My first real demo was about five minutes long. Remember, the standard recommended length for voice demos is two to three minutes. I've noticed that many just getting started in voice-over have a tendency to produce longer demos, just like I did. I don't know why I felt that my early tapes had to be so long. Perhaps I thought I could substitute quantity for quality.

If you ever are part of a voice-casting session, you'll soon understand why shorter tapes are better. When I was in the studio business, I frequently worked with clients to find talent for their projects. I'd take all the demo tapes which might, in some way, fit into the client's project, and stack them up next to the cassette player.

We'd put each tape in the machine and press the fast-forward button for a few seconds. We'd then listen to wherever we landed for just a few seconds. If the client found the talent might be useful for the project, we'd listen for a few more seconds, take the tape out of the machine, and place the tape in the "possible" pile.

The "rejects" were returned to the rack. These rejects were not people who were "bad" voice-over people; they just didn't fit what the director had in mind. The reason we didn't listen to each entire tape was because there simply was not enough money in the production budget for us to do so. The producer and the recording engineer's time cost money too. If the producers had plenty of time to "cast" a spot, they wouldn't be using demo tapes, they'd set up a casting session and have people audition.

So, if we happened to land on a segment of someone's tape where we didn't hear what might be right for our particular project, it would go into the "reject" pile. It's entirely possible that what we were looking for might have been somewhere on that tape, but we simply didn't have time to look for it. If, however, we heard a portion of a spot and then a different-sounding segment within the 10 or 15 seconds we spent on that tape, we would be much more inclined to keep listening.

If your tape has a bunch of very short segments, under, say 10 seconds each, it's much more likely that the person doing the casting will hear what you want them to. The worst tapes we dealt with were over seven minutes, with full-length 60-second spots. Those tapes would always get rejected.

I spent some time teaching at local colleges and at one of the private broadcast schools. The students all felt like their audition tapes needed to be much longer than necessary. I used to ask, "How long do you need to listen to a disc jockey before you figure out where he's at?" The student's answer was always the same: "just a few seconds!"

"Well," I would say, "That's really how long your audition tape needs to be. The PD will only need a few seconds to figure out where you are, in terms of your abilities, and whether you might fit in at their station." Of course, the audition tapes needed to be longer than that, but my point was usually well taken. It's the same way with voice-over demos.

An exception to this is in the area of "animation/character" demos, where it is necessary to demonstrate specific character voices. The voice-over people I know who also do animation work use a separate tape for that specific market.

More of a character

I occasionally get "animation/character" work, and I have a couple of samples on my tape. That's not my major focus, however; they are on there just to add variety.

The character sections on my tape are extremely short. It seems that I've been falling into more and more character work lately, and it is a lot of fun, so eventually I might put together an animation demo. For the time being, I'm not going to worry about it. Animation is a totally different area of voice-over work, one that I am certainly no expert on.

One thing that I've been lax on is getting copies of projects I've worked on. When you're working almost every day, it's easy to let those things go — you figure you can grab something any time, and besides, you don't want to be a pain. One thing I've noticed, though, is when you work on an actual project, it has a totally different feel from something you produced just for your demo, and I'm convinced that the listener can sense that. So, I try to put as much "actual" material on my demo as possible. There are some projects that I'm unable to get copies of, or the recording quality on my copy is bad, so, if I have a script, I'll sometimes re-cut a piece for my tape. Still, it doesn't have that "actual project" quality to it, and I wonder if I'm gaining anything by doing that.

I usually plan on putting together a tape in an afternoon. By the time the new demo is finished, though, it's usually a couple of months later. In the meantime, I have a tendency not to deliver my "old" tape, because the "new" one is going to be "so much better." If past experience is any indication, though, I'd better keep sending out the "old" one until the new one is finished.

An Impressive DAT Machine

▶ TASCAM, continued from page 51

protocol does not call for passing start IDs, but many manufacturers allow it anyway. Others don't, and this is a frequent source of grief and confusion.

The 32-page owner's manual provides a good description of the DA-45 controls and basic operation, although I've always found that the best way to learn about a machine is just to spend time playing with it.

Most of the basic controls are pretty intuitive, but you'll still need to read up on the advanced features. Tascam does not provide technical manuals with equipment; they need to be purchased separately. While I didn't get to see the technical manual for this unit, Tascam's manuals have traditionally been among the best in the business, and there is no reason to suspect that the DA-45 tech manual would be any different.

High-resolution release

Tascam's plans for the release of other 24-bit DAT machines are unknown. There is no information on its Web page, and my inquiries to the company were unanswered. The release of a high-resolution portable machine and stripped-down economy version might do a lot to promote acceptance of the 24-bit format.

Can you really hear the difference between 16- and 24-bit resolution? We evaluated the DA-45 HR in the World Cafe studios, using the console's digital output as the source, and recording live music. There was a definite improvement in clarity and detail in the 24-bit mode. The difference between 16- and 24-bit is not earthshaking, but quite noticeable during a careful listening test.

Aside from the higher resolution capability, the DA-45 received high marks from users for overall ease of use, character entry/display and frame-accurate location capability as well as the shuttle wheel. The extremely quiet transport did not go unnoticed, and that was also a plus. I appreciated the readily accessible Drum Time and Block Error displays — both speed the maintenance process. The transport is easily accessible for cleaning once the top cover is removed, and the overall quality of construction is up to Tascam's usual high standards.

I would imagine that the ideal market for the DA-45 would be the smaller project studio, where it could be used in conjunction with a 24-bit workstation. Larger recording studios with deep pockets might go for the high-resolution format as well. For the rest of us, while 24-bit capability is a definite sonic improvement, the prospect of replacing all of our older 16-bit machines with DA-45s, at a suggested price of $2,165, may be a bit daunting.

The difference between 16- and 24-bit isn't earthshaking, but quite noticeable through careful listening.

The larger questions raised by the release of the DA-45 concern the future of the media itself. With the DVD bandwagon gaining momentum, the DAT format, with its transport maintenance hassles and fragile tape, may soon become a thing of the past. If that happens, a 24-bit DAT machine will turn out to be a highly evolved dinosaur. Only time will tell.

For more information on the Tascam DA-45, as well as other Tascam products, visit the company's Web site at *www.tascam.com*

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EMU Hits All of the Angles

▶ EMU, continued from page 51

has its own level control, as does the headphone output.

The front-panel analog inputs have a push-button to switch them from microphone to line input. Like the sound card analog inputs, the E-Drive analog inputs are balanced using the same stereo phone jack arrangement. By changing internal jumpers, the inputs can accommodate low- and high-level microphones and even provide phantom power for condenser mics.

Caveat

The only caveat is that the E-Drive provides only 12 volts; most phantom-powered mics use 48 volts. However, most condenser mics will work down to 10 volts, and the Shure MX202 microphone I used to test the unit had no problem with the 12-volt supply.

For my money, the E-Drive unit sets this sound card apart from the competition. Because it mounts in a 5-1/4-inch drive bay, all of the controls are in front where easily accessible. The headphone output has plenty of gain to drive my favorite Sennheiser 414 headphones, and the headphone gain control makes it practical to use.

The two analog inputs at the front of the computer eliminate the hassles of trying to reach behind the computer case every time you want to change sources. Also, having a switch to change the inputs from mic to line plus a level control to adjust the overall levels is a real plus. It didn't take me long to fall in love with this sound card.

The crucial question for most people is: How does it sound?

It sounds great, but for me, the most important issue with a sound card that is mounted inside a computer is: How quiet is it?

When I first started using digital audio several years ago, my initial infatuation with digital audio cooled when I found that the ease of editing and adding effects was offset by the noise of the inexpensive card I was using. The computer-generated noise picked up by the sound card was worse than that associated with most analog recorders I had used.

This continues to be a problem with sound cards that are physically placed inside the computer. There, they are surrounded by video cards, network cards, SCSI cards and modems, each capable of generating its own unique kind of noise. Even the best shielding often fails to eliminate it all.

One of the best ways to minimize computer-generated noise is by running the input and output levels high enough to push the noise floor below audible levels. Most consumer sound cards can't do that.

The EMU Audio Production card is capable of producing an output level of a +10.5 dBv. In my tests, I found that the average input noise measured through the A/D input was slightly better than 100 dB, while the average output noise measured through the D/A output was 110 dB.

This pretty well matches the performance that I have been getting from the professional sound cards that I normally use, and is more than sufficient to render any computer noise virtually inaudible while maintaining the full dynamic range of the material being processed. As a sound card, the EMU Audio Production Studio passes with flying colors.

But its sound card features are only half the story. What about its software and synthesizer?

Ready to go

EMU Audio Production Studio comes with its own proprietary software: E-Control Mixer. With most standard sound cards, you install the card, hook up your audio cables, install the driver and you're ready to go.

Don't be surprised if when you first use your EMU Production Studio, nothing happens when you open your favorite digital audio software. The E-Control Mixer software controls every aspect of the sound card, and until you set it up, you probably won't hear a thing.

The E-Control Mixer is essentially a virtual sound board, complete with input strips, faders, submix busses and output strips.

The E-Control Mixer treats all four analog inputs as mono inputs, and you can pan them right, left, or anywhere in between. Each input has two inline inserts that allow you to apply digital processing to the input signal. In addition, each input strip has a source button, two auxiliary Buss selectors, a level indicator, an input fader and a mute/solo button. The analog input strips are mono while the digital input strips are stereo.

There are four auxiliary busses; each receives signals from all the input strips. The signal can be routed to any of the internal effects or to an outboard effects unit. A return mix slider control adjusts the level of the signal as it returns to the main mix.

Finally, the E-Control Mixer has a Master Output Strip with master faders, an indicator that tells the output destination, peak indicators, indicators that list which effects are applied to the auxiliary busses and faders to control the signals from each of the auxiliary busses.

What this means is that you have the software equivalent of an eight-input mixing console (four mono analog inputs and two digital stereo inputs), with four auxiliary busses and a two-channel output. The output can be routed to the analog stereo output or either of the digital stereo outputs.

But that's not all. The EMU Audio Production Studio uses DSP (Digital Signal Processing) to provide a whole host of digital special effects that can be applied to the signal. These include reverb, chorus flanger, echo/delay, auto wah, pitch shifter, distortion, compressor/limiter, shelving equalizers and parametric equalizers. It's like having the equivalent of an entire rack of high-quality audio processing equipment. Each of the effects can be individually tailored to suit your needs, just as their hardware equivalents can. And because the effects are produced right on the sound card, their use is not dependent on the speed of your CPU or the size of your ram.

I had a lot of fun playing around with all the special effects, and they are solid effects that provide sound that will cut it in the real world. Additionally, the E-Control Mixer allows you to mix MIDI sources with analog audio sources.

The E-Card also has two 16-channel MIDI synthesizer/sampler engines that enable it to support up to 32 MIDI channels. However, since the SynthEngine uses the host computer's ram, the actual number of channels supported may be limited by the amount of ram available on your computer. The SynthEngine has 64 oscillators that permit the playing of up to 64 voices simultaneously (64-voice polyphony).

The APS SynthEngine uses the SoundFont technology as a source for sound samples. This is a format jointly designed by EMU and Creative Labs. For more information on this new technology, check out *www.soundfont.com*

EMU includes SoundFont Bank Manager and Vienna SoundFont Studio software to supply the tools to create and manage SoundFonts. You can take an ordinary WAV sound file and turn it into a SoundFont file that can then be played using the EMU synthesizer. You can also purchase additional banks of SoundFont sounds as well.

Rich, full and realistic

EMU Audio Production Studio comes with a bank of 127 SoundFonts. These run the gamut from solo instruments like trumpet, trombone, piano and pipe organ, to brass and string ensembles. I found the sounds rich, full and realistic.

In addition to its proprietary E-Control Mixer software and the SoundFont software, EMU includes Cakewalk Express Gold version 6 and SoundForgeXP. The former provides abundant tools for composing and playing MIDI sound files while the latter provides versatile digital audio editing tools.

The EMU Audio Production Studio is priced at $699. For that you get the E-Card with two balanced analog inputs and outputs and one set of stereo digital inputs and outputs and a 64-voice music synthesizer/sampler; the E-Drive with two more balanced analog inputs with phantom power for condenser mics and level controls and an additional set of stereo digital I/Os and a headphone output with level control; the E-Control Mixer software that provides four mono analog and two stereo digital inputs, four auxiliary busses with real-time DSP effects processing and a two-channel master outstrip; Cakewalk Express Gold and SoundForge XP software.

EMU Production Studio requires a PC with Windows 95, a PCI slot, an open bracket for MIDI connector, one 5-1/4-inch drive bay, at least a Pentium 133 and 24 meg of ram. For best performance, a Pentium 200 with 64 meg of ram and a monitor capable of 1024 x 768 16-bit high-color resolution is recommended. I tested the EMU Audio Production Studio using a Pentium-166 with 64 meg of ram.

Add the EMU Audio Production Studio to your computer, and you will have essentially everything you need to digitally produce and edit MIDI, music and voice productions in one compact, easy-to-use package. This is an exceptional product with high-quality hardware and software.

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For more information, contact EMU Systems in California at (408) 438-1921 or circle ***Reader Service 111.***

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PRODUCT GUIDE

Products for Radio Production

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

Sonifex Digital Redbox

Sonifex is planning to introduce a range of digital products in its Redbox family of connection boxes later this year. Prototypes were on display at NAB99.

Included in the line are a distribution amplifier with either S/PDIF or AES/EBU outputs, an A/D converter and a sample rate converter. All units are able to handle 96 kHz audio.

"Our plans to expand the Redbox range of connection boxes are coming to fruition with the announcement of our digital product range," said Marcus Brooke, managing director. "After the launch of the analog Redbox series, we've had a lot of requests for digital products in the same style, so it's been a natural progression."

The units are based on the same styling of the analog range, with red anodized cases that can be screw-mounted or rack-mounted.

Also new is an automatic, dynamic mix-minus generator for use with consoles that lack clean-feed outputs for the telephone hybrid unit, where a mix-minus feed is needed to send to the caller.

For more information contact Independent Audio in Maine at (207) 773-2424, visit the Sonifex Web site at www.sonifex.co.uk *or circle* ***Reader Service 151.***

GT Electronics Microphones

GT Electronics, a new division of **Alesis**, has four studio condenser microphones that offer different choices for on-air and audio post applications.

The AM Series includes four large-diaphragm studio condenser microphones: two Class-A FET microphones, the AM 51 and AM52, and two tube microphones, the AM61 and AM62.

Each includes a 3-micron gold-evaporated diaphragm for extreme sensitivity. The AM51 and AM61 have a fixed cardoid polar pattern, the AM52 and AM62 offer three switchable patterns: cardioid, omni and figure 8. The AM62 also features super-cardioid, which increases the microphone's directionality.

For more information contact Alesis in California at (310) 255-3495, fax (310) 255-3481 or circle ***Reader Service 113.***

MIDI Sequencer

The Pro Audio and Combo Division of **Yamaha** introduced the RM1X MIDI sequencer/remixer as the latest addition to its 24/7 line of products for the DJ and dance-production markets.

The RM1X has extensive Play FX features, such as several real-time MIDI processes that can be applied dynamically to song data as it plays. These include the harmonizing of parts with octave and unison parameters, clock-shifting to move instrument tracks forward or backward in time, note-duration quantizing and the ability to modify note velocity.

The interface provides users with real-time control over voice parameters such as filter cutoff, resonance level and envelope decay.

The AWM2 synthesis engine provides 32 notes of polyphony divided among 16 timbral parts.

Three onboard effects processors allow users to produce finished mixes using the RM1X by itself. Available effects include various forms of reverb and chorus as

well as phasing, flanging and distortion. Its Digital Low-Boost function provides the user with control over the lower end of the frequency spectrum, allowing a boost or cut of up to 24 dB in the area of 50 Hz to 2 kHz.

For more information contact Yamaha in California at (714) 522-9011 or circle ***Reader Service 88.***

Shure Cardioid Microphone

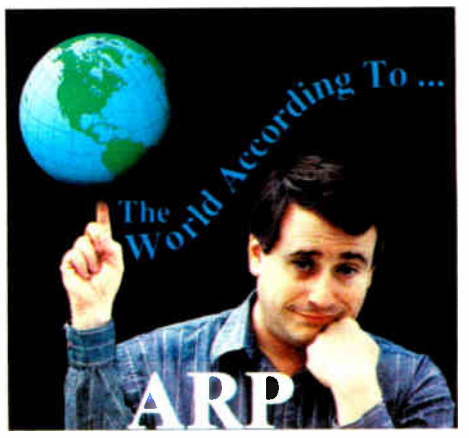
Shure is offering an improved version of its SM7 cardioid microphone with model SM7A. It is suitable for broadcast and voice-over work as well as radio talk shows and news desk use.

The SM7A features the same frequency response of 50 to 20,000 Hz as its predecessor. The natural and clear sound reproduction qualities are useful for discerning speech and music applications. Uniform in frequency and symmetrical about axis, its unidirectional polar pattern offers maximum rejection and minimal coloration of off-axis sound.

Central among the microphone's improvements is a redesigned humbucking coil that prevents electromagnetic hum generated by computer monitors, neon lights and other sources.

For more information contact Shure in Illinois at (847) 866-2573, fax (847) 866-2353 or circle ***Reader Service 75.***

Are You Busy After the Show?



Alan R. Peterson

There is zero doubt that the Internet has redefined the way we do business. Practically every product on the NAB show floor in April had some sort of Web access or Internet-friendly function.

Savvy station managers are using the new technology to great advantage, not only in streaming audio to listeners around the globe, but also in "value-added" Web site content as well. Happy listeners can click icons to view their favorite air personalities, buy CDs and link to an infinite galaxy of interesting sites, all courtesy of their preferred radio station.

Sadly, the Internet is causing the near extinction of a radio tradition — one that may yet be on its last gasps anyway: the lonely hearts telephone call to the late-night deejay.

Hi, it's me

The call is often the same from market to market, station to station, although oddly enough, male jocks are swayed more by female callers than the other way around.

A lonely listener, reaching out in the darkness to a friendly sounding voice in hopes of finding someone who "understands what I'm going through." First, a song request, then the reason behind it. Then the floodgates open and the story of the caller's life pours forth.

If the caller is successful, he or she hears the soothing words with the reminder that all is right with the world. As a bonus, the request might even hit the air. Some jocks press the caller for personal information like, "So what do you look like, hmm?" in hopes of a post-show rendezvous. Not too surprisingly, these same jocks are disappointed when, contrary to all assurances, the caller turns out to look nothing like Elaine from "Seinfeld."

That was then. Today, lonely hearts don't gather around the radio late at night with phone in hand. They are in Internet chat rooms living a different life. The late-night deejay of 1999 knows nothing of the way it once was.

Besides, why bother to place a call to the night-timer when an e-mail will suffice? Especially if the night-timer is sent in via satellite from a distant market. No, today the listener just clicks the icon and communicates with the morning team, the wacky mascot, or the research department to submit his or her five favorite tunes.

Streamlining

It certainly streamlines the process of communication, and e-mail is still so new and novel that answering a listener query is fun: no stamps to lick and no office manager to annoy for an envelope.

But for some jocks, the experience has a hollow feeling compared to blowing two hours of company time on the phone with a total stranger.

Among my friends are countless male broadcasters who, at one or more times in their careers, have found themselves as evening jocks, playing "segue city" with the music and stopping to read that liner card on the quarter-hours. You may even recognize yourself from a past life in this scenario.

It is three hours into the shift and you feel as lonely as Adam. You are playing a song so lame, you wouldn't buy the CD to use as a dog's chew-toy. The city has been deserted. No life to be found anywhere, save the cleaning crew on the floor above. The magazines in the jock lounge don't hold your interest. Your only companions are the hands creeping around the clock, counting off the eternity before joining the network for the Art Bell show.

At the peak of boredom and desolation, you contemplate a walk back to the coffee room to see whose leftover lunch you might liberate from the spill-stained, permafrost-bound company fridge. Then the studio line begins to blink.

"Great," you think. "The program director again. Jeez, why such a late call? What did I say now?" Except this time, it's not the PD, but a lonely listener.

"Hi," comes a soft and warm, yet troubled voice at the other end. Next thing you know, it's the life history, the request, the calls the next night, the meeting after work, the separation from the spouse, the psycho calls at home ... In spite of all the advice from the station veterans about never dating listeners, you believed it could not happen to you.

Ain't it grand? Welcome to radio!

Put the phone down

The Net has done what countless scores of psychologists (and unfortunately, divorce lawyers) could not do: provide an alternative to calling the Great American Disc Jockey. Chat rooms reassure the lonely listener that someone hears them and that someone will always be right there on the other side of the screen.

No more of that, "I can't talk tonight. Call me tomorrow," stuff from the jock. Any time day or night, like a Las Vegas buffet, there will always be a crowd in a chat room.

"Perhaps this is a good thing," say the experts. "Now maybe the night jock can put the phone down and concentrate on doing a good show." Truth be known, the nighttime show sounds just fine, and we at home have no idea the air talent is tied up on the phone. We have our own lives going on at the same time.

If jocks want to continue the tradition of lonely heart callers, I suggest using the Internet again to its best advantage. Create a jock chat room on the station Web site where listeners can congregate and exchange their biographies and troubles with other listeners who "understand what they're going through."

Three things will happen. First, the grand tradition of lonely hearts callers continues, although in a slightly altered state to stay abreast of the technology. Second, listeners discover they are not alone and can actually work out their loneliness amongst themselves.

Some jocks press the caller for personal info in hopes of a post-show rendezvous.

And third, now the night jock can take his pick of which participant will be the one who will eventually make his life a living hell.

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This month, Alan Peterson observes his 10th year as a ***Radio World*** *columnist. Congrats, Al.*

Don't Forget...
Readers Forum is now on the last inside page of RW.

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

AMPLIFIERS

WANT TO SELL

Dynaco ST-70, 70 W stereo tube amp, excel cond, $250. J Borden, 414-482-8954.

Heath WM-5 mono bloc amps(2) w/(2) preamps & Heath FM tuner, $400/all; McIntosh MC-60 single mono unit, very nice cond, $800/BO; Heath WM-5 single mono unit, nice cond, $150. C Collins, 414-363-9205.

WANT TO BUY

WE 129 preamp, 25B console, paying $1500 if nice, other models also wanted. 1-800-251-5454.

Microtech 1200. W Gunn, 760-320-0728.

ANTENNAS/ TOWERS/CABLES

WANT TO SELL

ERI FML-3E w/heaters & DC stub, vgc, tuned to 104.1, on ground in Central Wisconsin. C Gennaro, 906-932-2411.

Potomac Instrument 5 tower antenna monitor, digital read out, new, never used in original box, BO; ERI 2 bay FM antenna, 106.9, can be retuned, new, never used, BO.

Rohn 100' SSV series self supporting tower N-1 through N-5, used 11 months, tower on ground, $7000. Ms Sharp, 316-856-3794.

Scala CA5-150 EB 5 element yagi antennas (4), $150 ea/BO. G Croniser, 315-376-6518.

Scala 5 element yagi's, 2 receive antennas cut to 106.5, can be recut for higher freq, $150 ea. C Marker, 906-249-1423.

Coax patch panel 3-1/8"-7 pole. Mike, 800-588-7411.

Dielectric 3-1/8" coaxial relay, Mike, 800-588-7411.

WANT TO BUY

10-12 bay CP FM antenna at or near 104.9 MHz. B Campbell, 580-223-6797 or 580-221-1480.

AUDIO PRODUCTION

WANT TO SELL

Antex SX9 digital audio adapter for DOS and Windows, like new cond, $900. R Herrick, 909-584-5247.

Ramsa WZDE40-20 bit true stereo digital effects processor, w/2 graphic, parametric, notch EQs, compressors, speaker delays, spectrum analyzer, excel cond, $2000/trade for older recording gear. M Hughes, 301-962-6823.

Sony PCM-501ES, 16 bit PCM digital audio processor, records digital audio up to 6 uninterrupted hrs on std VHS tape rcdr, w/manual, $500. B Meuse, 650-969-2433.

Symetrix 538, complete recdg or bdct chnl, excel cond, $300 +shpg or will trade for EV RE20 or RE27. M Schackow, 605-374-3424.

White 4000 28 band parametric EQ, $200 +shpg. M Schackow, 605-374-3424.

ADC Propatch 1/4" punchblock patchbays, new, $600 (many, ADC TT 144 point patchbays recond, $149-229, Switchcraft 1/4" 96 point, new, 2 spaces, $249. W Gunn, 760-320-0728.

Yamaha BP-2 bass pedals electronics and/or schematic of this unit. B Meuse, 650-969-2433.

WANT TO BUY

TEAC portable DAT machine; Cinema 4031-B EQ. T Coffman, 619-571-5031.

WE 753 or 757 speakers, single or pair, will pay $1500-$2000 ea. 1-800-251-5454.

Dolby 301s; Neve 33609, 1072s, 1073s, 1081s, Urei LA4s, 1176s. W Gunn, 760-320-0728.

AUTOMATION EQUIPMENT

WANT TO SELL

IGM EC automation system, (3) IGM Go-carts w/software, manuals, $300. 707-829-5999.

Prophet Systems Wizard Ver 5 w/file server, (2) audio servers, (2) work stations, real time editor, digital r-r, (3) sat boxes & one spare, currently on support & in use, $10,500/BO. G Hornung, 308-381-1430.

Sentry Systems FS12C w/2 CD interfaces, 8 players ea & computer, gd cond. C Gennaro, 906-932-2411.

Sono-Mag MSP-12 12 chnl stereo automation system, 12 yrs in service, manuals & some spare parts & chips, BO. D Weer, 904-284-1111.

ANTEX STUDIOCARDS AVPRO...$400. Also call for pricing on ANTEX DIGITAL AUDIO CARDS. 626-859-0213.

BUSINESS OPPORTUNITIES

CART MACHINES

WANT TO SELL

3 new ITC Delta cart machines, never in studio, $2000 ea/BO. 248-435-3932.

BE 3000A mono P/R, $200; Dynamax CTR-10 stereo play w/manuals, $200. 707-829-5999.

BE 900-5302-010 triple deck mono player in great cond, $300; also single deck player model 3000, BO. D Weer, 904-284-1111.

ITC 3D stereo PB, gd cond, needs top capstan bearing; ITC WP/SP Premium series cart players, mono, 3 cue tones; Audicord DL, mono R/P, 3 cue tones; Audicord A series, mono PB, fair cond. C Gennaro, 906-932-2411.

ITC 3D, 3 deck, very clean, not used in radio environment, light prod studio demo use, w/manuals, BO over $650, we'll pay UPS. Keith, fax: 603-352-8461.

Audicord DLPM, not used, still in box, $700. M Larsen, 510-465-6035.

BE 3 deck, record mode needs work, approx 10 yrs old, 200 carts free, $1500/BO; Tapecaster X-700 in gd cond plus Harris 60's vintage, $75 ea. C Marker, 906-249-1423.

WANT TO BUY

BE DC-10/30 disc trak. G McLintock, 615-255-1300/1377.

CD PLAYERS

WANT TO SELL

Pioneer PD TM III 18 disk players, vgc. C Gennaro, 906-932-2411.

COMPLETE FACILITIES

CONSOLES

WANT TO SELL

Ampex AM10, 6x2 mixer, excel cond, $295; Altec 1599A 6 chnl mixer, $295. J Price, 214-321-6576.

BE BE5S250, $1100; BE BE8S250, $1700, w/manuals, on air now, going digital, sell soon. G Huff, 606-877-1326.

Sparta 4 pot A-10B, works, $75. C Marker, 906-249-1423.

BMX-14, slide fader, stereo & mono outputs, clock & clock timer, vgc, $5000 +UPS. J Bahr, 787-728-0364.

Roland M160 16 ch line stereo mixer, rackmount, +4 balanced out, $550; Shure M68, M68FC, M677, $150 ea, or will trade all for mikes or compressors. M Highes, 301-962-6823.

Mackie 1604 mixer board, 2 yrs old, new, still in box, never used, $700. J Smith, 336-751-0758.

Logitek 12 stereo mixer. Mike, 800-588-7411.

MCI 618 24 inputs (12 mono, 3 w/super EQ, 12 stereo) great prod board, $6k, MCI 528 27 in rrecording board $7k, Neve 8108 65 in, mint $59k, D&R Orion ik-nu 26 inline, (64 on mixdown) $12k, Trident 70 28x16, $8500, JL Cooper 16 trk automation, $1200. W Gunn, 760-320-0728.

WANT TO BUY

Ampex MX-35, working or not. J Borden, 414-482-8954.

5-8 chnl stereo console for on-air production. B DeFelice, 203-929-0730.

Soundcraft 600/800, Tascam 2600, Auditronics 110A, Mackie 1604, Neotek Elite. W Gunn, 760-320-0728.

DISCO-PRO SOUND EQUIP

WANT TO BUY

Altec 604/605 duplex speakers. R Cobb, 813-634-1940.

LIMITERS

WANT TO SELL

JBL/UREI M712 stereo comp limiter, $350 +shpg. M Schackow, 605-374-3424.

UREI LA-4 & 523 graphic EQ w/rack mount kit, BO. J Borden, 414-482-8954.

Dorrough DAP 610A tri-band audio processor (2), $275 ea/BO +shpg. B DeFelice, 203-929-0730.

Orban 8100 A/1 Optimod, complete system w/XT 6-band compressor & studio AGC chassis, excel cond, w/manuals, $5000/BO. H Landsberg, 626-355-3656.

Urei LA2A (extra meter added) $2500, dbx 900 rack (4 comps/4 gates) $1800, Gates Toplevel $550, CBS Audimax, Volumax comps, Dynamic Presence EQ $400 ea. W Gunn, 760-320-0728.

WANT TO BUY

Gates Sta-Level limiter for parts or complete; Gates SA39B peak limiter for parts or better; UREI LA4 or LA3 parts to make pair. M Schackow, 605-374-3424.

UREI, dbx, Collins, RCA, Gates, Universal Audio. T Coffman, 619-571-5031.

UREI, dbx, Collins, RCA, Gates, Universal Audio. T Coffman, 619-571-5031.

MICROPHONES

WANT TO SELL

Astatic 77, large diaphram dynamic mic, $250 +shpg. M Schackow, 605-374-3424.

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.

RCA 77DX ribbon mic in TV gray, late mdl w/block letter style RCA logo, excel perf & appearance, $1200. J Peterman, 414-277-7678.

MICS cont...

Neumann U-47 long body, VF-14 tube, orig psu cables, $5800; Telefunken M221B 934B or C capsules, orig psu cables, $2200/pr; AKG C-24, $5800; Neumann U-48 VF-14 tube, $5300; AKG D-25 orig stand mount, $450. F Danner, 781-294-1218.

Shure Prologue 10HLC (3), new, $39 ea; Prologue 12HLC, new, $59 ea. M Hughes, 301-962-6823.

Telex WT-50 & WT-200 xmtr & mic, $125 ea; tuner, $150; Sennheiser K3U-ME40 condenser cardioid, $135; EV 636, $65; EV 654, $85. J Price, 214-321-6576.

EV 634A hog nosed, dynamic hi-impedance w/cable, works gd, $65; copy of EV-664, needs little work, $40/BO. W Dougherty Jr, 573-998-2681.

Neumann U87s $1800, Telefunken U48, long body, chrome-top, New $6800, Altec salt shaker mics, $175/ea, Sony C37fet, ECM377 mics, $600/ea, Neumann U89, w/shockmount $1500. W Gunn, 760-320-0728.

WANT TO BUY

RCA 4AA mic, box camera style, used in 1920's, will pay well for it. Drago, 203-230-5255 (w) or 203-272-6030 (h).

Ribbons, condensers, dynamics, tube 1950-1990. T Coffman, 619-571-5031.

RCA 77-DX, 44-BX, KU-3A's, WE-639's, On-Air & recording lights wanted. 615-352-3456, FAX: 615-352-1922.

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

RCA ribbon mics. W Gunn, 760-320-0728.

MISCELLANEOUS

WANT TO SELL

Gates Criterion mono PB cart decks (2), gd cond; Gates Criterion stereo record electr, gd cond; Broadcast Tools USC-16 sat chan controller, like new; (2) Henry Telestor, new in box. C Gennaro, 906-932-2411.

Meissner FM receptor, very old FM rcvr operating on 41 to 50 MHz, small unit w/nice wood case, w/original box & rider notes, $150. C Collins, 414-363-9205.

Theremin, pitch increases as hand nears antenna, great effects, $50. C Collins, 414-363-9205.

UTC transformers "ouncers", variety of P/S Byer TR/BV35508, $25 ea. J Price, 214-321-6576.

World War II transcripts of Duke Ellington Orchestra on (2) 90 min cassette tapes; war bond ads; news of war progress, $30. C Collins, 414-363-9205.

360 Systems Instant Replay, hot key playback of digital sound EFX, drops & jingles, mint cond, 24 hr version, OEM soft case & manual, $2000/BO. J Herbert, 410-519-1517.

Albums, 33 & 70 rpm Christian music, light pop, 80's by many artists in excel cond, $75 +shpg; Biltmore USA Bd trumpet in exel cond w/hardshell case, $200. W Dougherty Jr, 573-998-2681.

RCA 5' heavy duty metal equip cabinet, weighs 200 lbs, $50. C Marker, 906-249-1423.

Small start-up station on air in Grand Bahamas seeking used equip of all types, not much budget. Jim, 1-800-887-2346.

Sony MDS-B3 Mini-Disc writer/player, excel cond; Sony MDS-B4P Mini-Disc player, gd cond. T Nelson, 612-798-8618.

WANT TO BUY

Old product literature, catalogs or manuals. M Hughes, 301-962-6823.

Used audio tape; 2-way active crossover. J Borden, 414-482-8954.

Jazz record collections, 10" LP/12" LP be-bop, swing, dixie, highest prices paid. B Rose, Program Recdgs, 228 East 10th, NYNY 10003. 212-674-3060.

WANT TO BUY TUBES (SPARES AND PULLS: OLDER AF INPUT, DRIVERS AND MODS), TUBE PRE-AMPS, TUBE AMPS, MICROPHONES. MK ENTERPRISES 800-330-2004.

MONITORS

WANT TO SELL

Belar FMM-1 & FMS-1 baseband & stereo monitors, work OK, w/manuals, $400/both. H Landsberg, 626-355-3656.

Altec 15" Valencias (voice of theater) $600, Yamaha NS10Ms $295, RSL 12" 3 says (same as JBL 4310) $250. W Gunn, 760-320-0728.

Used Mod Monitors, McMartin & Belar. Many to choose from, tuned & calibrated on your frequency, full guaranteed. Goodrich Ent. 402-493-1886.

WANT TO BUY

TFT or similar FM monitor w/5 station preselector, operational, or non-functional but complete units, considered. B DeFlice, 203-929-0730.

RECEIVERS & TRANSCEIVERS

DISTRIBUTOR(S) WANTED: New line of FM/SCA receivers from Apexcom, audio and data. Tel (613) 838-4054 Fax (613) 838-4357, e-mail: djlee@on.aibn.com.

WANT TO SELL

WANT TO BUY

STL for small community FM, prefer stereo, Alaskan exceptions for RPU's, microwave. Lewis, 907-783-2256.

Ampex 354-2 stereo tube rcdr in console, excel cond, $1000; Ampex 351 transports, BO; Ampex 440 stereo in console w/Ampex 6 chnl mixer, excel cond, $750; Ampex 440C in console servo motor 4 speed, excel cond, $995; MCI JH110 stereo in console, excel cond, $495; MCI JH110B stereo in console, $750; MCI JH110B 4 trk 1/2" in console, $1000; Otari MTR10-2 stereo in console, excel cond, $1750; set of new Ampex 8 trk 1" heads, $750; Ampex 16 trk 2" heads, new, $350 ea; MCI electr stereo set, $150; Otari CB-109 auto locator, new. J Price, 214-321-6576.

PR-99 play only (5), all w/tone encoder cards & manual, $500 ea. D Weer, 904-284-1111.

Revox A77 stereo R/P w/rack mount, play head gd, rec head worn, working, fair cond. C Gennaro, 906-932-2411.

Tascam 32 2 trk r-r, 1/4", 1.5 ips, great cond, just tested, tweaked & calibrated, $750. M Hughes, 301-962-6823.

Ampex AG-440C, excel cond, $2000/BO; Sony 3 head TC-355, solid state works, tabletop, $75. C Marker, 906-249-1423.

RECORDERS

WANT TO SELL

Revox PR-99 r-r play only w/manuals, $250. 707-829-5999.

Ampex 351 r-r from mid 60's w/tubes, gd cond, $1300/BO. C Ford, 972-448-3336.

Pioneer RT-701 r-r, 3 motor, 3 head direct drive, perfect cond, mounted in open counter top style rack, $300; TEAC W-500R dual cassette recorder, Dolby B NR, high speed dubbing & more, brand new in box, $100. D Smith, 978-297-4856.

Ampex PR-10 tube r-r, 7.5 & 15 ips, BO. J Borden, 414-482-8954.

Crown Ampex SX 824, Ampex 960. booth gd cond, Ampex tube set, extra parts included, w/manuals, speeds 3.75-7.5 r-r, BO. MG Morris, 212-505-9187.

Sharp stereo cassette deck, hi-bias, metal counter, works gd, $35. W Dougherty Jr, 573-998-2681.

Tapecasters X700 RP & P, vgc, $395/RP, $195/P. A Ishkanian, 804-752-6942.

Sony TCD-D7 Walkman DAT, $475, Brand New MCI 110C-2s $1600, MCI 24 trk $7000, MCI, Scully 8 trks $1500-2500, New short MRL test tapes, $229 for 2" $79 for 1/4" all formats avail, Otari MX5050 Mk III-8 $3k, Otari CB110 remote, $300, CB116 locator, $550 (all for $3.5k), Tascam 85-16 w/locator, remote, dbx, $1800, MCI JH110B-8 trk w/locator $2900, Akai Adam new, digital 12-trk $3500 (was $20k). W Gunn, 760-320-0728.

WANT TO BUY

Ampex 351-354 electr & (2) Ampex MR70 electr & stereo heads, 4 trk erase head. J Price, 214-321-6576.

Marantz PMD 221/222, dead or alive. L Houck, 830-537-5494.

Ampex ATR100 taperecorders for parts. Circuit cards, heads, motors, machine parts, or electronic parts. Call 818-907-5161.

Ampex MM1200-16 and 1200-8, Tascam DA38, Ampex ATR100s, Ampex tube recorders & electronics. W Gunn, 760-320-0728.

CONSULTANTS

REMOTE & MICROWAVE

WANT TO SELL

Marti R-10, STL 10, gd cond, $1600; Gentner VRC-200 command relay & remote, $900; Marti AR-10, RPT-15 remote transceiver & rcvr, chnl 161.640 & 161.670, $1800. J Smith, 336-751-0758.

Comrex 2XP 2-line encoder, $650. Tom, 1-800-860-9771.

Telos-Zephyr mono TX ISDN, $4000. H Stohl. 412-854-5492.

Vodavi Starplus, 1428 digital telephone system, configured to 8 line ports & 126 station ports, max expansion 14x28. 2 digital LCD speaker telephones & 9 digital enhanced speaker telephones, $3900; ITT 801 telephone system, older but works, $500. Ms Sharp, 316-856-3794.

Bogen Friday, 8 mailbox ans machine, 2 lines remote notify, all digital, $200. M Larsen, 510-465-6035.

Telos Zephyr 9200, new w/20 bit codec & built-in terminal adapter, $3995. P Christianson, 904-571-0364.

WANT TO BUY

Gentner Teleswitch line switcher for hybrid unit. M Shane, 402-422-1600.

REPAIR SERVICES

Circle (233) On Reader Service Card

SATELLITE EQUIPMENT

WANT TO SELL

Scientific Atlanta AD 4595 Sedat, excel cond, ready to go, $3700. R Herrick, 909-584-5245.

Scientific Atlanta 9640 C-band audio/video rcvrs, $200 ea; Prodelin 3.7 meter, 41 dB gain, polar mount, $400 ea. J Smith, 336-751-0758.

SOFTWARE/ DATABASES

WANT TO SELL

STATIONS

WANT TO SELL

TOWER SPACE AVAILABLE in SW Virginia, one mile from Interstate 81, high elevation, call 540-382-0303, ask for Bill.

WANT TO BUY

AM or FM station in New England area, non comm or comm, no station to small, will consider partnership. M Cardillo, 401-942-8341.

Network looking for stations! dark, brokered, AM & FM, fax details to programming: 954-735-0370.

STEREO GENERATORS

WANT TO SELL

Wilkinson S6-E-1 stereo generator, $400 +shpg. J Bahr, 787-728-0364.

TAPES/CARTS/ REELS/CD'S

WANT TO SELL

Wall mount cart racks (4), new in box, each holds 20 carts, $25/all. D Smith, 978-297-4856.

TELEPHONE EQUIPMENT

WE BUY AND SELL BUSINESS TELEPHONE EQUIPMENT. DOMINION TELECOM. 800-998-3281.

TEST EQUIPMENT

WANT TO SELL

Crown IMA dist analyzer w/extra rcdr bias patch panel meters; Tektronix digital multimeter DM150A & DM502A, $150 ea; Eico 150 solid state signal tracer, $100; HP 353A 100 dB attenuator, $65; Hickok tube tester 1575, $200; BK Precision Dyna-Jet 707, $200. J Price, 214-321-6576.

Delta TCA 40 EXRHV w/pick-up coil TCT1HV, 5-2 MHz 40 A, perf cond in original fitted foam carton, $1300. G Garus (pager 661-321-7682).

Racal Dana 9303 power meter, 0-2 GHz, new in original box, $475. N Macrae, 702-386-2844.

WANT TO BUY

Bird watt meter. Call John or Tim, 717-948-9136.

TUBES

WANT TO SELL

AMPEREX, EIMAC, RCA, SVETLANA 3CX400A7/8877, 3CX3000A7, 3-500ZG, 4CX250B, 4-400, 4CX400A, 807, 833C, ETC. Westgate 800-213-4563.

TUBES, Eimac, Svetlana, **800-430-6683, Fax: 905-844-6263** www.hard-to-find.net ams@hard-to-find.net

TURNTABLES

WANT TO SELL

Dual 1228 33 & 45 rpm w/pitch control, $50. C Collins, 414-363-9205.

Technics SL 1500-MK2, complete & ready to use, digital readout model, nice cond, $250. D Smith, 978-297-4856.

WANT TO BUY

TURNTABLES, LIMITERS, RECORD CUTTING MACHINES. 612-869-4963.

TUBES cont....

TRANSMITTERS

WANT TO SELL

Bext Lex 25 FM exciter 88-108 MHz 2.5 W max, like new, $1000. R Herrick. 909-584-5245.

CCA 1000-D 2 kW FM xmtr; Harris 2.5K, 2.5 kW, no exciter, needs work. $3000 +shpg; RCA AM 50 kW Ampliphase. $20,000. J Bahr, 787-728-0364.

CSI FM 3000E single phase xmtr upgraded to 5.000 kW in 1993, $7500; BE FX-50 exciter, $1500. Ms Sharp. 316-856-3794.

DB Electronics KA-1500/PM300, 1.5 kW, single tube w/solid state 300 W stereo exciter, on air 14 mos only, w/manuals, tune to any freq, $4000/BO. D Weer, 904-284-1111.

Harris 1983 MW-50-C 50kW AM, daytime use only, excel cond & ready immed, $30,000. J Weitzman, 202-683-3536.

Harris FM-1G 994 648300, 1 kW xmtr, runs well, may need some work, $1000/BO. D Curley, 1-800-660-9298.

Harris MX-15, vgc, retuneable across FM band, $1600 +UPS shpg; CCA 10-D/s, 10 W FM exciter, $450. J Bahr, 787-728-0364.

Jones/Tepco J-316 M, rated for 10 W output, currently on 94.7 FM & output is 95.9 FM, $2000/BO. G Croniser, 315-376-6518.

RCA BTA-50H2. 50 kW AM, complete but will sell all or parts, all offers entertained, will sell for scrap at end 6/99. R Meyers, 305-264-5963 or email: jrmeyers@bellsouth.net.

Energy-Onix Legend 1000FM, 1 kW, excel cond w/freq adjustable 30 W Energy-Onix exciter, $3900. A Stamat, 732-845-9362.

Gates 10kW AM BC10P, 1010 kHz, on-air standby, mint cond, 8302 hrs. avail in 2 mos, BO; RCA Ampliphase AM BTA50G, 1010 kHz, on-air, excel cond. avail in 2 mos, BO. Mr Kaufman, 618-797-2299.

Harris 1 kW 1996 Quest FM xmtr, solid state, excel cond, avail 5/15/99, $8500; Harris 1 kW Quest 1996 FM xmtr, new cond, used only 2 yrs, avail now, $8500. M Rogers, 831-373-2250.

Harris MS-15 FM exciter, freq agile, w/composite input module, 15 W output, excel cond, w/manual, $1500/BO. H Landsberg, 626-355-3656.

Tepco J-340 5-40 W (3), 2-4 yrs old, excel cond, $2000 ea. C Marker, 906-249-1423.

Harris FM-25-K xmtr. Mike, 800-588-7411.

WANT TO BUY

Low pwr AM bdct xmtr or exciter, up to 100 W. in working or non-working cond, for community bdct license, can arrange collection anywhere by FedEx. W.H.Y.? Fax: UK 011-44-1908-365726 or email: Big-Mobile@g4zow.freeserve.co.uk

McMartin AM/FM xmtr, any model, exciter or stereo modules. Goodrich Ent., 11435 Manderson, Omaha NE 68164. 402-493-1886.

ACTION-GRAM

EQUIPMENT LISTINGS

Radio World's Broadcast Equipment Exchange provides a FREE listing service for radio stations and recording studios *only*. All other end users will be charged This FREE service does not apply to Employment Help Wanted ads or Stations For Sale ads These are published on a paid basis only Send your listings to us by filling out the form below Please be aware that it takes one month for listings to appear. The listings run for two consecutive issues and must be resubmitted in order to run agian. Thank you

Please print and include all information:
Contact Name ______
Title ______
Company/Station ______
Address ______
City/State ______
Zip Code ______ — ______
Telephone ______

Brokers, dealers, manufacturers and other organizations who are not legitimate end users can participate in the Broadcast Equipment Exchange on a **paid** basis. Line ad listings & display advertising are available on a per word or per inch basis.

Are you currently a subscriber to Radio World?
☐ Yes ☐ No
Signature ______ Date ______
Please check only one entry for each category:

I. Type of Firm
- ☐ D. Combination AM/FM station
- ☐ A. Commercial AM station
- Providers
- ☐ B. Commercial FM station
- ☐ C. Educational FM station
- ☐ E. Network/group owner
- ☐ L. Consultant
- ☐ N.Delivery Service (Internet/Cable/Satellite)
- ☐ F. Recording Studio
- ☐ K. Syndicators Station
- ☐ M. Ind. Engineer
- ☐ G. Audio for Video/TV Station
- ☐ H. Consultant/ind engineer
- ☐ I.Mfg, distributor or dealer
- ☐ J.Other ______

II. Job Function
- ☐ A. Ownership
- ☐ B. General management
- ☐ C. Engineering
- ☐ J. Promotion
- ☐ H. Programming/production
- ☐ G. Sales
- ☐ E. News operations
- ☐ F. Other (specify)
- ☐ K. Production Mgt or Staff ______

WTS ☐ WTB ☐ Category: ______
Make: ______ Model: ______
Brief Description: ______
Price: ______

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WTS ☐ WTB ☐ Category: ______
Make: ______ Model: ______
Brief Description: ______
Price: ______

*Closing for listings is every other Friday for the next month's issue All listings are run for 2 issues unless pressed for space or otherwise notified by listee.

Broadcast Equipment Exchange
PO BOX 1214, Falls Church, VA 22041 • Tel: 800-336-3045 • Fax: 703-998-2966

EMPLOYMENT

HELP WANTED

Prophet Systems Innovations Tech Support opportunities

A position with PSi offers growth potential that is limited only by your drive to succeed. A degree is not required for this position as we value a good work ethic, the desire to do the job right and previous experience as being more important to success. Knowledge of DOS, Win3.1 and Windows95/98 a must, Novell Networking, LAN/WAN Experience a Plus. Computer Hardware Knowledge - Chassis to full running computer beneficial. Advancement, personal development, and knowledge enhancement opportunities available.

Prophet Systems, a division of Capstar Broadcasting Partners, is the worldwide leader in broadcast digital automation and audio playback systems. We are currently upgrading our Audio Wizard for Windows software and branching out into delivery of audio and programming via the Internet and Satellite. We are also expanding into audio delivery and playback for the restaurant and entertainment industries.

If you desire an exceptional working environment – where your ideas are taken seriously – and want to live in a small Midwest town that offers a low cost of living, good schools, little crime, and excellent outdoor recreational opportunities then we have the position for you.

Please fax, mail or email your resume and salary requirements to:
Prophet Systems Innovations
Attention: Candy Spady, Human Resources
111 West 3rd Street
Ogallala, NE 69153
Email: candys@prophetsys.com
Fax: (308) 284-2382

CHIEF ENGINEER needed for 6 station cluster in Central Pennsylvania. Experience must include RF broadcast engineering, computer software, hardware & network maintenance, digital audio delivery systems, transmitter maintenance & repair & multi-tower directional antenna tuning. Fax resume to:
Chris Tyler
at Dame Media, Inc.
at (717) 901-6729

Engineer needed: Must be competent in all facets of radio, RF, computers, and automation. Some travel required. Midwest location. (515) 242-3724.

INDIANA BROADCAST GROUP seeks a hands-on, self-starter CE that possesses a great attitude & the desire to do the job right. Proficiency with computers, studio & AM/FM transmitter maintenance required. Competitvte pay & 401K. If you're looking for a career, not your next job, then contact Dennis Rund at 419-422-4545 or email dennisrund@findlayoh.com. EOE.

CHANCELLOR MEDIA, WASHINGTON DC, has openings for Chief Engineers in our State of the Art, Market Dominant cluster of stations serving our Nation's Capital. We offer challenging work with a skilled crew, Excellent Pay and Benefits. EOE
Contact:
Tom Shedlick-Market DOE
Chancellor Media
1801 Rockville Pike, 6th floor
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◆READERS FORUM◆

DJ dreams

Dear **RW**,

I read with great interest Bob Rusk's feature on Paul Shinn ("Pre-Teen Pirate to Chief Engineer," **RW**, April 28).

Paul talked about his dream of becoming a DJ and building his own radio station "with foil on eight-track tape decks to trigger the next event," and facing the FCC inspector. It sounded so familiar.

In 1967, Chuck Conrad, my older brother Rick and I constructed 10 W carrier currier station WECM (AM 640) in the basement of Chuck's home in Walpole, Mass. It was a two-room operation with a main studio and a news booth.

WECM(AM) circa 1967

Chuck was the brains behind the operation, putting together a stereo board, of all things, and installing a couple of turntables and a tape deck — with foil on either end of the reel. While we worked during the day at WNAC-TV in Boston, (now WHDH-TV), that 30-minute reel would go back and forth for eight hours-plus, playing the same music (pity the poor listeners hearing "Light My Fire" *ad nauseam*) until we returned home in the evening, ate supper and rushed to the station to go live until 9 p.m. nightly. What a blast!

We, too, were paid a visit by the local FCC inspector who took "field intensity readings" that proved much higher than we and the inspector anticipated. He was a good guy, though. He told us he had never seen such a professional operation of its kind. As he left and we beamed, he whispered, "You can bring it back up, but not much."

The station was a great inspiration to keep our dream alive. For years, Chuck was in the technical end of broadcasting in Boston and later in Dallas, where he continues with a successful audio business. My brother keeps an active ear to Boston radio. And I'm rounding out 32 years in broadcasting, most of which have been spent doing news in Boston on WRKO(AM), WKLB-FM and WCRB(FM).

It's been a wild ride, but it's also been a whole lotta fun. And still going strong!

Ron Hurst
Walpole, Mass.

Memories ...

Dear **RW**,

Just finished the Ken R. article in the April 14 **RW** ("Top Floor and on Top of the World"). I was zipping through the paper when the name Howard Heath jumped out. Wow — a trip down memory lane.

I was chief engineer at WPAG-AM-FM from 1974-78. Ken's memories are pretty close to being on target.

Frank was actually Frank Gigler, not Gegler.

My favorite Howard Heath story is from one summer day when somebody chopped the phone lines out to the transmitter. The site still had power, but no way to communicate with anybody else. Twenty minutes later, Howard came screaming up the transmitter driveway in his white LTD. It was entirely too noisy in the transmitter building, so I set up one of the remote mixers on the front porch and Howard happily started reading his reports ... until the thunderstorm rolled in, and all his reports blew across the field.

That is what separates the real professionals from the rest of us — wire copy flying away in the breeze and the announcer going on as if nothing had happened. Howard just kept on crankin' away.

The comments about the "Announcer's Lounge" brought back another memory too. The "Lounge" was actually part of the building next door. There were massive renovations going on in that building and someone cut through the wrong beam. The front exterior wall of the building next door began moving. Both that building and the Hutzel building were evacuated.

There was a remote going on at the time, so we had the phone company reroute the line out to the transmitter. The PD and I spent the night planning out the new WPAG because we were sure the beautiful downtown Hutzel building would be a pile of dust by morning. Alas — morning came and the Hutzel building still stood. Rats.

Anyway, the news guy, Ted Huesel, had to do the first two hours of broadcast that day from the bathroom at the transmitter site.

Jerry McCarty
Chief Engineer
Center for Professional Development
College of Engineering
The University of Michigan
Ann Arbor, Mich.

Joe Radio

Dear **RW**,

I just read Mark Lapidus' *Promo Power* article in the May 12 issue ("Why Joe Radio Has No Character") and I gotta tell ya, he hit the nail on the head in regards to *fear* being what keeps a lot jocks from getting things done right.

I've noticed, though, that most times, the real scared-y pants in radio are the powers that be ... the PDs, GMs and consultants who, in theory — in a romantic sort of way — "agree" entirely with everything you (and I) say on that subject ... but don't *reeeeeeaaaally* want it implemented over the air.

I think what really scares those jocks is the soulless corporate "system" they have to work within. I've always thought it was more important to do a good job than to merely have one. Consequently, it has meant having to stand up for doing "fearless radio." I can still hear the echoes of those doors slamming shut (shut) (shut) (shut).

Bruce Campbell
The Campbell Brothers
HardRadio/HardRecords
Dallas

From Vapor to Hardware

In-band, on-channel digital radio has never had a better chance. One reason is that transmitter and receiver companies are beginning to get more involved. These parties see sufficient promise in IBOC to put their names and money on the line.

USA Digital Radio and Kenwood Corp. are working together to develop receivers. That's a big step toward launching the technology into the consumer market. It also marks the beginning of the process of educating audio electronics retailers.

Transmitter and RF hardware suppliers have been consulting with IBOC proponents, visiting the research plants and digging deep into the questions raised about waveform issues. Now they, too, are becoming more visible.

Nautel and Lucent Digital Radio agreed to cooperate in implementing lab and field testing of transmitter technology. Lucent also announced an agreement with ERI to develop combiner technology. USA Digital Radio has signed agreements with transmitter makers Broadcast Electronics, QEI and Nautel.

In general, there is a sense of momentum about IBOC this summer.

The proponents are all testing on stations. Lucent said it had successfully tested its system on WBJB-FM with no degradation of the host analog channel during transmission of the digital signal. Digital Radio Express was testing its AM system on a California station. USADR planned to begin testing its systems on several stations in the Washington, D.C., area.

FCC Chairman Kennard seems intent on starting a rule making, saying, "We don't want to leave radio in the Dark Ages while everybody else goes digital."

The proponents are eyeing evaluation guidelines as approved by a DAB group of the National Radio Systems Committee, and working to meet its request for full test results by December.

And more voices are emerging for cooperation among the proponents. In a statement about the Lucent deal, Nautel CEO David Grace said, "Nautel encourages all IBOC proponents to formulate agreement for a single national system. ... The potential benefits of IBOC implementation for AM radio are enormous."

We couldn't agree more.

— RW

Write to Us

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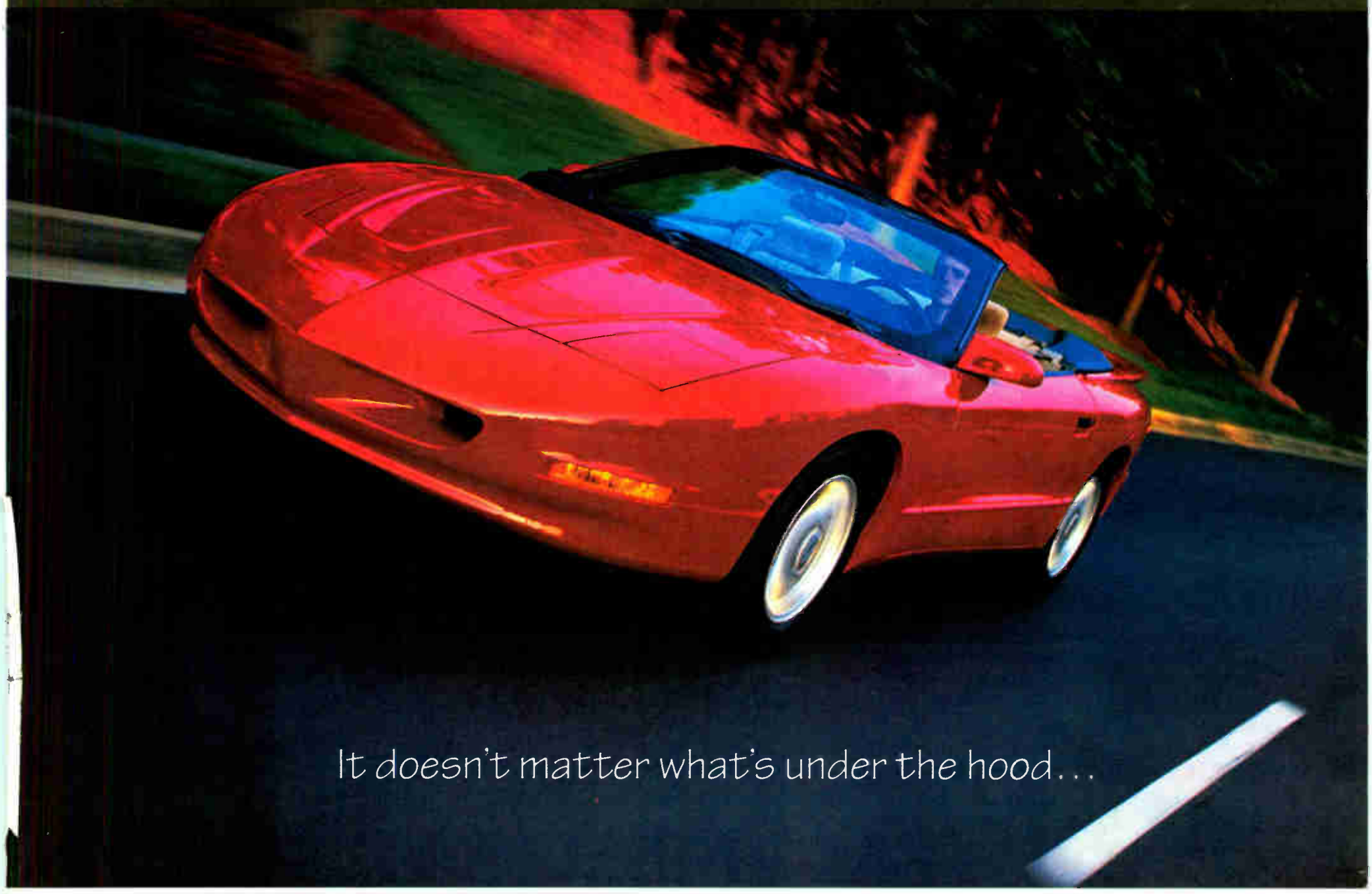

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