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Radio World®

Bob Donnelly and Dick Siezak on Making ISDN Work

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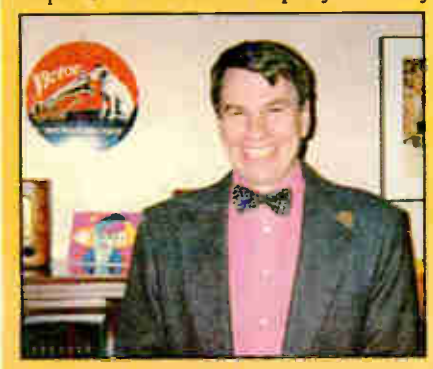
Vol 22, No 12 | Radio's Best Read Newspaper | June 10, 1998

ENGINEERING PROFILE

A Look Inside The World Of Capstar

by S. D. Yana Davis

AUSTIN, Texas In these days of close scrutiny from the financial mavens on Wall Street, one of the most closely watched radio broadcasters is Capstar. When the company recently



Frank McCoy

announced plans to sell 31 million shares of stock to raise money to buy more radio stations, it was expected to

See CAPSTAR, page 6 ▶

In-Band, On-Channel: Now What?

IBOC Landscape Has Changed in Recent Months; Proponents Press Ahead With Test Plans

by Leslie Stimson

WASHINGTON With the announcement by Lucent Technologies that it intends to develop a viable in-band, on-channel digital audio broadcasting system, the landscape of IBOC proponents has changed yet again.

Just one year ago, USA Digital Radio and Lucent had entered into a partnership for a joint development agreement, a partnership that has since ended. Back then, USADR and Lucent were the only companies publicly and actively pursuing an IBOC system for radio, according to the Electronic Industries Association.

Just a few months ago, Digital Radio Express announced its intentions, although its managers say they have been working on a system for two years. Now observers are asking whether any more companies will enter the IBOC development fray, and wondering how Lucent's presence affects the timetable for development of a system on which broadcasters, regulators and receiver manufacturers can agree.

Suren Pai of Lucent Digital Radio

NAB Vice President of Science and Technology John Marino said the entry of a presumably well-funded company like Lucent at this stage is exciting.

"What it can do is light a fire under everybody to start moving. USADR and DRE have their schedules mapped out. I would suspect anybody else coming in would make them relook at their plans to see where their priorities are and get on with their testing," he said.

Officially, USADR officials welcomed competition from Lucent and put a positive face on the news. The joint development agreement between Lucent and USADR originally was supposed to last six months, according to USADR Vice President Jeffrey Jury. The agreement was extended until February of 1998

because some tests were still being evaluated. Both sides discussed extending the agreement, but decided not to, he said.

Many times in joint development agreements, Jury said, "Each party has a view of what the future will look like," and that in this case, those views were not the same.

See IBOC, page 19 ▶

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FIRST PERSON

Super Bowl Frequency Coordination Team

A Story of Footballs, Blimps, Helmets, Police Choppers, Even a Stealth Bomber

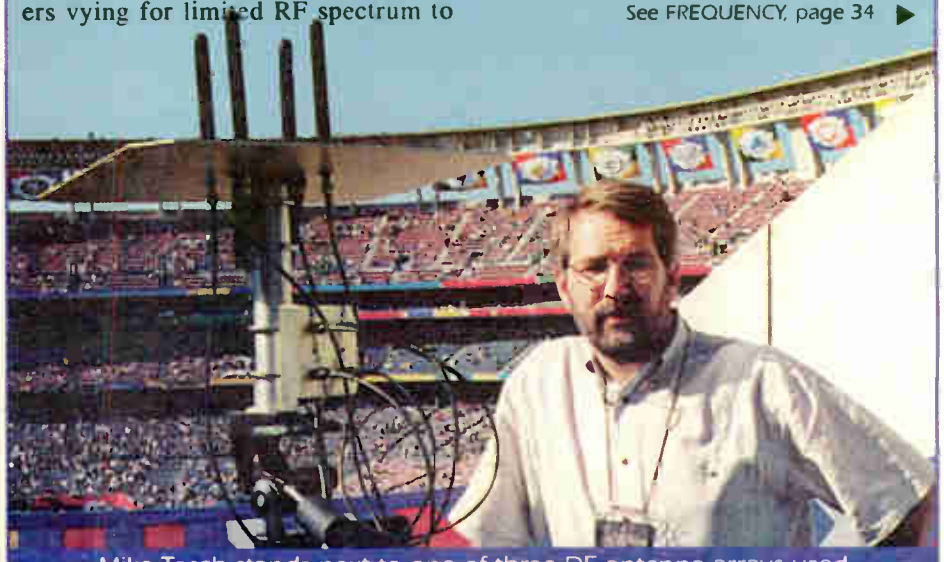
by Mike Tosch

SAN DIEGO The NFL Super Bowl requires teamwork both on and off the field. As difficult as it is to move the pigskin down the gridiron to the end zone, the same is true for the accommodation and coordination of the multitude of domestic and international broadcasters vying for limited RF spectrum to transmit video and voice signals. The task of administering spectrum at the Super Bowl fell upon a select frequency coordination team that included San Diego local coordinators.

Two teams

Frequency Coordination at Super Bowl XXXII consisted of two teams

See FREQUENCY, page 34 ▶



Mike Tosch stands next to one of three DF antenna arrays used during the Super Bowl at San Diego's Qualcomm Stadium.

World Radio History

◆ NEWSWATCH ◆

Satellite Failure Disrupts Radio

GREENWICH, Conn. Programming was disrupted for several radio networks when the Galaxy IV satellite turned away from the Earth on the evening of May 19. Both the primary and backup onboard computers used to keep the satellite aimed at Earth stopped working, according to PamAmSat, the owner of the satellite. The malfunction disrupted paging services, radio and TV network programming and financial services. PanAmSat, based in Greenwich, Conn., called the outage unprecedented and said the problem was caused by a hardware failure in the satellite's computers.

Among the hardest hit by the outage was the Public Radio Satellite System, managed by National Public Radio to carry its programming and that of other radio sources. The system carries programming for about 420 downlink stations and another 200 repeater or associate stations that feed off those downlinks. Commercial radio customers that buy satellite time on the system, either regularly or for special uses, include state regional networks and sports networks, according to Linda Dominic, manager for system development and planning for the Public Radio Satellite System.

Two days after the initial outage, most stations appeared to have repointed their satellite dishes at another PanAmSat satellite with low traffic, NPR Vice President for Engineering Mike Starling said. That was no mean feat; many dishes had not been repointed since they were installed in 1980.

Until the repointing, NPR and its affiliates found several ways of distributing programming, both high- and low-tech fixes.

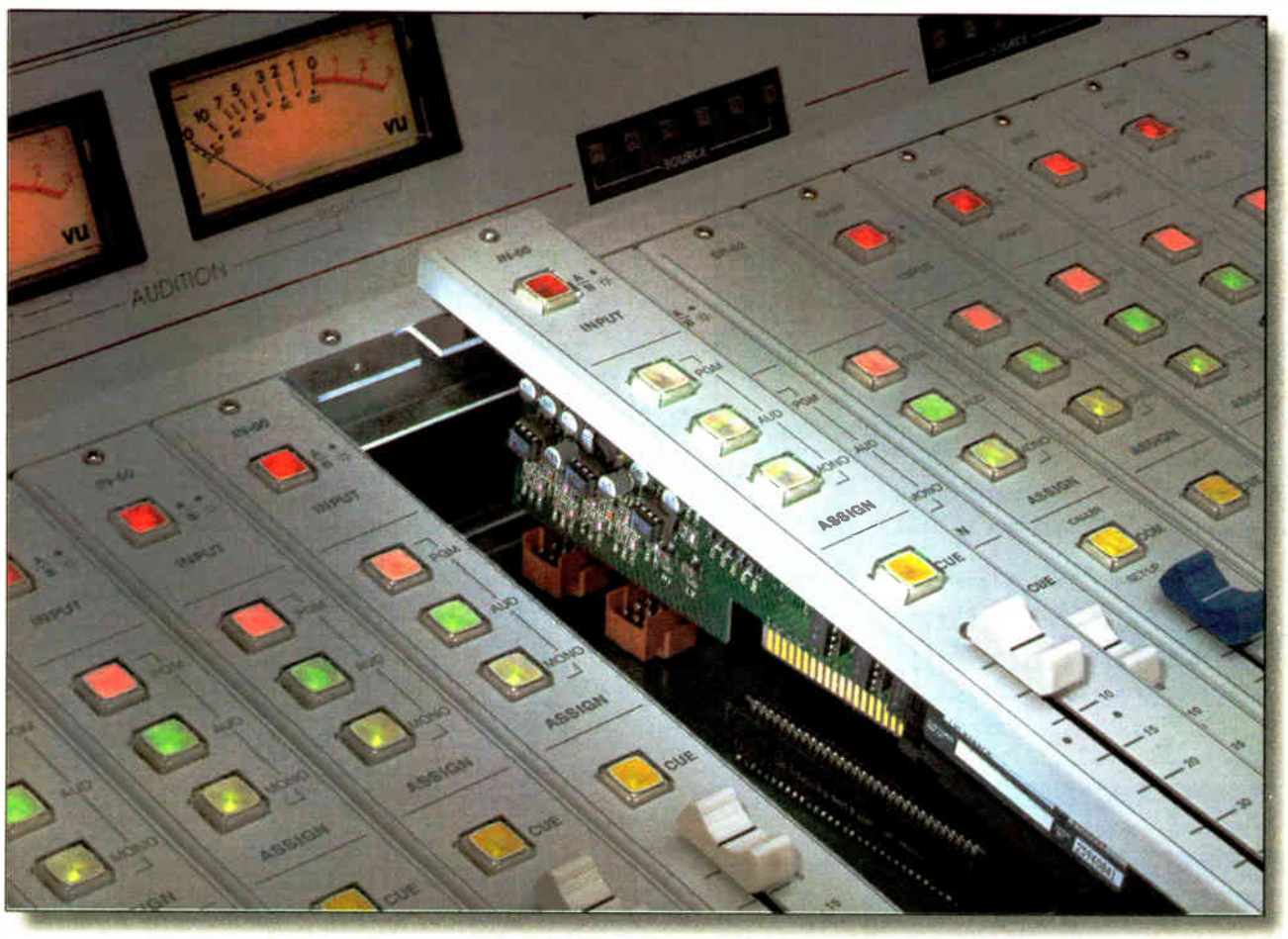
AP Radio Network set up an ISDN bridge with about 15 circuits that allowed NPR to feed stations over high-quality phone lines. ABC Radio Networks and the Canadian Broadcasting Corp. each cleared a channel for NPR on their satellites.

For 30 radio affiliates that have public TV counterparts, NPR fed audio via ISDN to WETA-TV in nearby Virginia, where it was fed to the Public Broadcast System satellite for distribution. NPR also used RealAudio to distribute audio via its Internet Web site.

For some weekend programming, NPR engineers created a "daisy chain" of DAT recorders, making real-time dubs of

See NEWSWATCH, page 17 ▶

Take a LOOK at THIS:



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Mic & Line, +4dBu	.004%
DIM	
Mic & Line, +16dBu	.005%
DYNAMIC RANGE	
Line	114dB
Mic	98dB
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World Radio History

EAS in California, Warts and All

Planners Find Coordination of 22 Local EAS Plans To Be No Small Task in a Big State

by Lynn Meadows

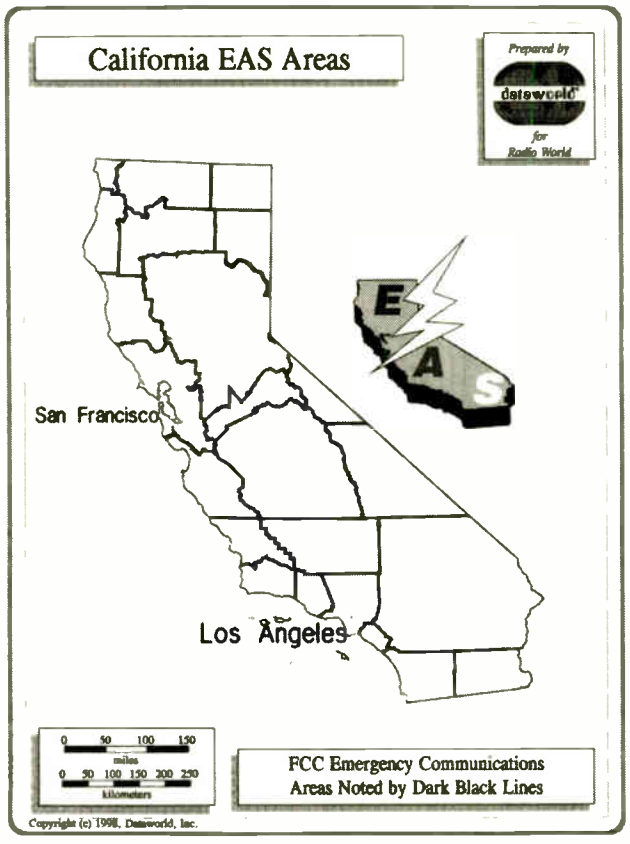
SACRAMENTO, Calif. The assets that make California a vacationer's dreamland make it an EAS coordinator's headache.

Fifty-eight counties offer mountains, deserts, beaches, valleys, rivers, oceans and wonderful cities for exploring. But try setting up an Emergency Alert System plan to alert members of the public in those 58 counties of the thunderstorms, flash floods, earthquakes, forest fires and mudslides that could harm them. Add in resistance from broadcasters and the public, and you can work up to a migraine that rates an eight-plus on the Richter Scale.

When finished, the California State EAS plan will be the sum of all 22 local area operational plans. The state technically has 23 operational areas, but Mono county (East of the San Joaquin Valley) was "ceded" to be in the Nevada State plan because that made more geographic sense.

The California local plans are in various stages of completion. Out of 22 total plans, nine are completed. The Los Angeles plan has been sent to the FCC after receiving approval from state and local authorities. Meanwhile, the Bay Area plan for San Francisco, Oakland and San Jose cannot be forwarded to the FCC because that Local Emergency Communications Committee (LECC) does not have a Cable Vice-chair in place to sign off on it. Though operating successfully, the plan cannot have final approval until the cable chair signs it.

Richard Rudman, chair of the Los Angeles County LECC and California Southern State Emergency Comunications Committee (SECC) Vice Chair, said, "The major problems facing California are that we have a ton of operational areas of different sizes. The common thread that runs through this is that Part 11 (of the FCC rules) mandates that there shall be a Local Emergency Communications Committee, but it does not say how to do it absent volunteer spirit."



Of the Bay Area local plan, Ed Cavagnaro, KCBS(AM) news and program director and LECC chairman for the Bay Area, said, "The biggest problem is you would like full participation, but some stations elect just not to do it. All we can do is put the steps in place. We're not in a position to try to force. It's a voluntary system."

In fact, stations technically do not have to forward any messages other than the six national level event codes.

As for how to pressure nonparticipants to get involved, Cavagnaro said, "I think the only pressure could come from the public if the weather service or the agencies putting out the messages were to make it public that they are upset that some particular stations are not participating. That would be a role for the agencies who want the message put out."

In some areas, no stations volunteered to be one of the local primary stations. The first San Diego LECC was disbanded in the spring of 1997 after an employee of the Jacor-owned LP1 station was quoted in a local newspaper article saying that the system did not work. Jeff Williams, current LECC chairman and program director of Jacor station KPOP(AM), said the FCC, the state and Jacor "just went through the roof."

In response, Jacor executives announced the company would supply an LP1 station and support EAS completely. To that end, Williams has trained the local Jacor station employees on EAS equipment and is able to dedicate time toward the LECC.

LP or "Local Primary" stations are responsible for carrying common emergency messages as specified in the EAS local area plan. The numbers (LP-1, 2, 3) refer to the sequence in which they are to be monitored by other broadcast stations in the local area.

All 12 Required Monthly Tests in 1997 were botched, said Williams, either through operator error or general confusion. Williams said the San Diego plan began to shape up when Oscar Medina, chief engineer at KNSD-TV, agreed to be vice chair of the LECC in September of 1997. Medina had experience helping put together the EAS plan in El Paso, Texas.

One of the thorny issues in San Diego was the mountain range that divides the densely populated area from the desert which none of the stations signals penetrate. Local broadcasters were upset at having to relay National Weather Service information that affected the desert when no one in the desert could hear it.

San Diego EAS

Stan Harter, former assistant chief of the Telecommunications Unit of the Information Technology Branch of the California Governor's Office of Emergency Services, drew a line and told the San Diego broadcasters they would only have to activate NWS for areas west of the line. Harter, who died in April (**RW**, May 13), worked ceaselessly to iron out wrinkles in the different local areas.

See EAS, page 10 ▶

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World Radio History

Turn Off TV and Watch the Game

I love baseball, and its myriad sounds: the bat crack, the vendor call, the crowd's muffled roar. These sounds are best on radio. Nothing brings this home to me more than two recent Major League Baseball games.

As a fan of the New York Mets and Baltimore Orioles, I have every reason to detest the New York Yankees. But as a friend and I drove north on I-95 through Delaware one recent afternoon, we listened in awe to the distant voices of John Sterling and Michael Kay on WABC New York, describing the incredible perfect game pitched by David Wells over the Minnesota Twins. Only a dozen men had achieved this feat in the long modern era of baseball, going back to days before radio as we know it existed.

The Yankees announcers did a superb job, conveying the rising excitement of the historic moment at "baseball's home office," Yankee Stadium. The power of the moment was obvious even to me driving in my car, more than 100 miles away. It was great radio, and it was sublime.

Two days later, sitting at home, I listened raptly to baseball once again, this time in dismay. An evening game between the last-place Orioles and first-place Yankees descended into fistfights following a pitch from Armando Benitez that hit a Yankee batter squarely in the upper back. The resulting brawl started on the field, then tumbled into the O's dugout in a frenzy. It was far more vicious and mean-spirited than most baseball fights. Jim Hunter and Fred Manfra told me all about it over Orioles affiliate WTOP in Washington, and I "saw" every punch.

This broadcasting miracle takes place every day, from spring to fall, in the background of our lives. Turn off your TV, fellow fans, and watch the game on the radio.

★ ★ ★

The recent service interruption on the Galaxy IV satellite, and the problems it produced for public radio and other broadcasters, demonstrate how important satellites have become in the fabric of our industry. Was your station affected? How did you cope? Drop us a line and we'll share your comments.

★ ★ ★

Working at **Radio World** puts us in touch with some of the best and most interesting people in radio.

Here's a sample: In our front-page engineering profile, we meet Frank McCoy and his colleagues at Capstar, the industry's largest station owner. Public radio engineer Mike Tosch of KPBS-FM in San Diego takes us inside the frequency coordination process at the biggest single-day sports event of the year, the Super Bowl.

Bob Donnelly of ABC Radio and Dick Slezak of AT&T's Global ISDN network join up to give us tips on getting the best possible performance from ISDN. Peter King of CBS Radio News offers suggestions for bringing field reports to life. Barry Mishkind weighs in with a profile of legendary station WBBM in Chicago.

At reader request, FCC Inspector Ron Ramage is back in our pages, with the first in a three-part series. He tells you what he looks for when he inspects your radio station — pretty useful stuff. National Internet writer Kim Komando joins us from the pages of Tuned In magazine, beginning in this issue. And Peter Senger, chairman of the new Digital Radio Mondiale consortium, explains DRM and why it matters to the world of radio. There's plenty more, too.

When we start work on every issue, I tell our staff of editors and writers: Make every page count. Publish interesting articles about the world of radio. The people who live in that world deserve a place to tell their stories; so let them.

Please let me know what *you* think. I'm at *pmclane@imaspub.com*

From the Editor

Paul J. McLane

★ ★ ★

Guy Wire, our masked engineering columnist, is found only online, at our new Web site. Recently s/he was getting him/herself all geared up over digital audio broadcasting. In a column titled "Hype and Hardware: Getting Ready for DAB," Guy wrote that eager equipment vendors might be calling soon to ask if your station is "DAB ready." S/he went on:

"They sometimes leave the impression that those who ignore the benefits of all-digital and hesitate in the conversion just might get 'left behind' by the more cutting-edge station down the street or up the dial," Guy stated. "Not that I'm against digital, mind you; it certainly is the future. It's just that too many in our industry under-appreciate how well analog systems can work and sound, not to mention ease of use and flexibility. I'm just waiting for some outfit to start marketing digital antennas, along with the ever-growing list of digital exciters, STLs, consoles, and processors."

You can get the full scoop from Guy Wire at *www.rwonline.com*, where you will also find past columns archived. Your ideas about how to improve our site better are welcome.

RF Specialties Recognizes Schneider

The RF Specialties Group presented John Schneider with a certificate of merit for 16 years of service to its customers in a ceremony at NAB '98. Schneider left RF Specialties of Washington in March to work in Latin American sales for Broadcast Electronics.

In 1982, Schneider and Don Jones, then independent distributors in the northwest and southwest, united the group into what are now eight independently owned and operated regional offices.

Schneider sold his interest in the RF Specialties Seattle office to Bill Newbrough and Sam Lane.

Lane and Newbrough now divide their time between the Seattle, Santa Barbara and San Francisco offices. Jerry Hill, the sales manager of RF Specialties of Washington, also is a part-owner there.

RF Specialties Group said the three-office arrangement offers "local support and big-company resources" to broadcasters in the northwestern United States.

Bill Hoisington of RF Specialties of Florida, left, presents certificate to John Schneider. Tom Monahan of RF Specialties of Pennsylvania is on the right.

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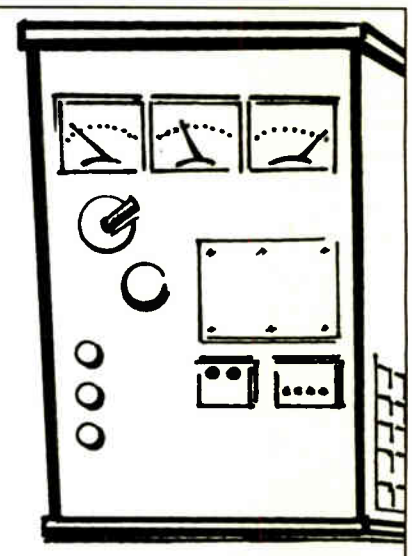

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World Radio History

◆READERS FORUM◆

Letters received are the property of **RW**, and may be edited for space considerations.

AM Underpowered

Dear **RW**,

I have always thought that the FCC 50 kW limit on AM radio station broadcasting power has never been totally logical. The limit ought to be 2.1 megawatts — especially for stations in Hawaii and Alaska.

The AM band is going to be abandoned to DAB in the next 20 years — so why not keep it going for broadcasters that can afford the 50 kW-plus high-power transmitters?

Mike Hackett
Lynnwood, Wash.

EAS sound-off

Dear **RW**,

This relates to Lynn Meadows' page 1 article in the May 13 issue of **RW**, "Winter '98 Put EAS to the Test".

This year my friend and I decided to drive to Las Vegas for the spring NAB show in order to visit family and friends in California, Arkansas and Missouri. On the return, April 16 to be precise, we were on Interstate 40, about 40-50 miles west of Nashville, Tenn., under an ominous sky, when the radio stations began to broadcast tornado alerts for the counties surrounding Nashville.

We had no idea what county we were in, with no signposts or other methods of county identification. Were we in a danger zone? Perhaps. Those at home or at work knew about the surrounding terrain and the county designations, but we, along with several thousand other drivers and passengers, had no idea of our whereabouts, county-wise.

Would it be in order for areas under such threats as common but unwelcome incidents with major arterials in their area to also include some information as to the location of trouble spots with respect to their location and relationship to major roadways? Just a few additional words would do it: "Those of you traveling I-40 between mileage markers 25 and 43 may expect a twister in that vicinity between 4:30 and 5:15 p.m."

In closing, we reached Nashville about one hour after the worst of the twisters had left their mark, suffering no problems, but with the unanswered question: Was there anything we should have been prepared for? I hazard there has to be at least a half-million people on the major U.S. highways each minute with potentially no means of knowing what might be a threat to them in the way of a tornado or other force of man or Mother Nature.

Jesse Maxenchs
LaFayette, Ga.

Dear **RW**,

Many of the problems outlined in your EAS article do not reflect weaknesses in the principles of the EAS system, they instead bring out problems in the application of those principles, primarily in the Local Area Plans.

For instance, to hear of a station "choosing" to monitor the AM/FM components of an LP-1, instead of an LP-1 and LP-2, may be indicative of a problem. Stations should not "choose" their monitoring assignments; those assignments should be made part of a Local Area Plan (which is incorporated by reference into the State Plan). In many plans, the AM component of the LP-1 station might be categorized as an LP-3 and made an optional monitoring source.

Another example of a weak plan is the problem mentioned where LP stations do not want to activate for any weather warnings. True, the FCC does not require carriage of local alerts; but the LP stations should have been selected for their willingness to participate. A good local area plan includes "memorandums of understanding" with the LP stations that state which alerts they will carry. The LECC might determine to carry only warnings, not watches, and perhaps delete the tired and overused Winter Storm Warning, but once determined, the LP stations should fully participate. PN stations (the rest of us) can then pick and choose as to the level of their participation.

Our Local Area Plan, while not perfect, is posted for all to see at *www.jmu.edu/wmra/sveas/svplan.html*

Bill Fawcett
Chairman
Shenandoah Valley LECC
Harrisonburg, Va.

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When The Bird Flipped

Where were you when the bird went down?

If you are a public radio engineer, or if you work at one of the many other broadcast organizations whose program audio passed through the Galaxy IV satellite, you know what we're talking about. The May 19 failure of the PanAmSat bird demonstrates just how heavily radio relies on its satellite-fed programs — indeed, how much we as a society rely on data transmitted from orbit.

The technical solutions with which networks and stations handled the problem were impressive. Up sprung ad hoc ISDN networks, alternate satellite paths, and systems to "bicycle" taped programs from station to station. Users got their audio via dial-up phone lines and temporary bridges, via fiber lines intended for other uses, even over the Internet — something to ponder for the future. Messages flew back and forth on the *pubtech* public engineering forum online, as engineers traded rumors, tips for repointing dishes and offers to help.

Stations affiliated with public TV licensees were able to get an NPR radio feed via the PBS satellite. Stations without abundant resources of their own reinvented themselves as local program providers for a while. Folks learned quickly how to make different brands of digital codecs talk to each other, and how to realign a satellite dish.

Shortly after the satellite disruption, which also brought the paging industry to its knees for a time, FCC Chairman Bill Kennard issued a statement pointing out that such problems are rare. But he said the FCC advisory committee in that area would assess the cause and make recommendations to the telecommunications industry. His concerns, of course, go beyond radio, but we're glad he's paying attention.

For radio, the failure of the satellite was disturbing. There are plenty of questions in the wake of the failure: How well was NPR and its satellite distribution arm prepared for such an event? How well were individual stations prepared to react to the loss of "mission-critical" program audio? Are other satellite services vulnerable? Can networks and affiliates do a better job — by conducting practice runs and by establishing emergency procedures, phone numbers and backup plans?

Managers of affected stations should demand answers from their providers, and from themselves. Managers at stations that were not hit also should take note and learn.

One lesson, though, is clear: In times of trouble, radio people are more likely to pull together than pull apart.

— **RW**

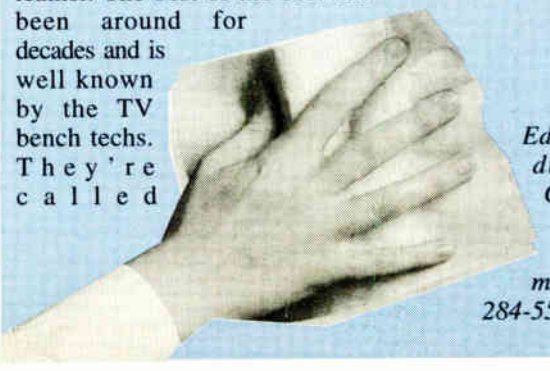
DAT's a wrap ...

Dear **RW**,

I have thoroughly enjoyed Jeff Johnson's articles on DAT upkeep, and thought I might add something for future reference.

As a 20-year veteran of both TV and radio rotary head machines, I've tried just about every type of swabbing gadget made, from the foam sticks to Q-tips to leather. The best of the best has been around for decades and is well known by the TV bench techs. They're called "Texwipes" and are a thin, extremely tightly woven cotton cloth. I've seen more heads torn off by foam sticks and cotton Q-tips than I care to count. The fibers in a Texwipe cloth will not fragment. They can be used on both the upper drums as well as the head tips themselves. Best of all, since most people use them for large-drum video recorders, they come in 9-inch-square sheets, so for DAT machines, you can cut them down smaller and save some money.

Bill Winans
Operations Manager
WMHT-FM/WRHV(FM)
Schenectady, N.Y.



Ed. Note: The company that produced Texwipe is now called CleanTex Direct, and the product is called CottonWipe I (item number 309). For more information, contact CleanTex at (800) 284-5577, or fax (800) 569-2800.

Correction

In our May 13 issue, the Web site address for Belar was incorrect. The URL is *www.belar.com*

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Next Issue of Radio World June 24, 1998

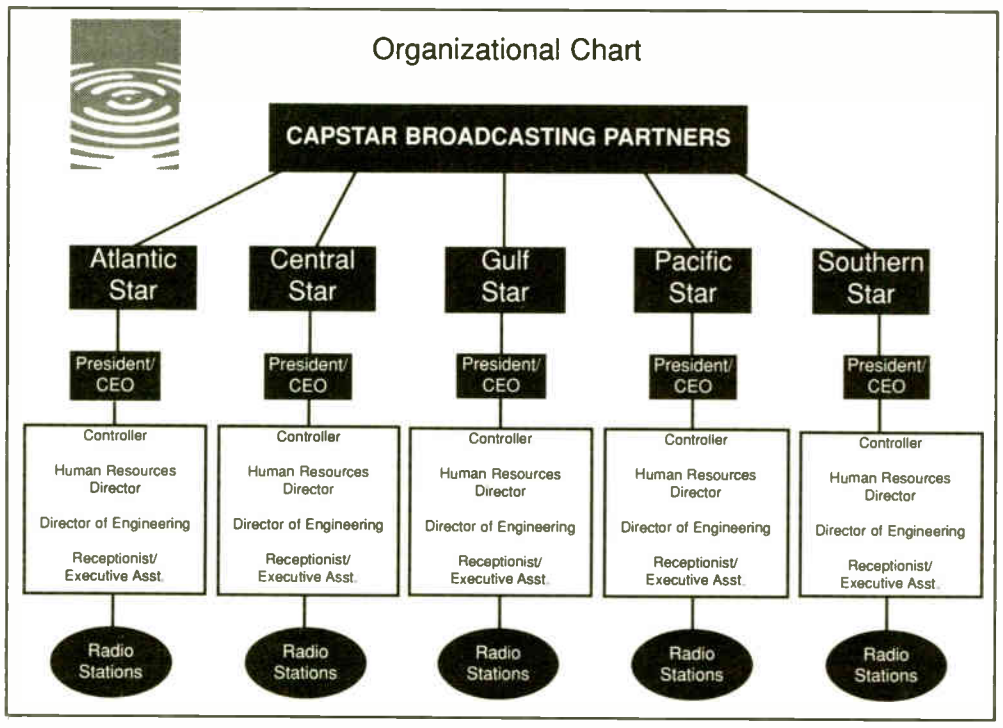
World Radio History

Engineering Radio's Largest Group

▶ CAPSTAR, continued from page 1

be one of the biggest deals in the financial community this year.

But part of the Capstar success story are the engineers behind the headlines. Their policies provide a glimpse into the excitement and problems of doing technical work for a huge radio group at a historic time in radio's history.



Capstar's five broadcasting divisions have similar structures.

Capstar Broadcasting Partners Inc., which claims to be the nation's largest radio group at 300 stations and growing, was founded only two years ago by brothers Steve and Tom Hicks. The Hicks brothers remain the controlling stockholders along with the investment firm of Hicks, Muse, Tate and Furst Inc.

At presstime, Capstar owned 211 stations in midsize markets. Capstar expected to close the SFX Broadcasting purchase at the end of May, gaining 88 more stations. Capstar also programs 19 other radio stations.

For this story, **RW** spoke to Capstar engineers Frank McCoy and Mark Stennett.

McCoy, a man of seemingly constant energy and ideas, is vice president of engineering for GulfStar, Capstar's flagship regional operating company, and has been a prime engineering force in the growing Capstar chain. He now oversees the work of 20 radio engineers throughout the Southeast.

"I attempt to be the 'switchboard' for GulfStar, to make sure that these 20 guys are plugged in to what each other are doing," he said.

Before he joined the company in 1997, McCoy ran his own radio engineering consulting firm in Chicago.

Stennett, now vice president of engineering for Capstar, moved there in February from Chancellor Media in Sacramento, where he had worked since 1993 as director of engineering. Together McCoy and Stennett boast several decades of broadcast engineering experience. At a group with a track record of acquisition, that experience is important.

"The main difference between Capstar and Chancellor relates to the types of markets we operate in," Stennett said. "Smaller markets present greater challenges to any potential buyer than do larger ones, because many of the stations we acquire have been neglected technically and have had the wheels run off of them." Stennett suggested that technical capital improvements are high on the list for Capstar.

The two engineers report to John Cullen, chief operating officer of Capstar and the president of GulfStar.

The Star System

As Capstar has grown, the company has made headlines with its extensive use of networked computer technology. The group is setting up wide area network systems, seeking to weave together the business and audio systems that are the lifeblood of each station. This is the Star System that so many radio people are talking about.

Steve Hicks conceived the Star System concept. The technology that makes it work is the product of Prophet Systems in Ogallala, Neb.

One of McCoy's first priorities when he was hired in early 1997 was to create the system.

"My first responsibility was to identify a vendor that could help us create and facilitate the transfer of intellectual property across GulfStar. ... That's a pretty broad canvas. I created a criteria 'wish list' to identify the ultimately successful vendor."

That vendor was Prophet Systems, a choice that rested on McCoy, who insisted that the chosen software vendor be owned by individuals who were the authors of the software. McCoy was well aware, in choosing a vendor and designing a system, that the size of Capstar meant many radio people would be watching closely.

"Any choices we might make could be something like an industry standard. Prophet did a great job, and we've had relatively few real problems."

The importance of that choice has since been made even more clear. Capstar recently purchased Prophet Systems, as noted in box on page 8.

So, what is the Star System and how does it work?

The system consists of a computer-based wide-area network, or WAN, over a frame relay system set up between stations using local loops and Sprint networks. The wide-area interconnection was designed and implemented by Joe Shannon, MIS director for Capstar. It allows any GulfStar station, and soon any Capstar station, to ship data, including information and digital production audio, instantly to any other similarly networked station.

"This includes our entire business platform — e-mail, the general ledger, eventually our phone lines," McCoy said.

See CAPSTAR, page 7 ▶

The Company:
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Austin, TX 48401

Chairman:
Tom Hicks

President/CEO:
Steve Hicks

Telephone:
(512) 340-7800

E-mail:
info@capstarbroadcasting.com

Web site:
www.capstarbroadcasting.com

Owners:
Capstar Broadcasting Partners LP, an entity of the investment firm of Hicks, Muse, Tate and Furst Inc., Dallas, owns 62.4 percent. Steve Hicks, President/CEO of Capstar, personally owns 2.4 percent. Chairman Tom Hicks, brother of Steve, personally owns 4.3 percent. Other directors and officers own a combined 7.9 percent.

Operations:
Capstar operates U.S. radio stations through five regional operating companies, GulfStar Communications, Southern Star Communications, Pacific Star Communications, Central Star Communications and Atlantic Star Communications. Capstar also owns Prophet Systems.

Other broadcasting holdings:
Although there is no direct relationship between Capstar and Chancellor Media, another prominent broadcasting group, there is a Hicks Muse entity with a minority interest in Chancellor.

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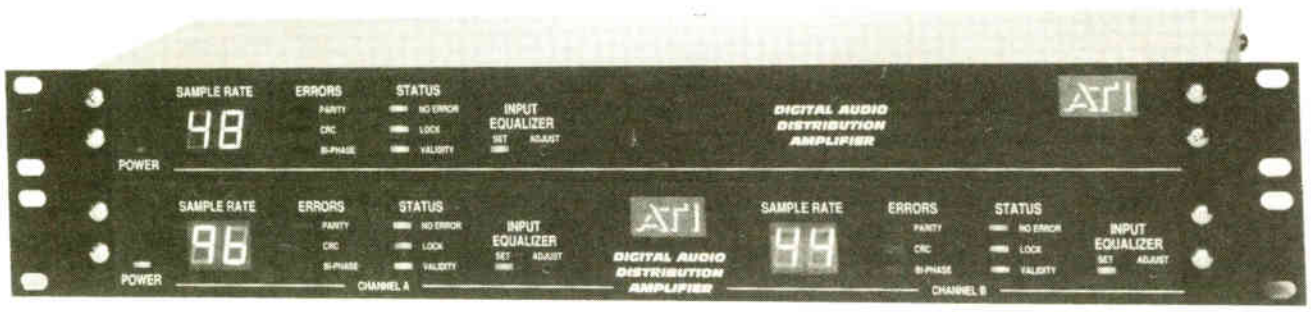

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Capstar's Mark Stennett

▶ CAPSTAR, continued from page 6

The hard-disk audio system is built on computers with audio cards and Prophet's Wizard for Windows software. An important feature of the Star System, according to Prophet, is the ability to produce custom programming from one main hub and a few smaller hubs for the entire group.

Stennett said, "Prophet Systems equipment required at each station consists of audio servers, Novell file servers and workstations for recording and editing new material on location. The Star System is connected to each market via frame relay circuit ranging from a 56K up to T1, and associated routers. Each location has the capability to run stand-alone with the Prophet equipment provided."

McCoy said that, with the Star System, "The same individual can do an air shift in more than one market, but unlike traditional network delivery, each market gets a custom result." Localism is preserved through local news, traffic and weather, as well as voicers targeted to the market, McCoy said.

This approach is supported by visits to the market, plus briefings on local events, landmarks and popular local culture.

The Star System also allows staff to produce commercials at one station, using talent at any other station.

McCoy said, "If we need a particular character voice in one market we don't have there, we can send the copy to, and get back audio from, another one of our stations where there's talent who can do the voice," using The Star System. "It allows for high-quality production values at all our stations. We ship audio packets, mostly, not complete productions. That's why I call it 'some-assembly-required radio.'"

The WAN also will be used for continuous monitoring of sales performance data, commercial and element delivery and other proprietary traffic, including several projects now in development.

Eighty engineers

Capstar employs about 80 full-time station engineers, with plans to add more as time goes on. Stennett said, "Each market is different. I prefer full-time employees wherever possible. At most of our stations, we'll be hiring additional engineers, but in some of the larger markets that may not be cost effective or feasible."

Like other groups, McCoy says, Capstar is looking for good engineers. He said he has engineering positions open in markets that are nice places to live in.

"One problem we face is that radio didn't grow new engineers in the '70s and '80s. A lot of the best radio engineers were picked off by cable and cellular telephone companies."

Stennett agreed. "The most troubling thing I see is the decline of fresh blood in the engineering talent pool. Good engineers with a passion for the business are getting hard to find."

In GulfStar stations, McCoy said his goal was to create "second-tier, assistant engineers." After a period of development, these employees, now qualified as chiefs, can be moved to other markets where they are needed.

Many engineering decisions are made at the local level. Technical goals for Capstar are delineated broadly, McCoy said, and the top-level engineers move quickly on project decisions, with changes and decisions made "in milliseconds." Important corporate goals include finding permanent homes for FM tenant antennas that may be pushed out by the demands of digital TV antennas.

Although Capstar systems engineers pride themselves on leading technical development, they attend NAB and other trade shows infrequently.

"I'd rather spend money on tuition for engineers to attend continuing education seminars, or on new databases," McCoy said. "That's the only way to ensure we're not swamped" by technological change.

Engineering reporting lines in the Capstar system are dual, according to Stennett. "While Capstar oversees the operations of each regional company, the engineering departments in each market answer primarily to their general managers and are responsible for the daily operations of their facility. The local engineer must also work with the regional engineer to be sure goals and technical

See CAPSTAR, page 8 ▶

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World Radio History

Capstar Radio Engineers at Work

▶ CAPSTAR, continued from page 7

standards are met."

Regional engineers, Stennett said, are "primarily responsible for overseeing construction projects, signal studies, making sure the stations in their region are maintained within compliance and good engineering practices, as well as assisting the local engineers with their problems from time to time. Our regional engineers could be considered part of the customer service department for our company. They work closely with the regional presidents as well as the corporate engineer. The regional engineer will also assist the general managers where recruiting new engineering talent is concerned."

Restructuring now underway at Capstar will not significantly affect engineering reporting lines, said Stennett. "Capstar is developing a more controlled environment for the company. While the actual structure of the company is not expected to change much, each regional position will be working closely with Capstar corporate, to achieve common goals."

Capstar certainly is growing. The company reported net revenue in 1996 of $42.9 million. In 1997, that figure had jumped to $175.4 million.

Despite Capstar's kudzu-like expansion over two years — or perhaps because of it — many facilities remain unchanged since acquisition. "We have many stations across town from each other, with leases still in effect," McCoy said.

When possible, Capstar will consolidate stations in a single market to a single facility. But this is a market-by-market decision.

The group has a real estate department, headed by Capstar's vice president for asset management, Michelle McDonald.

"It ensures all transactions make sense and that we avail ourselves of opportunities we ought to," said McCoy. Local engineers and regional engineering vice presidents have direct input into the process.

McDonald told **RW** that facility consolidations are completed, underway or planned at stations in 65 markets including Baton Route and Alexandria, La.; Melbourne and Pensacola, Fla.; Lynchburg and Roanoke, Va.; Cedar Rapids, Iowa; Madison, Wis.; Fort Smith, Ark.; Amarillo, Tyler and Lufkin, Texas; Anchorage, Alaska; Fresno, Modesto and Stockton, Calif.; Savannah, Ga.; and Columbia, S.C.; and Honolulu.

McDonald said mostly new equipment is going into consolidated facilities, along with the Star System. Consolidations vary from "add-ons to new buildings, to existing buildings that are renovated," said McDonald.

In Melbourne, Fla., Capstar stations WMMB(AM), WBBD(FM), WMMV (AM), WLRQ-FM and WHKR(FM) are newly housed in Brevard Mall, with studios visible through storefront windows to mall shoppers.

"It's really a showcase studio," McDonald said. "It's like putting radio into show business, with the mall location." She pegged the cost for the Melbourne consolidation at $300,000. Costs for other consolidations were not available, since almost all are underway or being planned.

DAB is, I think, a solution looking for a problem.

— Frank McCoy

Capstar's engineering managers share technical resources among stations, and emphasize personal networking.

"We get the engineers and technical people together regularly," McCoy said, often via conference calls and, less frequently, in person. Thanks to that communication, engineers can pool their equipment in what McCoy called "the Capstar swap shop." It also means that, in an emergency such as an RF facility hit by a tornado, the group can put together a team of five or six qualified engineers quickly.

"We call this system the Star Team," McCoy said. The acronym is for Studio Technical Asset Redeployment.

The process of standardizing equipment is moving slowly, mostly at the rate of to-be-needed-anyway replacements. Capstar's sheer size means that "vendors come to us," according to McCoy. He says suppliers are more than willing to negotiate volume prices, but there's "not really a lot of standardization" in equipment yet among the stations.

Certain opportunities are seized.

"If we go into a market and discover there are two or more stations with, say, a particular brand of transmitter, we'll probably go with another of the same brand there, too. It's easier to get spare parts," McCoy said. A deal for several dozen audio boards was negotiated recently, although McCoy declined to name the vendor.

Stennett said, "Capstar certainly has plans for major equipment purchases in 1998. While it would not be fair to drop vendor names in an interview," he said the company is assessing its equipment needs with help from a computer database cataloging system. "With this information, we will be able to negotiate fair pricing at volume discounts from vendors."

What is it like to manage for one of radio's leading broadcast groups? McCoy raves about it.

"Empowering people is a key goal at Capstar," McCoy said. "That comes directly from Steve Hicks himself. Our philosophy is to give our engineers and other staff as many resources, and as much freedom, as possible. I haven't been disappointed yet."

McCoy said Capstar could never survive as a top-down, autocratic company.

"Problems are different everywhere. We hire those who can do the best work, and then let them do it. Empowered people have the willingness and enthusiasm to solve problems and make money for our shareholders," said McCoy.

Contacted for their views about Capstar from the outside, other industry engineers contacted for this article declined to comment.

New technology

Asked to name the most important new technology for radio, McCoy said, he identified the computer, which he says is under-used.

"How we integrate computers into broadcast and telephone connectivity is going to be supremely important over the next five years, using them to seamlessly share production materials." Radio, McCoy said, has yet to make full use of the potential of computers in sales, marketing and administration, which Capstar intends to pioneer.

"We've created whole new positions already, such as directors of sales in our multistation markets, a position whose sole job is to oversee several sales managers

See CAPSTAR, page 16 ▶

Capstar, for Prophet

Earlier this year, Capstar purchased supplier Prophet Systems for about $25 million, including $15 million in cash and $10 million in stock for Prophet President and Chief Executive Officer Kevin Lockhart and partners Georg Joutras and Ray Lockhart.

With the purchase, Prophet Systems becomes a division of Capstar, with Kevin Lockhart as president of the new division.

With Capstar covering Prophet's payroll and development expenses, Lockhart said, the supplier can now be more aggressive in acquiring new clients and developing new products.

"It's given us instant credibility," he said. "We've talked to representatives of several large radio groups" about providing them with a digital automation system.

Other industry observers have wondered privately whether Prophet can continue to succeed as a vendor to groups other than Capstar. Those groups, they say, might be hesitant to put such an important part of their operations into the hands of a company owned by a competitor. But Lockhart says the ownership by Capstar means clients can be assured that this digital vendor, at least, will still be around in years to come.

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World Radio History

California Faces EAS Challenge

▶ EAS, continued from page 3

Williams said, "Stan Harter really pushed to finally get that issue taken care of before I even took over." Williams is looking for an LP2-S (Spanish) for San Diego. Los Angeles has both and LP2-S and an LP2-K (Korean).

Rudman said, "The other problem with EAS is that it works." When the NWS issues an alert, broadcasters receive it and sometimes complain.

Rudman said, "The complaints are probably higher in states like California that aren't use to a lot of weather alerts like 'tornado alley.' I think in tornado alley that broadcast stations and the public and broadcast management understand the role of broadcasting right now in helping the weather service get that information out much more clearly than in California."

In response to those complaints, employees in the Oxnard NWS office are trying to decrease the length of NWS alerts.

Rudman said, "Quite honestly, if you are delivering something to broadcasters on a two-way radio link that doesn't sound very good and the message isn't clear, concise and written for radio, you're going to hear complaints."

In San Diego, Williams is familiar with the issue. In August 1997, on the day an RMT was scheduled, the NWS issued several thunderstorm alerts.

Williams said, "That all occurred on the same day that the National Weather Service didn't have a clue of what to say. It gave three-minute-long rambling messages." The NWS issued two alerts per hour over a four-hour period, he said.

"I got back (from vacation) and had just a slew of angry voice mail and e-mail."

Coordination between NWS and stations has improved. Williams gave the local NWS office an outline script for alerts, which their employees faithfully followed during El Niño alerts. LECC vice-chair Medina set up a list serve e-mail system so people can communicate openly. Williams also set up a faxing system letting stations know two weeks prior and one week prior to the RMT so TV stations can schedule spots around it.

Bugs remain

Still, said Williams, some stations' employees think that every alert is just a weekly test that does not need to be forwarded. The big issue, he said, is training or at the very least having written procedures close by the units.

Operator error is no surprise to anyone familiar with EAS. It has caused innumerable foul-ups across the country and was partly responsible for a botched EAS RMT in Los Angeles this spring.

During the test, KFI(AM) experienced equipment failure and never received the test issued by the Sheriff's office. At another station, the operator simply did not know what to do.

Rudman said, "That's why they call them tests. He said that the FCC takes a "no harm, no foul" approach to failed tests as long as participants follow up.

Marvin Collins, chief engineer for KFI and three other local Cox Radio stations, said he has heard other broadcasters complain when his station delays airing an RMT for five minutes.

Some stations' employees think that every alert is just a weekly test that does not need to be forwarded.

— Jeff Williams

"There's nothing to prevent every station around southern California from monitoring the Sheriff's Department the same way we do so they don't have to rely on us relaying it," said Collins.

Rudman would like to go a step further. At the National Advisory Committee meeting in January, he proposed an "e-chip," an emergency chip to be installed in every personal communications device from Walkmans to pagers to set-top converters.

If someone is listening to a CD, said Rudman, we can do EAS "until we are blue in the face" to no avail.

"The real value of broadcasting after an alert is ongoing information delivery from the information source." Once people have been alerted, he said, they will know to turn on the radio or television.

"EAS or the alerting is really only the first part of what is going on. If you tell me the dam is busted, tell me which direction to run in, when it's going to happen and what else you want me to do."

■■■

This is one in a series of occasional articles about EAS implementation on the state level.

How is EAS working in your area? Tell RW. Send e-mail to radioworld@imaspub.com *or write to the address on page 5.*

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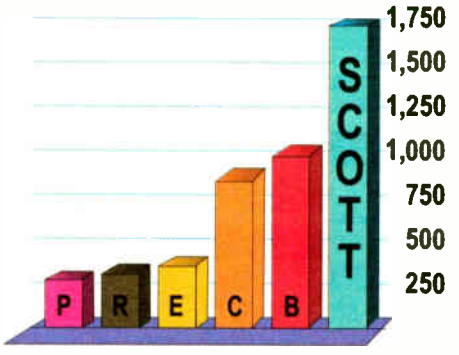

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World Radio History

Crown Satellite Now Shipping

Switch to Digital Seen as Opportunity for Supplier to Compete in Satellite

by Paul J. McLane

EKLHART, Ind. Crown International plans to pursue the satellite equipment market more aggressively.

The company has formed a new division called Crown Satellite, aimed at providing products not only to radio, but to other professional audio and networking markets. The division grew out of efforts within the Crown Broadcast Division in late 1995, to develop satellite tools for radio clients. Its management will be based in Dallas.

The product lineup is called SpectraCast, including multiplexers, IP gateways, satellite LAN bridges and network management control software. Ben H. Dorsey III, director of marketing and communications for Crown Satellite, said the division's first two products for radio are targeted to satellite networks.

"They put Crown into the market of competition for satellite transmission equipment, in particular multiplexed systems," Dorsey said, adding that Crown's other broadcast business remains strong.

"We're still fully committed to serving the needs of radio, through our existing radio division as well as this new satellite group. We're still Crown. We're confident enough that the (satellite) market is there, to invest in it."

Dorsey said the new division shares some resources with the rest of Crown, including accounting, information systems, human resources and manufacturing. The division's 25 employees are mostly engineers, plus a handful of sales and marketing personnel.

The new products began to ship this spring and reflect user interest in getting more out of satellite feeds. The DTMX1000, intended for the network head end, is a multiplexer with Windows software. It creates a composite stream of information to the satellite, allowing the network to feed several programs.

The DR2000, which began shipping in April, is for affiliates. It is a satellite receiver with a built-in decoder and demultiplexer that redivides the composite signal and feeds it the station's automation, air, LAN or other systems. Dorsey said a patent-pending feature of the unit is its FLASH memory for onboard storage of 32 minutes of stereo audio or 64 minutes of mono. In a typical application, the affiliate station records local spots to the Crown unit, and sets the system up through software to insert the spots in its network programming. Dorsey said one station can have up to three stereo output channels, plus data, and record local spots simultaneously.

Efficiency

"What's driving the interest is the switch to digital," Dorsey said. "It's a more efficient approach that lets them replace several separate receivers, and take over many automation system functions." Also, he said, the network head end can write to the FLASH memory of the affiliate's decoder.

Dorsey said National Public Radio was doing a limited trial of the products, and other networks were planning to test them as well, although he would not name those users.

Crown International is privately held. It is 51 years old, with 800 employees and an estimated $100 million in annual sales, Dorsey said. Its businesses are in radio, pro audio and medical imaging power systems. Radio products include audio amplifiers, microphones, and FM transmitters and translators.

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BUSINESS DIGEST

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Jacor Q1 Revenue Rises

COVINGTON, Ky. Net revenue for Jacor Communications Inc. in the first quarter of the year was up 48 percent over the same period the year before — to $142 million. Broadcast cash flow in the first quarter was also up, to $34.7 million, a 61 percent increase over the year ago quarter.

Including pending acquisitions, Jacor now owns, operates or represents 205 radio stations, making it the second-largest radio group after Capstar.

Net revenue from stations that Jacor owned for all of 1997 and through the first quarter of this year increased 12 percent to $89 million, while the company's broadcast cash flow grew 20 percent to $22.9 million. These 86 stations include 37 so-called "stick" properties, which had little to no cash flow and/or insignificant ratings when purchased.

Jacor Chief Executive Officer Randy Michaels said, "Jacor's strategy of buying and fixing sticks, exploiting the benefits of regional clusters and leveraging our product expertise is in full swing."

Michaels said Jacor's total stick portfolio of 98 stations is budgeted and on target to produce $100 million in cash flow by the year 2000.

World Radio History

How much are eight miles worth ?

Plenty, if you are a AM broadcaster. What if your station could get out another eight miles of coverage? What would it be worth to you? The audio processing that you use plays a big part in the coverage of your station. Are you getting all the coverage area that you can ?

AM 4 MONO PROCESSING SYSTEM

New audio processing from CRL can maximize the coverage area of your station. Our tri-band Limiter design delivers extra sideband and modulation energy to your listeners' radios. Our patented NRSC-1 filtering gives you the tightest peak control of any processor on the market. The result is an average of eight miles of additional coverage area compared to older processing equipment (average at 1200 kHz with 1 Kw power).

We manufacture the largest assortment of AM processing products on the market. Instead of only one or two processor choices, we offer 7 different AM systems. With thousands of systems in use, it's no wonder that we are the leader in AM processing technology. Plus our systems start at less than half of what the competition charges. How much is eight miles of additional Selling penetration area worth to your station ?

New Coverage Area

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Broadcasting in Stereo ? Moving to the expanded band ? Our matrix stereo AM systems deliver up to 6 dB better envelope (L+R) loudness than the competition. That translates into full reception range on all mono radios. Our patented matrix processing circuitry provides full stereo depth and fidelity that sounds almost as good as FM. Eight out of ten stations that broadcast in stereo use CRL audio processing.

MBL-100 NEWS/TALK PROCESSING SYSTEM

How many miles will a new CRL audio processing system give you? It's easy to find out ! We have a demo program available through our dealer network. Ask us for the details. In just a few weeks you could have better coverage and loudness, plus a larger Selling penetration area. Can you afford not to use a CRL AM processing system ?

CRL SYSTEMS

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Old Coverage Area

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World Radio History

GUEST COMMENTARY

DRM Takes Aim at Digital AM

by Peter Senger

COLOGNE, Germany Digitization is the greatest challenge facing the world of broadcasting.

Digitization started in the studios, used for the production of audio and video programs, and it flowed into distribution and transmission with DAB and DVB. Nowadays, the only broadcast spectrums that use amplitude modulation are short-, medium- and longwave.

But a new consortium was established recently to develop specifications for worldwide digital AM standards: Digital Radio Mondiale. As chairman of this consortium I would like to express my personal opinion about the chances for digital AM broadcasting in the information society of tomorrow.

Inauguration

For some years, broadcasters, research institutes and transmitter manufacturers have been investigating the possibilities of digital AM. Today five different approaches have been developed, but these efforts are uncoordinated.

To bring together all the interested parties, there needed to be an international consortium like those pushing DAB and DVB, but with worldwide representation from the beginning. This was achieved on March 5, in Guangzhou, China, when 20 participants — from the leading research institutes, transmitter and receiver manufacturers, network providers and broadcasters worldwide — joined to sign the memorandum of understanding that inaugurated DRM.

The Asian Pacific Broadcasting Union and the European Broadcasting Union have joined and DRM is now seeking sector membership of the International Telecommunication Union. If accepted, DRM will be incorporated under Swiss law and the project office will be headquartered in Geneva.

I am convinced that once the specifications for a single worldwide digital AM standard are developed, the AM frequency bands will experience a renaissance thanks to the great advantages digital offers.

Among these benefits are interference- and fading-free channels, easier-to-tune receivers with additional features, less transmitting power for the coverage of the same service area and the delivery of clear signals over long distances to large-service areas.

Similarly, low-power digital medium-wave transmitters also will offer new possibilities for local radio stations, which would hardly have a chance to thrive within the developing DAB environment and its limited number of frequencies.

Digital AM could become the only global DAB standard for low bit rates in the developing information society.

The exact extent of the existing AM broadcasting market is not known. Estimates are that 2.5 billion receivers and thousands of transmitters will need to be replaced if a shift to digital is made.

China, the most populous nation in the world, joined DRM because of its great interest in the new technology and its ongoing efforts to replace outdated transmission equipment. This situation is commonplace for most AM broadcasters.

Benefit everyone

The largest receiver manufacturer in China, Tecsun General, which produces more than 3 million AM receivers each year, also became a DRM member because of the business opportunities it expects to develop. Other DRM members see similar opportunities.

The interest of Tecsun and other DRM members will be defined in a consortium agreement, which is expected to be completed late in 1998. It is not too late for new members with an interest in new business and technology to join DRM.

Although DRM is off to a good start, questions still remain. Will there be a place for digital AM broadcasting in a multimedia world with hundreds of TV channels, DAB, the Internet and new digital satellite systems, such as WorldSpace?

Radio is still one of the basic means of information and entertainment. Digital AM broadcasting would be available in large areas for mobile reception, without the need for local gap-fillers or repeaters.

In addition, it would close the gap in signal quality between existing AM and FM services. In countries with DAB services, digital AM would be much more competitive than analog AM.

If DRM succeeds, digital AM could become the only global digital broadcasting standard for low bit rates in the new developing information society.

■■■

Peter Senger is chief engineer at Deutsche Welle and chairman of the DRM consortium. Contact him via e-mail at senger@dwelle.de

Information about Digital Radio Mondiale is available via the World Wide Web at www.drm.org/

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World Radio History

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OPTIMIZE LEVEL

The DBMax lets you work with both analog PPM's and digital meters. Dial in the type of level measurement you need to comply to, and the DBMax will get rid of your overs. Optimize 5-band compression can make you very loud. Limit: Sample accurate, distortion cancelled limiter. Multi-slope: Mid level boost with the rest untouched.

OPTIMIZE QUALITY

The DBMax DSP engine uses precision calculations at a full processing rate to keep aliasing distortion low and audio bandwidth high.

Bandwidth: Processing at 48kHz sampling for 24kHz audio. Resolution: Processing of all the 24 bits of an AES/EBU signal.AD/ DA converters: 24 bit resolution with analog pre-scaling.

The 5-band limiting and compression functions of the DBMax are supported by a variety of additional DSP plug-ins. At the same time you may use e.g. AGC, EQ, Soft Clipper, 5 band Expander+Compressor+Limiter all at 48kHz sampling:

INPUT
HP and LP filters.
Sample Rate Converter.
Delay 0-400ms.

INSERTS
Use up to three of these: AGC, Dynamic EQ, MS Decoder, MS Encoder, Normalizer, Parametric EQ, Stereo Enhancer, 90 Degree Mono Generator.

DYNAMICS
Expander, Compressor and Limiter (simultaneously).1-5 bands with selectable crossover points and slopes.

OUTPUT
Final Limiter with adjustable Soft Clip. Dither 8-24 bits.

FROM CLIENT TO CLIENT

With the DBMax it's easy to move from client to client or to target the mix for a VTR and a DAT.

Use your favorite Preset and load different Setup's to maintain full resolution under every condition.

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Inside Capstar

▶ CAPSTAR, continued from page 8

and make sure sales goals are being met by everyone." He said the full computerization of sales and marketing will create "whole new ways of managing, selling and marketing in five years," techniques that are now not yet fully known.

Internet use by Capstar? "We have a Capstar Web site and a number of our stations have Web sites, usually through trade agreements with local service providers," McCoy said. "We might have a single domain later on, if it looks beneficial."

System-wide webcasting is not in the cards right now, McCoy said, noting that Hicks Muse has an interest in AudioNet, a webcasting service on the Internet.

McCoy is less than enthusiastic about the viability of digital audio broadcasting.

"DAB is, I think, a solution looking for a problem," he said, contending that DAB offers only marginal audio improvement over analog FM, which already is fed digital audio by CDs, digital audio tape and audio on PC hard drives.

On the marketing side, McCoy said, digital audio has taken a beating in the minds of consumers at the hands of the digital phone companies.

"They (the phone companies) have tried to stuff too much audio in the bandwidth available." As a result, he said, signal quality has suffered, making consumers wary of anything tagged as digital audio.

"The only clear advantage I can see is that DAB would allow us to send, besides an audio signal, a data signal as well. Wouldn't it be cool to install a card in your PC, which could 'hear' data we transmit that you want to see crawling along the bottom of your PC screen? Data like the latest stock quotes or NFL scores, or downloads of demonstration versions of new software.

"I don't think DAB is likely to happen (for FM broadcasting). You can see that already, because a lot of the people who were working on DAB have stopped and moved over to work on HDTV. The result is, DAB development is at a standstill."

Does Capstar focus on certain formats? No.

"We have every format in every location, or just about," McCoy said.

Capstar is looking toward the future by deliberate choice of market size. "What you will notice is that Capstar is in Arbitron markets rated size 50 and smaller. And we're in some markets not surveyed by Arbitron at all, yet. Studies show the population of the United States is steadily moving from large cities to small cities and towns. Money is following them. Capstar will be there waiting."

Pilot program

The engineering team has other projects in the works.

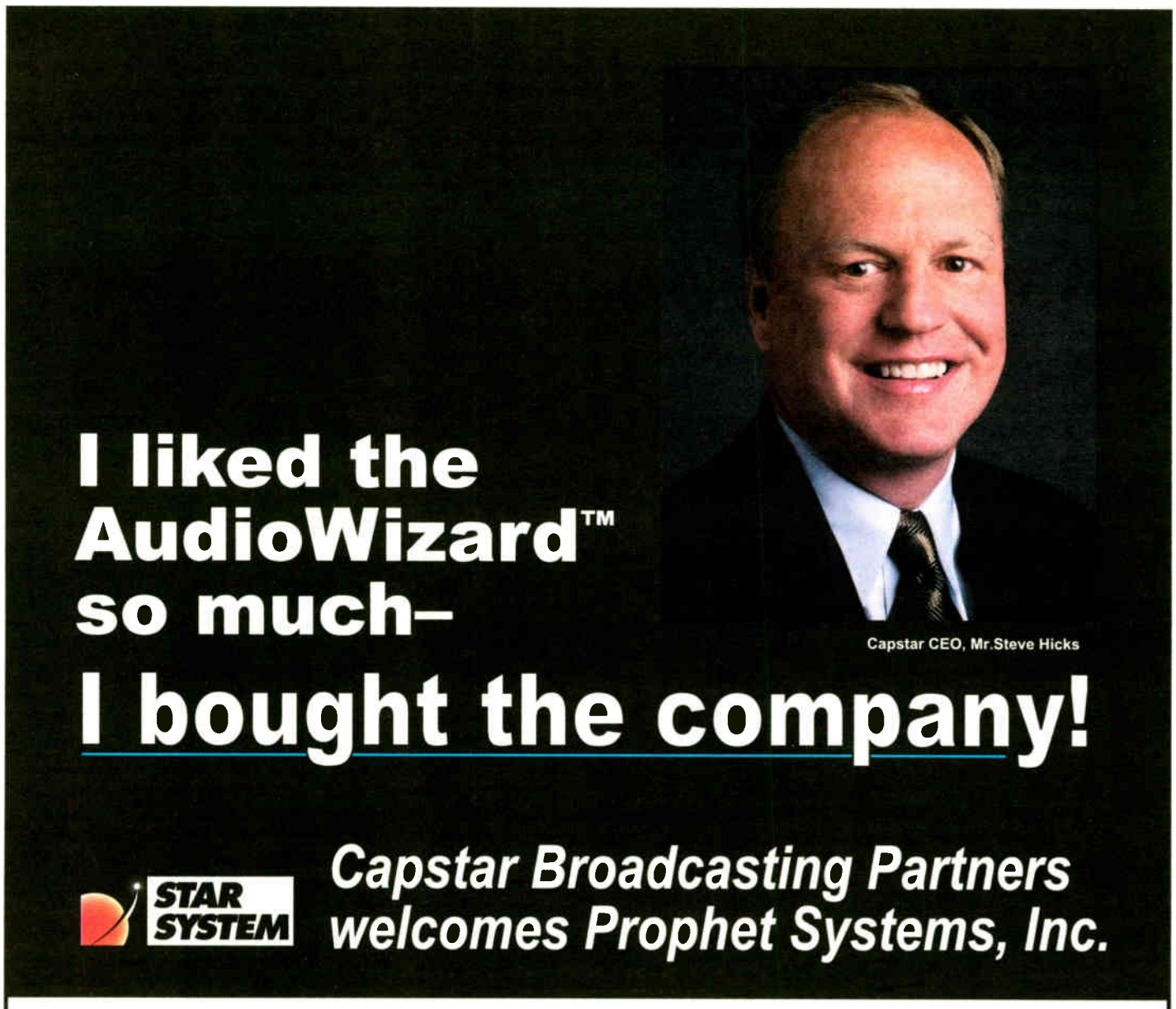
"We have a pilot program to increase the speed with which we warn people on the air about dangerous weather," McCoy said. "We want to shorten the reporting time and possibly save lives by doing that. We're looking into putting a unit into sheriffs' and police dispatchers' offices so that, with some training, they can interrupt programming and go directly on the air with an EAS watch or warning.

"That kind of sums up a major philosophic thrust of Capstar, and that's how we can provide better service to the communities we're in. That's really what Steve Hicks is all about and what the company is all about."

■■■

S.D. Yana Davis is associate university development director at Southeast Missouri State University and chief development officer for KRCU(FM), Cape Girardeau, Mo.

Paul J. McLane and Leslie Stimson contributed to this article.



You know Prophet Systems as the worldwide leader in digital automation for the radio industry. We credit our success to date to our innovative capabilities combined with our love of the industry. The support of Capstar demonstrates a serious commitment to improving the quality of radio broadcasting. We are working on several new products as well as enhancing our existing line, which is guaranteed to raise the standards for programming nationwide.

Our commitment to radio stations– big, small and in-between remains the same. But the face of radio is changing. Climb aboard for the ride.

A NOTE TO OUR COMPETITION: 'nuff said!!

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Radio Nerds On Tour

Frank McCoy is about to take a trip with his friends.

Officially he calls it StarTeam 98. Unofficially he calls it Nerds on Tour.

Starting this month, GulfStar will undertake a high-profile, three-month technical tour to bring "state-of-the-art measurement and analysis ... directly to the point of attack in a manner never attempted before." He's talking about visiting 83 stations in 19 markets, all to be measured end-to-end, with baseline performance evaluated, in time for the fall ratings period.

The goal is to make GulfStar stations, many of which have undergone build-outs and relocation in the past two years, as technically advanced as technology allows — to educate staff, guarantee FCC compliance, and make every station as competitive as possible.

What sets this tour apart even more is the participation of several vendors, some of whom McCoy calls "legends of our industry." Those vendors know that supporting a tech tour to 83 Capstar stations is good business, but McCoy says they also recognize a chance to show commitment to the industry. FCC regional engineers will also be invited to visit.

In the next issue of **RW**, McCoy will explain Nerds on Tour in more detail, and we will report back on its success later.

— Paul J. McLane

World Radio History

BE Buys Auditronics After All

QUINCY, Ill. Radio equipment supplier Broadcast Electronics has acquired Auditronics Inc. of Memphis, Tenn., a manufacturer of on-air consoles. Terms were not disclosed.

A spokeswoman said Broadcast Electronics plans to retain all 20 Auditronics employees and to continue to operate its facility in Memphis, incorporating these products into the BE organization as a line. BE handled the earlier purchase of Marti Electronics in much the same way.

As reported in **RW** on April 29, the two companies had been in discussions prior to the recent NAB convention, but at that time announced only that they would enter into a sales alliance. Executives of both companies hinted then that a sale might yet ensue.

In its announcement, BE stated, "The acquisition further enhances Broadcast Electronics' ability to meet the industries' requirements for tightly integrated studio solutions in today's radio operating environment."

BE President and CEO Jack Nevin said, "After further consideration it was determined that the acquisition of Auditronics would give BE a full line of analog and digital consoles to serve the radio market and is the last component needed to provide a turnkey studio solution for our customers."

BE bought the company from William S. "Steve" Sage, one of the original founders, and Stovall Kendrick. According to BE, Kendrick becomes the operations manager of the new division; Sage takes the role of technical director. BE's Jim Godfrey joins the division as sales manager. Bob Greenwald of Auditronics will report to Godfrey.

This is the first Broadcast Electronics company acquisition since its purchase by Hoak Corp. in August of 1997. BE has also acquired individual product lines in other recent deals.

In the eyes of BE managers, the new Auditronics NuStar digital console complements their AudioVAULT digital audio storage system and new AudioPOINT DSP-based routing switcher.

Auditronics also recently completed a redesign of its line of analog studio consoles and is marketing them under the Comet Series. BE said earlier that the Auditronics alliance marked the end of the old BE line of MixTrak and AirTrak consoles.

Auditronics has been a manufacturer of consoles since 1964. The company also makes television audio consoles, which BE will continue to manufacture.

—Paul J. McLane

◆ NEWSWATCH ◆

▶ NEWSWATCH, continued from page 2

programs and mailing them to stations.

UPI Radio Network also was affected by the satellite problem. National Broadcast Sales Manager Ben Avery said UPI also put programming on the Internet and obtained free satellite time from statewide news networks. Some UPI affiliates also relied on dial-up phone lines for program distribution.

CBS Television was affected by the problem, a CBS spokeswoman said, but CBS Radio was not.

FCC Gains New Chief Engineer

WASHINGTON A new chief for the FCC Office of Engineering & Technology begins work July 6. Dale Hatfield has been promoted from chief technologist after rejoining the commission in December following a 15-year break from government service. From 1982 to 1997, Hatfield operated a telecommunications consulting business and advised clients on technology, economic and regulatory issues. In the mid-1970s, he served as chief of the FCC Office of Plans and Policy. Hatfield replaces Richard Smith, who plans to leave the commission at the end of the month.

Also at the FCC, Chief Economist Michael Riordan planned to leave at the end of May to return to his position as an economics professor at Boston University. Riordan analyzed the effects of potential telephone company mergers and other mergers for the commission.

Tribune Watching Y2K Problems

CHICAGO Executives at radio station owner Tribune are keeping their eye on the Year 2000 computer problem and have appointed a manager to make sure they enter the new millennium smoothly. Kathy Ameche, most recently responsible for overseeing Tribune's financial and human resource systems, will oversee Tribune's Year 2000 compliance project.

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World Radio History

MS1402 • MS1202

Nearly everything (and possibly considerably more than) you ever wanted to know about Mackie's MicroSeries 1202-VLZ® and 1402-VLZ® mic/line mixers.

	MS1202	MS1402
Mic preamps	4	6
Mono inputs	4	6
Stereo inputs	4	4
–10/+4 switch on stereo chs.	no	yes
Total channel inputs	12	14
Aux sends	2	2
In-place solo	PFL	AFL/PFL
Aux returns	2	2
Channel inserts	4	6
Equalization	3-band	3-band
True low-cut filter	yes	yes
ALT 3-4 bus	yes	yes
Channel controls	sealed rotary	60mm faders
Master control(s)	ganged rotary	separate L/R faders
Ctl Rm matrix	yes	yes
Metering	12-LED	12-LED
Phantom power	yes	yes
Phantom pwr. LED	no	yes
Mono outputs	1/4"	1/4"
Stereo outputs	XLR/1/4" (both)	
ALT 3-4 outputs	1/4"	1/4"
Ctl Room outputs	1/4"	1/4"
Tape ins/outs	RCA	RCA
Width	11.8"	14.0"
Depth[9]	11.2"	13.0"
Height	3.3"	3.3"
Rack mount SKU	RM1202	RM1402
Total height w/rack mount	7 RU[10]	8 RU[10]
Weight (lbs.)	6.5	9.5
Silly puns on box	yes	yes

Superb mic preamps with our renowned discrete, large-emitter geometry design. Headroom to handle screaming vocalists or miked kick drums. Yet audiophile definition and ultra-low (–129.5dBm E.I.N.) noise help capture the tiniest nuances at delicate levels.

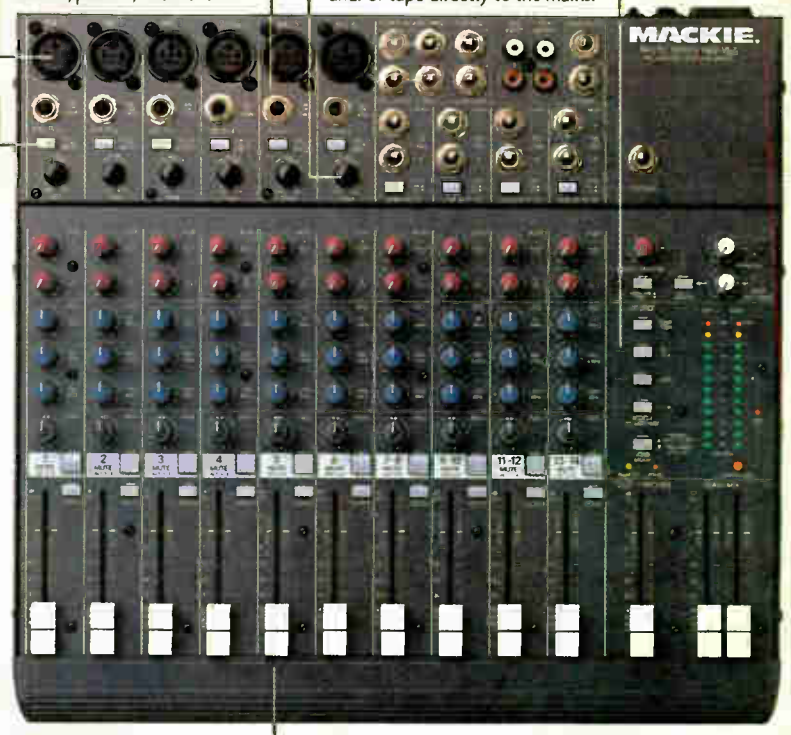
Low Cut Filter on mic channels lets end users apply Low EQ to voices without boosting harmful stage rumble, mic thumps, wind noise, and P-pops. Unlike the 6 or 12dB/oct. "filters" on some compact mixers, its sharp 18dB/octave design doesn't sacrifice audible bass above 75Hz.

What's all this VLZ® stuff about, anyway? We know hype rolls right off of contractors, so here's the straight skinny: VLZ means **Very Low Impedance**. We made internal mixer impedances as low as possible. At critical points in our mixers' circuitry, we've scaled down resistor values by a factor of three or four. That results in **three to four times reduction in thermal noise**. (An added benefit is considerably reduced crosstalk.) However, low impedance circuitry requires **high current** — which is why this approach was previously used only in very expensive, big studio consoles. Sheer convenience not withstanding, this is the primary reason we build such a beefy, high-current power supply into such modest-sized mic/line mixers.

Trim Control incorporates a –10dB "virtual pad." Total of 70dB input level gain handles a wide range of possible install situations.

All inputs & outputs are balanced except for channel inserts, phones, and RCAs.

Control Room/Phones input matrix lets you select any combination of tape, ALT 3-4 bus, or main mix for routing to headphones or Control Room outputs. You can also route the ALT 3-4 and/or tape directly to the mains.



60mm log-taper faders (MS1402-VLZ) include a new long-life wiper surface material derived from automotive sensor technology and ultra-tight-fitting co-polymer lip seals.

Nobody ever accused us of being excessively brief. Maybe the reason that our ads are so jam-packed with stuff is because our products are so jam-packed with stuff.

We pack our compact mixers with everything WE ever wanted in a mixer... and most every suggestion that ever came in on a warranty card[1]. Everything from an extra stereo bus on two-bus mixers... to those eensy teensy little lines above the MS1202-VLZ and MS1402-VLZ control switches (they show users when the button is pushed in without adding the cost of extra LEDs).

Above all, we build our products like tanks so that you can install them with confidence. Solid steel chassis. Gold-plated internal interconnects. Thick, double-sided, thru-hole-plated fiberglass circuit boards and loads of brass stand-offs. Impact-absorbing knob design. Metal 1/4" jacks and Neutrik® XLR connectors.

The stories of our compact mixers withstanding earthquakes, falling monitor speakers, drops off equipment trucks, spilled liquids and power surges that wiped out everything else in a system are legendary, numerous and true.

If you don't have a Mackie Contractor's Binder, complete with Architects' & Engineers' Specifications in print and on disk, call your local Mackie Designs rep.

In the meantime, tear out and save this ad. Nobody's expected to read the whole thing in one sitting.

1) Warranty Card: a piece of paper that contractors rarely if ever send back to manufacturers.

"(An MS1402-VLZ) survived and played through a glass of iced tea spilled all over it at a fashion show for a very important client of mine. Show was perfect. Client paid. I'm buying more Mackie." (H., Houston, TX)

"I am greatly impressed with the very low noise of all the mic preamps." (T.T., Belair, SA)[11]

Built-in power supply.

Balanced XLR outputs with a mic/line output level switch so the MS1202-VLZ & MS1402-VLZ can drive a wide range of amps & in-wall A/V systems.

Separate Control Room ouputs so you don't have to tie up the headphone outputs.

Inserts on mic channels (unbalanced). These are the distinctive, hybrid TRS input-and-output-in-one-jack design made famous on the classic CR-1604.

Balanced/unbalanced TS mono input.

Low cut filter (see wordy description above right).

Two aux sends per channel. 12 o'clock (Unity) position represents maximum on conventional sends. Ours provide another 10dB of gain above Unity to boost weak effects (or noisy ones you don't dare turn up very loud).

Musical-sounding 3-band EQ. 80Hz low frequency shelving, 2.5kHz peaking midrange with wide bandwidth (Q) for more natural treatment of spoken voices, singers and lead instruments, 12kHz shelving high frequency.

Constant loudness pan control. Apparent sound level remains the same when you pan a channel to the extreme left or right, the apparent sound level stays the same as in the middle — a critical requirement for accurate stereo mixes... and a Mackie Designs exclusive.

In-place stereo solo (1402) and PFL solo (both). Channels maintain stereo perspective (panning) when soloed. Moreover, the channel's operating level is displayed on the mixer's LED main level display. This makes accurate level setting quick and easy.

High-output headphone amp can drive even inefficient phones to aggressive volumes. Another reason why the MS1202-VLZ and MS1402-VLZ have such a beefy power supply.

We couldn't have said it better... "When the 'EFX to Monitor' switch is up, the two aux returns feed the main stereo mix as normal, but when the switch is down, Aux Return 2 feeds into Aux Send 1, which allows effects to be added to the foldback without adding them to the main mix. The two aux returns are also normalled, so if you only have a single effects unit, you can plug it into Aux Return 1 and it will feed both Aux 1 & 2 Returns. If you now switch on 'EFX to Monitor,' Aux Return 2 will act as an aux send control for Aux Return 1. If just thinking about this gives you a headache, you don't have to use it!" (Sound On Sound Magazine)

Selected specs	MS1202	MS1402
Noise, (2) (3)	–89dBu	–89dBu
Noise, (2) (4)	–86dbu	–86dBu
S/N	≥90dB	≥90dB
THD (5)	≤0.005%	≤0.005%
Crosstalk (6)	–85dB	–83dB
Mic E.I.N. (7)	–129.5 dBm	–129.5 dBm
Freq. Response (8)	+0/–1dB	+0/–1dB
Max mic input	+14dBu	+14dBu
Max input, other	+22dBu	+22dBu
Max bal. main out	+28dBu	+28dBu
Max other outputs	+22dBu	+22dBu

Negative gain mix amp architecture lets our compact mixers handle HOT signals from mics or digital recorders on every input without overload.

Sealed rotary potentiometers resist dust, smoke and other forms of contamination only mixer users can (and do) possibly come up with.

9) From the tips of the little rubber "feet" to the top of the impact-absorbing knobs.

10) Includes space for cable pass-through.

11) SA stands for Saskatchewan. Ever been to Saskatchewan? It's VERY quiet. This user KNOWS low noise.

2) 20Hz-20kHz bandwidth, line inputs to main L/R outputs, all channels assigned, panned L/R, master fader at Unity. 3) Channel gains down. 4) Channel gains at Unity. 5) Any output, 1kHz at +14dBu, 20Hz to 20kHz, channel input. 6) 1kHz at 0dBu, 20Hz to 20kHz bandwidth, channel fader down, channels at Unity. 7) 150- terminated max gain. 8) 20Hz to 60kHz, mic input to any output.

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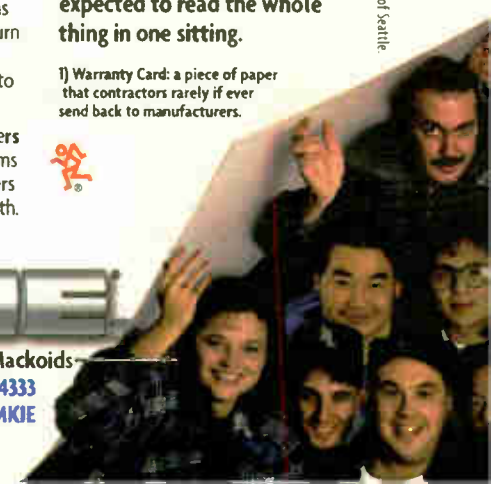
World Radio History

Below: A few of the 400+ folks who work at Mackie Designs in Woodinville, WA, 20 miles north of Seattle.



Charting DAB

▶ IBOC, continued from page 1

When asked if there could be legal action between the two companies concerning ownership of patents, Jury said did not rule out disagreement over intellectual property. "We're going to protect our position. I don't anticipate a huge problem, but at the same time we are going to be cautious about protecting what's ours."

Suren Pai, the president of Lucent Digital Radio, said the venture would walk away from any technology gained in the agreement with USADR. But he said technology Lucent owns can be used in any IBOC system Lucent develops.

The three players on the IBOC scene have much different kinds of backers.

Lucent's new digital arm, Lucent Digital Radio, is wholly owned by Lucent Technologies, and the company has a stated interest in selling technology on both the transmission and receiver ends of a digital radio system, as well as in digital radio satellite systems.

The USADR partnership, by contrast, is an effort funded and led by broadcasters — a point the company takes pain to emphasize. It represents a team of engineers and scientists from CBS Radio, Westinghouse, Xetron and major engineering universities. The partnership was established in 1991 by CBS, Westinghouse and Gannett. Although CBS has since purchased Westinghouse, resources from both firms still drive USADR efforts and Gannett remains a partner. USADR officials have said they do not plan to be a manufacturer, but to license technology that would let current broadcasters move to digital.

DRE has an alliance with semiconductor maker TriTech Microelectronics. In an earlier interview, DRE President Norm Miller said TriTech will manufacture the integrated circuit for the receiver in DRE's system. DRE has declined to disclose details of its funding.

Work proceeds

USADR is pressing on with its work. It recently awarded development contracts to Fraunhofer Institut für Integrierte Schaltungen for AAC compression technology, and to BittWare Research Systems for prototype hardware. Fraunhofer is an international research lab for low-bitrate audio coding and has been one of the main developers of coding schemes like MPEG Layer-3 and MPEG-2 AAC.

Jury said the development agreements with Fraunhofer and BittWare do not mean USADR has abandoned using the Lucent-developed PAC compression algorithm, but that USADR is now also looking at AAC.

At present, Lucent plans to use its PAC, while DRE plans to use AAC.

Of the new competition, Jury said the company hasn't changed its timetable for IBOC development, but the team is conscious of making every date on the schedule. USADR plans to begin field-tests this fall and continue them into next year with an eye toward having an IBOC system up and running in the year 2000.

USADR employees have moved into a new facility in Columbia, Md., designed for DAB development. The building has specially-designed rooms so engineers may conduct certain RF tests. USADR has a screen room, an isolated area in which engineers can generate RF signals without external interference. An antenna on the roof will enable engineers to broadcast test signals.

Lucent and DRE have not released details of their target timetables, but David Layer, NAB staff liaison for the DAB subcommittee of the National Radio Systems Committee, expects the newer proponents to release more details about their systems in the next few months.

Role of NRSC

The NRSC is seen by many observers as central to the success of a new radio system; it is sponsored jointly by NAB, representing radio broadcasters, and the Electronics Industries Association, which represents the receiver manufacturers. USADR is participating in the NRSC standard-setting process without altering its test schedule, developing its own tests and sharing that information with the committee. DRE is working with the committee to determine necessary tests. Lucent's level of participation is not yet known.

Several sources said USADR has been open in sharing system information with the NRSC, while DRE has shared less information. Calls to Digital Radio Express for this article were not returned.

At its recent meeting in Washington, subcommittee members adopted goals and objectives toward evaluating and adopting one IBOC system. Layer said, "Our process is evaluating IBOC systems and seeing whether or not they are an improvement over existing analog AM and FM systems. Significant improvement is what we're looking for."

While the NRSC will work with IBOC proponents to develop testing guidelines, the timetable for the tests is up to the companies. Layer said, "The NRSC doesn't want to design a system for proponents."

The process

EIA Director of Engineering Ralph Justus said it remains to be seen how Lucent's entrance into the IBOC proponent category will affect the standard-setting process. "All IBOC systems are struggling with four target performance areas and are devising tradeoffs." Those four areas are audio quality, compatibility, interference and digital performance/coverage.

Proponents must find a way to put a useful digital signal on a station's existing channel, without creating unacceptable interference to the host's analog reception or produce interference with other stations.

Another problem proponents is how to handle digital signal drop-off gracefully. Listeners are accustomed to hearing analog signals fade gradually at the edge of the coverage area, and USADR and Lucent both have proposed blending systems to solve that problem. With blending, both types of signals are layered, and the analog system is time-delayed, so the analog fills in when the digital drops out.

Richard Doherty, director of engineering for advanced digital technologies testing firm The Envisioneering Group, said whether blending will work for IBOC DAB is an open question.

"Digital phones that use blending don't sound pretty. It sounds like two phones calls at the same time," he said. Doherty is director of research for the firm, which conducts technology testing and market research on advanced digital audio technologies such as modulation systems and decoding systems.

Doherty was more enthusiastic about the compression algorithms that all three IBOC proponents plan to use.

Of PAC vs. AAC, Doherty believes both would work, but, he said, listeners would have to decide if they like the quality. Advocates of AAC say tests conducted by NHK in Japan, as published in "Report on the MPEG-2 AAC Stereo

Jeff Jury of USA Digital Radio

Verification Tests," showed "AAC profiles at 128 kbps give significantly better performance than do MPEG-1 Layer 2 at 196 kbps or Layer 3 at 128 kbps."

But PAC has its fans, including Lucent's R&D arm, Bell Labs, which holds the patents on the PAC algorithm. Lucent Digital Radio President Suren Pai called PAC "the best and most advanced audio codec available today."

Eventually the FCC must become involved in the standard-setting process. For now, the agency is an observer. Commission officials would have to consider whether to allow different types of IBOC systems to operate and how to regulate those systems.

Now, stations are licensed to operate on a specific frequency with an analog signal. Overlaid on top of that would be an IBOC signal. Among the big questions for the FCC: Will the proposed system be able to fit so much data into existing AM and FM channels, without causing new problems for the occupants of adjacent channels? Whether the agency sets new rules depends on which system is chosen by the industry and how it is implemented. The digital television rules, for example, allow for different ways to build transmitters and receivers to provide interference protection.

Receiver manufacturers are watching the developments of both IBOC and satellite-delivered DAB with anticipation. Justus said, "If digital radio is attractive to listeners, in a mass market, manufacturers will gladly step up to the plate. They don't care if it is satellite-delivered or terrestrially delivered, as long as it succeeds with listeners."

The two FCC license-holders to provide satellite-delivered DAB are CD Radio and American Mobile Radio Corp. Both plan subscription-based, 50-channel services. Presidents of both companies say they support IBOC DAB, reasoning that it will spur the development of new car receivers capable of receiving both S-band and IBOC DAB signals.

CD Radio plans to have its service in place by 1999 and AMRC in 2000.

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Does ISDN Work for Your Station?

Experts From ABC and AT&T Share Tips to Help You Get More From Your ISDN Service

Robert Donnelly and Dick Slezak

Robert Donnelly is vice president, engineering, ABC Radio. Dick Slezak is managing director, AT&T Advanced Network Services. They offer their insights into making ISDN work effectively for radio applications.

Radio broadcasting is at its best when it brings listeners live events, stories, situations and late-breaking news.

Today a remote broadcast can have the same sound quality as a studio production. The current digital transport technology virtually has revolutionized remote broadcast operations, and high-fidelity sound circuits are now widely available throughout the world. The crackle and fading sound from the distant shortwave circuits or costly and noisy audio lines have been replaced by the high-quality, high-fidelity sounds of ISDN, or Integrated Services Digital Networks.

This article is intended for users of ISDN and other digital services for sound broadcasting who want to optimize performance and ensure the channels purchased are delivered on time and work correctly from start to finish. The information is based on actual customer experience.

Although the ordering process for ISDN can vary depending on the service type and local or long distance company involved, there has been a significant industry-wide effort to make ordering more uniform.

For example, although BRI provisioning requirements vary by equipment vendor, each manufacturer specifies how to order BRI line for their equipment configuration. For this reason it is recommended that, when selecting an equipment vendor, customers identify their specific requirements and understand their ability to respond to future questions.

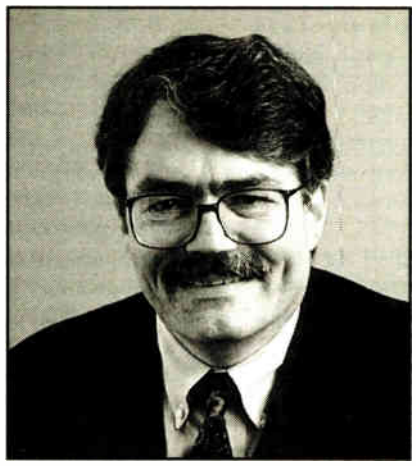
To ensure a smooth ISDN provisioning process and help with potential trouble resolution, it is useful to create a configuration template depicting how the various pieces of equipment and the network work together and to test this configuration before it is deployed. Often, a major carrier such as AT&T will provide help in selecting this equipment and sustain an ongoing program of testing equipment to ensure that it meets their published network interface specifications for trouble-free operation.

Obtain as much of the order information as possible, including switch type, circuit number, SPIDS and phone numbers. Some carriers will provide customers with a copy of the actual order form used for ISDN orders. Obtain, complete and submit this form with the appropriate order information to promote a smooth installation. In all cases, the first rule is to order early and check out any remote installations prior to the due date.

PIC selection

Ordering a BRI line is similar to ordering voice telephone service. Customers who order directly from the LEC must also select a long-distance or interexchange carrier, commonly known as an IXC. This selection is processed, converted to a code, or PIC, that designates the carrier and included in the line setup at the long-distance company switching center.

Since an IXC can cover the entire United States and any international requirements, the most practical approach is to select an IXC first and work with them to configure the equipment for a given application. The PIC selection does not affect the quality of the connection, only the ability to make the long distance call. Broadcasts are usually more reliable and of a higher quality when both ends of the circuit have the same long-distance carrier. Therefore, customers should specify the



Robert Donnelly

PIC for *both* ends of the circuit wherever possible.

If the PIC is not selected, not programmed or is programmed incorrectly, long-distance service may be carried by the wrong company or unavailable. To force a call to a specific long-distance carrier or to access an alternate carrier, customers can dial around their PIC using carrier-specified codes (e.g., 10-288 for AT&T). Dialing the five-digit code enables customers to complete long-distance calls until the switch is reprogrammed.

When selecting a long-distance service provider, choose one that enables access to any end point. Some providers, based on agreements with local companies, may only permit unidirectional calls at remote sites (i.e., only inbound calls or only outbound calls).

Installing ISDN

Although ISDN installation time varies by company, the average is from 7 to 15 business days. Prior to installation, the following information is critical and must be correct.

- *Service address*
- *Working telephone number at site*
- *Customer contact at site*
- *Credit information*

Most local companies also use a standard set of provisioning codes that specify which set of features to install for a specific customer. However, these codes may vary from company to company. To ensure proper installation, customers must provide detailed order information that includes the type of facilities ordered, PIC, B-Channel characteristics (i.e., voice and data), and other factors.

To resolve any installation problems that do arise, it can be helpful to know the installer's name and pager number. The installer has worked on the actual circuit and is familiar with the line. If problems arise with the line during broadcast, the installer might fix the line more quickly than a service technician.

ISDN service brings with it several special considerations.

Delay — ISDN remote sites can produce a slight delay (or worse) for live audio broadcasts. Typically, the delay results from the specific codec used, and varies by vendor and model. The nature of the coding can cause significant delay, producing an echo that affects production quality.

On-time line installation often can identify and help to resolve any delay problems. However, to achieve the highest-quality professional sound, customers should consider sending a mix-minus from the studio (using an off-air monitor for the talent will not work). The mix-minus is everything the customer wants the talent to hear *except* themselves.

Most on-air consoles have a "Program 2" or "Audition" bus that can be used to create this mix-minus and send down the ISDN line to the remote. At the remote, the mix-minus from the studio can be put on one input of a mixer/console and the talent on another input (or inputs). This way the talent hears himself as he talks instead of through the delay of the ISDN. Since ISDN is two-way, it is easy to get the signal to the remote. The trick is to be set up with the correct mixes on both ends of the remote.

Dick Slezak

The need for redundancy — ISDN does come with some built-in restoration features. One of the benefits of ISDN is the ability to get back on the air by simply redialing, minimizing lengthy outages. However, to avoid shorter outages, customers need to provide individual protection and redundancy. One way to avoid these shorter outages is to maintain clean power.

Redundancy also is an option. Depending on the importance of the application, a customer can determine the redundancy required. Specifically, if the service is critical to the customer's business needs, then the entire arrangement should be backed up, including the duplication of the local equipment that supplies the actual service application.

Codec — The coder/decoder, or codec, plays an important role in ISDN line performance. The codec on each end of the line must be capable of doing the same compression algorithms. Algorithms can be either an open standard or vendor-proprietary, although many vendors use proprietary algorithms to differentiate themselves from their competitors. The codecs must be verified and tested prior to moving forward with installation.

Most codecs have internal jumpers for in/out levels (bridge/terminating). Each manufacturer adopts its own method of using jumpers. If jumpers are not set for an

See ISDN, page 21 ▶

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▶ ISDN, continued from page 20

application, customers can overdrive the front end of the codec, resulting in audio dropouts on peaks, and, in some cases, the termination of the ISDN call. Peak limiting prior to codec input is a good idea for sports remotes and other applications where audio levels change rapidly.

Testing — The most important rule when testing ISDN service is to test early and to test often. The best medium for testing radio broadcasting is program audio. Tone will work most of the time, but users should remember that ISDN does not perform like analog circuits. Due to the human-auditory based digital compression and the various algorithms available, program audio, rather than tones, will confirm a quality link.

Trouble reporting — Trouble reporting procedures and phone numbers will vary by company. Many companies have different numbers for business and nonbusiness hours or an ISDN help desk that can resolve provisioning issues — including long-distance carrier assignments — more quickly than the regular repair numbers.

Be prepared when reporting trouble. Providing the SPIDs, line number, order number and installation date can aid in trouble resolution. Work out a trouble resolution plan before deploying a major application. This is a good test of the quality of your equipment vendors and service providers.

In most cases, when the customer reports trouble, the local and/or long-distance company creates a trouble ticket and tests the line to determine where the trouble is occurring. For all reported problems, get the trouble ticket number to ensure that the company tracks the problem and that a quick and efficient means to obtain problem status is available.

Radio professionals who seek to use ISDN for their stations are faced with certain common questions. We've summarized them in the accompanying story and provided tips for solving them.

To ensure a smooth ISDN installation, remember the three P's: provisioning, peak levels and power. Provide and obtain detailed requirements and order information, select and thoroughly test the codecs, and ensure and maintain clean power to attain peak ISDN performance.

■■■

Robert Donnelly has held a variety of positions at ABC Radio, including master control supervisor and manager of broadcast services. Following the network's conversion to satellite, Donnelly led ABC Radio's digital satellite distribution system. Donnelly was promoted to vice president, engineering in 1993. He heads up the ABC Satellite Services Sales team.

Dick Slezak has team leadership responsibilities for AT&T's Global ISDN network with service to 49 countries, as well as all computer-based intelligence for the North American voice network.

Solve Your ISDN Problems

Problem: Multiple Disconnects

ISDN equipment is digital and susceptible to power fluctuations, spikes and dips — just like personal computers. Power hits or dips can cause terminal adapters to disconnect an ISDN call. Power hits may also cause some codecs with built-in TAs to lose their parameters, requiring SPIDS and LD numbers to be reentered before ISDN will work.

All CPE should be connected to AC through a surge protector. Where available, a regulated power supply such as that used in a computer room or electronics facility can be used. A small UPS and battery also are recommended to attain clean power. Some UPS devices can regenerate 110V/60Hz that is helpful when overseas.

Problem: Call Not Completing

When provisioning the service, providers frequently configure one B-Channel for voice and data, and one for voice only. If both channels are not configured for data, the number will ring but will not pick up. Ensure that both B-Channels are provisioned for data, or voice and data.

Problem: Multiple ISDN Hang-ups

A faulty or intermittent ISDN card in the equipment can cause the problem. The local company can do diagnostics on the local ISDN card and replace the card to clear the problem. Checking SPIDS and doing a quick dial-up will not find the problem as hang-ups occur intermittently and the call will complete and work for a while.

Many vendors now subscribe to a new technical reference from AT&T and the Vendors ISDN Association. The reference allows long-distance providers and customers to dial in to remote equipment from a central site and "read" several days' worth of ISDN call history. As ISDN is an "intelligent" service, the conversations that occur between the local switch and the remote equipment often can reveal the cause of intermittent problems.

Problem: Cannot Dial Long Distance

If the long-distance carrier PIC is not specified during installation, ISDN may not be optioned for long distance. The installer usually checks the continuity of a newly installed ISDN only locally. Until the switch is reprogrammed, customers can use the long-distance service provider's five-digit dial code (10-288 for AT&T).

Problem: Audio in the United States

In the United States, do not forget the NT-1. Audio via ISDN is a three-step setup: codec, terminal adapter and NT-1. External TAs come with or without NT-1 built-in. NT-1 is not required in Europe because it must be supplied by the local telephone company.

Problem: Audio Dropouts

Most codecs have internal jumpers for in/out levels (bridge/terminating). If jumpers are not set for the application, overdrive can occur in the front end of the CODEC. This can cause audio dropouts on peaks. In some cases this can cause termination of the ISDN call. Peak limiting prior to codec input is a good idea for sports remotes and other applications where audio levels change rapidly.

Problem: Show Sounds Like a Tape on Slow Speed

When using Layer III, check the sample rate. Layer II and III work at different sample rates (24 kHz, 32 kHz, 48 kHz and others). In Layer II and III processing, the higher the sample rate, the lower the processing/delay time. If sample rate settings on send/receive codecs are not the same, codecs often will not frame properly in Layer III mode. Protocol for Layer II avoids this because, unlike Layer III, the sample rate is part of the header.

Problem: Codec is not framing

If a G.722 codec is fed with a tone prior to establishing an ISDN connection, the call will complete. However, the far-end codec will not frame for a while, or until the tone is taken down. G.722 uses ADPCM coding and only sends out the difference of the previous sample. Since the tone has no change in waveform, the far end codec has nothing to which to reference; hence, it will not frame. When the tone is terminated, the codec will frame.

Problem: Central Office not Recognizing Terminal Equipment

Usually, equipment requires a four-digit SPID. However, local companies may only provide a two-digit code. Adding two digits to the end of the SPID, typically "00" or "01," can resolve the problem. Also, remember to program the directory numbers in addition to the SPID.

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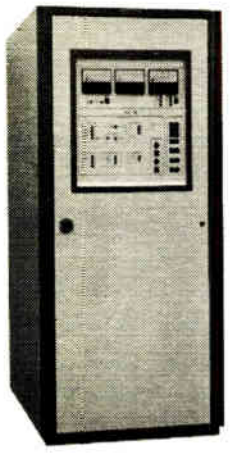

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FEED LINE

Tuning Up, Step by Step

W.C. Alexander

This is the 15th in a series of articles about contructing an expanded-band AM facility. The previous part appeared in our May 27 issue.

As we look at the very practical side of diplexing, a step-by-step list of the tune-up process is helpful, both for directional and nondirectional antennas. This article focuses on how to diplex into the nondirectional antenna of an existing station.

Before you begin

Before beginning the tune-up, make certain the diplexer is installed properly. As mentioned above, a typical diplexer cabinet will accept the existing station RF input via a stud connection on a bowl insulator. The new station ATU likely is incorporated into the filter cabinet and separated from the filter components by metal shields. The RF input to the cabinet from the new station will then be made via a coaxial termination feeding the ATU network.

Be sure the external tubing is installed using the shortest possible lengths and most economical routing. Long runs should be adequately supported using insulators attached to posts or other rigid structural elements. Check the quality of each connection, paying particular attention to solder joints.

Inside the filter cabinet, check the connections for both correctness (use the schematic as your guide) and security. The components may have been pretuned at the factory; if so, all the better. This minimizes tune-up time in the field. Many manufacturers offer pretuning as a service.

Once the connections are correct, you can set the series networks. Start by disconnecting the feeds from the antenna and both RF sources. The series networks tune rather broadly, so they are generally set by simply setting the reactances to the design values.

If the networks have been pretuned, you should still check them in the field. Mistakes do happen, even in the controlled environment of the factory. More than once, the test equipment used to tune a particular network has been set to the wrong frequency. Double-check settings in the field to save you a lot of grief later.

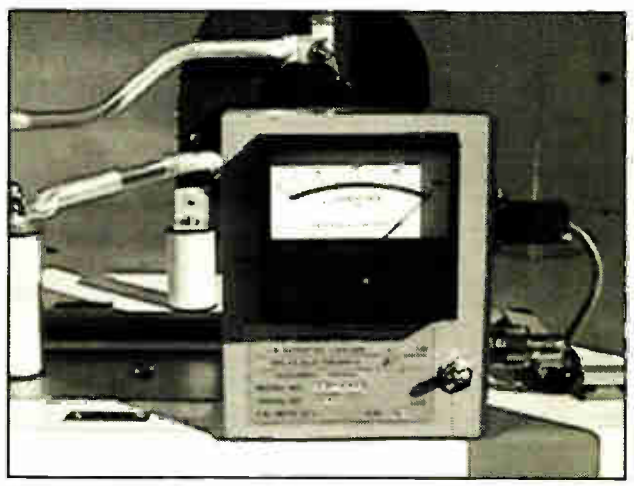
Impedance bridge

Use an impedance bridge to set the series networks. While you could use a vector impedance meter, it is difficult to read the meter on that handy device with the accuracy that an impedance bridge provides.

Set the oscillator to the pass frequency and tune each series network for zero reactance. Be careful to use the right frequency for each series network. Remember that main filter series networks are tuned on the pass frequency for that side of the diplexer while aux traps are tuned on the reject frequency.

After each series network is set to zero, change the oscillator to the other frequency and measure the residual reactance. Now set the parallel resonating components for opposite the measured residual reactance. For example, if on the high frequency side of the diplexer the residual reactance of the series network in the main filter measures -j20 ohms, adjust the parallel resonating components for +j20 ohms. Again, this may have already been done at the factory, but the setting should still be checked in the field.

With all the series networks set and all the parallel networks preset, you are ready to fine-tune the parallel networks. These networks tend to tune quite sharply, and they have a big effect on the bandwidth and isolation of the system. Tune them with great care. Some engineers elect simply to leave the parallel networks at the preset values and do nothing further. Because of stray reactances caused by tubing runs, however, some improvement can generally be made by fine-tuning them using a signal generator and a sensitive RF voltmeter.



A Delta RF Ammeter

Set the signal generator to the parallel-resonant frequency of the network (reject frequency for main filters and pass frequency for aux traps) and feed one side of the network. The other side of the network then is passed through a current transformer and grounded. The current transformer can be a Delta toroidal unit, or you can manufacture something simple yourself — anything to couple a sample of the current flowing in the tubing on the ground side of the network without affecting the network tuning.

The current sample is then fed to the RF voltmeter (usually a field strength meter), and the parallel resonating components are tuned for minimum current. The parallel network should tune quite sharply; if it does not, something is wrong.

Upon completion of the tuning, reconnect all the networks properly and remove the current transformers from the circuit. Spend a few moments double-checking connections for correctness and security.

With all the series and parallel networks now properly tuned, connect the diplexer output to the antenna and measure the antenna impedance looking through the filters. Do this by breaking the circuit between each ATU network and the diplex filters and bridging there on the proper frequency.

Next, recalculate and reset the tee network leg values for each station's ATU network. With that done, reconnect the ATU output to the diplex filter input, move the bridge to the ATU input and check for 50 ohms nonreactive. If necessary, make small adjustments to the shunt and input legs of the tee network to achieve 50 ohms nonreactive on the bridge. Repeat this at the input of the other station's ATU, changing the oscillator to the proper frequency.

As with stand alone ATU adjustment, you can measure the ATU input impedance on each sideband frequency as well as carrier and calculate the SWR on each sideband frequency. It may be possible to improve system performance by making the load at the sideband frequencies symmetrical. Changing the phase shift of the ATU network affects this, and you will have to experiment to find the optimum setting.

The last step is to measure the tower base impedance on each frequency. This is done at the output of the diplexer, downstream of all filters, where the base current ammeter will be installed for each station. The base resistance should measure close to the value read on the ATU side of the filters less the loss resistance of the filters. Note the resistance and reactance values, which will have to be filed with the FCC.

Power

You are now ready to feed power to the system. Start with the existing station and bring the transmitter up at reduced power. Check the base current to see if it tracks with the power indicated on the transmitter power meter.

The difference between the power read on the two meters, assuming they are both accurate, is the loss introduced by the diplexer. Check the base current ammeter on the other side of the diplexer for no indication. If base current is indicated on that meter at this point, you should shut down and double-check all connections and diplexer tuning.

If everything looks okay, bring the transmitter up to full power and check all the parameters. Assuming they all look good, run the transmitter for a few minutes, then shut it off and check all ATU and diplexer components for heating. Warm is okay; hot is not.

Next, with the existing station shut down, turn on the new station at reduced power and repeat the above procedure. If all looks well and there is no evident excessive heating of components, you can fire up both stations into the system and check for proper operation.

A number of additional considerations come into play when you are diplexing into a directional array.

We will address these in future articles, and wrap up our look at diplexing by exploring spurious and harmonic emission measurements and the required FCC paperwork.

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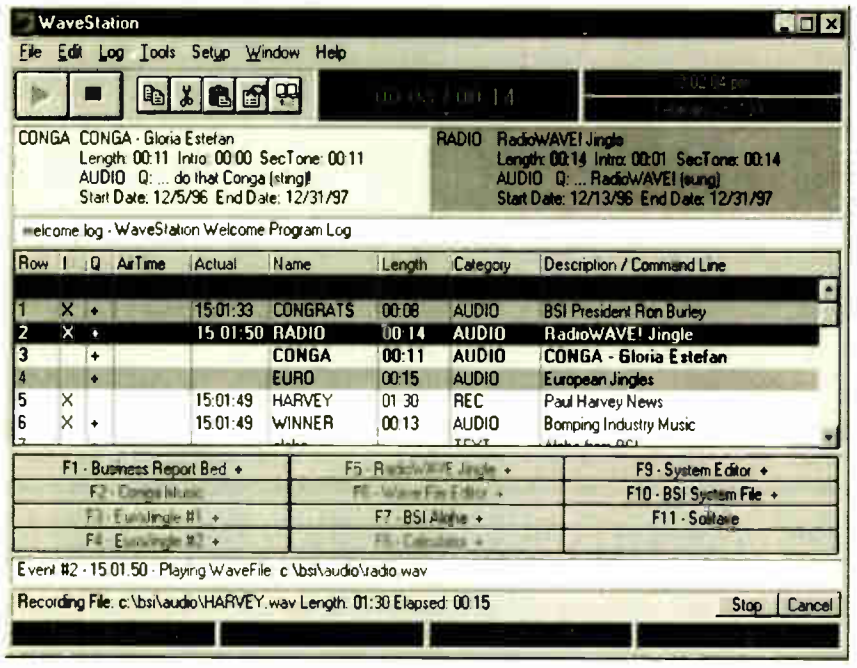

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PIONEER PROFILE

WBBM: A Passion for Radio

Barry Mishkind

There's no question about it. Broadcasting is a business. Without attention to the bottom line and ensuring sufficient spot load, no station can survive, regardless of the number of listeners. Many old-timers decry the "age of the bean-counter," claiming radio has lost its "soul," but this view is too simplistic.

True, radio is not what it was. In some ways that's good. The current state of the art allows stations to serve their markets more effectively than before. Yet some companies have used the same technology essentially to compress a radio station into a computer in a closet.

Still, for the true professional, broadcasting is not just a job or a paycheck. It is a passion for excellence.

Many radio pioneers were captivated by the new technology. Being able to send programs into the ether was a thrill. Les Atlass had a passion for excellence in programming, and his legacy to us is one of America's great radio stations: WBBM(AM).

On the 'shoulders' of Atlass

Born in 1894, H. Leslie Atlass was 17 years old in 1911, when he and his eight-year-old brother Ralph built their first amateur station. Originally using a spark transmitter, Station 9DFC was located in the basement of the Atlass family home in Lincoln, Ill.

Les Atlass went on to serve as an officer in the Signal Corps during World War I. As soon as he returned to Lincoln, he resumed his wireless activities with his brother while working in the family produce business.

Morning anchor Felicia Middlebrooks lauds her outgoing partner John Hultman, who will retire at the end of June.

As with all amateur stations, 9DFC was asked by the government to suspend operations until the end of the war for security reasons. Returning to the air in 1921, the Atlass brothers continued under their amateur license, now with a 200 W transmitter. However, this would only last two years, as Atlass clearly saw the potential for broadcasting to the public.

He asked the Department of Commerce to trade his 9DFC license for a new commercial license, and on Nov. 14, 1923, he received the license and call letters WBBM. After some testing and tweaking, the Atlass brothers quietly debuted their new station, still down in the basement, on April 14, 1924.

However, the event that shaped the history of WBBM was the sale of the family business. Atlass' father decided to move the family to Chicago. Les and Ralph asked the government to delete the Lincoln station, and allow them to move to Chicago. They were rewarded with a grant to move the station and increase power to 500 W.

After a restart in the basement of the new family home, Atlass arranged for a transmission site on the Broadmoor Hotel. WBBM soon began to make a name for itself with local listeners. At first the programming consisted mostly of recorded jazz music, although the first offering transmitted to Chicagoans was "Barney Google." The programs were popular, but this was not good enough for Les Atlass.

A man with a quick, decisive mind, Atlass felt that live entertainment would be key to successful radio. Searching out talent from all over the Chicago area, Atlass even recruited a staff orchestra for the station. The small studio became crowded, but the programs themselves were among the best on the air.

Still, there was a rather haphazard quality to the WBBM schedule, as no one could predict if enough "free" talent would show up to fill the broadcast day. Often the station announcers would be pressed into duty as performers, singing and playing the songs they knew over and over.

Nothing but the best

Atlass had a vision of what radio should be. He felt that his listeners should hear nothing but the best, from wherever it was happening in Chicago. A new policy was announced; programs would be 95 percent live music. Over the years Atlass' sharp "feel" for honest, fresh programming of high quality would bring the station renown.

However, this new policy came with a price tag. In order to pay for better talent, the station advertised its schedule, and became the first in Chicago to air ads. While advertisers such as the Yellow Cab Company did see results, it was not enough. Atlass tried selling all the airtime to one company, Stewart-Warner Speedometer Corp. This arrangement lasted about one year.

As WBBM cycled through the frequency, power and share-time changes of the mid-1920s, the station eventually landed on 770 kHz with 10 kW. Its reputation as "the station of the dance bands" was built on a full schedule of remote broadcasts from around the city. This led to union problems.

The local musicians' union demanded WBBM have a full house band, whether it was used or not, in order to do live remotes. Oddly, when the station tried to use its union "house band," Atlass discovered none of them read music! Eventually another "house orchestra," one that could perform, was assembled.

As the years went by, Atlass continued his policy of pursuing the best performers and paying them well. He demanded the best from his staff, expecting all his employees to have the same dedication and drive as he had. Overseeing the programming, he seemed to be listening to the station around the clock. Even an error at 3 a.m. could bring a phone call from Atlass.

If Atlass was demanding, he also was generous to the employees. He was known as an engaging manager with a sense of humor, interested in everyone and everything in the station. The staff responded with respect, loyalty and top-quality programming. As a result, WBBM became one of the most profitable stations in the country. This continued after the Atlass brothers sold the station to CBS in 1931. WBBM was a key reason CBS was able to stay solvent through its early years. The station remains in the hands of CBS today.

Impressive achievements

Les kept the job of station manager until he retired in 1959, one year before his death. Under his leadership, WBBM excelled not only in programming but also in its technical facility. From the WBBM studios came many of the CBS network programs, as well as many major singers and comedians.

A large special effects department was developed to meet the needs of the various dramas and variety shows. Some 2,000 records, including sounds recorded in the WBBM portable recording studio, were augmented by hundreds of devices in-studio, including 60 types of bells, dozens of kinds of clocks and 25 auto horns.

One of the more impressive achievements came in 1928, when it was noted that WBBM and KFAB(AM) in Lincoln, Neb., were "clashing" out in the rural areas. For example, listeners on 770 kHz would hear both station signals "fighting." When both ran CBS programming, the listener would notice a delay of about 34 milliseconds for the programs to get from Chicago to Lincoln via phone line and then transmitted.

The answer, as Atlass saw it, was to synchronize both the transmitters and the programming. During the evening hours, WBBM engineers devised a system to delay the program in Chicago, as well as synchronize the transmitters. The Federal Radio Commission was keenly interested in the project and received monthly reports from the WBBM technical staff.

Of course, there were no digital delay units, not even a tape recorder available, to do the job in those years. Instead, a series of 19 amplifiers, coils and condenser units combined to create a 35 ms delay. The stations cooperated until 1944, when KFAB moved to 1110 kHz, even going "silent" for half of the 30-second network station break, so the other station could give its ID.

In addition to having the 780 frequency to itself when KFAB moved (both stations had shifted on March 29, 1941), WBBM was now allowed to increase

See WBBM, page 35 ▶

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World Radio History

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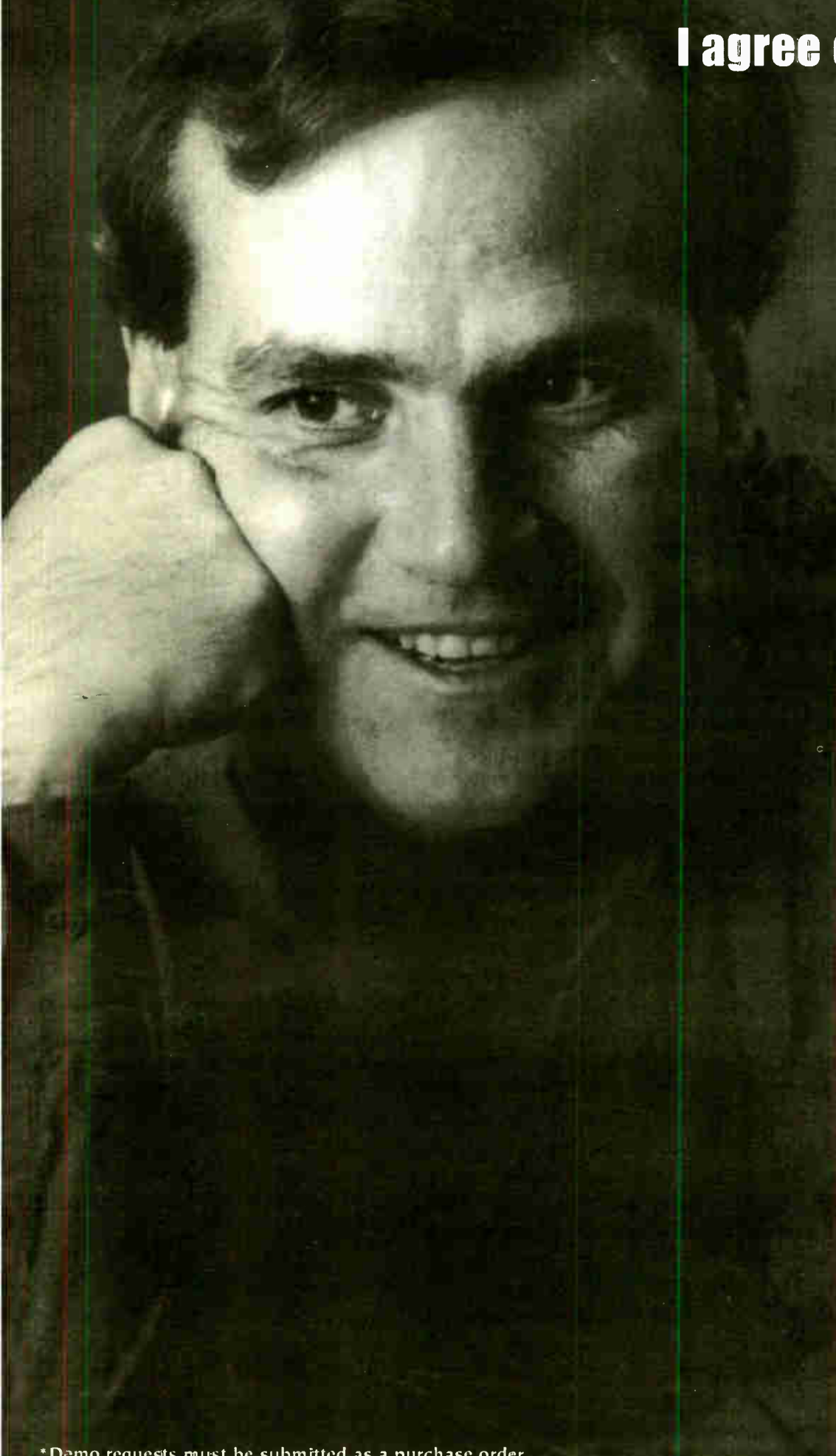

Russ Mundschenk, Chief Engineer,
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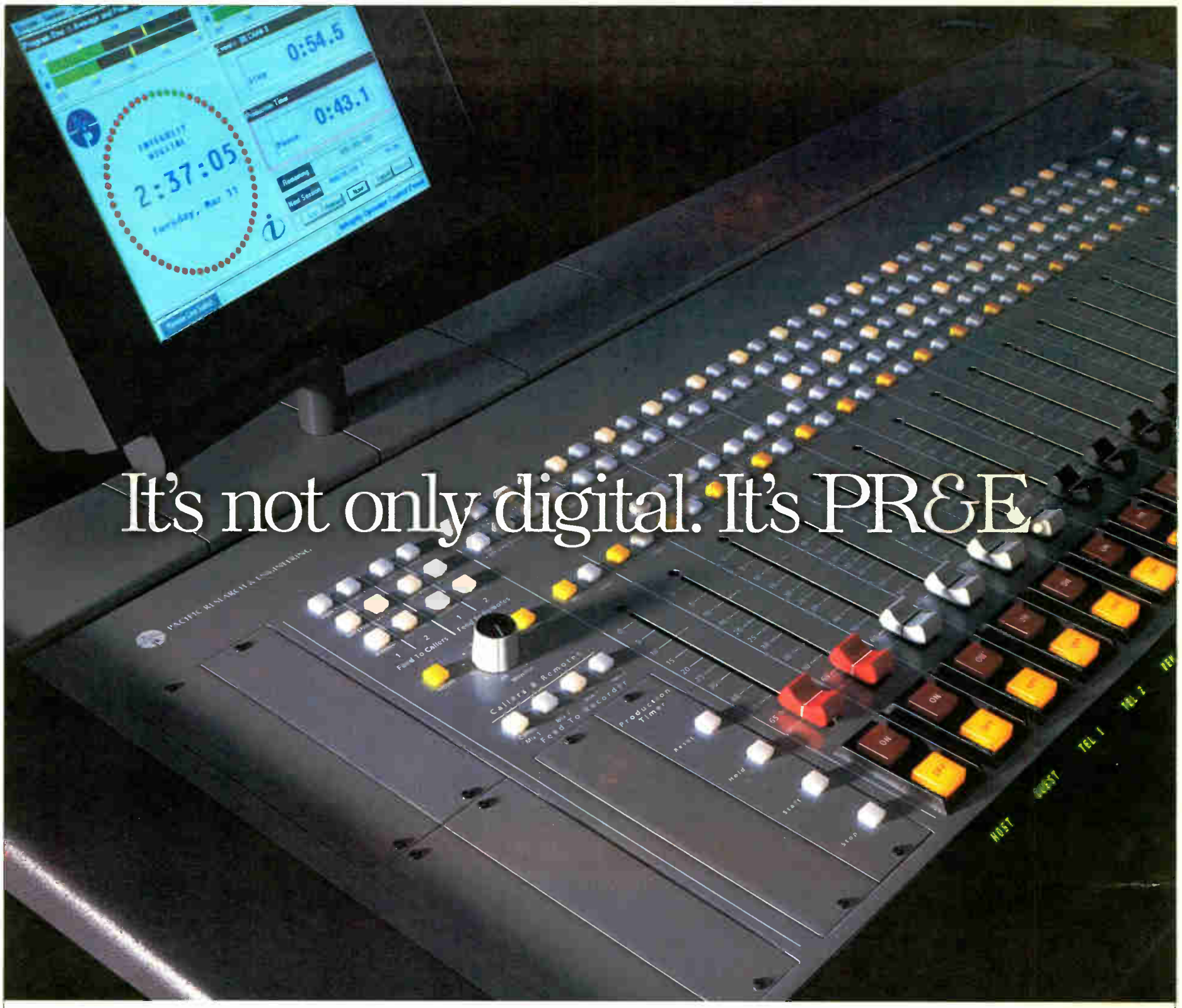

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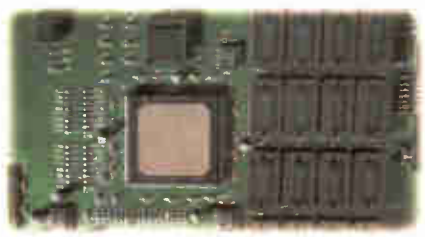
Integrity's difference is more than just digital. It also offers four special-purpose buses to provide automated mix-minus for telephone and remote feeds, each with IFB.



Integrity uses an array of state-of-the-art floating-point digital signal processors to perform its mixing, routing and other functions.

Each fader has a 10-character alphanumeric display. The display changes when another audio source is assigned, which can happen either manually or at a preassigned time.

PACIFIC RESEARCH & ENGINEERING

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A 'Swiss Army Knife' For the Newsroom

The RadioStar System Impresses Its Early Customers. Will The Rest of the Industry Embrace It?

M.G. Stevens

The American West is a hotbed of computer technology. People have become accustomed to looking toward the Pacific Northwest for software solutions.

Travel two hours north of Seattle, and you will find the source of one new software solution for radio newsrooms called RadioStar.

Vancouver, British Columbia, on the West Coast of Canada, is the home of Burli Software Inc., creators of RadioStar. The city also is a testing ground for this Windows 95/NT-based package. Early comments from engineers and news people are positive. They comment on its intuitive features and robust performance.

Features include multithreaded capture of multiple newswire and audio feeds per workstation, drag-and-drop text and audio editing, one-button record/cancel and an integrated automated Web server.

Praise

Rick Honey, a high-profile part of Vancouver's radio scene for the past 25 years, called me to rave about "this new audio software system" used in his recently-built, home-based on-air studio. This suggested further investigation.

Although now in use at a handful of stations as a control-room audio recorder/editor, RadioStar was designed as a "newsroom-in-a-box" solution by Stefan Ellis, founder of Burli Software and a radio buff.

The company faces the challenge of making its name more well known in the radio industry.

Ellis, during a live demonstration of the software at Vancouver's JR-FM, said, "I first did something like this in my last year of high school," he said. "I got into the local university station and noticed the reams of newswire paper that would pile up. Within a year, I cobbled together a stripped-down word processor and a communications program to get a system that would receive their newswire and provide very limited text editing on the screen. It ran in Double-DOS and did the trick."

No glitches

Ten years later, enter Campbell McCubbin, news director at JR-FM.

"Stefan came to me a couple of years ago with this idea to write a Windows program for the newsroom," McCubbin said. "He told me about the DOS program he wrote years before, and wanted me to look at a rough demo of the new one. It looked promising enough that I went out and bought a Pentium 200 to install it on, and we have been beta-testing since January '97 without a glitch."

Obviously the idea of operating "without a glitch" is attractive in any professional operations, but certainly in radio.

RadioStar also is finding fans outside of Canada.

EMS Digital, an engineering firm in Johannesburg, supplies 22 stations in

See NEWSROOM, page 28 ▶

The RadioStar work interface shows incoming story queue, main audio editor and story editor.

Industrial Strength Digital Audio Delivery

Digital Audio Delivery systems are now recognized as a must for every broadcast facility. But few systems provide the features, flexibility or reliability required to maintain profitability in this demanding and fault critical application, nor the support mechanism to maintain them.

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World Radio History Circle (159) On Reader Service Card

Software Solution for Newsrooms

▶ NEWSROOM, continued from page 27

South Africa with software solutions. Software Support Director Hayden Beetar came across RadioStar when his largest supplier, RCS, brought Ellis to New York for a closer look.

Beetar visited the RadioStar Web site (*www.burli.com*) and downloaded the demo version of the package. He was impressed enough with the demo to begin demonstrating it to his clients.

"I think it's great," Beetar said. "It does everything a news station would need." Beetar, like many in his position, wants a full-featured package that will integrate the variety of information entering radio newsrooms. He said RadioStar is "offering many things other products have not given us to date."

Closer to home, Ellis says the company is fielding interest from Canadian radio.

CKNW/98, a long-time leading news station in Vancouver, heads up a 12-station chain. Mark Friesen, the station chief engineer, has a staff of seven and is a supporter of RadioStar.

"With Year 2000 issues and the integration of the network's news operations, we have been looking at everything," Friesen said. "I have to say that RadioStar is leaps and bounds above others we have seen."

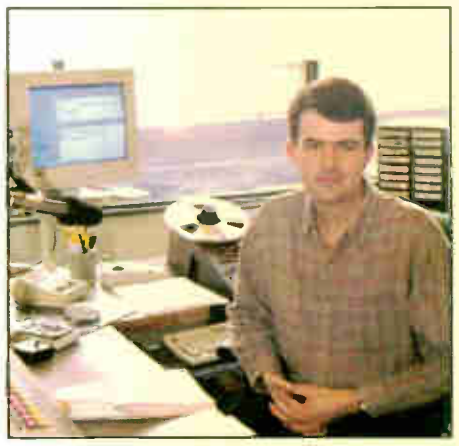
"There are a few things we do need in a package," he said, "and Stefan was able to add those things in less than a week."

The company faces the challenge of making its name more well-known in the industry. Sales of the software have been pursued actively only in the past several months; four companies have made the buying decision, others are testing the package.

Four companies have made the buying decision. Others are testing the package.

The supplier also faces the same challenge as other purveyors of computer-based products for the broadcast market, particularly smaller companies: convincing users that they can count on factory support.

Ellis said, "Some have wondered what would happen if I was, say, hit by a bus. I like to believe that with RadioStar's early robust track record, support will be less of an issue than with many other similar products. Still, providing a support team is my top priority. ... In the meantime, I think one solution is to put the source code in escrow, which offers some protection to Burli's clients."



RadioStar designer Stefan Ellis is pictured in the control room of CJJR-FM in Vancouver, British Columbia.

RadioStar's first customer, JR-FM's McCubbin, also had a hand in the development of the software.

"I guess I was lucky in getting to ask for what I wanted, but once I realized this could handle all of the information coming at me — things like e-mail and faxes — I realized I couldn't be without it." McCubbin said he saves enough on fax paper alone to pay for the system.

See Figure 1 for a rundown of RadioStar features. You can learn more on the company's Web site at *www.burli.com* or call them in Vancouver, Canada at (604) 738-3140.

■■■

Mark Stevens is a media producer and former broadcaster. He can be reached at (604) 541-8330; e-mail mgsmedia@cmag.net

While broadcast and video production environments have changed over the years, your need for a Shure mixer has remained.

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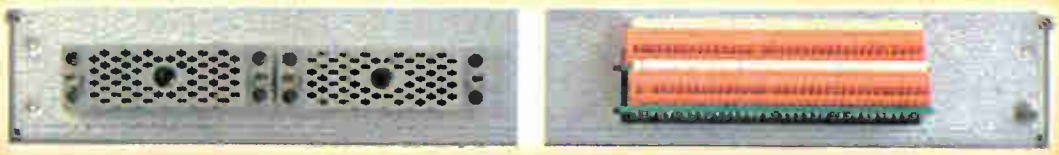

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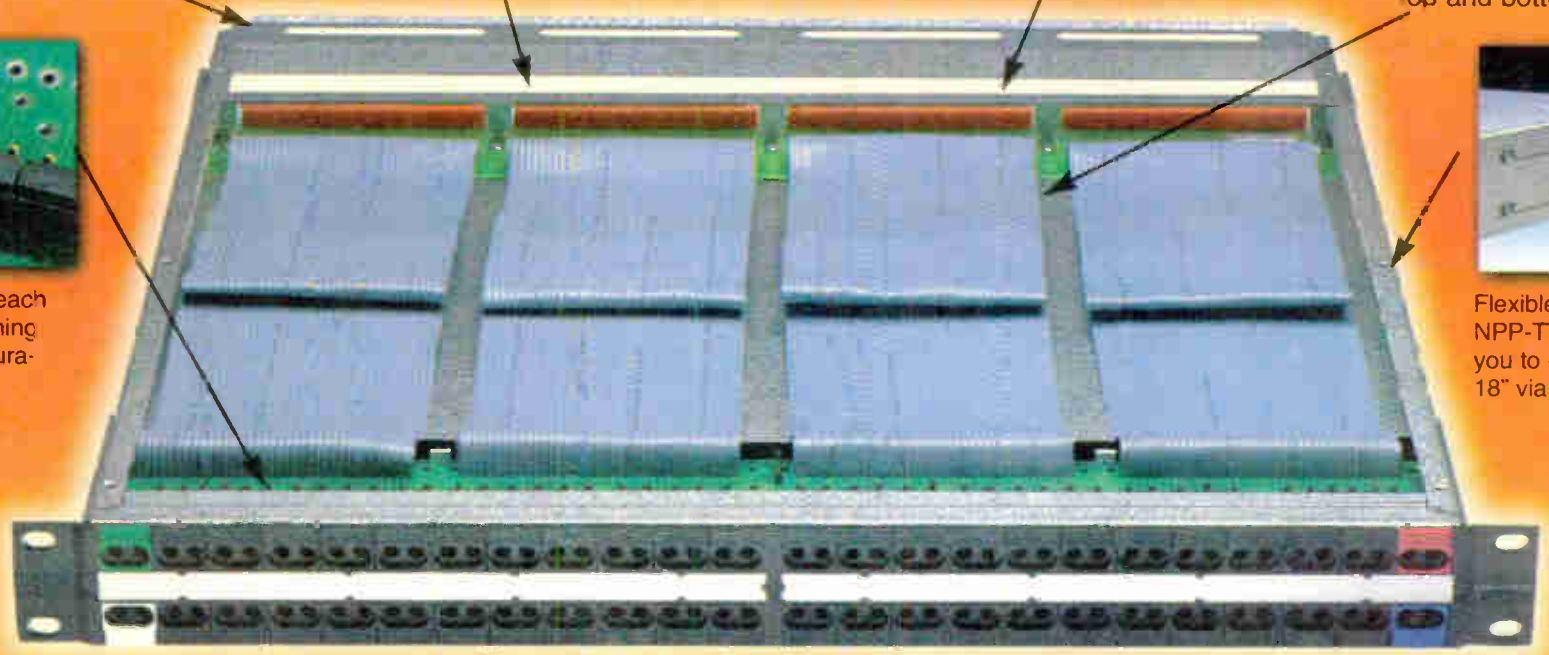

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World Radio History

Tales From the Top in Wake Forest

Troy Conner

Consider the ups and downs in the life of a tower worker. I write this article while sitting in my hotel room in Louisburg, N.C., because today was another rain-out. El Niño has steadily kicked our collective butts.

So far we have only been able to work three days out of the last eight. The crew has developed a mild case of cabin fever. These guys are used to working hard for 60 hours a week, not sitting around in their hotel rooms day after day. But that is the nature of tower work; the weather is always the biggest variable.

We were supposed to lift and install a large Dielectric TDM antenna and place it atop the 1,200-foot WCPE(FM) tower in Wake Forest, N.C. At present we have assembled 120 feet of gin pole (about four-and-a-half tons worth) on the side of the tower and "jumped" it up its "track" and out of the top of the tower. At this point we are ready to remove the top 72 feet of tower.

Every picture tells a story

Perhaps the photographs can tell the story better than I can. Figure 1 is a shot of the crew foreman, Randy, preparing to release the track so it can be lifted up the tower. The yellow gin pole is leaning out away from the tower so that the track will clear the structure while being raised.

Figure 2 shows Chris, our New Yorker, hanging out near the bottom of

Figure 1

the gin pole, keeping a close eye on the pole as it inches up the tower to prevent the pole from snagging or catching on any part of the structure.

Figure 3 provides an interesting perspective of the gin pole in position, "jumped" out the top and ready to lift the

Figure 2

top sections off the tower. Hanging from the red headache ball is the "pan" or personnel lift basket used as an elevator by the crew. Randy is standing on the top plate, and the smaller face-width top sections to be removed are partially visible behind the pole.

The tower originally was designed to utilize a face-mounted antenna system on the 72-foot extension, but it was never installed. Because this extension cannot carry the weight of the new antenna, and because of FAA/FCC height limitations, the top of the tower has to be removed. Later it will be re-erected as a small self-supporter, about a quarter-mile away behind the transmitter building.

Engineers who have been around awhile may have heard of the TDM, which is normally used as a TV antenna. This antenna will be the first Dielectric TDM series circularly polarized antenna designed exclusively for FM use.

Depending on the frequency, the TDM series antenna ranges from 65 to 72 feet tall and weighs in at about four-and-a-half or five tons.

Once we manage to mount it to the

Figure 3

tower top, plumb it for RF and get it running, the side-mounted, six-bay ERI antenna at 670 feet will become the standby.

The CP for the primary antenna will see a net gain of approximately 500 vertical feet. Once all is said and done, this station can expect a real kick in the pants in terms of greater coverage and increased signal quality at the peripheries of its market.

The crew I'm working with is out of Tucson, Ariz. The members were contracted to provide the crew and equipment to perform the project. I was retained by the customer to provide an independent opinion as to the quality of the work during the job. I do not anticipate any problems other than those the weather has been handing out.

I always enjoy working with different crews. Invariably we have common friends from the business, confirming that tower workers are indeed a small group of folks. This crew is both competent and a really nice group of guys.

Next time, if the weather will let us finish this danged job, I will describe the conclusion of this project. Until then, stay safe and have fun.

■■■

Troy Conner is the owner of Tower Maintenance Specialists. Reach him by phone at (704) 837-3526 or via fax at (704) 837-1015.

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- **1991: Harris demonstrates prototype digital FM exciter**
- **1993: Harris introduces DIGIT, world's first digital FM exciter**
- **1994: Harris introduces AES3 input module which allows DIGIT to directly accept digital studio standard audio**
- **1996: Harris introduces Platinum Z FM transmitter and DIGIT CD digital FM exciter**
- **1997: Harris introduces world's first *uncompressed* digital 950 MHz STL**

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Workbench

Radio World, June 10, 1998

Mend Fences With Your Tower

John Bisset

Perhaps you have received a reprieve from all the rain brought on by El Niño. If so, why not celebrate by taking a trip to your transmitter site? Make it an afternoon affair, picking up a fast-food lunch to enjoy at the site. Why? Because it is time for another quarterly tower inspection, and, no, this requirement has not been eliminated by the FCC!

All of the rain and harsh weather has taken its toll on towers. Is the paint blistering? Is rust visible? If the tower is of the hollow-leg type, are the weep holes open?

As you bask in the sun, take a walk around the site. Check your fences. Are these locked and secure? If plank fencing is used, are all the planks in place? What is the condition of any barbed or razor wire?

Even if you see no rust, what does the paint look like? Faded paint can earn you a notice of violation, with the requirement to correct the problem quickly. That means little time for competitive bidding. Ditto for the guy wires. Get rid of any weeds or brush growing up around the anchors. Check the condition of the guys. Is hardware missing on the anchor or at the connection point?

If you start seeing more than one or two of the above-mentioned problems,

Figure 1. Water does its damage to a tower base.

contact a tower rigger for a more thorough inspection. If you schedule such an inspection, have the rigger check the lightning rods mounted at the top of the tower (sometimes there are three, usually only one). The rod should extend well beyond the beacon, to protect it.

As the rigger climbs the tower, check the condition and connections of coaxial ground straps.

Of course, the transmitter should be off and the surface should be cleaned to bare metal. Repeated arcs can cause resistance in the form of rust or carbon build-up from the arc. This resistance effectively defeats the purpose of the gap. Gaps should be set just beyond the flashover point for 100 percent negative/125 percent positive modulation.

For grounded towers, at least four 10-foot ground rods should be driven into the earth at the tower base and securely bonded to the tower. Check to see that the connection of the rods to the tower structure itself is intact.

A pair of binoculars also helps. Use it to check the ceramic insulators that separate the guy sections.

Inside the building, check your surge arrestors. If your transmitter building lacks this kind of protection, consider it. Some of the major insurance companies that insure stations against lightning damage may help pay for such arrestors because they reduce claims. Ask your station's agent.

If you plan your day properly, at local sundown you can open your daytimer's antenna tuning unit. For a 24-hour AM, make arrangements to turn the ATU off for a half-hour. There will still be enough daylight to permit entry to the coupling network so that all the connections to coils, capacitors and interconnecting tubing can be tightened. Before you start, open the door to both the main and aux transmitters and throw the breakers. All too often, an overzealous air personality will try to raise the transmitter. Your mission is to prevent that from happening.

Nowadays, getting down time may be next to impossible to arrange. Got a GM or PD who won't work with you on this? Show them Figure 2. Loose connections generate heat, and where there's heat, there eventually may be a fire! A brief maintenance session pales in comparison to the off-air time and replacement component expense that such a catastrophe brings.

Something I saw in Louisiana was the hanging of those small pest repellent cards inside the ATU. Apparently the fumes do not disturb the components, but they do discourage bugs and bees from making their home inside. The pest strips work well inside the transmitter building, too.

In addition to your visual inspection, use your senses of smell and touch to make sure components are not hot and all connections are sound. If you have a contactor in the coupling network box, exercise it, check for loose or missing hardware, and if necessary, lubricate the moving linkage as recommended by the manufacturer.

Figure 2. Loose connections can have catastrophic results.

■■■

John Bisset has worked as both a chief engineer and contract engineer for more than 20 years. He is a district sales manager for Harris Corp.

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

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World Radio History

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World Radio History

Juggling Frequencies in San Diego

▶ FREQUENCY, continued from page 1

working together: the Helmet Communications Team and the Frequency Coordination Team. The Helmet Team, led by Harvey Shuhart, was responsible for quarterback communications. A helmet-mounted receiver allowed the quarterback to hear commands over an encrypted audio link. Each NFL team maintains its own custom radio helmets and repeater. Three

Helmet Team members, located on each sideline and in the press box, provided support for the radio helmets.

The Frequency Coordination team also consisted of three people. Karl Voss is an engineer from KPNX(TV) in Phoenix, a veteran of the three most recent Super Bowls. John Weigand is at KSWB-TV and is local San Diego County Frequency Coordinator. I served as the final member of the team; I'm the chief engineer for KPBS-FM in San Diego.

On the scaffold

The coordination team technical equipment consisted of three "DF" direction-finding stations to monitor and locate any possible interference in the 450 through 800 MHz bands. We had three DF stations. One station was located in the press box area, on an overhanging camera position at about the Denver 35-yard line; the other was located at the east end of the stadium, next to the big scoreboard, on a 30-foot raised scaffold.

During the game, Karl was inside the coordination trailer in the International Compound with a DF station and a spectrum analyzer. Inside the stadium, John was stationed at the press box location. I had the scaffold location.

Each DF station consisted of an Icom general-coverage communications receiver, a Doppler Systems DF unit and antenna system, a Communication Specialists PL/DPL/DTMF decoder and Motorola two-way radio for our own team coordination. The DF antenna system consisted of four rubber-ducky-style antennas mounted in a square on a common ground plane "plate." The plate was affixed to a sturdy tripod.

The system was designed and put together by Control Dynamics of Philadelphia to locate interference to the helmet receivers, two-way radios and wireless microphone frequencies.

Quick resolution to interference issues was critical. RF systems were in use constantly during game week activities as well as the pregame and half-time activities.

Well before the start of the big game, Karl Voss was at work sorting out spectrum requirements. Users submitted requests for spectrum requirements months ahead of time. They were compiled into a database and frequencies were assigned as they were available.

Even with extensive advance planning, minor problems and last-minute requests were not unusual. Coordination conflicts and last-minute requests were handled by Karl in a cordial and professional manner. The frequency coordinators did not play the role of "frequency police" but, rather, facilitated cooperation between the parties involved.

Some interference problems were resolved, some remained unresolved and some simply went away without an understanding of what had occurred. One such instance involved a local radio station using its affiliated television station's 7 GHz STL subcarrier for its digital audio path. Interference to the STL had made the link unusable.

Each touchdown garnered a blast of fireworks from the main scoreboard, directly over the head of our writer.

We later found out the interference was not related to the Super Bowl. The station resolved the complaint. In another instance, a small portable repeater brought into the stadium for concession personnel was being keyed up and not releasing after a two-way stopped transmitting. The two-way rental company assumed the stuck transmitter problem was related to interference from Super Bowl activities. Karl diagnosed the problem as excessive RF output power causing receiver de-sense. A reduction of output power solved the problem. Clearly, 40 W of power was not required to cover the stadium!

Another interference issue arose from the San Diego Police Department helicopter equipped with a video transmitter that fell almost directly on video ENG channel 9. FCC Part 90 and Part 74 users share common frequencies in the 2.4 GHz band. ENG channels 9 (-) and 9 (+) were assigned for use by two different blimps for NBC. The police were not coordinated or licensed for these channels! Karl contacted the police department, which promptly obtained a transmitter on the frequency they were licensed for. The police ended up on 8 (+), and the blimps stayed where they were originally assigned.

In the air

Airborne transmitters present a special problem. By careful coordination with a local user, the blimps shared several channels at different times. This was not without problems, however. The police receiver on 8 (+) was being interfered with by blimps on channel 9 (-) and 10 (+). One blimp moved to a channel used by a local television station to solve the interference. The 2.0 to 2.5 GHz ENG band is very crowded, so cooperation is a must.

Another problem resulted in FCC involvement the Saturday night before the big game. The B-2 Stealth bomber was scheduled for a fly-by with a chase plane providing video to NBC via a mobile, military ground station. The link to the relay point was being interfered with by something the FCC DF'ed back to the area of the NBC compound.

The coordination team was never informed of how the interference was resolved. Despite all the effort by the military, the video from the chase plane was not broadcast as planned since NBC was in a commercial during the fly-by.

Game day

Finally, on game-day morning, one of the concessionaires showed up with 160 two-way radios on a channel that was not coordinated for concessionaires. The channel used by the concessionaires was the same channel used by the Broncos staff to communicate with John Elway!

It took only 30 seconds to reprogram all 160 radios. A potential catastrophe was averted by the quick teamwork of both the frequency coordination team and the user.

During the game, everything was quiet on the interference front. Karl was stationed in the trailer and listened to the game on a spectrum analyzer audio output, alert to any potential problems. John and I manned our locations to wait for a call to action. Using specially configured headphones, I was able to hear the two-way in one ear and the communications receiver in the other, with independent volume controls for each receiver. The headphones also served to block out the audience noise present in the stadium.

Fan feed

While scanning around the band, I did identify what I thought was a motor-boating transmitter in the 450 to 451 MHz band. A call to Karl relieved the concern, as it turned out to be a coordinated channel carrying data for a blimp camera.

Carefully selected FM broadcast channels provided audio feeds to fans inside the stadium during the game. Using personal portable FM radios provided free to each fan, listeners could hear play-by-play provided by CBS Radio Sports and NBC television on one of four frequencies. The fifth feed was directed at the rest rooms, where temporary FM receivers were mounted to allow fans to hear the game action during nature's call.

The restroom transmitter system consisted of a 0.5 W transmitter with a magnet-mount antenna located just outside the main audio booth on the press level. The other four signals were transmitted using Crown FM exciters set at 3 W that fed individual Scala single-element folded dipoles. Antennas were hung from the press box level over the fans below. Frequencies for the in-house transmissions were chosen so as not to interfere with local broadcasters. Most frequencies were second adjacent to the local allocations.

After the game, we packed our gear in the travel cases and a cart picked us up. The big game went off without a hitch because of the proper planning and coordination between the NFL and local, national and international broadcasters. Frequency coordination for an event this massive is an absolute must. Credit for a job well done should be extended to all of those involved in making the broadcast a great success.

Next year's Super Bowl will undoubtedly present a myriad of unexpected frequency coordination issues. Lessons learned from San Diego will be applied to the unique situations presented at Super Bowl XXIV. My bags are packed!

■■■

Mike Tosch, KA6ZZL, is chief engineer for public station KPBS-FM in San Diego and can be reached via e-mail at MIKTOSCH@KPBS.ORG

You Read It Here

Ten Years Ago

"The FCC's desire to proceed with synchronous AM transmission as a priority in its AM improvement program is well-intentioned. ...

"Now, more than two years (after the original deadline), there is still not enough information available to know if synchronous AM can be accomplished and whether it will enhance the band or succeed."

— RW Editorial, June 15, 1988

World Radio History

All-News for 30 Years at WBBM

▶ WBBM, continued from page 24

night power to 50 kW, matching the daytime power since 1935.

The policy of extensive local live programming to complement the CBS network continued into the 1950s. WBBM had seven studios in operation, and plans for more. However, radio was changing. Television was getting more attention, and live radio drama and variety were becoming more difficult to accomplish. After nearly 30 years, WBBM acquiesced and started using records on weekends in 1955. A decade later, rising union fees for musicians would cause CBS to cancel all live music.

WBBM Founder Les Atlass

Caller comments

Various format variations were tried, including news and talk radio. As with many early talk stations, at first, the announcer would just repeat the callers' comments. Eventually, a special arrangement was made with the phone company to put the callers live on the air.

Finally, on May 5, 1968, WBBM went "all news."

Now celebrating 30 years of all-news operation, WBBM is still looking ahead. News and Programming Director Georgeann Herbert said, "It is a complex world, with constant change. We want to be there to help people understand and cope with the next century." Herbert said she targets the listener who wants fact, not rumor.

Earlier days at WBBM. Pictured left to right are Dale McCarren, John Hultman and Snerman Kaplan.

Noting the "portable, personal nature of radio" is a real strength, Herbert said WBBM gets "a lot of credit in Chicago for not crossing the line into sensationalism just for ratings," but uses strong rules of attribution and emphasizes doing the legwork to understand a story.

There is no question but that the WBBM staff knows the market. Many have been there the entire 30 years; morning anchors John Hultman and Felicia Middlebrooks have been paired for 14 years. Hultman will retire at the end of June.

The station has continued to maintain its standard of excellence. Even public officials seem to appreciate the fair hearing they get on WBBM. Herbert said "good reporters know stories are not one-dimensional. They usually turn out to have three or four sides!"

Winner of many local and national awards, WBBM also celebrated its 75th anniversary in April. WBBM is the top all-news station in the market.

Herbert said, "When you get up in the morning, you need someone to explain what is happening in the world. We want to be that someone."

From the basement of a home in Lincoln to a news powerhouse in Chicago, WBBM has continued to pursue the passion of its founder Les Atlass.

■■■

Barry Mishkind can be reached at (520) 296-3797 or via e-mail at barry@broadcast.net

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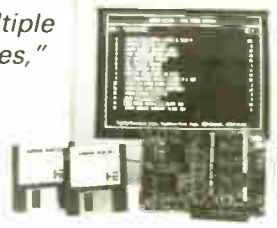

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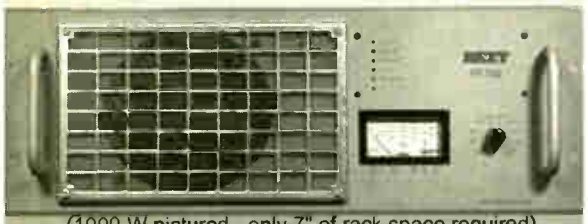

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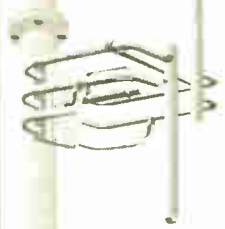

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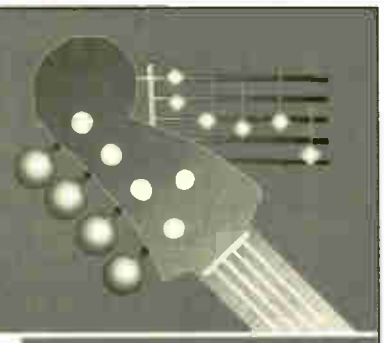

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World Radio History

Running Radio

Radio World | Resource for Business, Programming & Sales | June 10, 1998

An FCC Inspector Speaks
Page 40

ONLINE RADIO

Mind Those Station Web Pages!

Kim Komando

*Among the popular columnists moving to **RW** from the pages of Tuned In magazine is Kim Komando. She is a talk radio host whose show is syndicated by WestStar TalkRadio Network to more than 200 stations.*

When it comes to complexity, I have seen radio station and show Web pages that cover the spectrum.

New **RW** Columnist
Kim Komando

At one end are those that are very plain — at the other end are those that qualify as true multimedia extravaganzas.

Which begs the question, "How

See CONTENT, page 38 ▶

Say Hello To Kim Komando

RW columnist Kim Komando hosts "The Kim Komando Komputer Show" and "The Kim Komando Komputer Minute," heard in more than 200 markets across the nation.

In addition to her previous work for Tuned In magazine, Kim is a syndicated columnist with the Los Angeles Times and the computer editor for Popular Mechanics. You can also find Kim's writing at your local bookstores; she writes at least one book a year.

Radio World is pleased to introduce our readers to Kim Komando and her column "online.radio."

Lytle Pulls the Plug on RAB

Randy Stine

The four-year marketing alliance between the Radio Advertising Bureau (RAB) and The Lytle Organization ended this month after stalled contract negotiations forced Lytle to terminate their association.

Earlier this year, the two partners unveiled a new certification designation for radio sales professionals. The new sanctioning program, Certified Radio Marketing Master, proved controversial among RAB members because of the increased cost in training and testing.

High cost

The CRMM was a combination of RAB's Certified Radio Marketing Consultant (CRMC) and The Lytle Organization's Radio Marketing Manager (RMM) certifications. The cost for RAB's professional designation went from $175 for the CRMC to $799 for the new CRMM designation. The Lytle Organization controlled the pricing policy. The CRMM also called for periodic proficiency testing to maintain certification status.

"We are both surprised and disappointed," said RAB President Gary Fries. "I think both sides became very frustrated with the slow pace of negotiations. While RAB will miss the expertise of The Lytle Organization, we will continue to work with several other outside training organizations," he said.

In characterizing the negative response of radio sales people to the increased cost of CRMM certification, Fries said it came from all corners. "We underestimated the cost factor. We can now reiterate our goal to provide training and certification for radio sales professionals that works and is affordable," he said.

The Lytle Organization, based in Madison, Wis., is a training and certification firm. Lytle entered the radio industry by first working with Canadian broadcasters on training and certification in Canada before teaming up with RAB in 1994. Company founder Chris Lytle said the decision to terminate its agreement with the RAB was an agonizing

See LYTLE, page 38 ▶

Will Border Audience Cross Over?

Canadian Radio Struggles with Implications of New Higher Content Regulations

James Careless

What sends shivers down the backs of Canadian border broadcasters? The prospect of listeners tuning to U.S. radio stations.

The reason for their fear? Effective Jan. 1, 1999, the required percentage of Canadian songs played during the 6 a.m. to 6 p.m. time slot will increase from 25 to 35 percent. The order comes from the Canadian Radio-Television and Telecommunications Commission (CRTC), a regulatory organization that recently conducted a comprehensive study of Canadian radio.

Singing the blues

For radio broadcasters like J.J. Johnston, vice president of programming for CKFM-FM (Mix 99.9) in Toronto, this is nothing but bad news. WKSE(FM) and WBLK(FM) both broadcast across Lake Ontario from New York state and can easily be heard in Toronto. Both WKSE and WBLK have a distinct advantage over Mix 99.9 and other Toronto broadcasters. Unhampered by Canadian broadcasting rules, these U.S. stations can play the hits Canadians want to hear, without the encumbrance of restrictions.

As a result, these two stations already are "taking around 5 to 6 share points in the marketplace," Johnston said.

And those ratings reflect the current 25 percent requirement. Once the Canadian content increases take effect, "I believe there is going to be more tuning to the Buffalo marketplace, and you will probably (see) the same thing in the Vancouver market as well," Johnston said.

At the heart of the problem is the quantity of quality Canadian music. Although the industry has produced big stars such as Celine Dion, Shania Twain, and Alanis Morissette, Johnston said the industry is not producing enough good music to fill the 35-percent requirement.

"There is some myth that there is some sort of pool of music that a whole lot of

See CANADA, page 41 ▶

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World Radio History

RAB Introduces CRMC-2000

▶ LYTLE, continued from page 37

one, but logical. "RAB wanted to have pricing control over what is really our product. It was just something we could not do," he said.

Chris Lytle

The talks

Negotiations for a contract extension between RAB and Lytle began in April 1998. "Technically, we had been working without a contract since June of last year," said Sarah McCann, CEO and president of The Lytle Organization. "We went ahead with merging the two certification programs on good faith that the differences could be resolved. Unfortunately, they were not."

The breaking point came last month when RAB returned a revised contract to Lytle that included wording giving RAB control over the pricing policy for the CRMM designation. "We were shocked when the contract came back with the request that they set the pricing," McCann said.

CRMC-2000 will include a one-time proficiency test for radio sales people.

McCann acknowledged that a skillful touch was required at times to maintain the partnership between her group and the RAB. "In the end, this question of whether we would give up the power to set the price for our product was not something we could budge on. We just felt, at that point, it was best to terminate the relationship," she said.

The idea of re-certification for radio sales people to maintain CRMM status also irked some RAB members. Fries of RAB admitted the organization had many calls on the subject.

Meanwhile, McCann feels the time has come for higher standards. "Why the radio industry has not taken a firmer stand on this issue is beyond me," she said. She points out that even beauticians in some states need to re-certify to stay in the business. "It's really a question of self-improvement."

The future

The Lytle Organization will remain involved in radio sales certification. "Our RMA, RMM, and MRM designations really are the radio industry standard. Nothing has changed in that regard," McCann said. Lytle's radio sales training and certification courses are currently being used in 24 countries with more than 7,000 registrants. McCann added that the company plans to take a more global approach to training and testing in both radio and other industries.

With the CRMM program being discontinued upon completion of the May course, the RAB has introduced the new CRMC-2000 certification designation. "CRMC-2000 will include a one-time proficiency test for radio sales people," Fries said. "It will give sales professionals in all size markets the resources they need for modern day marketing in a single industry certification program."

Radio sales people seeking certification will study through a correspondence course before taking the CRMC-2000 test. The RAB estimates there are 55,000 radio sales professionals in the United States.

■ ■ ■

Randy Stine is the news director of WXIK(FM) in Lansing, Mich. Reach him at (517) 699-6397 or e-mail cstine@voyager.net

Circle (160) On Reader Service Card

Avoid Online Content Clutter

▶ CONTENT, continued from page 37

much content is just the right amount?"

If you create an overly simplistic Web site with the thought that your visitors will appreciate how quickly it loads, you risk a good number of people saying, "Gee, this site is too boring" and never returning again. On the other hand, if you load your site with all sorts of multimedia with the thought that your visitors want to see every bell and whistle possible, you risk a good number of people saying, "Gee, this site takes forever to load" and never returning.

Keep 'em coming back

The trick is to find a happy middle ground. Keep in mind, though, that just as it is impossible for one radio station to please every listener, it is equally impossible for one Web site to please every listener. In finding this so-called happy middle ground, you may lose some listeners who connect using older, slower modems and who long for text-only Web pages. You may also lose a few listeners with super-high-speed connections who would love to see live footage of your on-air personalities while listening to their broadcasts via their computers. The good news is that most listeners do not fall into either of these categories.

So exactly where do you find a happy middle ground? Start with your home page — the first page people see when they visit your site. It's been a long-standing, albeit misguided, tradition among all sorts of companies to open a site with a gigantic, vividly colored banner graphic that proudly announces the visitor's arrival to the most important Web site on the Internet — a virtual billboard, if you will.

The difference between this scenario and a real billboard is that people already know whose site they are visiting. There is no need to drill it into their heads with a big, slow-loading graphic. While such a graphic may demonstrate the amazing skills of your graphic artist, for the end user the time spent downloading is often seen as a big waste.

The important point that many Web developers still miss is that while the Web is indeed a visual medium, people who use it do not do so just to look at the pictures. Most Web surfers would gladly trade an overabundance of graphics for some real function. They come to your Web site looking for information that they can use, not to be dazzled by your art department. Keep your graphics small and fast-loading, and you will go a long way toward encouraging repeat visitors.

Along these same lines, there is a temptation —especially among radio stations — to include background music or some other audio track as part of the home page. This is another big mistake, as far as I'm concerned. Not only are these files typically large and slow to download, more often than not a visitor's Web browser must take additional time to launch a helper application or start up some extra internal function to handle them.

Unless you see some compelling reason to do otherwise, make any audio component of your home page an option. Visitors who want to hear the audio track will not mind making one extra mouse click, and those who do not want to hear it will appreciate not being forced into doing so.

I also urge you, at least on your home page, not to include any multimedia elements that require a special browser plug-in. I can tell you from personal experience that nothing is more offensive to a Web surfer than waiting for a page to load, only to discover a big empty space in the middle because the right browser plug-in was absent.

The best way to go is to offer both a high-bandwidth plug-in-enhanced version of your site and another low-bandwidth version. This may take some extra effort on the part of your Web developers, but you will benefit in the long run by accommodating both plug-in junkies and Web surfers with simpler tastes.

How much?

Beyond all the multimedia considerations for your site lies the question of just how much actual information you should include. There is no doubt that publishing information on the Web is very easy. With this thought in mind, some entities — radio stations included — think they should put every minuscule detail about their company online.

Suppose for a moment that your child is working on a book report and asks you to bring home a book on the topic from the public library. Instead, just to make sure you leave no stone unturned, you bring home an entire set of encyclopedias. How do you think your child will feel? Overwhelmed? Intimidated? Frustrated? All of the above?

Choose wisely

When considering content to include on your Web site, try to think like potential cyber-visitors. What information are they likely to be looking for when they stop by? Once you answer that question, stick with only those items you identify.

Burying useful information with that which is somewhat less useful is like tossing a diamond into a bucket of ice and expecting someone to be able to pull out the diamond at will. If you include too much information on your site, visitors will grow tired of performing endless searches just to hunt down the real gems.

Web content can be boiled down to two basic rules. First, in terms of graphics and multimedia, do not overburden your visitors with audio and visual components they may not want. Second, in terms of content, offer the information they are likely to want, not every last detail they may possibly want.

■ ■ ■

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World Radio History

BOTTOM LINE

Here are three ways Eventide can help:

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

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World Radio History

Circle (186) On Reader Service Card

A View of a Broadcast Inspection

Ronald Ramage

*A recent **RW** article by FCC Inspector Ronald Ramage produced great interest from our readers, who asked for more about what the inspector looks for during broadcast inspections. Ramage is back with a three-part series on that topic.*

Rarely is a federal, state or local regulatory inspection welcomed by the recipient, regardless of the outcome. Much of this feeling is due to the recipient's lack of experience with an inspection. Once he or she has experienced various types of regulatory inspections and understands what the inspector is looking for, that person tends to become more confident, and therefore, more relaxed when the next inspection occurs.

FCC inspections are no different. Station personnel who know what I look for during an inspection tend to be more at ease. I have also found that people who are nervous do not remember well. I often spend the early part of an inspection trying to put people at ease so they are willing to listen, learn and ask questions.

Why my station?

Various events can trigger an inspection. The vast majority of inspections occur simply because the station has received no inspection for a prolonged period.

The inspection could be a repeat visit, thanks to previously detected discrepancies. Another trigger is when a station located in one community is found to have a problem. We may inspect other stations owned by the same licensee in another community to see if the problem exists at those stations as well.

Some inspections result directly from a complaint. Licensees usually are informed of the nature of any complaint.

Station personnel who know what I look for during an inspection tend to be more at ease.

The broadcast associations of each state, along with certain national groups, have developed an Alternative Broadcast Inspection Program (ABIP) for conducting paid inspections of broadcast facilities without FCC involvement. Under agreements with ABIP providers in each state, the FCC will not inspect a station that has passed the ABIP review for the agreed number of years (usually two to three years), unless a specific complaint or other special event warrants such an inspection. In my opinion, this is a good program that has several benefits for the licensee.

First, the licensee avoids developing a history of violations. This is useful to group owners in particular. Once a licensee receives an FCC violation notice concerning a problem at one of their stations, we expect this licensee to take corrective actions at all of its stations. Similar violations detected during a subsequent inspection at any of the stations owned by this same licensee could constitute a history of violations.

Inspections may focus on one or two items, or include a full inspection of a facility. Most inspections are not prearranged with station management. The inspector typically will arrive unannounced, identify himself and ask to see the manager. Should the manager not be available, the inspector will ask to speak with whoever is in charge of the station at that time.

The inspector is not required to wait for a manager or other station personnel to arrive at the station prior to initiating the inspection. I recommend that stations develop a chain of command and make sure all employees understand it.

Administrative review

We can break down the inspection into various areas of concern.

The area we call "Administrative Items" typically results in the most violations, but these violations generally are the easiest, and least costly, to correct. In my experience, a common reason for this type of violation is that management expects the engineer to ensure compliance with FCC items. But engineers generally do not handle the administrative items, so stations often overlook this area. Some of the more common administrative items we look for are:

Authorizations: I check to see that the most current full-station license and/or construction permit is available, as well as the most recent renewal notification. The licenses and renewal notifications need not be posted if they are immediately made available upon request. In many cases, the last full license may include a previous licensee name and/or call sign. As long as the technical information has not changed, this may be the last full license issued. If the authorization is not available, contact the FCC Mass Media Bureau, 1919 M Street NW, Washington, DC 20554 to request a duplicate.

Chief Operator Designation: The licensee is required to designate a person as the station chief operator. This designation must be in writing and must be posted or made available upon request.

The responsibilities of the designated chief operator are to review, sign and date required station logs and records at least once each week. This is one of the most cost-effective ways for a station to identify and correct problems. With one weekly review, the chief operator can determine that the station has met all EAS test requirements, whether there were any tower light outages and subsequent notifications made, and whether the licensee-designated monitoring and calibration schedules were met. The chief operator and station can then initiate any corrective actions necessary, all within a maximum of one week of a problem occurring. See §73.1870 of the FCC Rules.

Local/Toll-Free Telephone Number: The licensee is required to maintain a local or toll-free telephone number from the community of license to the station's main studio so residents of that community can contact the studio without incurring a charge. See §73.1125(c).

Main Studio Presence: This area is receiving more focus lately due to an increasing number of violations. I check that a human presence is maintained at the station's main studio during normal business hours.

I use the term "human" because some stations have tried to use an answering machine or other electronic devices in lieu of a person being present.

The main studio presence requirement is separate from transmitter operations. Do not confuse the two requirements. Stations operating unattended with regard to their transmitter monitoring and control still are required to maintain a main studio presence during normal business hours. Acceptable normal business hours generally constitute an eight-hour period between the hours of 8 a.m. and 6 p.m., Monday through Friday.

Public Inspection File: The public inspection file is by far the most common area where broadcast violations occur. I recommend that licensees pay particular attention to sections §73.3526 for commercial stations, and §73.3527 for noncommercial. I also recommend that stations maintain copies of required documents in the file made available to the public, and keep the originals of these documents in a more secure place. This allows lost or destroyed documents in the public file to be replaced more easily.

A comprehensive listing of the items required in the public inspection file is contained in the FCC Broadcast Inspection Checklists, bulletins CIB-18 (AM, FM & TV), which are located on the Internet at www.fcc.gov/cib/

A couple of the more prevalent items that must be checked are:

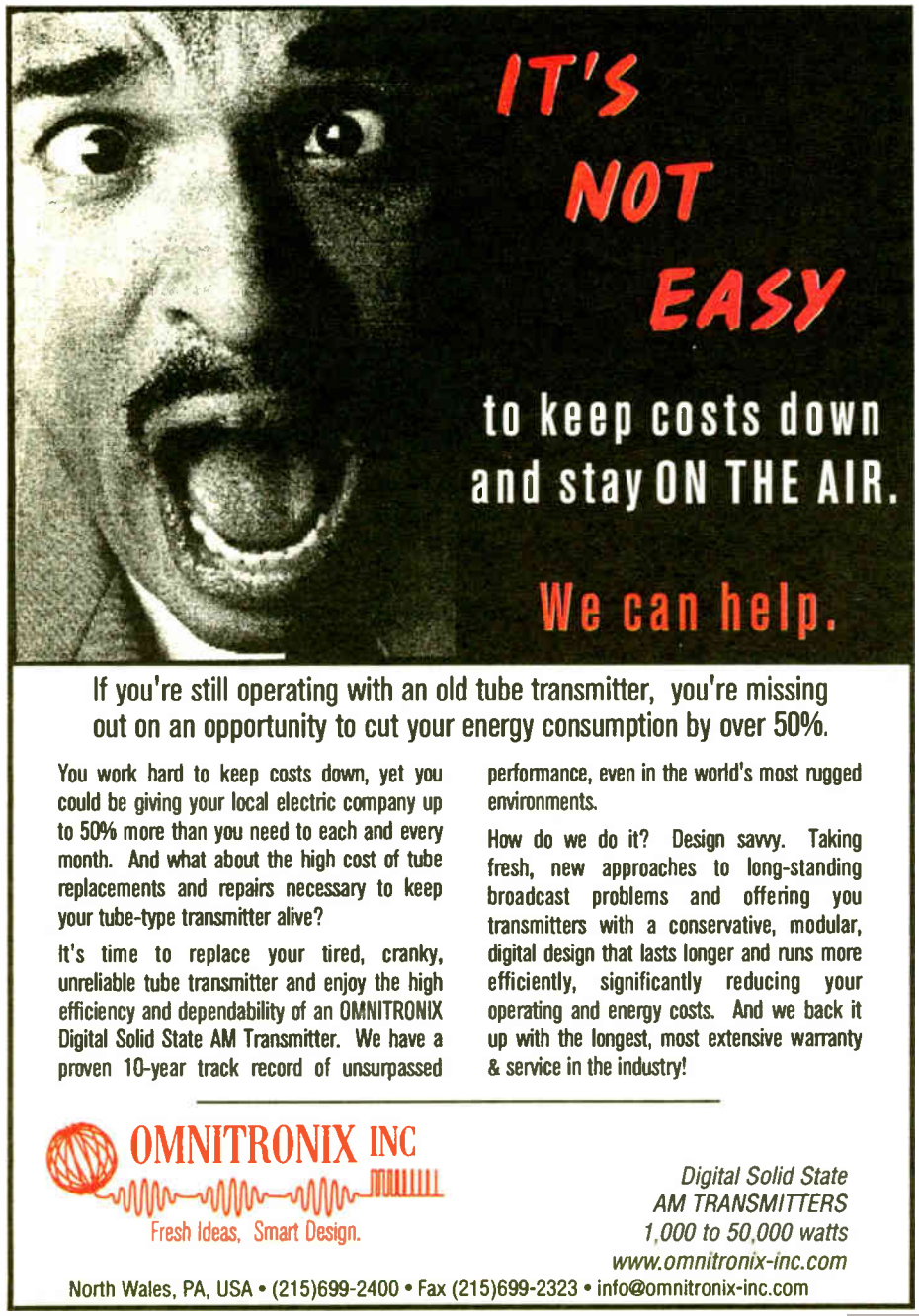
Issues-Programs listing: Because this is the most common violation at a broadcast station, this area receives a lot of attention. The listing should contain the programs the station aired the previous calendar quarter that provided the most significant treatment of community issues.

I look for a list containing a minimum of five things: 1) the issue being addressed; 2) a brief description of the material that was aired to address the issue; 3) the exact date the program aired; 4) the time of day on the specified date in which the program aired; and 5) the duration of the program.

Licensees should avoid listing time as "various" and dates as "all month." Specific times, dates and duration are necessary. See §§73.3526(a)(8), 73.3526(a)(9) and 73.3527(a)(7).

Ownership reports: I check to see that

See FCC, page 41 ▶



Circle (212) On Reader Service Card

World Radio History

Debating Canadian Content

▶ CANADA, continued from page 37

people want to listen to, and it is not being played," said Michael McCabe, president/CEO of the Canadian Association of Broadcasters (CAB).

"All our stations are competitive," McCabe said. "If they could have found better music to play, they would be playing it today. That music is not there. ... Do you not think that JJ Johnston is not trying his damndest to find every piece of music that can get him the edge over the competition?"

However, this argument has not found sympathetic ears among Canadian government officials. In fact, when the CRTC privately briefed the radio industry on the new Canadian content rules, "one of the staff had the gall to stand up and say, 'Well, what about turntable hits? You're forgetting them!'" McCabe recalled.

"It had to be explained to him that the term 'turntable hit' is a term of derision. What it means is something that is not a hit, but you have to play it to plug in your Canadian content. (These songs are) nothing anybody wants to listen to, but you need to play them because there is not anything better."

Today, the CAB is considering some kind of mass "noncompliance" with the new quotas, in an unprecedented effort to overturn the regulations.

Given the radio industry's relative lack of clout in Canadian politics, this probably will not be enough to overturn CRTC policies.

Ironically, stations such as WKSE are not too excited about the possibility of winning more Canadian listeners. "I think that we already have a very large audience," said Terry Rodda, general manager of WKSE.

U.S. stations can gain access to Canadian ratings by signing up with the Bureau of Broadcast Measurement. BBM is a nonprofit consortium owned by Canadian broadcasters, ad agencies and advertisers. BBM collects quarterly ratings through mailed diaries.

Although BBM Vice President and Manager of Radio Don Easter would not discuss how many Canadians actually listen to U.S. broadcasts, he did confirm that some U.S. stations are already "associate members" of BBM.

Given this, it is clear that some U.S. border stations already are capitalizing on their Canadian audiences. Thanks to the efforts of the CRTC, these U.S. border stations are likely to see that audience, and their ad revenues, increase.

Michael McCabe

▶ FCC, continued from page 40

the most current full-ownership report is on file along with any subsequent letters. In some cases where no change has occurred to the ownership, the licensee has filed a letter, in lieu of an annual ownership report, that states nothing has changed since the last report was filed. Please remember that this requirement is for public access. In some cases I have found only the subsequent letter in the file. A letter with no report to reference it to does not provide the necessary ownership information for individuals who may review the file.

At noncommercial stations, I look for ownership reports filed within 30 days of any change made to the ownership, such as a change in officers, directors, board members or trustees. See §§73.3526(a)(3), 73.3527(a)(3) and 73.3615(f).

A station does not have a public inspection file if the public cannot get access to it. Licensees must maintain a human presence during normal business hours to answer telephone calls from listeners and either to allow access to the public inspection file or provide the location where access can be obtained. In addition, licensees also should be aware of the requirement to allow an FCC inspection during normal business hours or any time the station is on the air. See §73.1225(a).

A licensee may be in violation of this requirement if I cannot contact responsible station personnel during normal business hours.

■■■

Ron Ramage is assigned to the FCC-CIB office in Kansas City, Mo. The views expressed are those of the author and do not necessarily reflect those of the commission.

In the next part of this series, he will look at the outside facility and the inside control of a station. If you have questions or comments pertaining to this article, contact the inspector at (816) 353-8934 or by e-mail at rramage@fcc.gov

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Circle (5) On Reader Service Card

World Radio History

DMX Chooses MediaTouch; Looks to New Distribution Methods

DMX Inc. and **MediaTouch** signed an agreement for the design and development of custom software for the DMX network of digital audio file server studios. DMX said the agreement will advance its delivery of CD-quality music to businesses and homes, and will create one of the world's largest digital music libraries.

DMX said the announcement also is its first step in becoming a worldwide point-to-point distributor of digital audio through the Internet, eliminating what it calls the logistics and costs associated with satellite and other distribution methods.

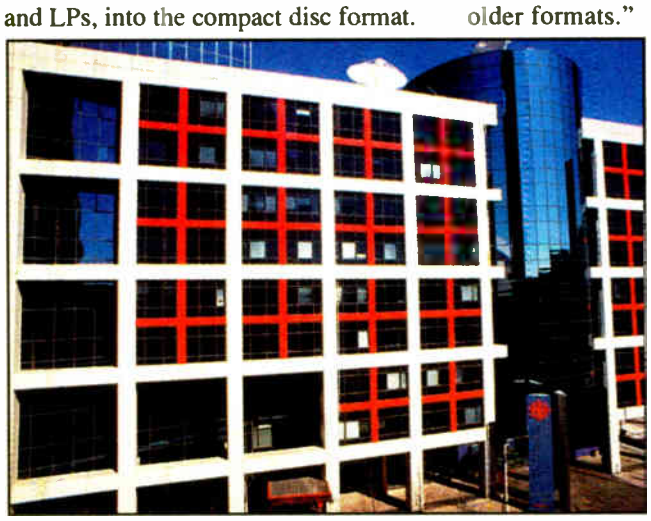
DMX Inc. is a division of TCI Music Inc. Its studios are located in TCI's television center in Colorado. MediaTouch is a division of OMT Technologies Inc. based in Winnipeg, Canada.

The MediaTouch relationship is aimed at developing new and expanded digital file server studios and software for delivering DMX music services. "This new digital audio delivery system will provide automated broadcasting beyond the current 95 DMX music formats and hard-disk storage management of over 600,000 music titles, creating one of the world's largest libraries of digitized music," the companies said in a statement.

*For information from MediaTouch, call Scott Farr at (888) 665-0501, fax to (204) 783-5805, or circle **Reader Service 42**.*

CBC Archives With HHB

The broadcast library for the **Canadian Broadcasting Co.** uses an **HHB** CDR800 CD Recorder to transfer various older formats, such as 45s, 78s and LPs, into the compact disc format.



The Canadian Broadcasting Co.

"If we have something that is very noisy, we can simply store that recording on the CDR800," Adrian Shuman, CBC user services librarian, said. "We can then expose it to Cedar (noise reduction), clean it up and burn a new CD from there. ... It has allowed us to use parts of the library that had been unused for quite a long time because technicians were unfamiliar with the older formats."

The CBC broadcast library has been transferring between 60 and 80 hours of material a week. The recorder has been used on the national music show "Take Five," and will be used to transfer hard-to-get LPs that are not available on CD, for the use of CBC outlets.

The CDR800 won an honorable mention from **RW**'s panel of Cool Stuff Award judges at NAB '98.

*For information from HHB, call David Dysart at (416) 867-9000, fax to (416) 867-1080, or circle **Reader Service 94**.*

Voice of Vietnam, RFA Look to BE

Broadcast Electronics won a contract worth more than $400,000 with the **Voice of Vietnam**, to provide BE transmitters and peripherals to seven locations.

The project is in conjunction with BE's representative in Vietnam, Stanford Technology Network. BE will furnish AM-10A transmitters, antenna tuning units and automatic voltage regulators. Shipment of the order was completed after a recent visit by a Vietnamese delegation to the BE facility in Quincy.

Also, **Radio Free Asia** selected BE to supply an AudioPOINT routing switcher. The deal calls for a 224 x 336 digital switcher and a 32 x 32 analog switcher with redundant DSP controllers, custom software and AudioVAULT audio system. RFA is based in Washington and broadcasts domestic news and information in seven languages to listeners in Asia who do not have access to free media.

*For information from BE, call the company at (217) 224-9600, fax to (217) 224-9607 or circle **Reader Service 120**.*

PR&E Completes Deals

Pacific Research & Engineering recently signed a contract with **KNPR-FM** in Las Vegas to build and install equipment and studio systems for the NPR affiliate's new 7,000-square-foot studio complex. The deal included three Radiomixer and two AirWave consoles, six rooms of custom furniture, five rooms of PrimeLine modular studio furniture, wiring and installation.

PR&E also won an order to supply the **GulfStar** division of **Capstar Broadcasting** with consoles and furniture for new facilities in Capstar's Austin, Texas, headquarters. The company put the value of the deal at $250,000 and said it includes 10 Radiomixer air consoles.

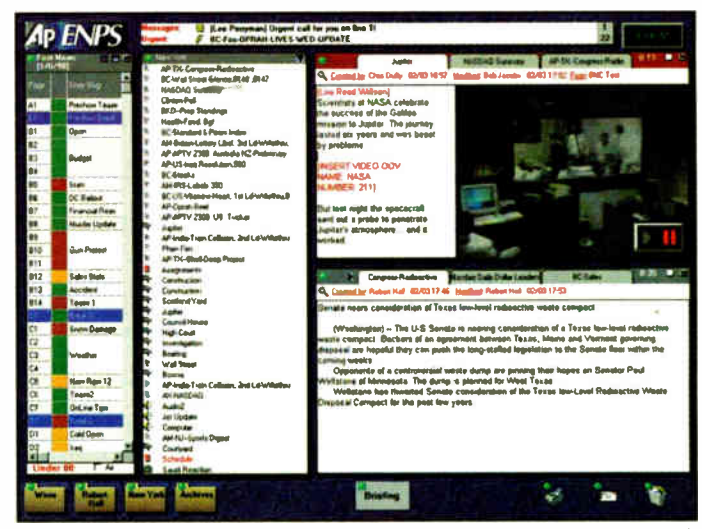
*For information from PR&E, call (760) 438-3911, fax to (760) 438-9277, or circle **Reader Service 146**.*

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

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

Major News Users Compute With AP

The Associated Press said it won contracts for new ENPS newsroom computer systems from **CBS News**, **ESPN**, Britain's **Independent Television News** and news station **WTOP** in Washington.



AP said its Electronic News Production System will replace several systems at CBS, while ESPN and ITN will replace Avid-BASYS. Each organization, along with the British Broadcasting Corp. in the United Kingdom where the roll-out of ENPS began last year, will complete migration to ENPS by the end of 1998.

"We selected ENPS after a thorough evaluation of some very strong competing systems and extensive feedback from our colleagues throughout CBS News," said Andrew Heyward, president of CBS News.

WTOP NewsRadio, a CBS Radio affiliate owned by Bonneville International Corp., chose ENPS to manage news production from story assignments and live broadcasts. (The AM station has been upgrading its facilities at the same time it expanded its coverage to the FM dial. It launched an FM simulcast last year, and in April of this year it moved that service to a stronger FM signal at 107.7 MHz.)

ENPS is Windows-based and uses drag-and-drop navigation, a rearch engine, scripting, program lineups, contacts, news wire management and other useful features for news operations.

*For information, contact AP at (800) 821-4747 or (202) 736-1100, or circle **Reader Service 68**.*

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World Radio History

PROMO POWER

Consolidation Is a Promo Plus!

Mark Lapidus

Shortly after a certain duopoly took effect, I got the two promotion directors together and explained that they were now able to share resources. Initially this meant swapping P.A. equipment, remote gear, vans and even part-time helpers.

A week went by and nothing happened. Two weeks went by and still no sharing of resources occurred, even though each had mentioned needing the other guy's stuff. Why? Change is not easy, and people have a tendency to protect the environment that they know.

Sharing is smart

While there are few co-owned stations today that have this kind of equipment-sharing problem, many still have enormous problems sharing and capitalizing on other resources. This happens most often in situations with multiple GMs, PDs and promo directors in the same group. It is ironic that you get the least co-operation just when you have the most people to take care of business and maximize resources.

This can be rectified by appointing a group coordinator who is empowered to capitalize on the benefits on consolidation. This "coordinator" can still do his or her main job; the coordinator simply is the conduit who carries information and reports on progress to the GMs. The best person for the position is a promotion director. Here are areas where coordinators can have fast impact:

Marketing: There are still many groups airing television spots for their co-owned stations at the same time. Even if they are non-competitive, this makes no sense. Radio is a product category. The more products advertised at once in that category, the more confusion.

"But, Mark," you say, "we all have to be on during the spring book!" Fine. One station airs Sunday through Wednesday, another Wednesday through Sunday. Both air the first month of the book. In month two, stations three and four do the same. In month three, stations five and six do the same. And the big bonus for everyone is that if you coordinate this as one group buy, you are going to save a ton of dough!

This same strategy works with direct mail, transit, billboards, telemarketing, faxing, e-mailing, and any other method you utilize. Every week of the book is really a separate ratings period and has nothing to do with the next week. People have long tried to prove that one week is more important than another, and in my view, the arguments have been weak (pardon the pun).

Promotion: Begin by laying out every station event calendar on a big desk. Since all my regular readers are now planning annually (aren't you?), you can now juggle dates until you have the least number of conflicts. With more than three stations, it is hard to avoid some scheduling problems, but do your best. There are only a certain number of active listeners in any given shared formats.

Next you will want to improve your on-air promotion. No, you are not going to run promos for your sister station's event, but you should be airing commercials! To clarify, if "97 Rock" is doing a Chili Cook-off this Saturday, commercials for that cook-off (minus call letters) should be airing on "Country 106.5."

Care more about which events make the most sense to promote on what stations. For those that argue against this cross-pollination, remember that your advertisers do it every day. They air spots on several stations because they reach more people. Duh!

There will come a time when stations regularly promote other stations' specific on-air specials, but most folks I speak with still consider this a confusing, radical concept.

Eventually programmers must come to the conclusion that listeners actually cume several stations, and it makes more sense to keep this TSL in the same group of stations!

Production: Should you share voices among stations? Some think this destroys the unique sound of a station. I agree when it comes to sharing the big voice/identity of a station. However, if we are talking about voices for commercials, my advice is to share as much as possible.

We should be so lucky to have listeners remember us or turn us on to hear our advertisements!

Part-timers: It is difficult to find vibrant, talented part-time help for either on or off-air help. I'm no fan of sharing jocks on stations that share more than 15 percent audience, but when sharing levels are low, this is not much of an issue.

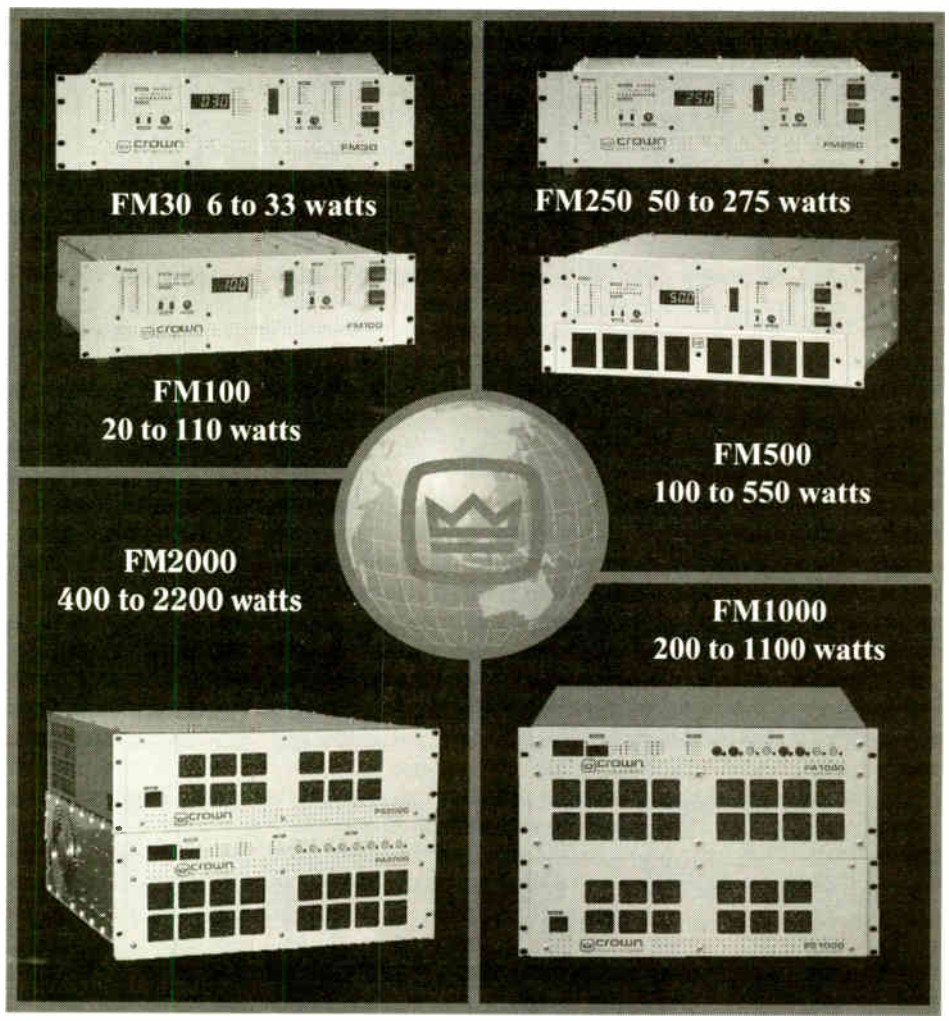
For off-air workers, like part-time promotion people, drivers, and temps, give your part-timers the chance to make the extra money.

I am most interested in hearing more of the positives of the consolidation effort in the promotion, programming and marketing arenas. Send me an e-mail! Readers with the best ideas gets to keep their jobs! Just kidding.

■ ■ ■

Mark Lapidus is president, Lapidus Media. For marketing and programming consultation, call (703) 383-1805; e-mail: lapidus@erols.com

A World of Possibilities. . .



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World Radio History

Products & Services Showcase

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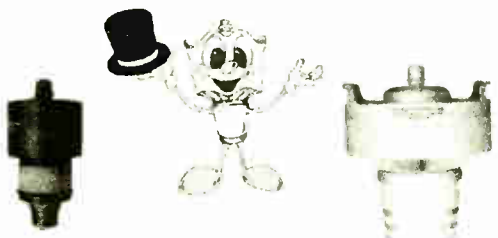

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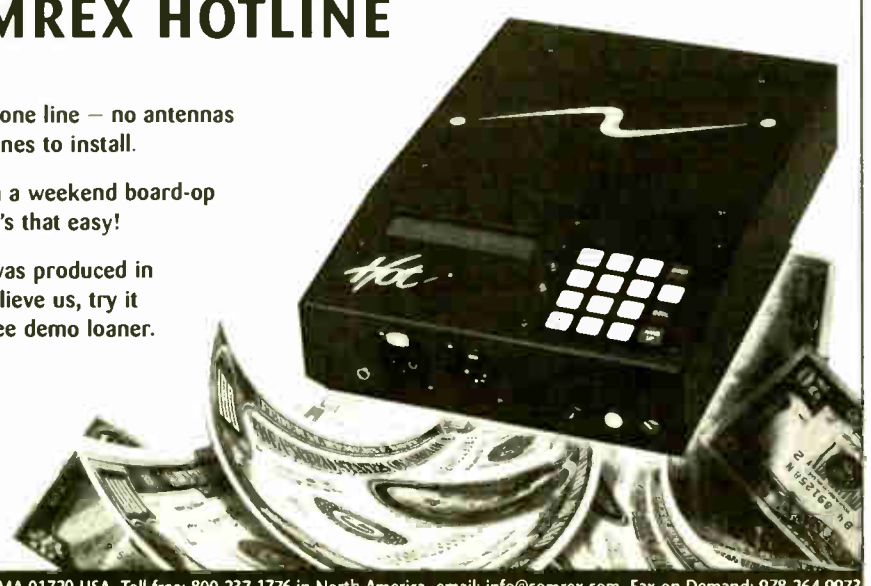

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World Radio History

STATION FINANCING

When the Clock Starts Ticking

Dain Schult

This continues a series of articles about financing the purchase of a radio station. The previous part appeared May 13.

When last we left our intrepid station buyer, there were smiles all around. The Asset Purchase Agreement had been signed and it finally was time to file it with the FCC.

The hard part is over once you sign the APA, but the work is not complete until the paperwork is done.

Are you a convict?

You need to ask the FCC to approve the assignment of the FCC station license from the seller to you and your company. Generally speaking, the FCC does not pass judgment on your deal — whether you paid too much or too little or should have gotten the Accounts Receivable thrown in, too. The FCC will, however, check to make sure the necessary language is in the APA and that there will not be a premature transfer of control of the station from the seller to you.

The commission asks a number of questions on Form 314 to ascertain whether or not you and any partners/shareholders are U.S. citizens and whether or not you or your partners/shareholders have ever been convicted of a felony (particularly a drug conviction), or mass media-related antitrust or unfair competition, discrimination or fraudulent statement to a government unit.

If you can answer "yes" to being a U.S. citizen and "no" to being a convicted felon, you are that much closer to being a station owner. The FCC also is interested in your intentions regarding programming to the community and, if you intend to employ five or more full-time employees, which local sources you will use to advertise and notify the public of any future job openings. (Equal employment opportunity considerations, in the news because of the recent court ruling against them, may still be a concern, but are outside the scope of this article.)

Approval time

The time it takes to fill out Form 314 and receive approval usually runs between 75 and 90 days. There are two periods of time in the process at which interested parties can comment on this transaction. The first is before the FCC issues its initial grant of the assignment. For 30 days following FCC public notice of the acceptance for filing of the assignment application, parties in interest can file what is known as a "Petition To Deny." That's a fancy way of saying somebody who may not like you, for whatever reason, can write the FCC to attempt to block this proposed license.

Right behind that grant comes another period for oppositions. For a period of 30 days after FCC public notice of the grant, interested parties may file a Petition for Reconsideration of the initial grant. Assuming no such petition is filed and the FCC does not reverse its action on its own motion, the grant becomes final 40 days after the FCC public notice of the grant.

The FCC is not in the collection business, so you see someone selling their station, and they owe you money, the FCC cannot do anything about it. You can have a lien on a piece of broadcast equipment, the tower or the studio building, but you cannot have a lien on the station license.

The FCC takes a dim view of the filing of frivolous petitions. For the petition to do any good, you have to present evidence that the proposed license holder is not qualified to have the license. File one for a lark and you likely will be sued by either the buyer or the seller.

The seller and buyer normally fill out their respective sections of the FCC Form 314 and file that along with copies of the APA and a check for $690 for each station being sold. I always have split that fee with the seller.

Decide on who will write the check to the commission, because the FCC will not accept two checks on one assignment application. The other party can write a check to the party that pays the FCC. To even everything up, you can adjust the sales price at closing.

Form 314, along with the APA, check and requisite copies then get bundled up and shipped to Pittsburgh, where your check can be deposited into the FCC account at Mellon Bank. The check stays in Pittsburgh, and the rest of the package is forwarded to the commission in Washington.

You and the seller can fill out the form by yourselves, but if you already have engaged communications law counsel it makes more sense to have your FCC attorney help you with this process. After all the hard work getting the APA executed, you would not want the application spit back out because it was incorrectly filled out, would you?

Once the sales announcement is running on the air, your local competition will start the fun and games with advertisers.

Once the application is filed, the seller is required to make public announcements of the pending sale of the station generally both on the air and also in the local newspaper.

You want to have a meeting with the staff right before this happens so that they can find out first what is going on instead of being the last to know. It can be demoralizing for the staff to learn about the sale by hearing about it on the air. After a group meeting with the staff, I have found it useful to make myself available so I can talk with any person on the staff who would like to talk to me and ask any questions.

These staffers believe you hold their lives in your hands. This is not a time for flippant behavior; it is serious stuff, so act the part. Honesty is the best policy. I run on the premise that I will answer any question you ask me.

You may not like the answer, but if you ask the question, I will answer it or get the answer for you if I do not know it right out of the box.

Once the sales announcement is running on the air, you can rest assured your local competition (if you have any) will take this opportunity to start the fun and games with advertisers by spreading all kinds of interesting stories about how the station is going to change formats, or everyone is going to be fired, or how the station is going to be moved to another market down the road ... you get the picture.

When your competitors do this to you, it sets the stage for less-than-gracious relations in the future. It also sets the stage for them looking pretty stupid when after the closing, you do not change the format, or fire the whole staff or move the station anywhere else.

■■■

Dain Schult is a 30-year broadcast veteran and consultant with experience as a DJ, general manager and group operator. He is based in Austin, Texas.

Got a question or suggestion for Dain to address in an upcoming part of this series? Send an e-mail to ***RW*** *at* chamaker@imaspub.com *and let us know.*

Harris Promoted At ABC Radio

Steve Harris has been promoted to vice president, Urban Programming for **ABC Radio Networks**. His new responsibilities include overseeing all ABC Radio Urban programming, including "The Tom Joyner Morning Show" and "The Doug Banks Show" along with the 24-hour formats "Classic R&B" and "The Touch."

Harris joined ABC Radio Networks in 1993.

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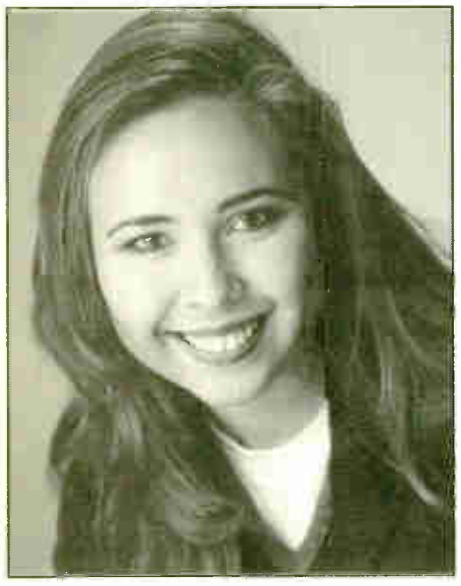
STATION SERVICES

Programs and Services for Radio Stations

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

Breaking 'Ground Zero'

Jones Radio Network puts an alternative spin on its syndicated programming with "Ground Zero." The evening show



Lalaine

explores the alternative music lifestyle, combining celebrity interviews, audience phone calls and great alternative music.

The 11-hour program is available six nights per week. Alternative radio veteran Lalaine hosts the first segment of the program, from 7 p.m. to midnight, after which the show is turned over to Sam Stock.

"'Ground Zero' is a unique concept targeting the over 500 alternative/active rock stations in the United States," said Phil Barry, Jones Radio Network vice president of programming.

"Ground Zero" programmer Doug Clifton said affiliate stations have experienced an overwhelming listener response since going on the air April 1.

For more information from Jones Radio Network, contact CJ Johnson in Colorado at (303) 784-8664; or circle ***Reader Service 172.***

Catch The Sunday Spirit'

Listeners now can enjoy their favorite contemporary Christian hits during the two-hour Sunday morning show, "The Sunday Spirit." The rhythmic CHR-targeted program is currently available from United Stations Radio Networks, Inc.

United Stations and Right Turn Radio's Terry Wright have combined their efforts to bring positive music to weekend programming.

"The Sunday Spirit" features upbeat, dance-oriented music along with a spiritual message. The program is hosted by Dallas on-air personality Hollywood Henderson. United Stations also is responsible for other contemporary Christian programs such as, "American Christian Music Review (ACMR)," "Sonrise" and "Face-to-Face."

For more information from United Stations Radio Networks, Inc., contact Julie Harris at (212) 869-1111; or circle ***Reader Service 198.***

Simmons' Slice of Life

Exercise enthusiast Richard Simmons, gets the chance to strengthen his media empire with a new syndicated radio program, "Richard Simmons' Slice of Life."

Richard Simmons

The program will consist of daily two-minute vignettes, written and hosted by Simmons. He plans to address topics dealing with exercise, health and fitness, motivation and inspiration.

"Richard Simmons' Slice of Life" will become one of the biggest daily features on radio," said Dean Gavoni, Ph.D., vice president of NBG Radio Network.

Gavoni is very excited about the multi-year contract that Simmons has signed with NBG.

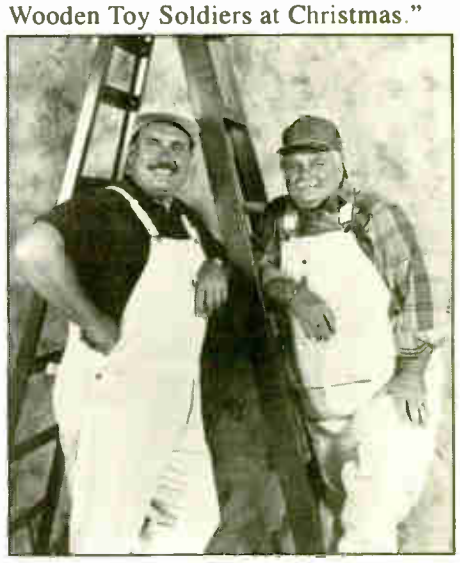
For more information on NBG Radio Network, contact John Holmes at (503) 802-4624; or circle ***Reader Service 43.***

A Minute a Day Keeps The Handyman Away

Home improvement gurus James and Morris Carey, hosts of the four-hour syndicated program, "On the House with the Carey Bros.," can now be heard for one minute a day.

The Carey Bros. have now made their program available in a new format, "Tip of the Day."

As the title suggests, the program will run everyday as a one-minute tip, preceded by a 15-second tease and a 30-second national spot. Listeners may learn the fine arts of "Using Coca-Cola and Cat Litter to Clean Your Driveway" and "How to Build Wooden Toy Soldiers at Christmas."



The Carey Bros.

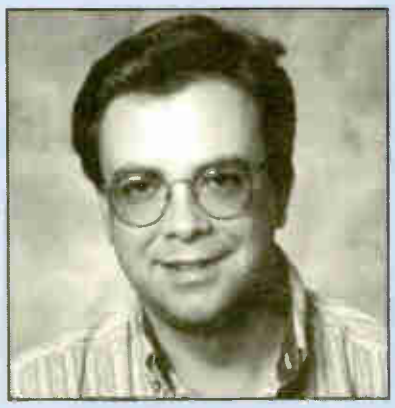
According to Steve Raucher, director of syndication services for On the House Syndication, "The vignette allows stations with talk and other formats to capitalize on the popularity of the Carey Bros."

For more information from On the House Syndication, contact Steve Raucher at (510) 432-7246; or circle ***Reader Service 69.***

MUSICAM Hires Wilder

MUSICAM EXPRESS named **Perry Wilder** as senior director of services.

Wilder will be based at the company's Valencia, Calif., offices where,



among other duties, he will help oversee deployment of the company's new MX/Net delivery service.

MUSICAM EXPRESS specializes in the digital delivery of broadcast-quality audio and video and is a joint venture of StarGuide Digital Networks, CBS Corp. and Westwood One.

Online Expansion at NPR

National Public Radio has expanded its staff within the New Media department. **MJ Bear** heads up the effort to improve the distribution of news and the streamlining of information for NPR listeners and stations.

The New Media department now boasts six full-time staffers including Webmaster Rob Holt, production supervisor J. Chris Holt, and online writer/editors Leon Steinberg, Douglas Alteen and Marcy Fine.

NPR has also updated its main Web site at *www.npr.org*

Crown Crowns Molinaro To New Position

Crown Satellite has selected **David J. Molinaro** as the new director of sales and marketing. Molinaro will serve as leader of the international promotion and sales activities for Crown's new line of satellite broadcast equipment.

Crown Satellite, a new division of Crown International, creates delivery solutions for the point-to-multipoint broadcast of audio and data via satellite. Crown markets products worldwide through its Audio, Techron and Broadcast divisions.

Basila Promoted at Arbitron

John Basila has a new title. The **Arbitron Co.** veteran has been named manager, Midwest Radio Station Services for the research information provider.

Basila previously served as a senior account executive, Radio Station Services in Los Angeles.

World Radio History

Dixon Takes Radio on the Road

Modern Broadcast Gear Lets A Travel Host Take His Show Almost Anywhere

John F. Mason

For years, Michael Dixon has traveled the globe, reporting back what he sees and learns to radio listeners in the United States.

Based in Phoenix, Ariz., Dixon is a multifaceted professional with years of experience in radio talk shows and travel reporting. He has won 10 awards from the Arizona Associated Press. But the most intriguing thing about Dixon is the way he integrates a multitude of simultaneous activities.

Travel

Monday through Friday from 2 to 5 p.m., Dixon broadcasts from his home studio a three-hour general-topic, open-line, talk show for KMOX(AM) in St. Louis.

"We discuss current events, political scandal, anything that is on the minds of people that day," Dixon said. "I get calls from all over North America."

Dixon also hosts "Michael Dixon's Travel Planner," a Sunday afternoon travel show, and the "That's Entertainment" weekly entertainment show on KTAR(AM).

"One of the nice things about radio, and having the studio at home, is that I can get up at any hour and broadcast in my swimming trunks if I choose," he said.

On both KMOX and KTAR, Dixon promotes travel excursions he and his wife, Gaile, host around the world. Dixon stays on top of all these shows, even while traveling.

"Someone sits in for me when I am on a trip, but I often call back, live, or on tape, to inject something into the program. No matter where I happen to be, I am actively engaged in what is going on with my shows back home," he said.

Important gear

The Dixon studio in Phoenix includes a Switched 56 dedicated digital line that goes directly to St. Louis. "Switched 56 is not ISDN technology, but it works for us, so we have stayed with it," Dixon said. He uses a Comrex codec to interface with the Switched 56 line.

Modern broadcast gear lets Dixon take his show anywhere.

To broadcast his travel show from Sitges, Spain, Dixon used a Comrex HotLine POTS codec, which provides two-way audio over a traditional analog telephone line.

"The HotLine provides up to 10 kHz audio bandwidth in both directions simultaneously, with no crosstalk on the incoming and outgoing channels. It even operates on fairly poor telephone connections," he said.

According to Dixon, the HotLine is

Michael Dixon

ideal for his audio transmissions because it is easy to use anywhere there is a phone line. The system delivers the best audio possible for the line by determining the optimal data rate of the particular connection.

Preset

"If you suspect that your lines will be less than great, you can preset the HotLine to connect at lower-than-maximum connect speeds for a margin of safety," Dixon said. "Even on a 14.4 kbps connection, the HotLine yields 5.4 kHz audio."

If Dixon has guests, all he needs is the HotLine, a Spirit by Soundcraft Folio Notepad mixer — which supports four switchable mic/line inputs, a tape player and other external sources — and a Symetrix headphone amplifier, which accommodates up to four headphones.

"With that equipment, plus a DAT player, I can have four guests and do a full-blown radio show from anywhere in the world," he said.

For Dixon, this equipment setup makes it possible for him to move around easily. He also can tape a broadcast. He said he can never be without his Sony Walkman DAT recorder, just in case he runs into someone or something interesting.

Dixon has broadcast from many places, Italy, Portugal, Hawaii, Egypt, Israel, Austria, Australia and Fiji among them. For two years he aired a program for Radio Fiji Gold, one of the Fijian state-run FM networks.

He sent reports to Suva, Fiji, mostly amusing anecdotes about life in the United States, which, Dixon said, seemed to be well received. In 1996, Dixon went to Fiji to broadcast a two-hour program featuring Fijian singers and musicians.

"In my travel broadcasts I try to give a flavor of the place I am in, what the people are like, the weather, how to get here, how to make smart travel choices," he said.

Spontaneity

Dixon believes spontaneity is one of the keys to radio. "The day you can put away your prepared questions and start reacting instinctively to the person you are interviewing, then you are having a real conversation," he said

Dixon has done both radio and television, but prefers radio. The obvious advantages of radio, he said, are its mobility and capacity for spontaneity.

"With the technology of today, one can be anywhere in the world and instantly bring that place home to the audience," he said.

Listener bond

But Dixon said radio also is a medium that allows presenters actively to engage the imagination of listeners to create mental pictures.

"You speak directly to their emotions. You create an intimate bond with them. Your voice to their ear. It does not get better than that," Dixon said.

■ ■ ■

John Mason, a free-lance journalist, reports on the industry for ***Radio World*** *from Sitges, Spain.*

I can get up at any hour and broadcast in my swimming trunks if I choose.

— Michael Dixon

RADIO BUMPERS

Where do you think the "Heart Land of Virginia" is? Try Farmville, Va., a town within a couple of miles of the geographic center of the state.

Down at the lower end of the radio dial, at 92.9 MHz, is WVHL(FM), programming boot-stompin', hat-tossin' country music all day long.

The station signed on September 1, 1997. Jennifer Wall, wife of general manager Bidgood Wall, designed the bumper sticker.

What message does your station bumper sticker convey? Send the sticker, and a 100-word explanation, to: RW Bumper Sticker, 5827 Columbia Pike, Third Floor, Falls Church, VA 22041. Stickers sent without explanation will not be considered for publication.

— *Chris Hamaker*

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World Radio History

Studio Sessions

Creative Sound In Radio News See Page 51

PRODUCER'S FILE

Roland DAW Has Fun New Features

Ty Ford

It had been a couple of years since I sat down with the Roland VS-880 laptop-sized workstation. Even so, when the VS-880-S1 with built-in digital effects ($2,245) came in for review, I was able to fumble my way around, plug in a mic and record in less than two minutes.

Most of the simple record/playback functions are easy, but you can be just one button away from success and remain daunted. I commend Roland for its attempts to improve the readability of the main manual and for publishing various QuickStart and TurboStart versions. But as exhaustive as the manual is, the language sometimes remains inscrutable.

You know it is attempting to explain *something*, but you really wish Roland's Laura Tyson was there to punch the right button and have you on your way.

Roland VS-880-S1 Workstation: New effects and features mean more creative production.

Question marks

For example, the manual does not actually say you can't be in Record Ready mode when you do a Cut edit, but the LCD display stares back at you with question marks if you try (unless you are in Play mode ... aha). You also cannot stay in Scrub mode after finding the right edit points because you cannot do the cut from there.

Pricier DAWs like the Orban Audicy have response windows that redirect the user when an impossible task is requested. The VS-880 has some of these, but could use more.

Before I get off the subject — a note to Roland: consider a binder with replaceable pages. This would allow those inevitable changes to be made in a more orderly and permanent fashion.

Like earlier models of the VS-880, the VS-880-S1 requires a lot of menu noodling. For example, it takes 13 keystrokes to Scrub and do a simple Cut procedure. Fortunately, Roland has made the additional features worth the calluses and the eyestrain you will likely get from peering into the VS-880's diminutive LCD display.

You cannot switch virtual tracks while in Play, but so what? At least you *have* virtual tracks: eight per channel. If you are in Record Ready with the channel indicator and master Record light blinking, you cannot return to Zero or Song Top without getting out of Record Ready. If you try, there is no indication that you did not get back to the top of the tune and you end up going into record wherever you happen to be.

I am not bashing the VS-880. There are other DAWs with larger views and more dedicated controls, but they cost more. The specific point here is that the VS-880-S1 has some of the same features as the "high-priced spread" and a few that some of the big guys do not have. Not the least of which is that all versions of the VS-880 are about the size of a pizza box.

For a simple tracking date, you can stick one in your backpack, pedal over to your session, do the gig, pack up and pedal home. Oh, but don't forget the mics, headphones, extra cables, phantom power supply for condenser mics and the AC plug adapter.

In addition to transportability, the VS-880-S1 brings some nifty new features to the party.

Onboard automix for volume, panning, effects level and effects type. You needed an outboard MIDI recorder before. This works both in dynamic and snapshot-automation modes — sorry, but no moving faders. I tried it, it works and it adds a lot of value to the box

There is a "grab faders" option for levels and pans. You can select Null or Jump: Null requires that you move the fader or knob back to its previously set point before any change occurs. In Jump, the value will change as soon as the fader or knob is moved.

Six tracks, no waiting

Also new, simultaneous playback of up to six tracks in uncompressed Mastering mode, and eight tracks of playback in any of the compressed modes. Do not expect that kind of performance if you are using an external ZIP drive.

A maximum of four tracks can be recorded at one time in any mode. And now you can add another analog or digital stereo source — like a submix from a MIDI rig or the stereo output of another VS-880 — to your eight-track mix. You can also adjust the level and pan of that source.

I commend Roland for its attempts to improve the readability of the main manual.

Track levels can now be adjusted ±12dB. Digital signals that have been emphasized will automatically be de-emphasized. You can now prohibit additional digital copies from being made from your master DAT mix.

Scene switching and effects switching is possible via MIDI Program Change commands. Up to eight channels of three-band EQ is available in Input Mix/Track Mix mode.

A new Peak/Hold feature lets you set the meters so that peaks remain on the display, and there are more effects routing than on earlier VS-880s.

Oh yes, the effects. The VS-880-S1 has 100 new preset effects patches based on 10 new algorithms. We will kick *that* football around in the next issue.

■ ■ ■

For information, contact Roland in California at (213) 685-5141; visit the Web site at www.rolandus.com *or circle* ***Reader Service 192.***

Ty Ford can be reached at www.jagunet.com/~tford

SHORT TAKE

Ramsa Digital Mixer Is Less Than $5,000

Time to add another affordable digital mixer to the buffet: the Panasonic Ramsa DA7.

For several years, Ramsa analog consoles have been a popular choice in radio production rooms.

The reasonably priced mixers offered four-bus operation, choices of stereo and mono inputs and enough sends and inserts to keep the busiest production person happy.

The recently introduced Ramsa DA7 digital mixer has 32 inputs, 24-bit I/O capability and automated mixing. The suggested retail price of the DA7 is also likely to please production people: less than $5,000.

The DA7 is an eight-bus console with moving faders, instantaneous recall of all settings and a large backlit LCD screen displaying all settings and bus assignments.

Built-in DSP functions include four-band parametric EQ and a gate/limiter/compressor/expander on each channel. Fifty EQ and 50 dynamics memories can store preferred settings.

Four cursor keys on the console surface can be switched to transmit MIDI Machine Control (MMC) commands to operate DAWS, sequencers or the transport mechanisms of modular multitracks such as ADAT or DA-88 digital tape recorders.

Expansion slots on the back plane allow digital connections to recording devices via AES/EBU, S/PDIF, ADAT Lightpipe or Tascam TDIF.

Two other ports on the back plane allow the DA7 to connect to a Mac or PC. Frequency response is 20 Hz to 20 kHz, with a dynamic range of up to 114 dB (digital in to analog out). The meter bridge shown in the photo is optional.

For information on the DA7 and other Ramsa products, contact Panasonic in California at (714) 373-7277 or circle **Reader Service 166.**

— Alan R. Peterson

World Radio History

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World Radio History

PRODUCT EVALUATION

Put Aside Time for A3000 Sampler

Rick Barnes

The question for the day is, is it now time for a sampler to be part of the standard equipment in a radio station production studio?

Although I have never used samplers in a radio environment, I have used them in college for composition projects in electronic music studios. When I was asked by **RW** to take a look at the Yamaha A3000 sampler, I looked forward to this project with great anticipation. Likewise, when I placed the unit in the production studio at Radio One in Washington — owners of WKYS(FM), WMMJ(FM), WOL(AM) and WYCB(FM) — the production guys literally jumped up and down.

The same reaction occurred when I later installed it in Charlie Garrett's home recording studio; Charlie is a member of the U.S. Army Field Band in Washington and a budding recording engineer. All the folks that hang out there were ecstatic. Everybody that I showed it to seemed pleased to take a look at it, at first.

After having the Yamaha A3000 in two different environments, all users came up with the same two conclusions: the device certainly has a lot of capabilities, but it also has a very steep learning curve.

Yamaha A3000 Professional Digital Audio Sampler

Operating the A3000 involves the use of five knobs to set the various parameter values, to switch display pages and to execute operations. These knobs are also pushbuttons: rotate them to change values and pages, then depress them to actuate certain functions of the sampler.

For example, to change the frequency of a filter, a particular knob would be rotated. To start or stop recording, the knobs below those words on the display are pushed. A lit pointer lamp above a knob indicates that particular knob can be pushed to execute an action. If the lamp is off, pushing the knob has no effect.

The Yamaha A3000 also provides five operating modes: Play, Edit, Record, Disk and Utility. Modes are selected by pressing the corresponding button. Above and to the right of the front panel, a matrix of additional buttons is used to divide each mode into six functions.

After selecting a mode, you can switch among its functions by pressing the appropriate function keys. A Command key accesses additional commands relevant to the mode and function and an Assignable key is available for four more functions.

One feature that I particularly enjoyed was the Audition button. While editing a sample, this button allowed me to quickly hear the work in progress. This button is located directly to the left of the disk drive, as shown in the photo.

MIDI ease

Although the sampler can be operated without a MIDI controller such as an electronic keyboard, we found that it worked with much greater ease when used in conjunction with a MIDI synthesizer or even a home keyboard with a MIDI Out jack.

Such controllers are common in recording studios and a smattering of broadcast production rooms, but are generally not standard items in radio studios.

Say a vocal sample is loaded into the A3000. When triggered from Middle C on the MIDI keyboard, the vocal sample plays in its original pitch. If triggered from keys above Middle C, the pitch of the voice increases until it begins to "chipmunk." When triggered from lower-pitched keys, the Darth Vader effect kicks in and the pitch drops down.

You also can trigger multiple pitches simultaneously and play the sample polyphonically at various pitches at the same time. Presto: instant "Singing Dogs."

The Yamaha A3000 is compact in size and fits in a 2 RU space. For that reason it was easy to mount with other equipment in Radio One's production room and Garrett's recording studio.

As I said before, the learning curve to get the A3000 up and running was quite steep. When I installed it in the production studio of Radio One, nobody seemed to be making any progress with it. I thought at first that this was my error by asking the production staff to work with the sampler in December, during the holiday commercial crunch and a move to new studio facilities. Likewise, after I installed it in Garrett's recording studio, I heard no immediate response from him or the other musicians that recorded there.

Simplicity

The layout of the five multifunction knobs, the mode matrix and the three additional buttons were developed to keep the front panel simple, avoiding filling the face of the unit with numerous buttons and knobs. However, all who used the A3000 agreed that this design seemed complicated and unintuitive in the heat of battle. As Kirk Tanter, production manager for Radio One told me, "Samplers should be simple. This one was not too simple."

The A3000 worked with much greater ease when used with a synthesizer or MIDI home keyboard.

A second problem with the box configuration was that the inputs were located only in the front panel, even though the outputs and MIDI jacks were in the rear. In both studios, we had to leave one rack space blank to bring cables to the front of the unit.

Going back

I found myself constantly referring to the manual and had to contact Yamaha technical support several times. Those people were responsive and most helpful in getting me out of jams. My thanks in particular to Avery Burdett of Yamaha tech support, who really taught me a lot about the A3000.

Data is stored on standard 3.5-inch computer disks. The Yamaha A3000 comes with five disks and one CD of sounds ready for sampling and looping. Clyde Connor, drummer and composer with the U.S. Navy Band's "Commodores" jazz ensemble, was impressed with the quality of the drum sounds. By recording sounds into the sampler either from the CD or other source, Connor was able to make effective drum loops.

The Yamaha A3000 is not a standard item at most broadcast equipment distributors, although it can be ordered. I checked around for pricing with music stores in the Washington area as well as with broadcast equipment distributors nationwide. It was in stock at all of the music stores that I called. With a list price of $1,995, I found "street prices" of $1,299 to $1,499.

See SAMPLER, page 51 ▶

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World Radio History

Bringing Stories to Life at CBS

Peter King

Creative production is not limited to the studio. Radio news reporters have only sounds and words to bring a story to life, often live from the field, mixed on the fly under immovable deadlines.

Read how CBS Radio reporter Peter King does it, then use the methods he describes to create compelling and interesting news reporting at your station.

It is Thursday, about 5 a.m., here in Orlando, Fla. The answering machine awakens me. "Peter? New York calling. There has been a tornado in Birmingham Alabama. More than 20 are dead." I know what is coming next.

About an hour later, I am on my way to the airport with my travel bag, which is always packed and ready for trips such as these. My laptop and a heavy-duty case full of broadcast equipment are slung over the other arm.

Hit the ground running

Several things are on my mind. Making it to the airport without getting nailed by Orlando's legendary traffic. Where to go and what to do once I get to Birmingham. In other words, a game plan for finding news, gathering it, and putting it together in an accurate and comprehensible form while working on an hourly deadline. And on top of all this, making it creative and compelling for listeners.

This scenario is repeated daily by radio reporters all around the country — local mic-slingers covering a shooting or fire just around the corner, and network reporters at a disaster hundreds of miles away.

Sometimes in the rush to get our stories on the air, we forget about being "creative and compelling" and just grind out the news like so much sausage from a factory. Those deadlines and disasters may cause us to forget our basic tools of using sound to hold the listener's attention and make him or her care about the story.

Peter King, CBS Radio News

One of the best pieces of basic advice I have ever received was from CBS Radio News Director Larry McCoy. When I first began covering major assignments for the network, Larry stressed the importance of painting a picture for the listener and telling an "up-close and personal story." This is done using words and sound to make the listener feel as if he or she is there and can almost see what is happening and making them care about it.

Deadlines and disasters may cause us to forget our basic tools of using sound to make the listener care about the story.

It is not enough just to say that 300 homes were wiped out in a massive storm, yet quite often that is exactly how it is reported on the radio.

Instead, a verbal *walk* through the wreckage helps describe exactly what is seen in a more personal way. This hits home: "The family who lived here had children — there are pieces of clothing strewn about the wreckage: a little girl's dress still on its hanger, a small boy's sneaker, a tricycle..."

Television news can show you what happened. In radio, all we have is sound. We need to use words and sounds to paint that picture.

Natural sound is a great tool which is often ignored. Nat sound is simply what you get when you start recording. This differs from "atmo" or ambient sound as is used in film and TV production because your tape deck or MiniDisc recorder is eavesdropping on people and things that make noise.

Sounds of life

For example, in tornado-stricken Alabama, the sounds of Sunday morning church services provided me with much material; music and the sounds of folks greeting each other served as backdrops for several wraps I filed from there. One piece began with nat sound of old friends saying hello and hugging, followed by my description of who they were, why they

See CBS, page 52 ▶

▶ SAMPLER, continued from page 50

So is it time to add a sampler to the inventory of your radio station's production studio? It is a great tool to help in the creative process for your production folks. If you are looking for innovative commercials, liners and promos, the answer is yes. However, if you do make the Yamaha A3000 your choice, plan to block out the time necessary to learn its intricacies and master this device.

My thanks to everyone that gave me a hand with this evaluation: Kirk Tanter, Mike Johnson and Rashad Smith at the Radio One production department; Charlie Garrett, Loran McClung and Vince Norman of the U.S. Army Field Band; and Clyde Connor of the U.S. Navy Band. Their time and effort greatly helped with this project.

■ ■ ■

Rick Barnes, CBRE, is a contract engineer in Washington and secretary of SBE Chapter 46 in Baltimore. He has studied electronic music at Ithaca College, Catholic University and the Peabody Conservatory of Music. Send e-mail to KE3QJ@msn.com

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World Radio History

Sound Effects for Radio Theater

Make the Effects Fit the Action and Match the Intensity When Producing for Radio Theater

Jerry Stearns

Most certainly, "The play's the thing." But for radio theater, much consideration must be devoted to sound effects: creating them, when to use them and where to use them to be effective.

Sound conveys meaning. Sound stimulates our visual imagination and creates visual images in our minds. The study of this phenomenon is called psychoacoustics.

Radio theater is the art of telling a story by the careful mixing of sounds, both verbal and non-verbal. Radio is also a "hot" medium, in that the listener's imagination and experience are involved in giving the story depth, substance and meaning.

Where are we?

Sound effects describe the circumstances of a dramatic audio situation. They can be used for such things as defining a setting or a place, conveying action, solving certain narrative problems and evoking characterizations.

In radio theater, we have but four objects to work with: Dialogue, Sound Effects, Music and Silence. Each one is important and dependent upon the others.

In spite of sophisticated technology, real sounds are more convincing than synthesized ones. But most things do not make the sound we think they make.

Most effects you hear — especially in the movies — are actually the result of at least two people doing something with two or more objects, completely unrelated to what you are supposed to be hearing. Fights in old "Kung Fu" movies are enhanced by the sounds of whips, hand slaps against leather and vegetables being chopped.

Montage

Sounds may also consist of more than one single part. For example, a door opening is not just one click of the latch, but a rattle, a click and perhaps a hinge squeak. Answering the telephone must be more than the simple and quiet click we actually make picking up the receiver. Again, rattle-rattle!

A sound effect is like a mini-drama, with a beginning, middle and end. It is meant to indicate some action or event, and it should follow through to complete that action. This is why the single door click feels and sounds incomplete.

Acoustic space is also important. Every place on the planet has its own voice which changes with the time of day and year. Prerecorded sound effects are recorded in a particular place and sound environment, generally not in the same acoustic space where your actors are, or where you want them to sound like they are.

An effect that does not sound like it is in the same place as the actors can alter or destroy the image you are building for the listener. So rather than have a character go outside, place him or her walking down a long hallway. If possible, record your own effects in the same place that the actors are recorded.

In general, the listener should hear the sound effect before the dialogue or action refers to it, if it is referred to at all. It provides a mental flow of action for the listener, besides preventing the mortifying "I'll get the phone (... ring ...)" flub.

Literal effects are intended to sound like what they are supposed to be. A type of literal effect is the "emblematic" or "associative" sound effect, which is associated with specific events to clearly tell us what is happening.

Memory trick

Once established, such sounds can cycle back later in the radio play to return to a place, event, or image, easily and quickly.

Here again, the sound must consist of specific elements to create a desired image or make a particular association.

See THEATER, page 53 ▶

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GP-5	5	6,000W	4.3	$3,150
GP-6	6	6,000W	5.5	$3,700

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SGP-4	4	10,000W	3.3	$4,500
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Creative Radio News

▶ CBS, continued from page 51

were there and appropriate actualities, all in a 35-second package.

How is it done? With the right toys, the work is easy. Using two Sony MD recorders, I can produce the entire piece by picking out the cuts I want, arranging them in the correct order and sandwiching them in between pieces of nat sound timed to fit my script. I then add my voice live over the edited "bed."

I can also use one MD to play back nat sound and the other to play back the actualities. What I did in this case, however, was to feed all the elements — nat sound, actualities and my voice — separately via cellphone, along with assembly instructions.

Certainly I could have produced it in the field with the two decks, but I know the producer on the other end could mix and assemble the piece digitally much more quickly than I could with deadline approaching.

The reality is that most reporters do not have the luxury of a producer to assemble complicated pieces back in the newsroom, much less two MD recorders to do full-scale production in the field.

Old times not forgotten

I am only seven months or so removed from a local newsroom, so I have not forgotten what it is like to go bare-bones with a cassette deck and cell phone.

There are easy, yet creative ways to use nat sound and make your wraps come alive without having all the toys the network biggies have. You can still produce a network-quality wrap from the field.

Remember, it is not just *how* you send it back, but *what* you send back that counts. Most of us can prefeed nat sound that can be used to lead into a recorded or live piece during the newscast, which allows the on-air anchor to set up the story as shown in the accompanying box.

OSDs are "On-Scene Descriptions," and are sometimes also known as "rosers," which means "Radio On-Sceners." These do not require any extra work, yet can do the job nicely by combining words and nat sound with imagination and ingenuity.

Describe what you see in detail and use relevant nat sound as a backdrop. It works; radio play-by-play announcers do it all the time.

Vin Scully makes you feel as if you are in the middle of a Dodgers game instead of miles away. CBS newsmen Jim Krasula, who also goes anywhere on a moment's notice, and Robert Berger, one of our Middle East reporters, have a knack for finding things to talk about with great backdrops which draw the listener into the scene.

Depending on the story, machines, loud crowds or music all serve the purpose. Tony Winton of Associated Press Radio is a marvelous ad-libber who routinely capitalizes on these situations.

Start practicing

If you are not proficient at ad-libbing, jot down some notes or an outline. Better yet, practice by looking around and speaking out loud about what you see, the more details, the better.

In future **RW** articles, I plan to write about how networks get the news to you and the equipment that helps us do our jobs.

Radio reporters from small markets to networks, beware: I also plan to call on you to share your expertise and experiences.

In the meantime, feel free to e-mail me at the address below. After all, we are all looking for the same results: getting the story on the air quickly and accurately, and making our listeners care about it.

■ ■ ■

Peter King is a reporter for CBS News Radio. In another life he worked with ***RW*** *Technical Editor Al Peterson at WHEN(AM), Syracuse, N.Y. Contact him at* pkingnews@aol.com

Sample Use of Natural Sound In Network News Story

(Nat sound: Chain saw up and under)

Anchor: "The cleanup continues in tornado-stricken Alabama. Newsman Peter King has this live report."

King: "Bill, you can't go more than a few hundred feet without hearing that sound here in Jefferson County — people with chain saws are very popular right now ... "

(Actuality: Local guy cutting up debris, fade out nat sound)

King: " ... And Joe Smith says he'll be out here cutting until all his friends and neighbors have room to move and rebuild. Live in Jefferson County, Alabama, I'm Peter King, CBS News."

World Radio History

▶ THEATER, continued from page 52

Running water can be used as an associative effect, but when the sound of a shower curtain sliding across a rod is added, it is distinguished from brushing teeth or washing dishes.

On the other hand, *non*-literal effects are sounds that indicate or suggest an event, without being the actual sound. This is true for things that do not have a characteristic sound or events that do not actually happen.

For example, what do ghosts sound like? How do you create sharks passing under water? Music is often used to indicate these sounds.

Ambiance, atmosphere and background all define sounds identifying location, setting, or historical time. A good, unedited background — like birds in a park or the thrum of machinery — can cover choppy dialogue editing, making it sound real and continuous.

Discrete spot effects indicate individual events and define their "whats" and "hows." These can be brief individual effects or composite effects, specifically placed and timed for a single action.

Foley effects are named after Jack Foley, a second unit director for Universal Studios in the 1940s. These are incidental naturalistic sounds of movement and business, recorded to match the action of the play. Footsteps, doors opening and drinks pouring are all Foley effects.

Some Foley effects can be recorded live on the voice track. Having the performers themselves make the sound can aid in timing the effect, and it helps the radio theater actor's voice convey the movement.

On the other hand, it could also complicate the recording session.

Isn't that in Washington?

"Wallas" are crowds. The "walla-walla" of many people convey a crowded situation, without specific voices or words being distinguishable.

One walla does not fit all sizes. For instance, bar wallas differ from baseball game wallas, which are also very different from concert audience wallas.

Bars, for example, are a difficult environment to control, due to what music is being played and how loud, or when distractions occur. You may have to record a lot of this background to be able to find enough for you to use.

Often a foreign crowd scene works well because English words never pop up unexpectedly, distracting the scene.

One other element worth mentioning is Silence. As a dramatic element, it can be very loud. The absence of sound builds tension when it is needed most.

For proof, go back and watch the movie "The Exorcist": moments of stark terror were often preceded by protracted silences to build up to the shock.

Mixing two or more sounds together creates a combined sound that is more than each of the individual sounds alone. When used, it often consists of non-specific background with added associative sounds to help identify or differentiate specifics in the scene.

Fights in old 'Kung Fu' movies are enhanced by whips, hands slapped against leather and vegetables being chopped.

Suppose we create a restaurant scene. It might begin with voices and kitchen noises in the background, then add foreground plates, silverware, then music. Depending on the choice of elements, we begin to see what kind of restaurant we are in: refined four-star or rowdy roadhouse chili parlor.

A wilderness scene might begin with birds and insects. Add in some distant wolf howls, or close-up footsteps and chainsaws, and the story already begins to unfold without any dialogue.

■■■

Jerry Stearns is executive producer of Great Northern Radio Theater in Minneapolis. He can be reached at jstearns@mtn.org

This piece was originally published in the Midwest Radio Theater Workshop Journal and has been adapted and reprinted in RW with permission from the author.

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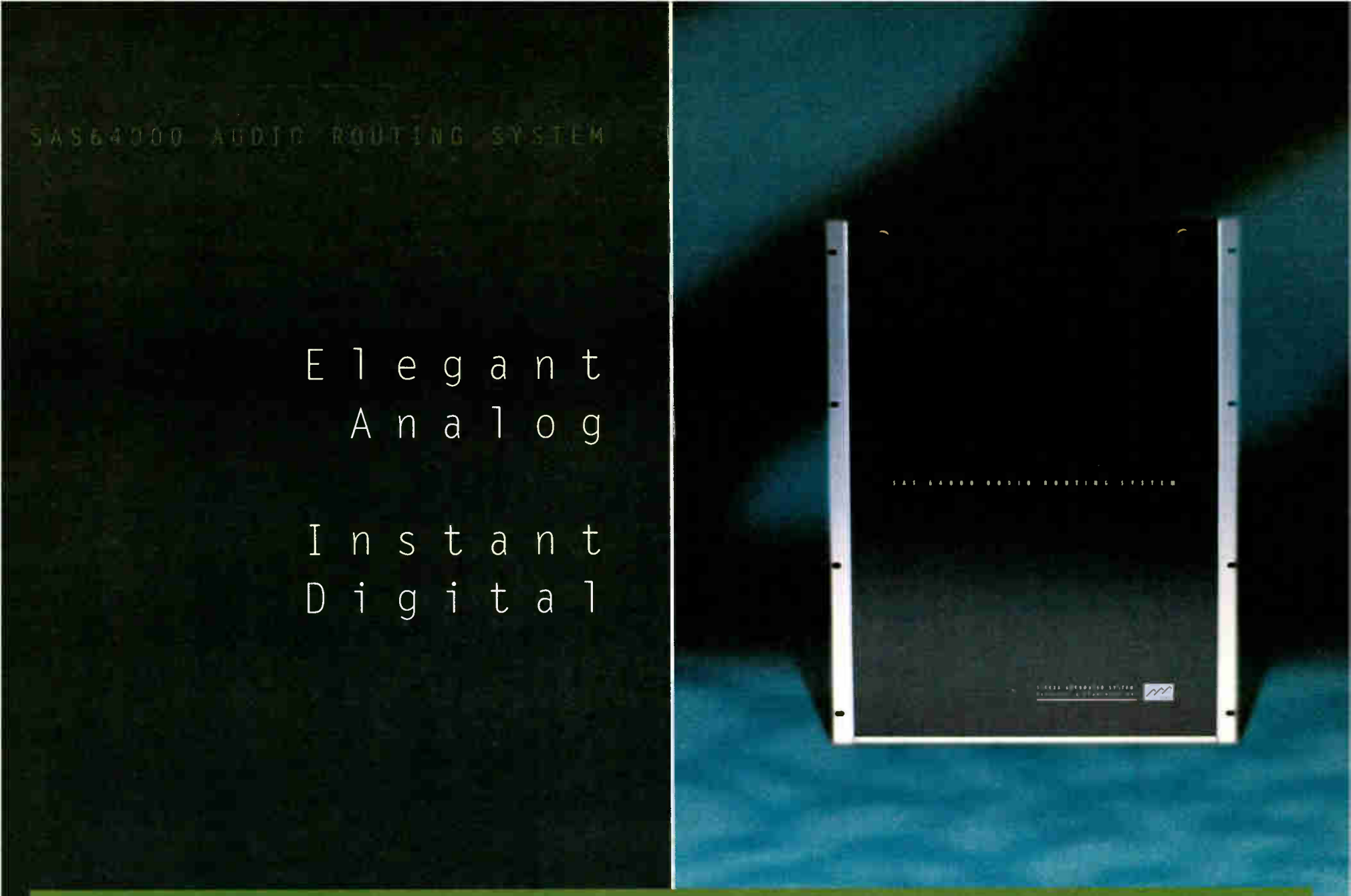

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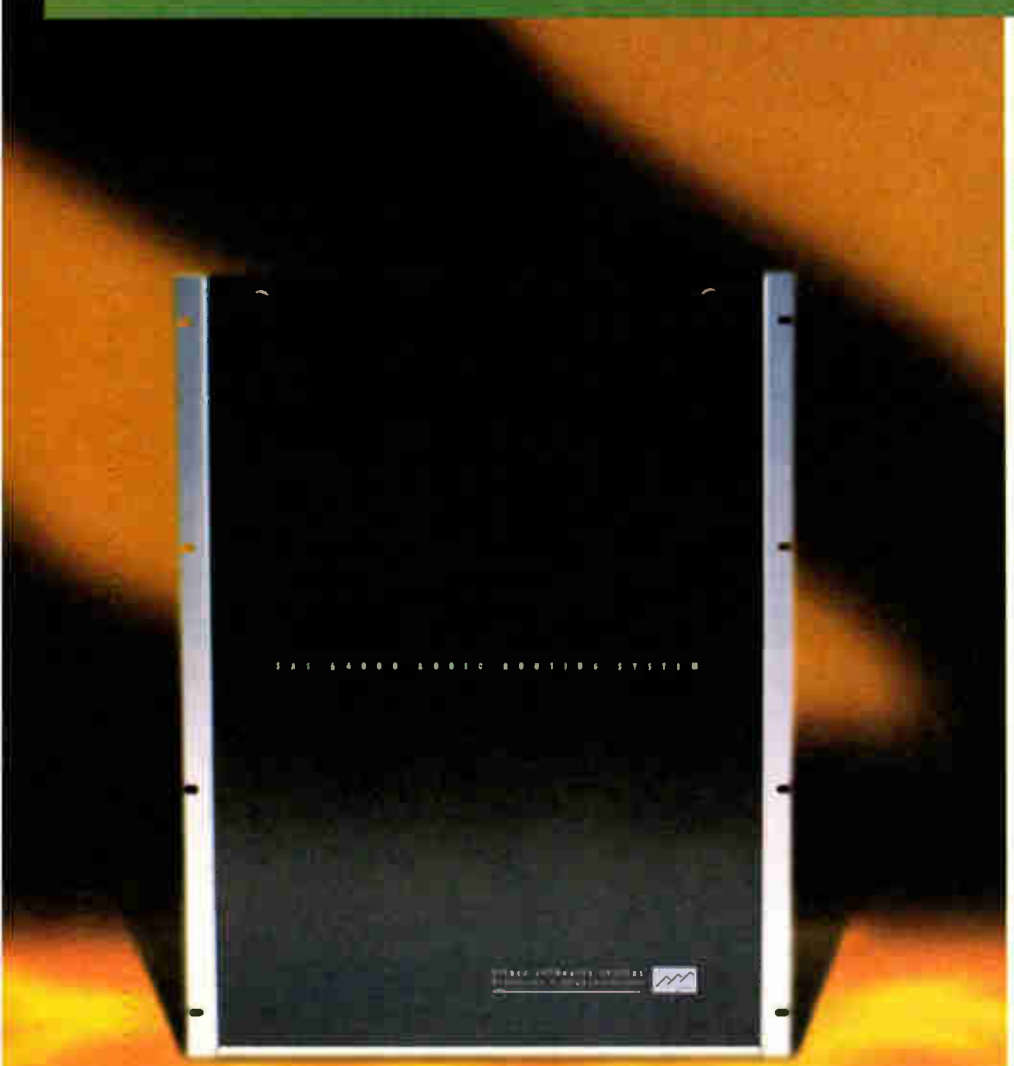

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World Radio History

•PRODUCT GUIDE•

Products for Radio Production

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

Sound Forge XP 4.0

The price of the Sound Forge XP 4.0, Sonic Foundry's budget audio editor, has been reduced to $49.95.

The program records and plays 8- or 16-bit audio with any Windows-compatible soundcard and can output audio in a number of formats, including RealAudio, RealMedia, Java AU and Microsoft AVI files.

Even at its under-$50 price tag, Sound Forge XP 4.0 is capable of fades, reverb, normalization, 10-band graphic equalization and time companding.

The XP CD-ROM includes native versions for Windows 95, Windows NT-compatible systems and Windows 3.1. The Windows 95 and Windows NT versions will run on a minimum 486 processor, while the Windows 3.1 version can function on a 386 machine with 4 MB RAM.

For information, contact Sonic Foundry in Wisconsin at (608) 256-3133 or circle ***Reader Service 49****.*

Hafler Powered Monitors

The Hafler TRM8 is a powered monitor speaker system that features internal Hafler Trans•Nova bi-amplification and frequency response to 21 kHz.

The 6-ohm high-frequency driver is powered with a 75 W Trans•Nova DIAMOND amplifier, while the 4-ohm woofer is fed with 150 W. A bass level control offers selectable levels from -4 to +4 dB, 40 to 200 Hz. A similar treble level control tweaks response from 3 to 20 kHz.

The TRM8 powered monitor is intended for use in broadcast production facilities, film and video post production, and mastering facilities. Suggested price of the TRM8 monitors is $2,400 per pair.

For information, contact Hafler in Arizona at (888) 423-5371 or circle ***Reader Service 78****.*

Maxell Cleaning Compound

New from Maxell Corp. of America is CL-S, an advanced and ecologically sensible cleaning solution for magnetic head surfaces.

CL-S was developed to replace freon and chlorine used until recently in many head-cleaning products. The compound offers benefits that freon, chlorine and alcohol do not, while maintaining an ozone destruction coefficient of zero.

An ionic bonding process allows a lubricating layer of fluoride and other additives to be established on the head surface. CL-S is nonflammable and does not degrade or dissolve rubber pinch rollers or other transport components. Low surface tension gets the compound into small gaps and its hygroscopic characteristics prevent corrosion to metal parts (CL-S does not absorb water).

Maxell CL-S is available in 30 and 500 ml bottles and a 150-ml spray.

For information, contact Maxell in New Jersey at (201) 794-5922 or circle ***Reader Service 38****.*

Fidelipac DCR 10 'Cart' Machine

The DCR 10 — successor to the Fidelipac DCR 1000 — is a new digital audio "cart" machine that uses removable

Zip, MO or high-density 2 MB discs.

The DCR 10 is equipped with a standard 2 MB drive operating at 32 kHz. Jingles and commercials can be handled in a one-disc/one-spot preference. High-capacity Zip and MO drive options allow up to 99 cuts on one disc. A front-panel search knob or optional keyboard can be used to cue up succeeding cuts.

The new Q50 keyboard is for instant access to any cut on a high-capacity drive. Up to 50 cuts can be accessed and played back from the keyboard; chaining, loops and rotations can also be entered from the optional Q50 keyboard.

For information, contact the Fidelipac division of Amplifonix in Philadelphia at (215) 464-2000 or circle ***Reader Service 48****.*

The Digital Console that Fits

Logitek designed and built the ROC-5 digital console to meet your needs for a small size console. Ideal for dubbing studios, newsrooms or stations that use automation or satellite programming.

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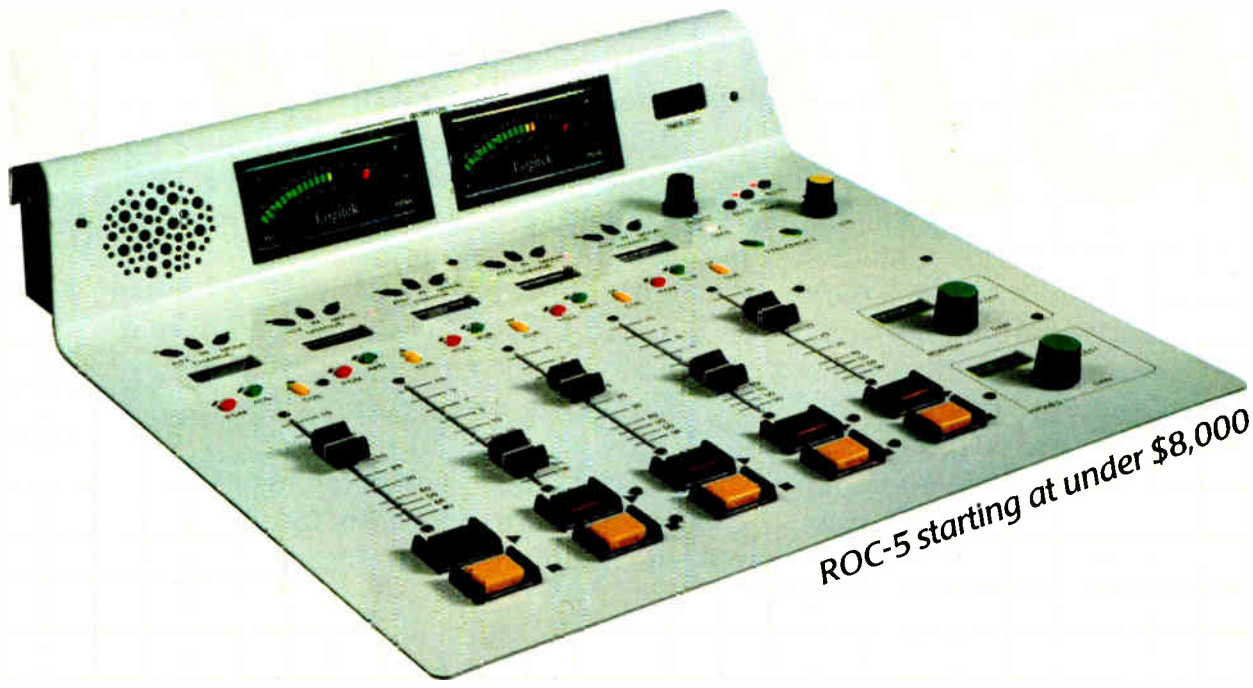

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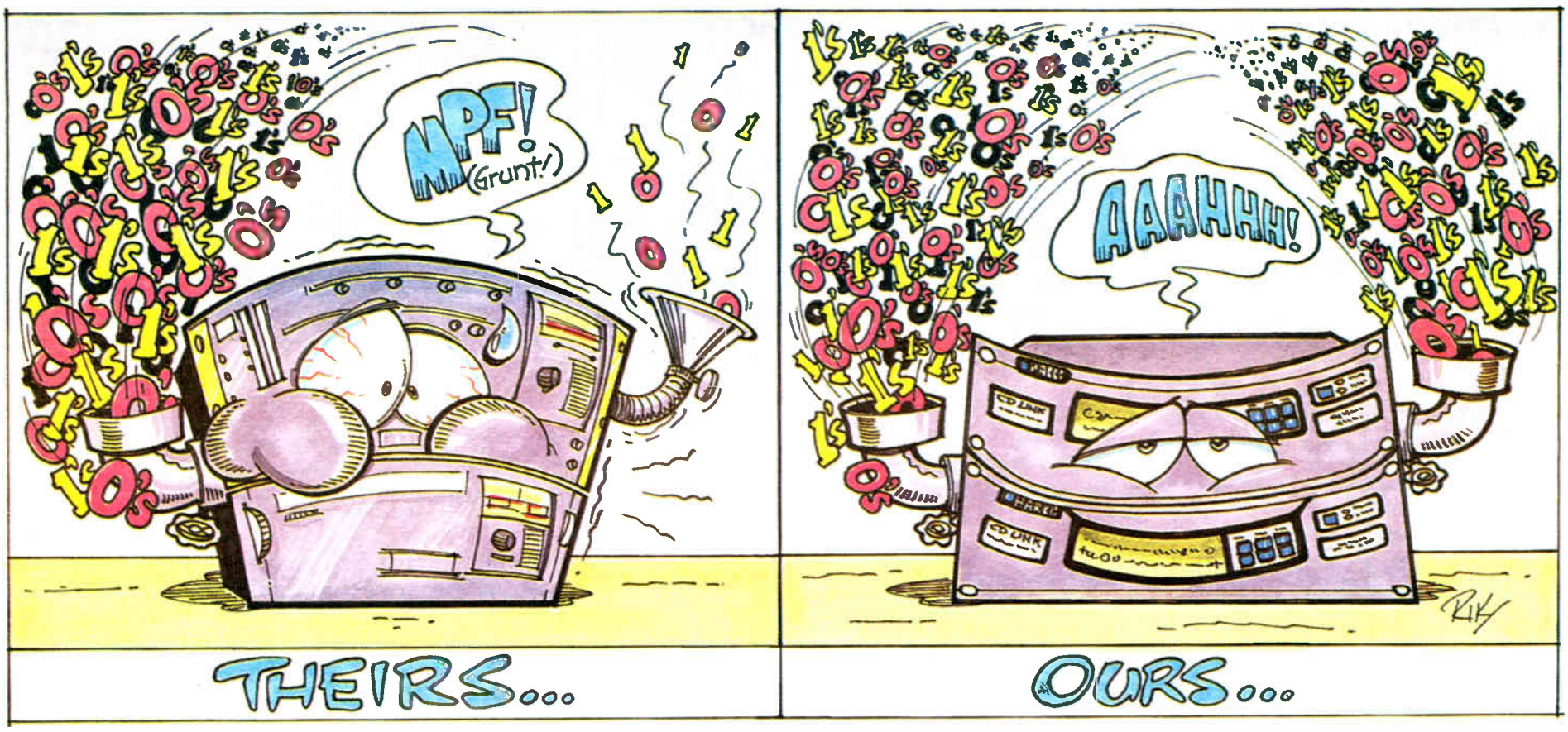

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The CD LINK 950 MHz STL is available for off-the-shelf delivery. You program it to your operating frequency on-site. If you have more than one frequency available to you, *no problem*, you can just reset the frequency as your needs change. CD LINK is a field proven product with many units on the air for a year or more, while competitive companies are still promising deliveries sometime in the future.

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World Radio History

BSI Ready With Webcasting Software

Alan R. Peterson

As Microsoft prepares to launch its streaming media technology NetShow 3.0, Broadcast Software International is poised to distribute its own NetShow-based product, WebStation.

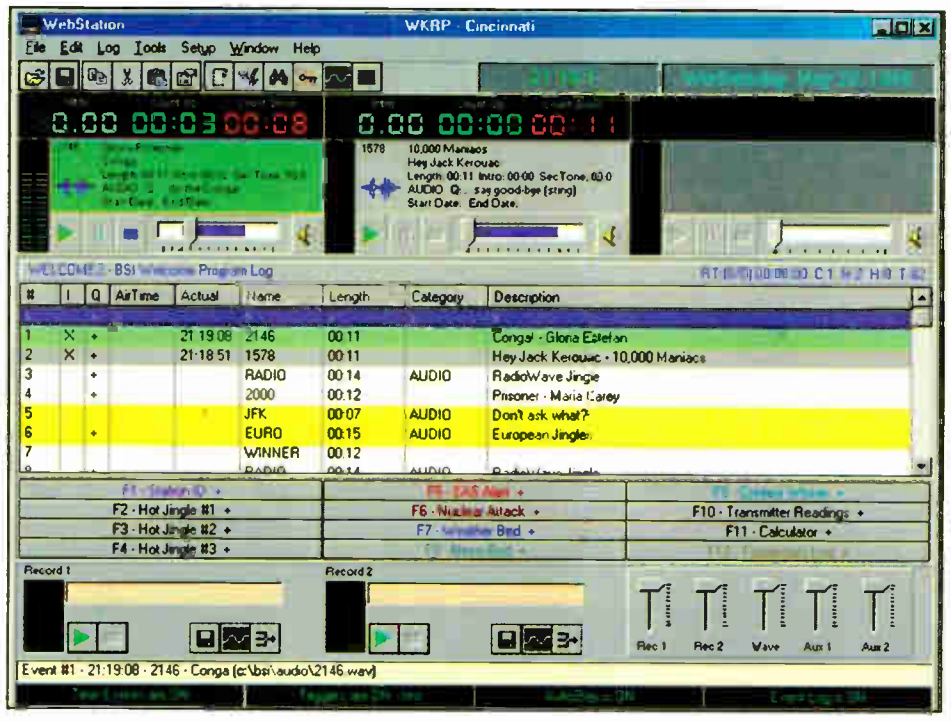
BSI is first out of the gate with an automation system that can stream audio, video, graphics and HTML scripting. The system offers radio stations the option to author and stream original programming and graphics over the Internet, rather than merely to duplicate existing on-air programming heard in their respective markets.

"Broadcasting on the Net means that a small radio station can, if promoted properly, have a truly global reach," said BSI President Ron Burley. "We have yet to see the 'little guy who makes it huge,' but we will, in much the same way a small book or a 'little' movie can become worldwide best sellers."

WebStation operates on a standard computer and runs the NetShow server software under Windows 95, 98 or NT. Conventional drag-and-drop Windows-style menus and editing makes WebStation simple and familiar to anyone who can use a PC. Program logs can be imported from most scheduling software.

NetShow 3.0 is a streaming media service for Windows NT Server that allows audio and video to be distributed over the Internet, LANs and ATM networks, over a wide range of bandwidths.

Microsoft released NetShow in public beta form in May. The new version of the Microsoft Media Player can play back NetShow content, along with WAV sounds, AVI and QuickTime movies, and



RealAudio and RealVideo content. According to Microsoft, the Netscape Navigator browser also is capable of viewing NetShow content.

The NetShow specifications allow up to 1,000 "unicast" streams to be sent from a single Pentium 233 server under ideal conditions — an Internet or LAN/WAN with 28 to 56 Mbps bandwidth.

Even with limited bandwidth — say as low as audio-quality 2.4 kbps — NetShow is capable of providing a high degree of streaming. Details can be found at the Microsoft Web site.

Visit *www.microsoft.com/ntserver/netshow/about* for details.

According to Burley, Microsoft approached BSI. "Microsoft came to us to develop WebStation and we considered it carefully. We didn't want to abandon our core radio client base. Instead, we developed a new product which complements our existing line," he said.

WebStation provides automated control and sequencing of video clips, graphics, animations and audio, much in the same way radio automation systems sequence and overlap audio events.

The main screen of WebStation resembles that of the BSI WaveStation automation system (**RW**, Dec. 10, 1997). The addition of a third virtual "cart machine" and the means of viewing realtime NetShow information and the number of connected clients are the obvious differences.

"WebStation is important to radio broadcasters, as it will give them the opportunity using NetShow to demographically adjust what ads are heard or seen by the age and/or location of the listener/viewer," Burley said.

For nonradio use, Burley suggested perhaps a fashion magazine might have thousands of hours of fashion video, but no interest in owning a radio or TV station, much less buy time on one or the other. "They could use WebStation to broadcast this content," he said. "Also, an auto manufacturer could broadcast videos on its new product line with links to test and graphic information."

The BSI WebStation is expected to be released this month, coinciding with the full release of NetShow 3.0 by Microsoft. Expected price is $999.

For more information, visit the BSI Web site at www.bsiusa.com *or circle* ***Reader Service 41****.*

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World Radio History

PRODUCT EVALUATION

ATI Portable Mixer: About Time

Alan R. Peterson

I was hoping one of these would come along someday: a rugged, battery-powered, micro-mini field mixer that would mix up to three balanced mic or line sources. One that could be dropped into the remote bag or news kit and be out the door at a moments notice. It took Audio Technologies Inc. (ATI) of Horsham, Pa., to come up with the NANOAMP Series MXS100 stereo field mixer.

I have always admired the high-quality portable audio equipment sound technicians use on location film projects. While a Nagra reel machine would be a somewhat extravagant buy for a typical radio station, I always thought those small mixers used by filmmakers to sum several mics would be welcome at that same radio station in an instant. The MXS100 suggests such a mixer, minus the "movie" price that accompanies such a device.

The MXS100 eschews frills such as Aux sends, EQ and input trim pots, opting instead to be a solid three-in, two-out field mixer with a limiter, a number of handy options and three different means of powering the unit. Add to this a padded nylon carrying case and a 1.5-inch wide shoulder sling, and the MXS100 can go wherever you will.

The ATI MXS100 is designed to be used with a pro-level DAT or tape recorder, hence the balanced XLR I/O. However, a pair of eighth-inch TRS plugs on the back panel let you connect the mixer to -10 dB audio components. The MXS100 works with an HHB PortaDAT or a consumer MiniDisc recorder.

Inside the box

I hesitated to disassemble the MXS100 sent to **RW**, only because I got to see an opened unit at the New York AES show last fall. Inside are high-quality components on five stacked, densely packed PC boards.

The MXS100 makes plentiful use of Analog Devices ICs, including SSM2017 mic preamp chips, an SSM2164 quad voltage-controlled amplifier chip for the limiter circuitry and a pair of SSM2142s at the outputs to bump the internal single-line audio path up to a +4 dB balanced differential output. The 2142 simplifies the output circuitry a great deal, as the board is already too crowded to accommodate many more components.

Admittedly, the density of the innards surprised me. Often, opening the tops of small mixers reveals very little circuitry. It is unfair to bring up the past, but a certain Lafayette mixer I used at one station was little more than a passive device with a single transistor to make up for lost gain. "Black box" radio mixers constructed by station engineers are often little more than this as well.

The box is not sealed for life. Internal jumpers may be selected for mic gain and phantom power on each channel.

Twiddle the dials

The front and back panels of the MXS100 are likewise as dense. Peel down the clear protective plastic screen of the nylon carrying case and a cramped but logically laid-out control surface is revealed. The black plastic surface of the front panel allows you to see every letter and legend over each control. The ten-segment LED VU meter is visible in bright sunlight.

There are three input level pots, each with a concentric ring pan control. Square red buttons at the four o'clock position of each knob switch between Mic and Line level inputs. The headphone level knob is a simple blue pot shaft, adjustable only by thumbnail or a small screwdriver blade.

One would think a larger knob for headset level would be preferred, but it makes sense in its own way; the panel is already cramped and a small control seems right. Plus, you do not want to grab the headset pot thinking it was an input control and accidentally blast your ears out.

The only inconvenience I can see about the front panel is the difficulty in switching between input levels. Those buttons are awfully tiny. But then again, one does not constantly switch between the two settings as a matter of routine. Hit it once for the project at hand and leave it.

The panpot rings around each level pot are equally tough to get to. But how often do you plan to do sweeping pans during recording with the MXS100?

Cut the rumble

Clustered together to the left of the VU meter are three small toggle switches for two-pole low-cut on each input. Each switch does a -3 dB drop at 125 Hz with a 12 dB/octave slope. If you are recording voicers or actualities near machinery or doing a remote from the agricultural fair (and they placed you next to the Ferris wheel), you will find these switches useful.

A test tone oscillator with bright green LED is activated by a switch in the upper left corner. Switch it up and you may set the overall level with the Master pot. Switch it down and the LED turns yellow as a slate microphone hidden next to the Input No. 1 pot is activated.

Power options include an AC-to-DC wallwart (24 VDC), a rechargeable battery pack, a car adapter and a nifty slide-on module called a BBU100 battery pack; amusingly nicknamed a "baba-booey" by acquaintances who helped me review the mixer.

Inside the BBU100 are four open slots that hold common 9 V batteries. Folks used to high-tech answers to everything will consider this battery tray almost a Tinker-Toy approach, but they will change their tune fast when they find their field recording saved by a quick trip to the convenience store for a "replacement power supply."

The back panel consists of five Neutrik XLR connectors for in and out, a pair of slide switches for +4 line or -50 mic level outputs, two eighth-inch jacks for stereo Tape In and Out, and another eighth-inch jack to connect additional mixers or the ATI XPS100 input expander. The jacks are braced to the back plate and soldered to the PC board so they will not work loose with repeated plugging in and out.

ATI MXS100 Portable Mixer

The ATI MXS100 is designed to be used with a pro-level DAT or tape recorder, hence the balanced XLR I/O.

I tried out the MXS100 on a multi-mic interview recording, which was simultaneously being videotaped on a consumer camcorder. The mixer's twin outputs came in handy as I routed a +4 level to a DAT recorder and a -50 mix to the camcorder mic input. Judicious level setting and the limiter kept levels consistent and the mixer's flat response left the audio uncolored.

I have the feeling semi-pro videographers would like this mixer. Cameras contain severe compressor circuits which are driven hard by wildly varying audio levels. The ATI MXS100 would take some of the load off the compressor and provide a clean sound.

Crushing sound

Added benefit: the limiter on the MXS100 has some very nice "squeeze." I once worked at a station during the early 1990s that had a small voice and playback-only booth with a simple five-pot mixer/compressor. Overdriven, it squashed voice tracks beautifully for recording. I wanted to see if the MXS100 could duplicate it.

I connected a Sennheiser 421 dynamic mic to the mixer, ran the Line Out into my PC running Sound Forge 4.0, and "swallowed" the mic to make a recording. The limiter was driven as hard as I could manage, and I got just the right amount of classic "AM radio" compression that I love to hear on my voice. A trimpot inside the MXS100 can alter the limiter threshold, but I wasn't about to knock a factory unit out of calibration.

The recovery time on this limiter was much faster than on the earlier mixer; most likely a testament to the SSM chips vs. the opto-electronics and long RC time constants of the older design. That means a field recording of fireworks going off on Independence Day is not likely to "breathe" or duck all over the place.

Final thoughts

Your own personal experience with ATI equipment might have been limited in the past to the Emph'-a-Sizer mic processor, phono preamps or some of the company's economical studio consoles. The company's recent entry into field mixers — as well as AES/EBU distribution amplifiers — demonstrates that ATI is conscious of what broadcasters may need right now and are not content to dwell long in the past.

Remember to pack extra 9 V batteries and a screwdriver when you go out. You don't need the 'driver to put in the batteries, but you may want to switch to phantom power or change mic gain in the field and need to open the box.

The price is also attractive. For about $955, you can get the MXS100, the carry bag and a BBU battery unit. A lot of accessories are available for the mixer, but these will get you started.

I wouldn't mind phase reverse switches on the inputs. A two-person remote in the field wired out of phase would do much to minimize background noise such as machinery or crowd ambiance. Plug-in XLR adapters would admittedly work fine, but it would be nice just the same.

Beyond that, there is little I can say negatively about the MXS100 mixer. If you have hammy fingers, you will find the front panel tough to work around. Tip the unit over and the power block may slide out and hit your toes. Somebody is bound to complain about no direct digital output — *why* I don't know, but someone will.

And if you still feel argumentative, just read the ATI Limited Warranty: the company will warrant the MXS100 to work for one year, "As long as nothing larger than an elephant is allowed to jump on it."

That's confidence.

Product Capsule:
ATI NANOAMP MXS100 Stereo Mixer

Thumbs Up
- ✓ Small and rugged
- ✓ Built-in limiter
- ✓ Lots of features and jumpered options

Thumbs Down
- ✓ Front panel cramped for large hands
- ✓ No input phase switches

For more information contact ATI in Pennsylvania at (215) 443-0330, or circle **Reader Service 39**

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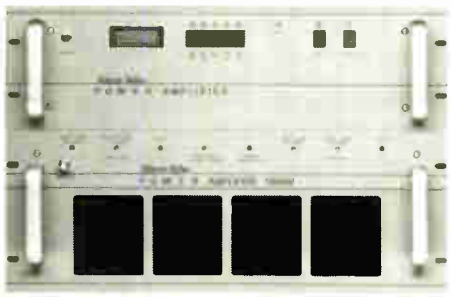

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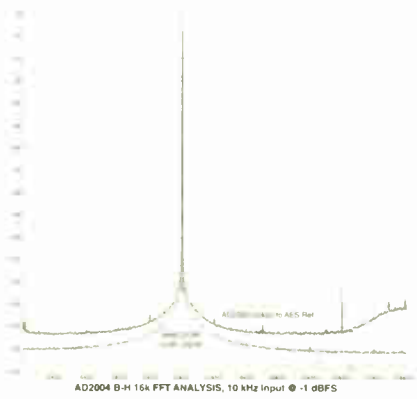

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World Radio History

Buyer's Guide

Marketplace
Page 70

The Evolution of On-Air Processing

What's Hot and What's Not in the Subjective World of Radio Station Sound

Tom Osenkowsky

In the beginning ... there was very little processing.

Perhaps the only audio processor in line with the transmitter was a peak limiter to keep modulation within FCC limits. Then came the AGC, used primarily to correct inconsistent audio levels.

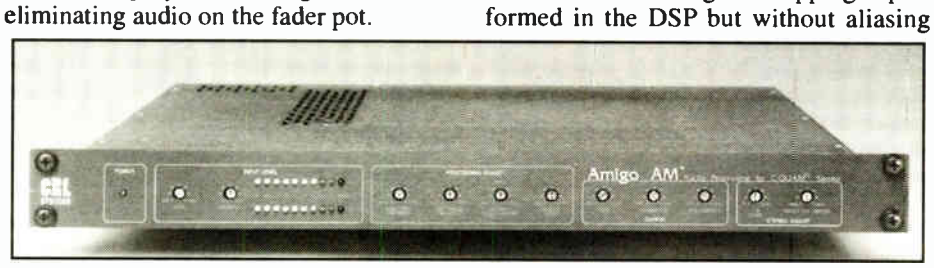
For AM stations, the main obstacles to achieving loudness were tilt and overshoot caused by iron core components in the modulator sections. For FM, loudness was hindered by overshoots created in the pilot filters of the stereo generator.

Early audio processors such as the Collins 26 series limiters, StaLevel, Level Devil, CBS Audimax and Volumax were classics. A revolution in audio processing came about with the introduction of the Dorrough DAP 310 tri-band processor; no longer would bass pump the entire audio envelope. Time constants for each audio band could be tailored to produce a consistent, undistorted sound.

Various technologies have since been employed in analog processing. The advent of the Voltage Controlled Amplifier chip revolutionized processor design. Early analog designs depended on rectifying a portion of the processor output and feeding the DC to a transistor, FET, LDR or other device. The VCA allowed a "feed-forward" approach.

The feed-forward design allows sampling of the input signal to obtain control voltage. This is possible due to the linearity characteristics of the VCA. VCAs now are employed in mixing consoles for eliminating audio on the fader pot.

Cutting Edge manufactures the new Omnia.fm digital audio processor. "People who put the Omnia on the air can't believe it's digital, not analog," said Foti. The secret to Omnia's sound is in the Digital Signal Processor (DSP) stage. "We have developed a proprietary DSP algorithm," said Foti. "All the hard audio work such as limiting and clipping is performed in the DSP but without aliasing distortion. When using DSP, you can get into trouble quickly unless great care is taken in the design stage."



The Amigo AM Processing System

Today, the trend in audio processing is digital. According to Frank Foti, president of Cutting Edge Technologies, "People's expectations of digital is a reality. They want digital, but without the digital grunge sound. We have addressed this. My design criteria is that we'll go digital, but without the grunge."

Cutting Edge has discontinued its Unity 2000 product and replaced it with the Omnia line, though it will continue to support the Unity 2000 line. The Omnia.am is under development. The Omnia.dab, a digital processor specifically dedicated to DAB broadcasting, is on the air in Portugal and further European sales are expected.

Bob Orban, chief engineer of Orban, sees "a greater emphasis on cleanliness and quality ... loudness is not getting them where they need to go ... grittiness is not intrinsic to digital." He stresses the importance of converter setup and ensuring that no clipping takes place. "Don't take digital as a panacea," said Orban.

Bob Orban was responsible for the FM on-air processing revolution with the design of the Optimod 8000. Its main feature was the lack of overshoot in the pilot filtering stage, which easily produced a gain of 3 db of loudness. The current Optimod line includes the 8200 and 2200 digital FM processors. Additionally, there are several analog 8100 Optimods in use worldwide.

Orban debuted its model 9200 digital AM processor last year. "(It) has been very well received," said Bob Orban. Most people have been very pleased with it." The 9200 is only available in mono. "People never really became aware of AM stereo as a product," said Orban.

As for digital processing in general, "People are thinking digital. In terms of

See PROCESSORS, page 64 ▶

In This Issue

Our focus in *Buyer's Guide* this month is on-air and audio processing, a topic dear to the hearts — and ears — of radio people.

Radio World User Reports are back by popular demand. These product reviews, written by your industry peers, will help guide you in choosing the best equipment for your purposes. Our hope is that these reports, to be found in each edition of *Buyer's Guide*, will serve as a useful tool.

Also in this issue, Tom Osenkowsky checks in with an informative overview of what's going on technically in the highly competitive world of on-air processing. Tom speaks with manufacturers and engineers for their insights on the processing landscape.

If you have suggestions, or if you have recently purchased a new product you'd like to tell us about, let us know. Send e-mail to *bgalante@imaspub.com*

— Brian Galante

USER REPORT

Con/Air: A Solution For On-Air Monitoring

Frank Giardina

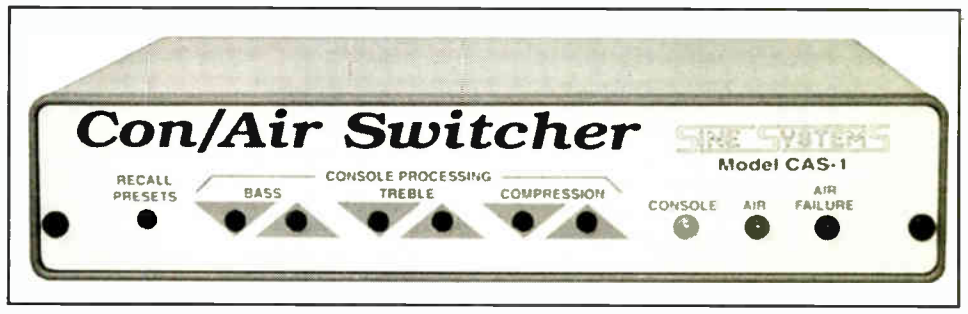
In the radio business, a change in site can be an opportune time to bring in some new equipment.

During the first quarter of 1998, WZRR(FM), one of the six Dick Broadcasting stations in Birmingham, Ala., moved to a newly constructed 700-foot tower and new transmitter building on Red Mountain. We took this opportunity to install a new Continental transmitter utilizing the new 802D digital exciter. We also installed a new digital audio processor in the air chain.

As with most stations, the air talent uses a feed from the modulation monitor for the monitor speakers and headphones. I knew beforehand that the slight delay introduced by the digital processor and exciter would not be noticeable until the talent opened the mic and began to talk.

At that time, the air feed with the delay, coupled with the talent's own bone conduction of the voice to the ear, would be out of phase and cause real problems. Believe me, it's noticeable; just try talking into a mic with a delay coming back through the headphones.

The simplest solution is to have the talent monitor off the program feed of the board. However, problems exist with this as well; no processing is heard. If your staff is accustomed to hearing their voices run through processors, they won't enjoy this approach. In addition, without a split headphone and speaker feed, they will not be able to tell if something is wrong on the air.



The Con/Air Switcher From Sine Systems

A relay, either solid state or mechanical, coupled to the mic switch will work, but the processing problem must dealt with anyway. Using an old processor in the board feed coupled to the relay and then adjusted to the talent's liking is another solution. If you are blessed with a morning show that is mostly talk, then you will have to make arrangements for off-air and silence sense warning.

Recently, I learned of a new product being offered by **Sine Systems** of Nashville that was designed to solve the problems encountered when digital processors, exciters and STL links are used. These are the same people who introduced low-cost dial-up transmitter remote control and a variety of other studio and transmitter, monitoring and control products. The unit is called the Con/Air Switcher, or CAS-1.

Discovery zone

The Con/Air Switcher takes your air feed along with a program line feed free of delay, but the microprocessor-based unit does plenty more. Not only does the CAS-1 contain a noiseless switcher, but it also has adjustable equalization and compression applied to the program line feed. The simple setup procedure consists of adjusting the EQ and compression while the unit is keyed to approximate the sound that is heard from the air feed. It even has memory positions for the EQ and compression settings that can be recalled.

See CON/AIR, page 69 ▶

World Radio History

USER REPORT

Omnia Poised on the Cutting Edge

Mike Callaghan

The **Cutting Edge** Omnia.fm produces a new benchmark in FM processing.

Few things matter more to program directors than the sound of a station. They work hours to get the music mix as perfect as possible, and then rely on us, the engineers, to achieve the best in processing before it goes on the air. Unfortunately for them, and fortunately for us, we don't have to listen to dozens of new hits each week to fill our end of the bargain.

Mike Dorrough introduced multiband processing, the emphasizing (and separate processing) of each of the frequency bands. The result was a wide, fat sound, even from wimpy-sounding records. The principle of multiband processing was simple to understand, and that simplicity sold a lot of processors and made Dorrough well known in the radio industry.

Today, things are different. The principles ingrained in the various processing systems are much more complex. And since the advent of DSPs and the new toolbox of algorithms they offer, the science of processing has become even more transcendental and mysterious.

As complicated as processing is, the result is easy to judge: What sounds best? Trying to explain multiband processing was hard enough, but today's processing is inexplicable.

Invariably, the bottom line ends up being the same in 1998 as it was in 1968: What's the loudest? What makes the most records sound the best on the air? Can we be the loudest station on the dial? Most important, can we be loud without scrunching up the music and driving away listeners?

These questions have been addressed by Frank Foti, president of Cutting Edge Technologies, in the new Omnia.

Not only does the Omnia.fm bring a new level of clarity and smoothness; it does it consistently, reliably and with ease.

Assets aplenty

The first thing you notice about the Omnia is its look. There is no boxiness to its front panel. Smooth curves and pleasing appearance make it look exciting even before you unpack the power cord. The two controls forecast an easy and intuitive user interface; this rings true when you start through the manual.

A jog wheel and a push button are all that's needed to step through the Omnia's capabilities.

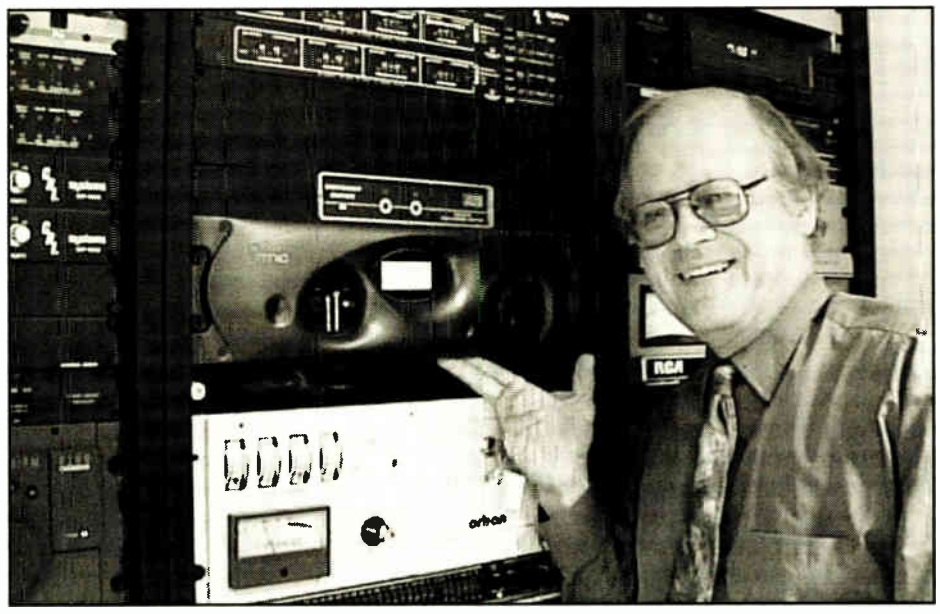
The audio interface has all the options you could need. Ins and Outs are not only the conventionals, but Foti has developed a new 'Direct Digital' output that allows direct driving of the modulator stage in the exciter. It's not AES/EBU or fiber-optic — it's something even better. At present, this precludes having the Omnia and the transmitter apart from each other, but QEI, maker of the CatLink, promises to have a pair of modules shortly that will allow separate operation.

For those that trust numbers and specs more than their ears when evaluating processors, the Omnia features Four-Band, Phase-Linear, Dynamically Flat, Time-Aligned Crossovers. The Omnia has virtually eliminated the artifacts when the outputs of the four bands are recombined. This problem has historically plagued multiband processors from their onset.

The Omnia Stereo Encoder uses an all-digital. numeric implementation to produce stereo separation better than 65 db 38 kHz. Suppression exceeds 75 db down. If your program director really wants to go crazy, the built-in composite clipper precedes the 19 kHz pilot insertion, avoiding the 'bobbing pilot' reading on the modulation monitor. Stereo noise is better then 80 db down, system distortion is less than 0.017 percent. Input impedance is 10.5 Kohms balanced. Maximum Input Level is +24 dbu. Minimum is -10 dbu, so you may need a line amplifier if you have no choice but to use 15 kHz phone lines.

As one would expect, the unit arrives with a number of bodacious presets that can serve as starting points for your particular processing recipe; you and the program director can start off sounding great, and things just get better from there.

Foti's experience as a "guerrilla" type of engineer are evident in these features:



Mike Callaghan shows off his Omnia.fm.

• A simple Web server built into the system provides a rich graphical interface to show what the processor is doing, as well as allowing repeatable and super-easy adjustment changes.

• Two levels of control are available, based on your experience and familiarity. This is like providing a pair of training wheels to get you off to a fast start while still offering an advanced interface for the ultimate in fine tuning.

• A "Thunder Boost" circuit introduces up to 12 db of wall-shaking thunder. More than just an EQ circuit, this uses low-end time alignment to add clean bass response without sacrificing loudness. Note that not all exciters can handle this boost; you *must* have a dual-speed PLL in the AFC loop of the exciter or it will unlock with embarrassing consequences.

• A headphone jack on the front panel. What a concept! Now you, too, can hear the air signal in the transmitter room despite the *de facto* wind tunnel running inside most of them.

• Daypart Automation. Everything has a clock in it these days, and the Omnia is no exception. Change the way things sound at night! Drop the highs to keep those female listeners when you know they're listening.

The only thing that keeps the Omnia from being totally plug-and-play is the need for a line amp at the input. The KIIS-FM Studio Switcher is passive; we input +8 from the studios, and get –20 or so at the output. While most earlier processors were happy with equalized phone lines at that level, the Omnia needs more. A simple ATI line amp filled the need. We use the composite output with a CatLink, which will be upgraded to the Direct Digital system as soon as it is available.

The Omnia is easy to use and set up. The manual is well written and easy to follow.

The Cutting Edge Omnia has been an extremely important part of the KIIS-FM sound for over six months. We've continued looking at other processors, but nothing has come even close in providing the full, rich, competitive sound we use to tantalize our listeners.

■■■

Mike Callaghan is the chief engineer at KIIS-FM/KXTA(AM) in Los Angeles, the founder and owner of Vital Sounds Co. and a former college instructor. Reach him via ***RW****.*

For more information, contact Cutting Edge Technologies in Ohio at (216) 241-3343; fax (216) 241-4103; or circle ***Reader Service 161.***

TECHNOLOGY UPDATE

Alesis

The Wedge from **Alesis** represents a new approach to reverb and ambient effects. Its design allows the user to place it directly on the console in the center of the mix for complete processing control. The Wedge uses an adavanced DSP chip, operating at over six million instructions per second. It provides the most detailed reverb processing ever offered by Alesis.

Editing reverb parameters on the Wedge is done via four smooth-control sliders and a menu that allows the user to fine-tune all sound details. Additionally, the Impulse Audition button sends a full-spectrum audio burst through the Wedge reverb to set up effects with no coloration.

The Wedge features quarter-inch TRS inputs and outputs as well as full MIDI implementation for automated modulation control and program backup.

For more information, contact Alesis in California at (800) 5-ALESIS, or circle ***Reader Service 187.***

Aphex Systems

The 2020 FM Pro digitally controlled FM audio processor is the latest addition to the **Aphex** radio processing product line.

The FM Pro provides sound designers with the tools to create an on-air sound for a specific market and format. The unit is programmable and remotely operable, and can be automated for each daypart.

The FM Pro is modular and can be upgraded. It provides analog stereo inputs and outputs, the patented Aphex Frequency Discriminate Leveler, a multiband processor, bass processor, peak limiter and a digital remote control. The unit incorporates technology from several Aphex patents, including Easyrider compression and Peak Accelerated Compression algorithm. There are also six patents pending for new technology designed for the FM Pro.

The FM Pro has 16 user-programmable read-write presets for instant manual or automated recall as well as eight read-only presets that simplify start-up use on a variety of formats. Intuitive menu-driven controls allow easy front-panel operation, and use of a computer and RS232 cable permits users to control and monitor every parameter from almost any location.

For more information, contact Aphex Systems in California at (818) 767-2929; fax (818) 767-2641; or circle ***Reader Service 213.***

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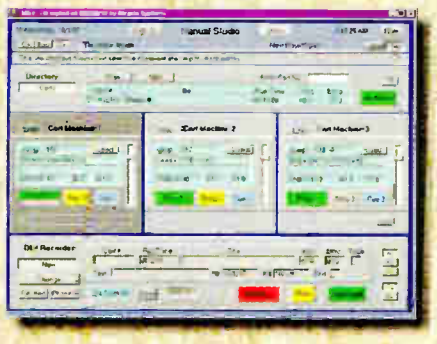

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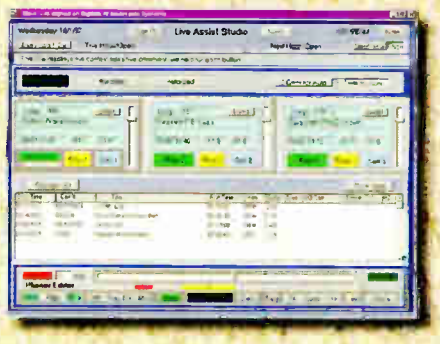

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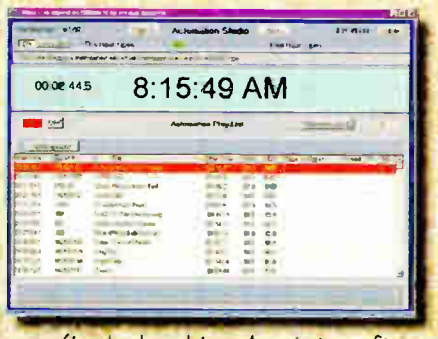

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World Radio History

Processor Choices for All Formats

▶ PROCESSORS, continued from page 61

unit-to-unit monthly sales, the 8200 is outselling other analog Optimods in the past," Orban said. Another advantage of digital processing, said Orban, is the ability to daypart and repeat control settings.

Orban, too, has its eye on DAB. A model 6200 DAB unit was shown at NAB '98 in a preview form. According to Marty Acuff, audio processors product manager for Orban, "We expect to ship in fall '98. The intended market is Canada, Europe and Asia." Acuff expects the 6200 to be applicable to in-band, on-channel DAB in the United States once a system is in place.

Quality of control

Bill Ammons, national sales manager for CRL, said "On the FM side, the loudness war escalated with the introduction of new devices. Most CEs want more control over parameters. How much control do you give somebody?"

Ammons raises an interesting point. In older analog processors, the most frequent change involved the release time resistor. With digital, parameters such as attack and release times, crossover frequencies, band input/output levels, gating, clipping, and many others can be controlled by software. No component changes are necessary. Too much control in uninformed hands can produce a poor on-air sound, while too little control can hamper the knowledgeable engineer in attaining the desired sound.

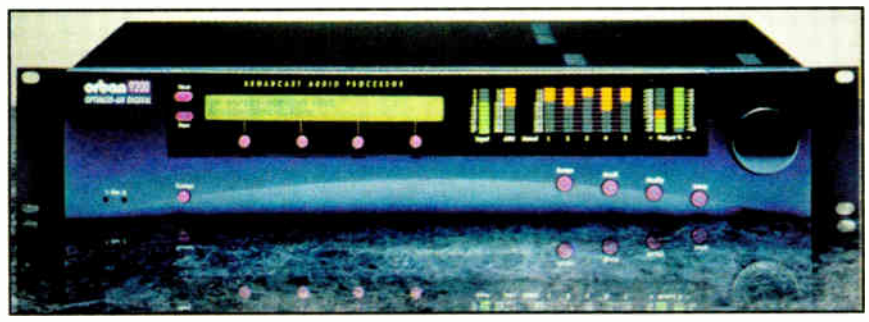
According to Ammons, the DP-100, CRL's digital processor, is a good seller. "The FM Amigo is a top seller also. It's less expensive and simple," said Ammons. Feedback from customers allows software upgrades and even custom software for its DP-100.

"There is a certain fixed cost for building a digital processor. It's cheaper now than to build it analog," said Ammons. With the cost of DSP chips decreasing, users can expect lower prices in the future. "Digital makes sense if you want high quality," said Ammons.

"Unfortunately, people are looking for maximum loudness and consistency cut-to-cut," said Marvin Caesar, president of Aphex Systems.

Radio people are familiar with the Aphex Compellor, Dominator, Aural Exciters and EasyRider. Last year, Aphex debuted its model 2020 digitally controlled FM processor.

About the 2020, Caesar said, "By maintaining an absolutely pristine audio path, we've been able to keep the audio not grungy. We have no digital grunge. All processing is performed in the analog domain, thus no digital artifacts. In the model 2020 we employ processing algorithms that are very musical, yet loud. The strong point is a deep, defined bass."



The Orban Optimod-AM 9200 Digital Processor

According to Caesar, some of the algorithms employed in the Compellor were used in the 2020. He said that several hundred 2020s are in the field. Caesar also said producers at one of the world's most popular TV talk shows use a 2020, as did engineers at the Super Bowl and Nagano Olympic Games.

"The 2020 isn't a one-trick pony," said Caesar. "It has been used on classical, jazz and hard rock stations."

A relatively new entrant into the transmission processing arena is DBMAX from TC Electronics. According to Ed Simeone, managing director for TC Electronic North America, "Many people were using the Finalizer for on-air processing. We realized that there was a market for a product tailored specifically for on-air processing. It kind of happened organically."

The Finalizer is a three-band product primarily intended for post-production and CD mastering. Hence the birth of the DBMAX, intended as an on-air broadcast audio processor. The DBMAX features five bands of processing, extensive user control, selectable pre-emphasis for FM, gating, compression, limiting and EQ.

Simeone claims that 300 to 400 DBMAX units are in use worldwide, especially catching on in Europe. "The European market is very standardized," said Simeone. "When a government or broadcast company decides on a unit, they buy 25 to 50 at a time."

After extensive field testing, the DBMAX has been released in the United States. This model is Version II, revised with 24-bit processors and upgraded from its original three bands to five bands.

Jim Wood, president of Inovonics, said, "We see a trend in one area of the market to buy the most sophisticated, expensive audio processor. Then there is another segment that is looking for something more reasonable." NAB '98 saw the debut of the Inovonics 235 AM processor. The 235 features AGC, three bands of compression, plus a final limiter and clipper. It is slated to begin shipping in July.

Inovonics' top seller is the DAVID II FM combination processor and stereo generator. It features AGC, limiting, bass enhance circuit, compression and composite clipper. Also popular is the 250 processor, with five bands of compression, AGC, and two bands of limiting.

"With the eventual reality of digital radio, it's a shame people are still on this loudness kick. With digital radio, that's not really necessary. This loud-is-good attitude is unfortunate," Wood said.

... Out with the old

Another perspective on on-air processing trends comes not from manufacturers but from equipment dealers.

Jack Conners, sales engineer for dealer Audio Broadcast Group in Grand Rapids, Mich., said, "The move to digital is the big thing. People want a complete digital path." He also claims more digital than analog processor sales at present.

"The Orban 8200 and CRL DP-100 are good sellers," said Conners. "There isn't much call for analog processors for FM ... depending on the situation, loudness is not as important as cleanliness."

What about the end user?

"Loud is good as long as it's clean," said Russ Mundschenk, chief engineer at WBEB(FM) in Philadelphia.

"Every processor has its own signature. Maintaining a complete digital path is very important," said Mundschenk. "Being able to return to a known starting point is a clear advantage of digital. Trying to repeat a screwdriver adjustment is nearly impossible." He also praised the ability to adjust a processor by remote control; i.e., by a laptop in a real-world listening environment.

Pete Partenio, chief engineer at Y-107 in New York, said, "We're seeing a lot of digital boxes. DSP-based processing needs to be a little more powerful. Digital boxes don't seem to sound right." Partenio uses the Aphex 2020 in New York and at sister stations in Chicago and Los Angeles. "It's the only processor that has real bass. It's the processor I always wanted," said Partenio.

On-air audio processing has come a long way. Digital appears to be the future. Loudness or quality? You can have both, but so can your competitor. There are many quality on-air processors on the market. Use them wisely.

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TECHNOLOGY UPDATE

Eventide

Eventide has unleashed another in its popular line of Harmonizer effects processors: the Ultra-Harmonizer DSP4500.

The new unit combines the features and software of the Eventide 4000 series models: the original DSP4000 studio model, the GTR4000 GuitarPro Ultra-Harmonizer, and the DSP4000B broadcast unit.

Additionally, the DSP4500 includes the Alchemy 101 library, a collection of 225 program presets from sound designer Scott Gilfix. In all, over 1,000 program presets are included as a standard in the DSP4500.

Also included in the unit is a versatile 87-second internal sampler. Sounds captured by the sampler can be combined within many DSP4500 presets. Advanced stereo looping and multiple looping capabilities are provided as well.

The DSP4500 features an advanced effects module architecture which allows users to create up to 147 personal effects. Creation of new user programs is aided by use of free Eventide full-screen graphical PC software.

For more information, contact Eventide in New Jersey at (201) 641-1200; fax (201) 641-1640; or circle ***Reader Service 136.***

World Radio History

USER REPORT

DBMAX: 24-Bit Audio Processing

Gary Baldassari

The **t.c. electronic** DBMAX provides a solution at the end of the broadcast air chain or production audio chain. Broadcast audio transmission and its associated chain no longer have to be thought of as just equalization, compression and limiting. The era of full bandwidth multi-level processing is here and is presented for use by t.c. electronic of Denmark in the 24-bit digital audio box known as the DBMAX.

The DBMAX springs from the company's $12,000 model M5000 dual DSP digital audio mainframe. Its ToolBox / MD2, which can be time-tuned to a processing delay of 0.8 ms, was the start of this broadcast process. In December 1995, the mix team of Steve Weber, John deRussy, and Gary F. Baldassari used Toolbox / MD-2 live to ABC network for the Walt Disney World "Very Merry Christmas Parade." The audio portion of the broadcast received an Emmy nomination.

The DBMAX 24 Bit Digital Audio Processor

Since that eventful show, we have been in regular contact with t.c. design engineers to give some small input while t.c. created a stand-alone device that fits into a single RU space. It has been released as the DBMAX for less than $4,000.

Your way, right away

What is 24-bit live audio processing? In the case of the DBMAX, it means a broadcast optimizer and post-production and mastering processor.

Before we get to the nuts and bolts of the device, I would like to impart this secret to making it work. Adjust the compressor attack and release times to a slow, peak-immune speed, then lower the threshold into constant processing. If the limiter attack and release times are set very fast while maintaining a threshold just above the peak signal, the DBMAX has the ability to separate, add space and draw sparkle from any input source.

While increasing the separation of sounds, it will provide a warm and powerful sound quality. It is also important to achieve the cleanest and lowest possible fundamental in any production.

The input power auto-ranges from 90 to 240 VAC. The backup battery should last 10 years. There are control interfaces for RS 485 I/O on a five-pin DIN, MIDI In/Out/Through and a GPI. Pedal and fader inputs are provided on a quarter-inch phone jack.

In and out

The front panel includes two rows of eight buttons, an "OK" button, a rotary dial, power on/off and a Help button. Each line of eight buttons controls utilities or parameters and the operational patterns are easy to learn.

The analog I/Os are on balanced XLRs. The maximum input and output levels are +22 dBu. The A/D and D/A converters are 24-bit with an input delay of 0.8 ms and an output delay of 0.5 ms at 48 kHz. The dynamic range is just better than 103 dB unweighted and the DBMAX has a frequency response of 10 Hz to 20 kHz. Both AES/EBU and S/PDIF digital I/Os are included, and are controllable on In Page 1 of the DBMAX menu. There you will also find a sample rate converter.

User controllable

Sample rates are selectable at the standard frequencies of 32, 44.1 and 48 kHz. The total processing delay is controllable by the user from 0.208 to 416 ms.

There are very useful filters on the In Page 2. Input low frequency filter is selectable from DC to 200 Hz. Each step from 80 Hz down to 2 Hz has the ability to find and define a pure fundamental while cleaning up the hum and noise below. There is also a selectable high cut at 15 kHz on input and output.

From the options that follow the input, the user can select any series of seven DSP functions. These selectable devices — such as a three-band parametric equalizer with dual shelving equalizers at each end — can be installed in any order or bypassed completely.

There is also a normalizer available that can squeeze enough acoustic power into any broadcast. The tunable dynamic equalizer has the ability to notch out a referee's whistle while leaving the announcer's words almost untouched. This is done again by making the dynamic equalizer fast while keeping the compressor slow.

It is important to achieve the cleanest and lowest possible fundamental in any production.

The dynamic equalizer can also be used on music to remove a snare drum ring or to create a new sound by "hole-punching" a very narrow portion of any sound. Start all functions in Bypass mode and engage each separately to hear their sonic function. As the need arises, one button re-engages each on the fly.

Feature attraction

Now, the five-band expander/compressor/limiter. Each of the five bands in this section has separate adjustments for threshold, range, attack, release, ratio, hold and level. Each stage has a slightly different set, but they are all similar.

For example, in the limiter section, you can turn on one, two or all five bands if you desire. The expander can be dealt with as a selective noise reducer. The ratio of expander/gate can be tuned from infinite to off, and across all five bands. Start with the expander on very fast attack, a three-second release and a threshold of -55 dB.

All bands are variable. You can install an expander/compressor/limiter or any combination from 100 Hz to 250 Hz or 630 Hz to 1.6 kHz. This allows audio surgery in post-production and provides the ability to minimize hums and noise in narrow bands in a live situation.

Digital compression works by squeezing the lower-level sounds up to where the louder sounds are. It tends to leave the peak intact. By sloping reverberant harmonic "air" upwards to meet the untouched peak fundamentals, the user gets the impression of a clearer and brighter sound. There is an adjustment that affects each of these parameters in the DBMAX.

CD quality

Engineer Pearlie Hammers used the DBMAX for live gospel mixes for Dr. Bobby Jones Gospel shows on the Black Entertainment Television cable channel. Every record executive that

See DBMAX, page 71 ▶

Arrakis Studio Furniture systems are #1 with over 1,000 sold !

The Master Control Studio, shown right, is one of seven Arrakis studios in Sony's Manhattan network origination center for SW Networks.

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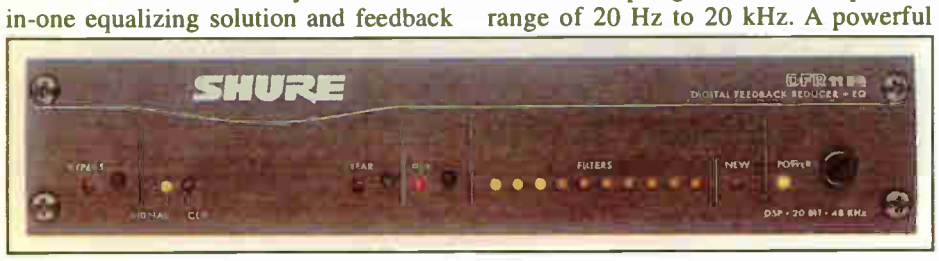
World Radio History

TECHNOLOGY UPDATE

Shure Brothers

Introduced earlier this year as a two-in-one equalizing solution and feedback reducer, the DF11EQ digital feedback reduction system from **Shure Brothers** is now offered with Version 4 software.



Among the new capabilities the upgrade brings is an expanded equalization section, offering a choice of a 30-band, constant-Q graphic EQ or a 10-band parametric unit. Both EQs include high- and low-pass filters.

The DFR11EQ features a 24-bit signal path, 20-bit A/D and D/A converters, a 48 kHz sampling rate and an operable range of 20 Hz to 20 kHz. A powerful DSP processor governs the operation of the unit. Feedback reduction is done by automatically identifying offending frequencies and activating one of ten 1/10-octave adaptive notch filters. The DF11EQ occupies only one-half RU.

For more information, contact Shure Brothers at (847) 866-2200; fax (847) 866-2279; or circle Reader Service 188.

Symetrix

Symetrix offers the 628 Digital Voice Processor to meet the needs of on-air and live performance voice talent.

The 628 combines a premium mic pre-amplifier, 20-bit A/D and D/A converters, de-esser, expander/gate, compressor and parametric equalizer into a single rack-space unit. The new voice processor also combines digital signal processing and an analog-like interface with the power of factory and user-programmable presets.

The 628 was designed as a voice-only processor, with the realization that voice and mixed music require different design philosophies. The control complement is simple — Threshold, Ratio and Release — but each has been optimized for voice work. The 628 is a compressor that can tightly control gain from hard compression to gentle level control with minimal or no side effects.

Three overlapping bands of digital parametric EQ enhance the processing power of the 628. The equalizer can simultaneously cut interference, boost low frequency range, cut mid-range grunge and brighten a dull, muddy voice.

For more information, contact Symetrix at (425) 787-3222; fax (425) 787-3211; or circle Reader Service 214.

Radio Design Labs

The ST-CL1 "Stick-On" compressor/limiter from **Radio Design Labs** is designed for broadcasters looking for positive audio level protection.

Featuring multistage incremental gain reduction, this circuitry samples the audio at different rates and levels. Each stage of gain reduction preconditions the audio for the next gain reduction detector. Tailoring the audio for each subsequent increment of gain reduction, together with interactive release-time circuitry, produces nearly inaudible operation.

With fully automatic operation, the ST-CL1 also features tight audio peak control and a low-noise compressor as well as a select average/peak or peak-only control.

The ST-CL1 has an input signal range of -10 to +4 dBu for 6 dB gain reduction, a balanced output signal range of -1 to +8, and unbalanced output signal range of -10 to -1 dBu.

The typical attack times are 500 ms for compression, 500 us for fast compression and 100 us for peak compression and limiting. Release time automatically adjusts from 1 ms to 500 ms.

For more information, contact Radio Design Labs in California at (805) 684-5415; fax (805) 684-9316; or circle Reader Service 137.

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Circle (51) On Reader Service Card

World Radio History

HARRIS DRC 2000 DIGITAL RADIO CONSOLE

Future-Proof Your Operation.

Take your radio operation to the next level with the Harris DRC 2000 Digital Radio Console. It delivers the next generation in state-of-the-art capabilities.

The DRC is famous for not only meeting, but exceeding the expectations of broadcasters everywhere. It offers the world's best 5 band parametric equalizer per channel as a standard feature. Assignable per channel, the filters include: low shelf, notch, bandpass, peak and high shelf. You can even use one or all five EQs simultaneously on any input.

With the Harris DRC 2000, you get versatility beyond compare. Don't spend time reconfiguring hardware. It's completely user-configurable. With the DRC's powerful software, you can change the console to match your needs in literally seconds.

The console surface has a familiar design so that talent can learn to use it quickly. But, don't let its familiar controls fool you, the DRC provides the high level of sonic quality expected from today's broadcasters. Power comes from 32-bit internal precision floating DSP technology.

The Harris DRC 2000 Digital Radio Console now includes linking and reverb. (optional)

No matter what the future of your broadcast facility holds, the DRC 2000 will keep you "future-proofed" with its exceptional capabilities— all in an easy-to-use and install package.

Unique Harris DRC 2000 Benefits

- Linking allows expansion of the console or multiple studios to be linked together
- Reverb (optional)
- Dedicated "dump" button for use with delay option
- User-definable fader layout which allows any input to be assigned to any fader
- EQ, gating, pan and compression functions that can be assigned by channel and set-up
- Built-in mix-minus

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World Radio History

USER REPORT

Upgraded Optimod Assists Station

Terry Grieger

With more than 40 signals to compete against in the Los Angeles radio market, we here at KKBT(FM) are always looking for new ways to keep our audio signature distinct and competitive. After five years of continuous use of the **Orban** Optimod 8200, we began investigating new or updated products that would aid us in our quest.

After reviewing many products on the market, we found the Version 3.0 software upgrade for our existing Optimod 8200 did everything we required and more.

The main features of the Version 3.0 upgrade include 21 completely new format-specific presets and adjustable parameters such as ± 3dB adjustable output balance on the five-band compressors; phase rotation on/off; adjustable bass clipper threshold; control of AES/EBU status bit to accommodate digital STLs and adjustable high-frequency coupling of the third and fourth compressor bands.

Installation of the upgrade is simple and takes only a few minutes. I highly recommend using the included PC software to back up your current Optimod configurations just in case.

Next, turn off the power to the 8200, open the front cover, remove the control card and replace the software module. When done, reinsert the card and turn the power back on. All custom settings will be saved and converted over to the new Version 3.0 format. Only the original presets are replaced with the new factory versions.

Here are some of my observations on these new controls. The compressor output mix controls provide the user with "sonic color" controls. This gives the user a means to color the station's sound differently than the competition, even if they have an 8200.

The bass clipper threshold control creates a more solid bass punch — ideal for urban and dance formats. Because our station tends to process less aggressively than others, we have more control over the bass without having to overly process the rest of the audio.

The phase rotation on/off control allows the user to defeat this function, which was previously always on. I found this to be a subjective control that required a lot of listening to evaluate. Certain instruments tended to sound slightly less defined with the phase rotators turned on. With this control off, I find most string sounds to be more natural. The tradeoff is that many asymmetrical male voices are audibly distorted.

When turning off the phase rotators, I recommend using a microphone processor that has phase rotation in it or to use the design supplied by Orban with the Release 3.0 software to build your own.

The Band 3 - 4 coupling control is quite interesting, as it finally offers a solution to what has been erroneously called "that digital sound." A consultant and long-time friend of mine has often complained about the excessive high-frequency density of the Optimod processor, blaming it on the unit's 32 kHz sample rate.

To begin with, the device's output clipper always has been oversampled at *128* kHz, which is how the unit achieves the absolute peak control it does. Another product we tested did not provide such accurate peak control, nor did it interface with our 32 kHz digital STL without gross amounts of overshoot. This overshoot required an external clipper to achieve competitive loudness.

So what exactly is that "digital sound" many people complain about? Simply a result of the Optimod doing what it was told to do — dynamically equalize for high-frequency deficiencies. It has nothing to do with sampling rates. As long as the source material is clean, everything is fine. But if the material is high frequency-deficient and the highs that are there are distorted, the Optimod only does what it is told to do and accentuates the source problem.

The Band 3 - 4 control couples an adjustable percentage of the Band 3 gain control signal into Bands 4 and 5. This forces both bands to follow the gain reduction applied to Band 3. Because Band 3 has a slower release time than Bands 4 and 5, it can result in a more open high end by limiting the amount of dynamic equalization. When this happens, the synthetic high-frequency density is prevented. This should be of great interest to easy listening stations or those broadcasting poorly produced material.

This firmware upgrade packs new punch into an already versatile product. In our tests, we found that there is still no other digital or analog FM audio processor with the sonic and technical performance of the Optimod 8200. I would recommend it to anyone looking to take their audio to the next level.

■■■

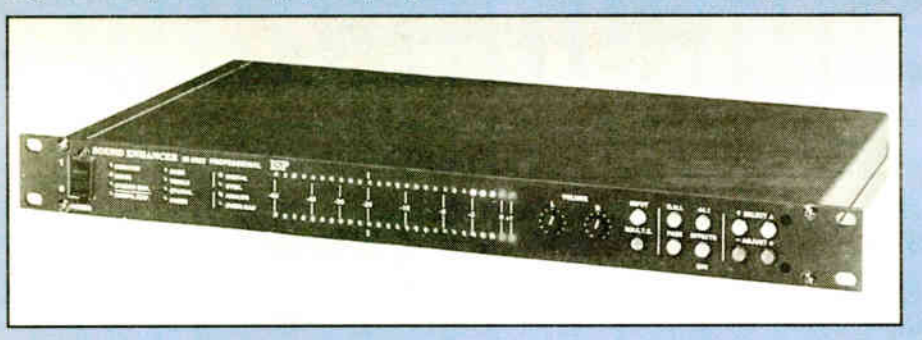
Terry Grieger is the chief engineer of Chancellor Media's KKBT(FM), "92.3 The Beat" in Los Angeles.

For more information from Orban in California, call (510) 351-3500, fax to (510) 351-0500 or circle ***Reader Service 174.***

TECHNOLOGY UPDATE

Superscope Technologies

Superscope Technologies offers the IS5022 and IS5021 Digital Sound Processors, incorporating a wide range of technologies from Philips and offering versatility in creating quality digital recordings.



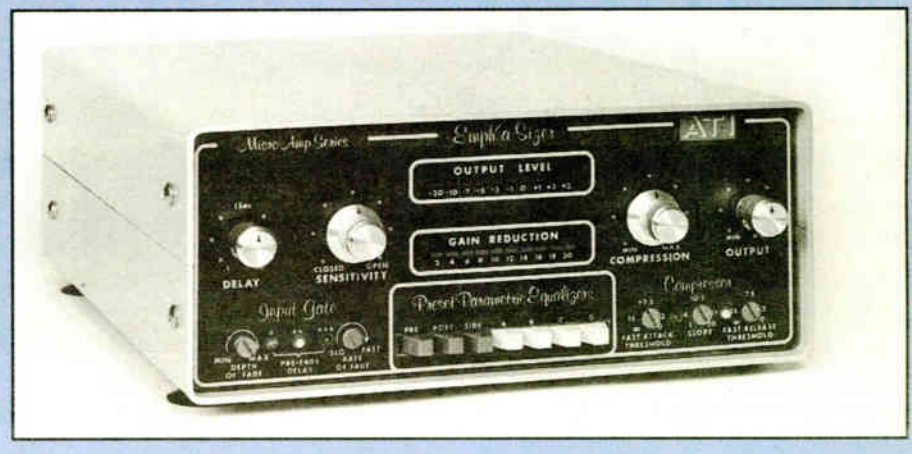
Both models include a digital sound processor, A/D and D/A converters and a sample rate converter in a compact, user-friendly package. Both models are designed for recording, post-production, playback, duplication and broadcast applications.

Quantization Noise Imaging improves 16-bit audio signals by moving outside the audible range. Compression and expansion functions allow further enhancement of the audio signal. Compression reduces the dynamic range for recording from digital to analog, while expansion increases the dynamic range of the source material to its maximum.

Both the IS5022 and IS5021 offer a comprehensive set of digital processing features, used in enhancing older tape and vinyl recordings. Sharp clicks and artifacts on vinyl recordings are detected and noticeably reduced. Random noise and tape hiss can be eliminated with the adjustable 6 to 16 kHz low-pass filter.

For more information, contact Superscope Technologies at (630) 820-4800; fax (630) 820-8103; or circle ***Reader Service 163.***

ATI Audio Technologies Inc.



The EM1000 Emph'a Sizer from **ATI** features a low-distortion compressor-limiter designed around a pro audio, 100-dB range low-noise monolithic VCA.

High headroom capability allows the VCA to handle maximum inputs without input attenuation, thereby achieving maximum signal-to-noise performance on low-level inputs.

The compressor normally operates in a slow-acting, minimum distortion mode. Fast-rising or decaying signals independently trigger either "fast-attack" or "fast-release" operation only when the signal exceeds adjustable dynamic thresholds set around the operating level.

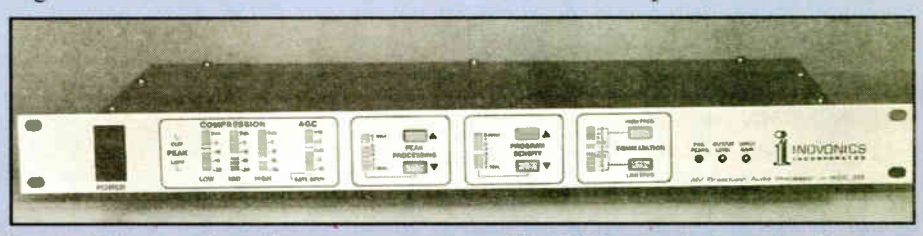
The fast-time constant networks are switched off as soon as the output signal is brought within the allowable preset dynamic range. This approach to compressor-limiter design allows tight control of peaks while minimizing the distortion generation due to LF signal modulation.

The compression level is adjustable upward from minimum inputs of -55 dBm mic levels or -15 dBm line levels.

For more information, contact ATI at (215) 443-0330, or circle ***Reader Service 189.***

Inovonics

The 235 AM Broadcast Audio Processor from **Inovonics** is a "complete air chain" for AM stations striving for market dominance without jeopardizing sound quality.



The audio connection to the processor is on a removable rear barrier strip. Processing begins with a slow, gain-riding, gated AGC that erases long-term input-level variations. Along with the pre-emphasis network is a three-band compressor with boost and cut capabilities for high and low equalization.

The 235 incorporates peak processing that controls the interaction between limiting and clipping for maximum signal density. After dynamics processing, audio is fed into a patented overshoot-compensated, low-pass filter to limit the audio bandwidth to 10 kHz, per the NRSC AMAX specification.

The 235 was designed to be controlled remotely via modem, allowing a user to make adjustments to any processing parameter by calling the 235 from a PC. Engineers can listen to their stations in "real world" situations and adjust the sound appropriately.

For more information, contact Inovonics at (408) 458-0552, or circle ***Reader Service 167.***

World Radio History

Con/Air Enhances Processing

▶ CON/AIR, continued from page 61

The greatest aspect of the CAS-1 is that it compares the air audio with the console audio and can be made to alarm or switch back to air if there is a discrepancy between the two feeds. This way, your morning talk show will be warned immediately of any interruption.

Thus far, the Con/Air switcher has been a hit for us. It was installed with only two members of the air staff aware of what was happening. To this day, there are still those unaware of any changes to the headphone feed.

The CAS-1 is a switcher with adjustable EQ and compression.

If a digital exciter or processor is in your future, you will be faced with the delay issue. The Con/Air Switcher is an effective solution to this real problem.

Note: Despite the recent tragedies at Sine Systems — the death of founder John Pate and tornado damage to the company facility, as reported in the May 13 issue of **RW** — the company continues to serve its customers under the direction of employees Susan Ford and Marc Pezolla. Its headquarters are temporarily located at 1204 Demonbreun Street in Nashville.

■■■

*For more information, contact Sine Systems at (615) 228-3500; fax (615) 227-2367; or circle **Reader Service 95.***

Frank Giardina is the chief engineer of WJOX(AM)-WZRR(FM) in Birmingham, Ala.

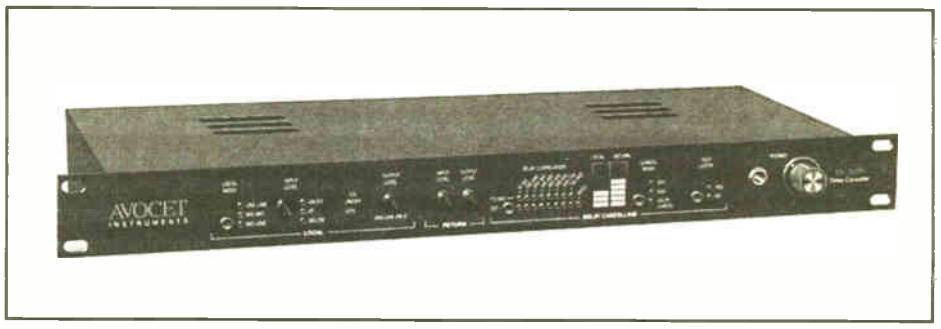
TECHNOLOGY UPDATE

Avocet

The Delay Canceller from **Avocet Instruments** removes delayed echoes of remote audio from the air or monitor feed heard at remote sites. This product earned a Cool Stuff Award from **RW** at NAB '98.

The new unit allows remote talent to use the air feed as return audio from the station, rather than utilizing conventional "mix-minus" systems requiring a dedicated path to the remote site. Used at the remote site, the Delay Canceller compares audio being transmitted to the studio with audio received back at the remote site by way of the on-air signal, satellite link or microwave path.

As the Delay Canceller recognizes transmitted audio in the receive path, it adapts to remove it. The unit can compensate for transmission delays of up to 800 ms.



The local microphone connection is a loop-through with a mic preamp and a compressor/limiter in its path. The preamp offers both mic- and line-level outputs when a mic signal is the input. The compressor/limiter offers an amount of processing to assist in removal of the sharp peaks associated with voice.

*For more information, contact Avocet Instruments in Oregon at (503) 671-9424; fax (503) 671-9626; or circle **Reader Service 215.***

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

QEI Mobile RF Systems

The new transportable RF systems from **QEI** are designed for LMA transmitter sites, emergency backup use and industrial, scientific and medical applications.

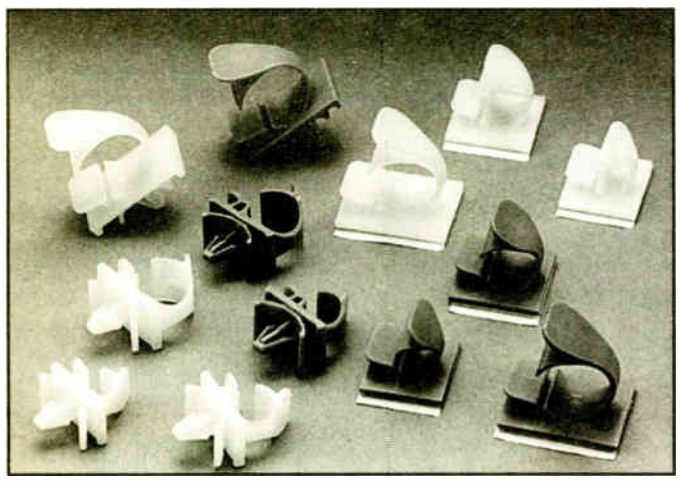
With integrated transmission components in a self-contained transportable package, stations can now consider upgrades which were previously unmanageable. Prewired and preassembled with new or existing equipment, this package allows the installation of a removable system.

The RF systems are de-signed in mobile, permanent or semipermanent units, and feature solid-state or single-tube power levels up to 10 kW. The systems are suitable for fixed-tuned and frequency-agile applications.

For more information, contact QEI at (609) 334-9154; fax (800) 629-1751; or circle ***Reader Service 138.***

New Security for Wire and Cable

Panduit has expanded its line of LWC Latching Wire Clips, designed to contain and secure wires, cable and tubing in various applications.



The Panduit Line of Latching Wire Clips

The expanded line now features six sizes for bundle diameters from 0.19 to 1.0 inch, all with releasable latches. Two mounting configurations — Adhesive Backed and Push Barb — are now available. All models use low-latching force for high-speed assemblies and high-unlatch strength for product security.

The Panduit line of LWC Latching Wire Clips are produced in ISO 9001 certified facilities. They are part of the company's complete line of wiring accessories.

For more information, contact Panduit in Illinois at (630) 990-0220; fax (630) 990-2556; or circle ***Reader Service 164.***

Rechargeable Lithium Battery Features High Capacity

Tadiran introduces the TLR 7104 Super In Charge AA rechargeable Lithium battery, featuring a 20 percent increase in capacity from previous models.

The TLR 7104 delivers 950 milliamp-hours (mAh) in comparison to the standard TLR 7103 In Charge cell, which delivers 800 mAh. The new battery also delivers an energy density 100 percent greater than Ni-Cad units and 50 percent greater than Lithium ion equivalents. TLR 7104 cells provide the capacity needed for extended running time in modern hand-held and portable devices.

The TLR 7104 Super In Charge Batteries

TLR 7104 cells feature a self-discharge of about 1 or 2 percent a month. They adapt to harsh operating environments in temperatures from -30 to +55 degrees C and do not suffer from memory effects. They also feature a patented fail-safe design, incorporating an electromechanical system to prevent hazardous events such as external or internal short circuits, overheating, overcharge and overdischarge.

For more information, contact Tadiran in New York at (516) 621-4980; fax (516) 621-4517; or circle ***Reader Service 190.***

ATI Introduces Distribution Amplifiers

Six new models of AES/EBU digital audio distribution amplifiers from **Audio Technologies Inc.** are now available in single- and dual-input configurations including

Models available are the DDA106-XLR (1X6); DDA112-XLR (1X12); DDA206-XLR (Dual 1X6); DDA112-BNC (1X12); DDA124-BNC (1X24); and the DDA212-BNC (Dual 1X12).

Levels and connectors in all models are optimized for use with balanced XLR 110 ohm cable or unbalanced BNC 75 ohm coax. Adjustable input cable equalization and multiple regenerated independent AES/EBU low jitter outputs make them ideal for demanding digital audio signal distribution requirements in large and small audio facilities.

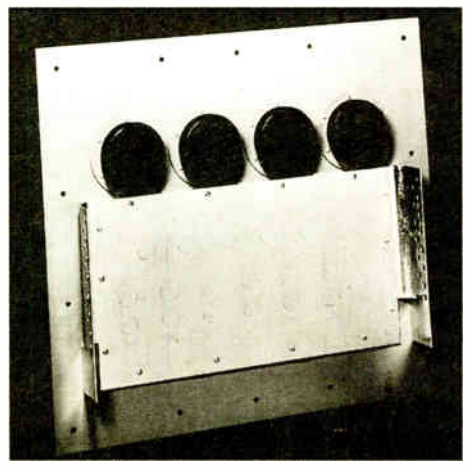
ATI Digital DAs

Sample rates from 27 to 96 kHz are decoded and cleanly regenerated. Signal status and error messages included in the AES/EBU data format are decoded and displayed to provide visual assurance of data integrity and to provide a means to optimize input cable equalization.

For more information, contact ATI in Pennsylvania at (800) 959-0307; fax (215) 443-0394; or circle ***Reader Service 139.***

New Grounding System for Transmission Lines

The Arrestorport II from **Andrew Corp.** is an improved single-unit cable entry and grounding system for RF wireless systems.



The ArrestorPort II integrates transmission line building entry, grounding and surge suppression into a single unified system. Benefits of this unified system approach include reduced installation costs and improved protection from lightning damage.

ArrestorPort II fits most common shelter openings, uses 4-inch cable entry boots for elliptical waveguide entry, and features sturdy all-metal construction. The new system accepts all Arrestor Plus bulkhead-mounted surge arrestors.

With its multiple entry ports, ArrestorPort II accommodates microwave, GPS and other applications common with current wireless systems. Surge arrestor installation or future expansion is accomplished by punching out the proper bulkhead knock-out, sized to accommodate the system interface.

For more information, contact Andrew Corp. in Illinois at (708) 349-3300; fax: (708) 349-5222; or circle ***Reader Service 216.***

TECHNOLOGY UPDATE

Broadcast Technology

The TRI-MAZE from **Broadcast Technology** is a processing package designed to meet the needs of diversified programming requirements of AM and FM radio.

The TRI-MAZE allows precise control of loudness, coloration and density as effortless as adjusting bass and treble on your home stereo. It can interface directly to the multiplex input on any stereo generator as opposed to correcting symptomatic problems associated with other processors.

The front end is a broadband AGC amplifier capable of up to 35 dB of gain reduction with low distortion and dynamic destruction. Its preprocess section can process a 10 kHz square wave burst intact.

The input section utilizes Triggered Absolute Level Expansion, which automatically determines the mode of expansion for both voice and music. An output is provided ahead of low-pass filtering and clipping to allow for implementation as a multiband AGC.

For more information, contact Broadcast Technology at (719) 336-3902; fax (719) 336-9473; or circle ***Reader Service 218.***

World Radio History

DBMAX Polishes The Mix

▶ DBMAX, continued from page 65

came to listen in the production truck commented on how Hammers' live mix sounded like a CD.

We have hardly touched on the fact that the device can hold many presets for sound quality as well as input and output engineering parameters. It also has a useful tools section that provides metering for flow, surround, PPM peak hold and a selectable tone generator for calibration and troubleshooting.

My setup is to install the DBMAX into the mix bus at the production console.

My standard broadcast setup is to install the DBMAX into the mix bus of the production console as an insert. The mixing console is arranged with each input channel inserted with an analog compressor/limiter set for light compression. These mix components are equalized and blended together.

Finally the DBMAX controls and polishes the mix. Once the initial pad, EQ and compression settings are derived, a flawless audio broadcast is achieved with a minimum of effort.

Audio desires

When my DBMAX is not used on a broadcast, it has a space in the rack at Bacchanal Bay, a mastering house running a Sonic Solutions 24-bit mastering platform. In this configuration, my wildest audio desires have been achieved. The DBMAX has the ability to reshape audio in ways other than frequency vs. level control.

We probably have only touched on 65 percent of DBMAX capabilities and these few operating tips are just a starter kit for quick understanding of its daily use. When you get your hands on one, you will find that your bar has been raised to the sky.

■■■

*For information, contact t.c. electronic in California at (805) 373-1828 or circle **Reader Service 162**.*

Gary Baldassari is director of engineering for Incorporated Magi and a mastering engineer for Bacchanal Bay in Florida.

TECHNOLOGY UPDATE

Klark-Teknik

The DN504 Dynamic Processor from **Klark-Teknik** is a quad compressor/limiter, with four channels of full-function compression occupying only a single unit of rack space.

The four independent compressors make the DN504 ideal for riding gain on four separate microphones in conference recordings and keeping levels consistent on four-track tape or digital recorders. Two such units would be required for eight-track recording.

The inclusion of hard- and soft-knee compression, plus auto and manual modes, is intended to give the DN504 the versatility to handle a wide range of applications in broadcast studios. The VCA circuit design offers low noise and distortion performance.

The DN504 has XLR-terminated, electronically balanced inputs and unbalanced outputs, with optional transformer balancing available to order. Gain reduction and output level metering are provided for each channel, as are separate sidechain inputs.

There is a stereo link function on the DN504 which provides two pairs of stereo channels. XLR connectors are fitted as standard for main audio termination.

The DN504 is just one in a line of three processors from Klark-Teknik. The 500 Series of dynamic processors also features the DN500 Dual Compressor/Limiter/Expander and the DN514 Quad Auto Gate.

The DN500 features two channels of full-function compression, expansion, limiting and peak clipping in only 1U of rack space. There is an automatic attack/release mode for inaudible compression, as well as a manual attack/release mode for creating compression effects.

A peak clipper eliminates transient overload and tracks limiter threshold for total protection, and a peak limiter with variable threshold and program-related release provides additional protection.

The DN514 includes four frequency-conscious high-performance gates in 1U of rack space. The Sync function synchronizes separate parts by interlocking all four gate release times. Additional key inputs for each channel allow triggering from external sources.

*For more information, contact Klark-Teknik in Michigan at (616) 695-4750; fax (616) 695-0470; or circle **Reader Service 165.***

World Radio History

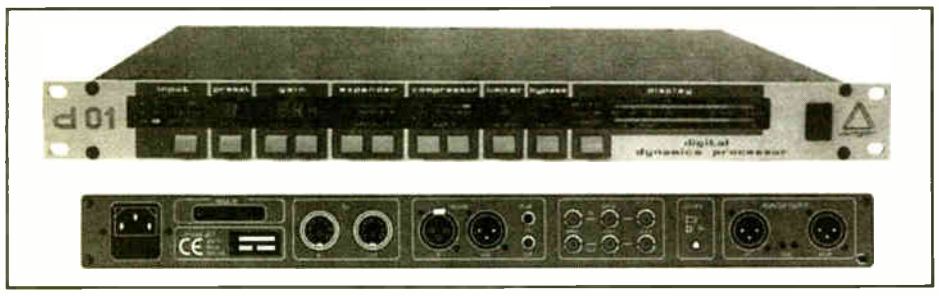
TECHNOLOGY UPDATE

Junger Audio

The **Junger Audio** line of digital audio dynamics processors consists of compressors, limiters and expanders that provide high audio quality without coloration, pumping, breathing, distortion or modulation effects.

Standard Model d01 is designed for adjusting the dynamic range of digital audio signals in mastering or studio applications. Easy to operate, the Model d01 can be connected to all common digital audio formats.

Universal Model d02 can adjust the dynamic range of digital and analog audio signals in studio applications.



The unit has a digital AES/EBU interface and high-resolution 24-bit A/D converters that allow dynamic range processing in the digital and analog domains.

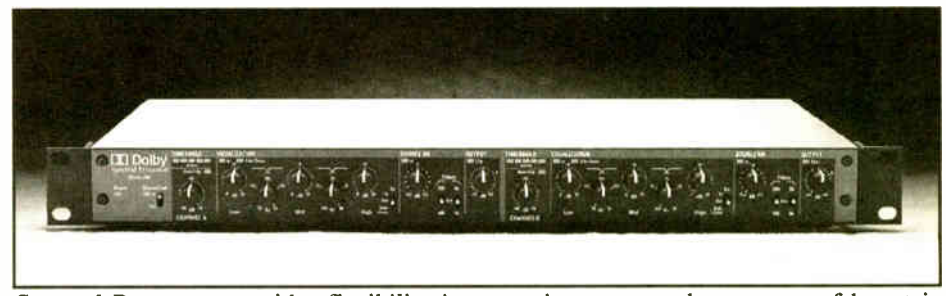
Model d03, the mastering processor, is a compressor and limiter designed for processing the dynamic range of digital audio signals in mastering or studio applications as well as providing sample rate conversion. The input and output may operate with different sampling rates or may be unsynchronized at the same sampling rate.

All models work according to a multiloop principle, operating in conjunction with several frequency linear control circuits.

For more information, contact Junger Audio in Germany at +49-30-6777-21-0; fax +49-30-6777-21-46; or circle ***Reader Service 191.***

Dolby Laboratories

Whether bringing out the subtleties in recording, production and live performance, or lending character to audio broadcasts, the **Dolby** Model 740 Spectral Processor provides flexibility in audio processing.



Based on the filtering characteristics of Dolby SR noise reduction, the two-channel dynamic equalizer allows processing of low-level signals while high-level signals remain untouched.

Broadcasters can achieve a distinctive sound by adding the Spectral Processor to the on-air processing chain. The Spectral Processor is said to add punch, presence, clarity and loudness when used in conjunction with a conventional compressor/limiter. Selective enhancement of low-level signals allows broadcasters to fine-tune the sounds of their stations depending on format.

All parameters are user-adjustable, including the threshold where the processing occurs, the amount of boost in each band and the crossovers between each band. Three different processing modes — In, Out and Side Chain — are selected with a single "EQ Mode" switch.

For more information, contact Dolby Laboratories in California at (415) 558-0200; fax (415) 863-1373; or circle ***Reader Service 217.***

Roland

The SN-700 Noise/Hum Eliminator from **Roland** is a digital signal processor designed to aid the radio or audio engineer in processing sound that is as clean as possible.

This single-ended, real-time noise eliminator is ideal for live broadcast, music or commercial production and live sound. It is designed to identify and isolate troublesome frequencies and noise sources in a variety of applications.

The SN-700 removes 60 Hz hum, dimmer buzz, fluorescent lighting and ground loop noise among other audio intrusions. With simple Threshold, Release and Frequency settings, the user can easily dial out annoying noises and hums. The special Auto function can set these parameters automatically.

The Width parameter designed by Roland can silence virtually any type of hum. All functions can be controlled via MIDI and the parameters can be edited and saved into one of 16 program locations.

For more information, contact Roland in California at (213) 685-5141; fax (213) 722-0911; or circle ***Reader Service 140.***

Circuit Research Labs

The AMIGO AM processing system from **Circuit Research Labs** is intended to be a complete, easily operable processing system for stereo and mono AM.

The AMIGO AM consists of a wide-range dual-band AGC, a full tri-band matrix processor and precise NRSC-1 audio low-pass filtering. The unit provides stereo and mono outputs; most adjustments can be made from the front panel.

The modified matrix limiter circuitry from CRL allows the AMIGO AM to broadcast high-quality stereo and mono signal components, and it produces a safe area of approximately 70 percent negative L+R modulation. This ensures that the stereo decode always has some carrier to demodulate — otherwise, when the carrier drops to near zero, the stereo decoder chip in the receiver will lose sync with the carrier, causing distortion or collapsing down to mono.

To keep consistent L+R modulation levels, the AMIGO AM features a mono gain support circuit, which provides full envelope (or mono) coverage area.

For more information, contact Circuit Research Labs in Arizona at (602) 438-0888; fax (602) 438-8227; or circle ***Reader Service 141.***

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Grommes PE2 line/isolation amps (2), bal to unbal & unbal to bal, $50; Altex 1569 100 W pwr amp w/RCA-7 tubes, $200. E Davison, 217-793-0400.

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Rohn 80 350' radio tower, guide, steel, no rust, $16,000 at site, 209-477-2688.

Dielectric Cablewave 3" coaxial elbows (3), never used, $75/ea, $200/all; Dielectric A-50000-313 (3) port solenoid RF switch, 50 kW, never used, $3000/BO. P Wolf, 941-548-3777.

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SWR FM-10 4 bay FM antenna tuned to 102.3 MHz, recently removed from service in gd cond, $1500/BO. P Bossart, 719-738-3636.

Want to Buy

6 bay low pwr FM antenna tuned to 96.7 or 101.1; 1 kW AM xmtr, 10 yrs or less. R Murphy, 702-299-3326.

AUDIO PRODUCTION

Want to Sell

ART DR-1 digital reverb w/wired remote control, $450. M Schackow, 605-374-3424.

ATI M-1000-2 precision dual mic pre, as new, $200. M Shea, 212-989-2084.

Burwen Research DNF 1201 noise filter, $125; MXR dbx type II NR unit, $100; Aphex aural exciter w/Big Bottom, $150. G Dunn, 925-516-0299.

Rane ME-15, 15 band/chnl stereo EQ, rack mountable, 2 yrs old, like new, $175/BO. R Erak, 253-839-9414.

Shure M675 bdct prod master, 2 phono inputs, 2 line inputs, monitor speaker, $60; (3) female-to-female XLR adapters, $5 ea; (2) 1/4" splice blocks, $15 ea; cassette splice block, $5; disc feet, 1 set of 4, $10; (12) music DeWolfe LPs, gd cond, $20; (75) Norelco cassette boxes, worn but servicable, $20. E Ribner, 314-771-2155.

Sonomag 350/450 8 Carousels in gd operating cond, BO. E Stokes, 802-728-4411.

AKG R-25 console mountable remote control for AKG BX-25 reverb unit w/30' cable & connector, trade for RC-170 or RC-90 Teac remotes. J Roper, 812-877-2663.

Altec 1606A mixer/amp, 4 chnl mixer w/plug-in transformers & Altec table top rack, $250. J Borden, 414-482-8954.

Burwen TNE 7000A transient noise eliminator, rack mountable, gd cond, will trade for UREI Cooper time cube. J Roper, 812-877-2663.

Koss LV-20 stereo headphones, new, will trade for older working pair of AKG K-141 or K-240 headphones. J Roper, 812-877-2663.

Mackie 16:8:2 mixer, Sony DCTA7 DAT w/Apogee A/D; Hafler Pro2400 amp; Anchor AN100 TB spkr; 4 short w/booms & 2 tall mic stands; 100' 16 way XLR-1/4" snake; various cables, $3900/BO. R Rhodes, 212-245-5045.

Radio Systems mono dist amp, never used, $100; Shure M-267, like new, $250. P Wolf, 941-548-3777.

AUTOMATION EQUIPMENT

Want to Sell

Arrakis GEM-600 Gemini System w/1.2 Gig + network board & software, w/cart call; Arrakis TS-8C Trak Star workstation w/270 Meg w/network board & software, 1 yr old, both currently on air, $7500/BO. L Zeve, 717-249-1717.

Smartcaster 2000 w/(2) R/PB audition units, (2) prod units, D-4000 SCS, (4) Akai digital editor, (2) SC-45 Smart Touch, SS-1 traffic/billing system, (2) SW-4 switches, (2) MOD-2 modem, SC-500-5 network node, (4) IPF plus all necessary cabling & wiring, BO. E Swanson, 920-236-4242.

CART MACHINES

Want to Sell

PR&E Tomcats (3) in rack mount w/spare set cards plus one rcdr w/o rack cage, all checked out & calibrated, $1500 +shpg. M Shea, 212-989-2084.

ITC Delta stereo P/B (3), new heads, great cond, $875/ea. C Guglielmetti, 650-589-3313.

ITC Omega mono, (6) play, (1) R/P, gd cond, $150/play, $225/R/P, $950/all; BE R/P 3000 series cart deck, gd cond, $200. P Wolf, 941-548-3777.

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CONSOLES

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AudioArts/Wheatstone power supply w/phantom & cable for 8x console, $125. D Kocher, 610-776-1455.

BE 8S250 & 5S250 in excel cond, in use, both stereo, $1700/8S250, $1100/5S250. G Huff, 606-877-1326.

MCI/Sony 618, 24x24, $6.5K; Quantum 24x24, $4.5K; Soundcraft 600, 32x16, $5.5K, like new; Model 30, $295; 512, $950; 520, $1450. W Gunn, POB 2902, Palm Springs CA 92263. 760-320-0728.

Want to Buy

Altec 1567A rackmount mono mixer. M Schackow, 605-374-3424.

Soundcraft 400B spare input channels. J Borden, 414-482-8954.

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JBL/UREI M712 stereo limiting comp w/owners manual, new cond, $450. M Schackow, 605-374-3424.

Cutting Edge Unity 2000-I just back from factory, excel cond. L Martin, 606-233-1515.

Dorrough DAP 310 (2) w/FM limiter cards & manual, $225/pr. L Tschirhart, 210-349-5808.

Want to Buy

CBS Labs Volumax, mono, manual or schematic. P Galasso, 609-294-9796.

Optimod 9100A, stereo w/NRSC already in. R Hill, 850-478-6000.

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.

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EV 645-TR noise-cancelling telephone handset mic, $25; EV RE-50, worn case, $70. E Ribner, 314-771-2155.

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EV RE-16, $125. T Wheeler, 970-223-6078.

EV 623, 636, 630 chrome finished omnidirectional mics, $125/all. J Borden, 414-482-8954.

EV N/D457 (8) dynamic high output in new cond, $100 ea. E Davison, 217-793-0400.

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IGM/SMC 24 cart Carousel, $250; Pioneer F-9 tuner & SX-7 stereo rcvr, $15 ea; Ampex 440 stereo, $200; Sony TC-FX120, $10; Ampro 10 chnl dual console, $800; Otari ARS-100 PB (3), $150 ea; IGM Insta-Cart 48 tray (2), $250 ea; 200 cart stand alone rack, $20; Revox PR-99 (2), $225 ea; Toshiba DCP-26 bookshelf speaker pr, $25; 19" racks, 65" tall (3), $50 ea; Star SR-15 printer, $30; IGM Insta-Cart (48) for parts, $100; IGM automation controller series 400 on rack w/wheels, $300; Schafer 901 controller, $100; IGM sat controller, $50; Insta-Cart parts, cart trays, circuit boards, $50; Sansui S-350 bookshelf speaker pr, $100; Pioneer SG-9 EQ, $75; computer desk, $25; 72x30" bookcase, $25; 4 drawer steel letter size file, $30; 2 drawer steel letter size file, $15. R Hill, 850-478-6000.

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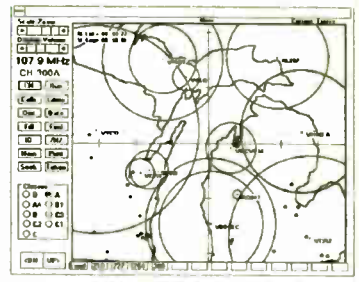

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EQUIPMENT LISTINGS

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. Simply send your listings to us, following the example below. Please indicate in which category you would like your listing to appear. Mail your listings to the address below. 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
- ☐ B. Commercial FM station
- ☐ C. Educational FM station
- ☐ E. Network/group owner
- ☐ F. Recording Studio
- ☐ K. Syndicators/Station Providers
- ☐ G. Audio for Video/TV Station
- ☐ H. Consultant/ind engineer
- ☐ I.Mfg. distributor or dealer
- ☐ J.Other _____

II. Job Function

- ☐ A. Ownership
- ☐ B. General management
- ☐ C. Engineering
- ☐ D. Programming/production
- ☐ G. Sales
- ☐ E. News operations
- ☐ F. Other (specify) _____

WTS ❑ WTB ❑ Category: _____

Make: _____ Model: _____

Brief Description: _____

_____

_____

_____

Price: _____

*Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.

Broadcast Equipment Exchange

PO BOX 1214, Falls Church, VA 22041 • Tel: 800-336-3045 • Fax: 703-998-2966

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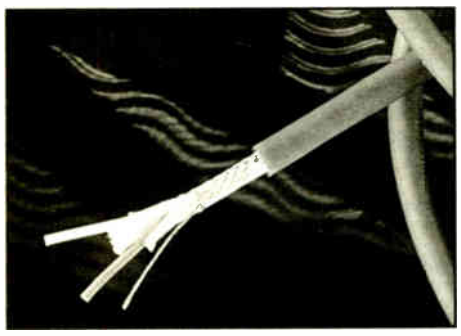
◆ MARKETPLACE ◆

Products for the Radio Broadcast Professional

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

New Cable for Brilliance Line

The Brilliance family of broadcast cables from **Belden Wire & Cable** is growing.



The 1800F High Flex AES/EBU digital audio interconnect cable meets AES/EBU standards for digital audio applications and provides high performance in traditional analog audio microphone applications. A shielded, 110 ohm, single twist-pair cable, the 1800F can be used as a flexible digital audio patch cable, an analog audio mic cable or an interconnect for new digital audio mics.

The cable uses Belden's patented French Braid Shield, a double spiral shield (tinned copper double serve) in which two spirals are tied together by one weave. Belden says this produces a shield coverage of 95 percent, with lower levels of microphonic and triboelectric noise than either spiral or conventional braid shields. To hold microphonics to the minimum, Belden uses a paper tape between the French Braid Shield and the insulated conductors.

The 1800F features one pair of 24 AWG stranded (42 x 20) bare copper conductors with blue and white high-velocity Datalene insulation and a drain wire. The bare copper drain wire eliminates the time-consuming practice of "pigtailing" the shield for termination.

For more information, contact Belden Wire & Cable in Indiana at (765) 983-5200; or circle ***Reader Service 219.***

Winsted Publishes Large Resource Catalog

A new 164-page catalog from **Winsted Corp.** is its largest ever.

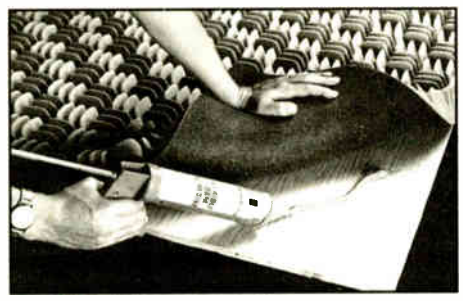
Growing lines include its broadcast, video, tape storage and security products. New LAN and file server products with versatile mobile LRx stations featuring L-Frame architecture expand on a product line introduced last year. Its line of broadcast counters include several new mobile producer's desks ranging from 42 inches to 94 inches wide.

Winsted also offers a line of welded economy racks. These feature a textured black enamel finish for a maintenance-free life.

For more information, contact Winsted Corp. in Minnesota at (612) 944-9050; fax (612) 944-1546; or circle Reader Service ***142.***

Adhesive Eases SONEX Installation

The PA-02 acoustical foam panel adhesive from **illbruck** is a nontoxic, water-based adhesive that provides a strong, permanent bond when installing SONEX acoustic foam panels.



Applied with a standard caulking gun, each tube of PA-02 adhesive is sufficient for installing up to 32 square feet of SONEX panels. PA-02 adhesive is compatible with both polyurethane and willtec SONEX panels. This high-tack adhesive also features easy water clean-up.

For more information, contact illbruck in Minnesota at (612) 520-3620; fax (612) 521-5639; or circle Reader Service ***168.***

New Switchcraft Guides Available

Switchcraft has published the third edition of its Engineering Design Guide, featuring a 32-page catalog of its Molded Cable Assemblies and Patch Cords Guide.

The 32-page Cable Catalog is a subset of the 350-page Engineering Design Guide. It includes a variety of molded cable assemblies and photographs, specifications, and part numbering systems of the company's patch cords.

The rest of the two-color Engineering Design Guide features more than 5,000 electronic and electromechanical components of connectors, jacks, jack panels, jackfields and switches. Along with numerous photographs, drawings and specifications, mating and ordering information is included, as are listings of North American sales representatives. Twelve pages are dedicated to switching and connecting terminology.

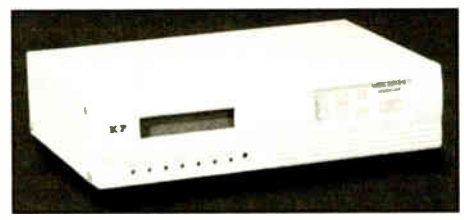
For more information, contact Switchcraft in Illinois at (773) 792-2700; fax (773) 792-2129; or circle Reader Service ***194.***

DigiCeiver Line Adds Two New Products

The DigiCeiver line from **International Communications Products** is designed for satellite broadcast systems providing one-way distribution of data or audio information. The company has added two audio receivers: Models DCR-972 and DCR-971.

The DCR-972 Multifunction digital data/audio receiver is programmable and can be configured to operate in an SCPC or MCPC mode with data and audio outputs from a TDM or packet multiplexed data stream. An optional Ethernet 10Base-T output also is available for IP multicasting.

The DCR-971 SCPC data receiver with audio upgrade capability is used primarily for SCPS data applications but is expandable to include four channels of digital audio. The unit has one expansion slot for additional data or audio capability (the DCR-972 has two expansion slots).



Both units operate at data rates of 19.2 kbps to 1,024 kbps in the BPSK mode or 38.4 kbps to 2,048 kbps in the QPSK mode. Outstanding BER performance is provided over the entire range of data rates through the use of sequential forward error correction. As an option, they can also be provided with Viterbi or DVB-compliant concatenated FEC and higher data rates.

For more information, contact ICP in Florida at (407) 722-2700; fax (407) 722-9200; or circle ***Reader Service 143.***

Anchor Audio Expands Liberty Line

The Liberty Xtreme is a new portable sound reinforcement system from **Anchor Audio.**

The 130W A/C-only Xtreme features a switchable Mic/Line level XLR input with selectable Phantom Power, an additional quarter-inch line-level input and a balanced XLR line-level output. Both inputs have independent volume controls.

As with all Liberty systems, the Xtreme includes a Music/Project switch that creates two different sound modes for maximum flexibility: a "Music" mode for clean full-range sound, and a "Project" mode for articulate voice projection. Biamplification (40W horn/90W woofer) creates more clarity and audibilty for vocals.

As a stand-alone system, the Xtreme handles both a single user with a wired microphone or multiple users connected from any mixer's line-level output. It will accept virtually any microphone or line-level source.

For more information, contact Anchor Audio at (310) 784-2300; fax (310) 784-0553; or circle ***Reader Service 90.***

Jam Nut Power Connector

Detoronics has released a new gas-tight, glass-sealed Jam Nut Power Connector for broadcast transmitters/receivers and antennas.

The glass-to-metal gas-tight seal is used to create a bonded seal that will maintain rated electrical characteristics through continuous exposure to thermal and mechanical shock.

The seal adapts to wide fluctuations in humidity and pressure. This aids in reducing assembly and maintenance costs by providing a vacuum seal which is heat-proof to fabrication operation and product maintenance.

These connectors are available in various shell sizes with two to 55 contacts. The mounting nut and "O" rings are supplied with the connectors.

For more information, contact Detoronics at (626) 579-7130; fax (626) 579-1936; or circle Reader Service ***64.***

Studio Furniture for Radio

The new Delux Radial studio furniture series from **Spacewise** is a contemporary styled version of the standard Delux series.

The Delux Radial incorporates four-inch radial corners for a more contemporary appeal and look. There is room in the two enlarged, 23-by-32 inch base pedestals for four PC audio systems with easy access to wiring and disk drives.

As with all Delux systems, the new furniture features 1-1/2-inch-thick top counter surfaces, solid oak wood trim around the top counters; added trim on vertical and bottom edges (virtually every edge is protected with trim); kickboards; heavy-duty rack rail systems with easy rear access; and the versatility of modular construction for easy shipping and installation.

For more information, contact Spacewise Broadcast Furniture in Arizona at (800) 775-3660, or circle ***Reader Service 220.***

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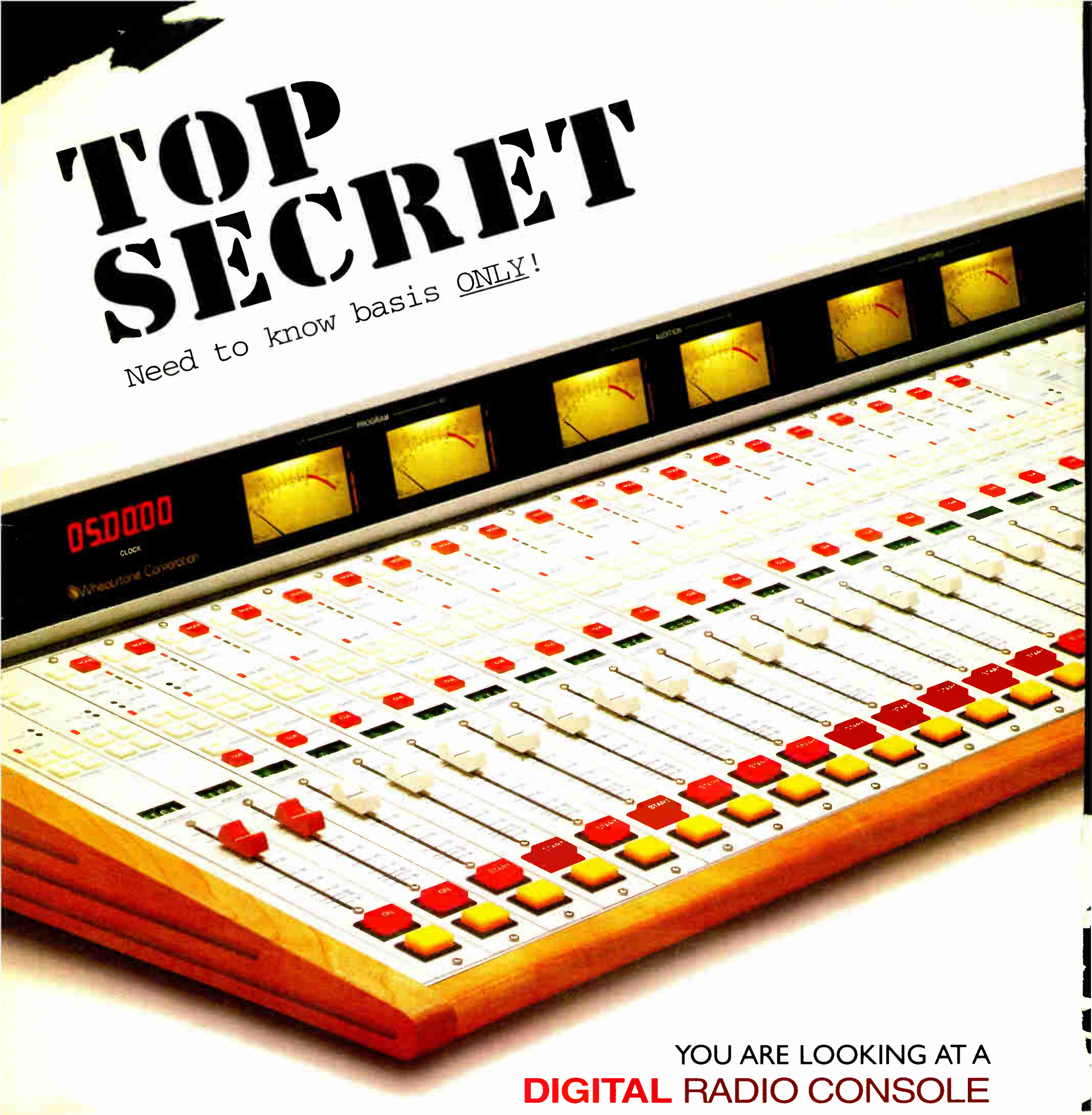

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