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Radio World®
The Newspaper for Radio Managers and Engineers
November 11, 1998

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DAB, Wall Street Top Agenda at Radio Show

by Leslie Stimson

SEATTLE Digital audio broadcasting, low-power radio and the condition of Wall Street were on the minds of the approximately 7,000 attendees at The NAB Radio Show.

Radio's transition to digital was a timely issue, driven in part by a petition for rulemaking at the FCC filed just before the convention by USA Digital Radio. Attendees heard from the three proponents of in-band, on-channel DAB, with updates on the progress of their research (see stories, pages 3, 7 and 8). It was the first Radio Show to include booths by Digital Radio Express and Lucent Digital Radio.

Although this was not the first Radio Show that Bill Kennard has attended, it was his first as chairman of the commission. In a strong, pointed address, Kennard seemed to kill broadcaster hopes that the FCC may abandon the idea of a new class of low-power stations.

"We are seriously evaluating proposals for a new microradio service," Kennard said. "I believe we have an obligation to explore new ways to open the doors of opportunity to use the airwaves, particularly as consolidation closes those doors for new entrants."

At the same time, Kennard sought to assure radio broadcasters that even if the commission approves some sort of low-power service, it would not undermine the technical integrity of the FM band.

"Our job is to be the guardian of the spectrum, not to degrade it," he said.

NAB officials responded tersely. "Shoehorning in hundreds of additional stations into already crowded spectrum

See WRAP, page 22 ▶

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USADR Filing Ignites Debate

by Leslie Stimson

SEATTLE USA Digital Radio says it has taken a historic step. Its IBOC competitors are less enthused.

USA Digital Radio asked the FCC to develop criteria to let the commission evaluate proposals for an in-band, on-channel digital audio broadcasting system. The FCC should adopt a single

See REACT, page 8 ▶

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World Radio History

◆ NEWSWATCH ◆

Chancellor Kills GRC Deal

DALLAS Chancellor Media Corp. will not proceed with the purchase of a 50-percent economic interest in Grupo Radio Centro of Mexico.

The deal, under which Chancellor would have paid the Mexican broadcast group $237 million in cash and Chancellor stock, was announced in July.

According to Chancellor, under its July 1998 agreement with GRC the corporation had the right to withdraw from the purchase prior to completion of the deal. No further details were given by Chancellor when it made the announcement to kill the deal on Oct. 15.

GRC officials stated that Chancellor's attempted unilateral termination of the deal is improper and that it would explore legal remedies to reinstate the purchase.

GRC owns and/or operates 15 radio stations in Mexico, 13 of which are located in the capital, Mexico City. In addition, GRC operates Organización Impulsora de Radio, which syndicates programming to more than 90 affiliates in 57 cities throughout Mexico.

New President For EIA

ARLINGTON, Va. The Electronic Industries Alliance has a new president — former member of congress Dave McCurdy. McCurdy succeeds Peter McCloskey, who retires after 21 years as president. McCurdy served seven terms in the U.S. House of Representatives (1981-1995) representing Oklahoma's fourth district. Most recently, McCurdy ran his own consulting and investment practice for high-tech clients.

Also, the Consumer Electronics Manufacturers Association, a division of EIA, has elected new executive leaders. Darrell Issa, president of Directed Electronics, was elected chairman of the board. Ron Stone, executive vice president of Pioneer Electronics (U.S.A.), was elected vice chairman of the board. Jerry Kalov, vice chairman of Cobra Electronics Corp., was re-elected industry vice president. The new leaders assume their roles Jan. 1, 1999.

See NEWSWATCH, page 3 ▶

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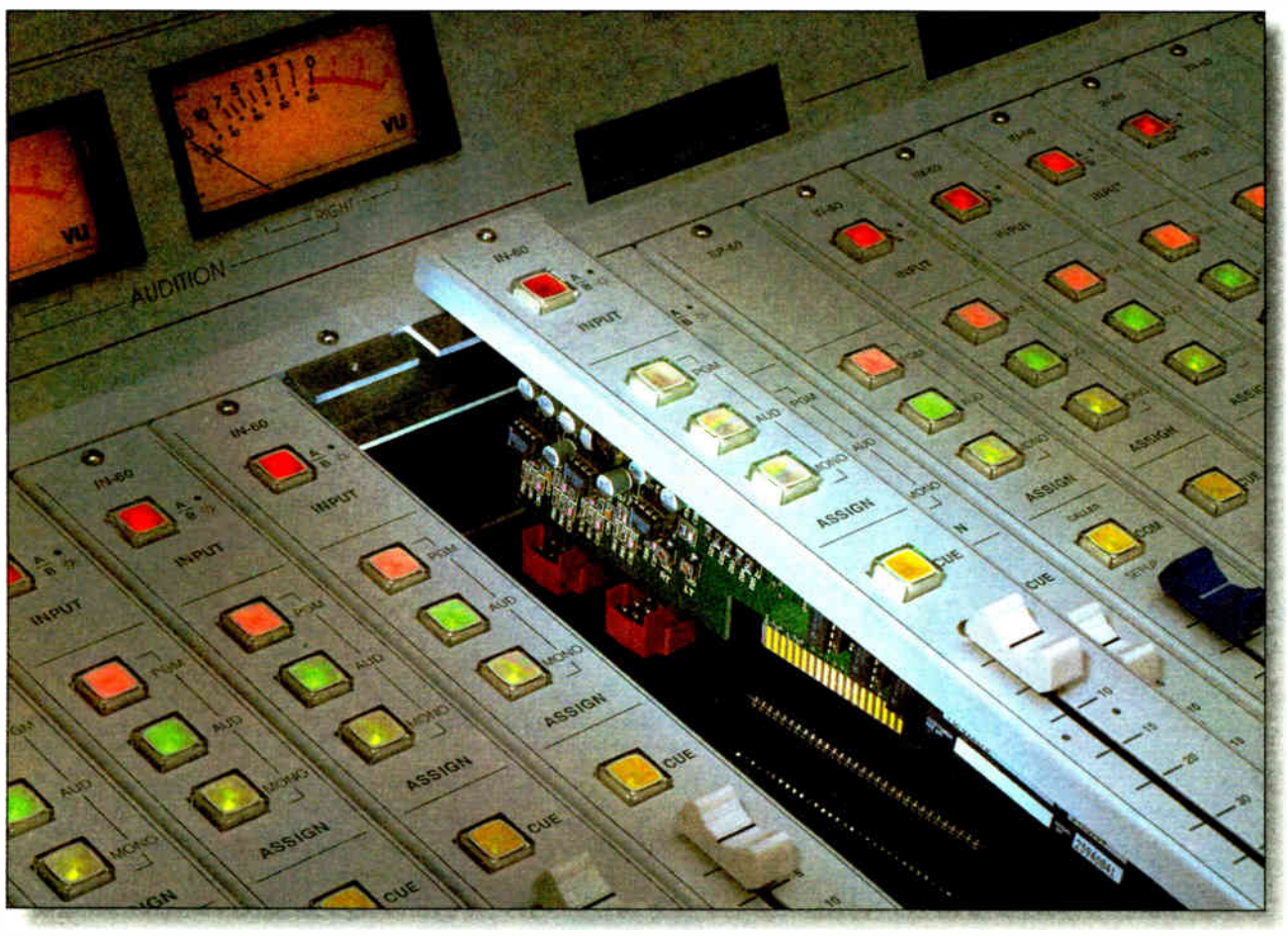

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World Radio History

NEWS ANALYSIS

IBOC Technical Details Emerge

Lucent Digital Radio and Digital Radio Express Describe Research and Development Progress

by Leslie Stimson

SEATTLE The three companies developing in-band, on-channel digital audio broadcasting systems have become more open about how their systems are designed technically and where they stand in their research and development process.

One reason is the petition for rulemaking filed last month with the FCC by USA Digital Radio. Another was the presence of Digital Radio Express and Lucent Digital Radio on the exhibit floor of The NAB Radio Show in Seattle. A third is the renewed involvement of the National Radio Systems Committee and its DAB subgroup.

In its petition, USADR asked the commission to designate IBOC as the DAB system for the United States (**RW**, Oct. 14). "This filing is going to change radio forever," said Glynn Walden, vice president of engineering for USA Digital Radio.

USADR also asked the FCC to establish interference protection standards and criteria to evaluate IBOC systems, as well as set a timetable for the regulatory rollout of IBOC DAB.

Necessary capital

The interference standards are necessary, USADR stated in the filing. "Broadcasters will not invest the necessary capital in digital audio broadcasting equipment unless they can be assured their signals will reach listeners without interference from other stations. ...

"Moreover, the willingness of consumers to purchase new digital radio receivers after the interference rules are adopted may be adversely affected if existing digital receivers had been rendered obsolete by these rules."

In the petition, USADR said the FCC is the proper government authority to set a single technical standard for IBOC DAB. Without a single standard, USADR warned, IBOC would go the way of AM stereo, which is widely considered a failed attempt to improve that band.

USADR also has filed applications with the U.S. Patent and Trademark Office for several terms it says it invented, including "IBOC DAB." USADR used the terms with trademark symbols on prototype exciters and receivers it exhibited at The NAB Radio Show.

Digital Radio Express VP/Engineering Derek Kumar said his company would take legal action to prevent USADR from obtaining the trademarks.

"IBOC is a functional description and cannot become a registered trademark," he said.

A Lucent Digital Radio spokesman said only one objection is necessary to delay a trademark application, but said Lucent has not decided whether to fight the application.

Bit-rate reduction

The choice of an audio bit-rate reduction algorithm — or compression scheme — to encode and decode the audio bit stream is an important element of IBOC DAB.

The proponents are trying to convert their analog signals to digital with the highest-quality audio at the lowest bit rates, to have room left in their existing bandwidth for ancillary data other than audio programming. Such data capacity is one of the selling points for IBOC, in the eyes of at least some proponents.

In the technical description of its system in the filing, USADR said, "First, an IBOC DAB system must allow a broadcaster to serve the same geographic area as that served by the existing analog broadcast.

"Second, within the coverage area, the digital signal must have high immunity to multipath, noise and interference. This 'robustness' requires significant error concealment and protection against dropouts.

"Third, the digital signal must not noticeably increase noise in the analog host or in adjacent channels.

"Fourth, the codec should be based on commonly used coding schemes to promote standardization.

"Balancing all of these factors, USADR has selected MPEG AAC (Advanced Audio Coding) as the audio compression scheme which optimizes its system performance with a 96 kbps rate for the FM system and 48, 32 or 16 kbps rates for the AM system." USADR previously indicated it was considering both AAC and PAC algorithms.

Digital Radio Express showed its test van at The NAB Radio Show.

Lucent Digital Radio's Suren Pai

Digital Radio Express also uses MPEG AAC, which Kumar said provides near CD-quality at 96 kbps and FM-like quality at 48 kbps. Kumar said DRE settled on MPEG AAC before USADR did.

USADR's Walden said the two compression algorithms are not quite the same. He said the USADR algorithm is enhanced to work specifically with its system.

In DRE's recent tests of its FM system in San Francisco, Kumar said, DRE used a high-efficiency multicarrier modulation, 50 percent higher than what his

See IBOC, page 7 ▶

◆ NEWSWATCH ◆

▶ NEWSWATCH, continued from page 2

Bass Group Invests in CD Radio

NEW YORK CD Radio, one of two FCC license-holders to provide digital audio broadcasting services, said that Prime 66 Partners L.P. will acquire a $100 million interest in the company. Prime 66 is a limited partnership composed of persons associated with Sid Bass of Ft. Worth, Texas. The deal was expected to close this month. Once approved by regulators, the partnership will own 5 million shares, or about 20 percent of CD Radio's common stock.

CD Radio also has hired national radio advertising sales organization MediaAmerica to sell national ad time on CD Radio's 50 non-music channels. CD Radio plans to offer 100 channels of pay programming.

Space Systems/Loral is building three satellites for CD Radio. The satellites are scheduled to be launched late next year.

WHAT COMES AFTER DIGITAL?

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

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

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

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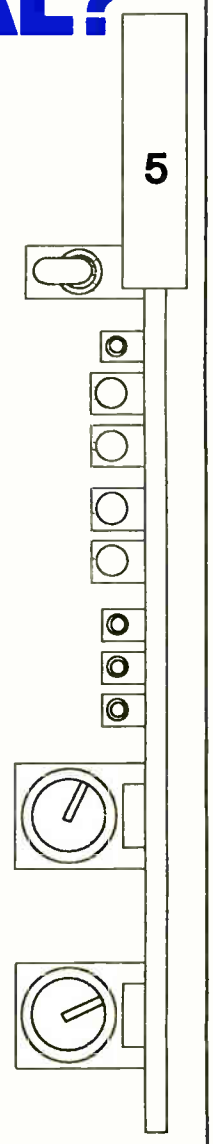

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World Radio History

Seattle and the 'DAB' Radio Show

Following USADR Petition, Radio Show Visitors Wonder If IBOC Is Close at Hand at Last

SEATTLE The debate over digital audio broadcasting moved to a new level during The NAB Radio Show here. Whether it actually moved *forward* is less clear.

In-band, on-channel DAB certainly dominated the headlines and hallway chat at last month's convention. Owners and engineering directors seem to be following our advice and paying closer attention now.

They aren't listening just because we said so, of course. The most immediate catalyst for this interest was a petition for rule making filed with the FCC by USA Digital Radio. That petition calls on the commission to publish criteria to evaluate IBOC systems by next July, and a deadline for test results of next December.

A 12-year hybrid transition period would ensue, with stations broadcasting both digital and analog signals, leading to an all-digital radio industry in 12 years.

The petition is about the size of a phone book in a medium-sized market, and it contains plenty to chew on for those of us who care about the future of the industry. You will read more about it in **RW** in coming months.

But in its essence, this document is less about technology than about policy.

Creating momentum

USADR wants to move the DAB process forward. This filing serves its purposes, but it also is good for the industry in at least one important way. We have talked seriously about DAB for eight years or so, and the process has seen numerous setbacks and detours. Many people are skeptical that the U.S. radio industry can make DAB happen at all without conceding to an out-of-band solution. This filing helps focus attention on IBOC and, perhaps, kick it forward.

At the same time, USADR clearly wants to assert "ownership" of the IBOC DAB issue, right down to claiming that it owns the phrase itself (a contested point).

The challenges for USADR now are to justify the content of its filing, to show that is has not circumvented the NRSC process, to show fellow broadcasters that the plans of this CBS-backed enterprise are consistent with the business goals of all radio owners. And, of course, to show that the USADR system actually works.

(L to R) USADR's Glynn Walden, Lucent Digital Radio's David Mansour and DRE's Derek Kumar

One reason for the timing and scope of the USADR filing, I believe, is the new and substantial presence of its former research partner, Lucent Digital Radio. Lucent, like a debutante, is relatively new to us, has money, is attractive thanks to its technology background, and used the show as a way to introduce itself to the U.S. The convention constituted Lucent's "coming out" party. Broadcasters who have read about Lucent in **RW** had their first chance to shake hands with its managers and engineers and to learn about its plans.

Lucent created a large presence on the exhibit floor and took part in the various DAB sessions and panels, on equal footing with the other proponents. Several industry people whose opinion I respect told me that the show was an important step in the acceptance process for Lucent.

The people who run Lucent know that they could be seen as radio outsiders, an extension of the phone company. They have lobbied behind the scenes to complement their show presence, hoping to make opinion leaders more comfortable with the Lucent agenda. They believe they are succeeding.

Among their challenges now is to demonstrate that their commitment is real, that they are not trying simply to profit from spectrum for data distribution, that they understand the financial and technical needs of broadcasters. And, of course, that the Lucent system actually works.

1999

Digital Radio Express, the third IBOC proponent, has been on the scene publicly for only a few more months than Lucent, although it says it had been working on DAB for some time prior to that. It plans to complete its 1999 field testing earlier than the other proponents, and it has been the most active in trying to work within the NRSC committee system.

DRE has said that its FM system is near completion, which is surprising given that DRE has tested it on only one station. At the Radio Show, its competitors were not shy about hinting that DRE has the most obstacles to overcome, that its tests to date have been unconvincing. At least one observer said flat out that USADR and Lucent were the only "real" players now.

While that conclusion is overblown, DRE does have an image problem. It should work harder to make itself known to radio people. For example, for many months DRE managers declined to speak at length on the record with **RW** about their plans and technical work — an opportunity to speak to the industry that DRE's competitors seized early. That tight-lipped approach seems to be changing now.

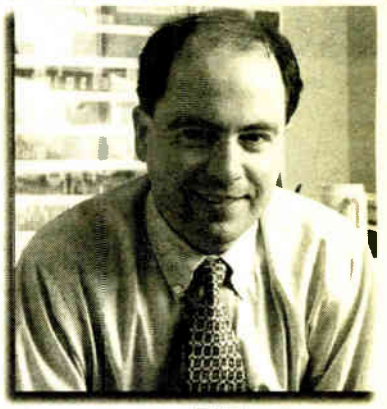
The challenges for DRE are to communicate its goals to the industry, to demonstrate that it has the financial resources to see this project through over the next several years, to dispel its image as a minor player.

And, of course, to show that the DRE system really works.

Is DAB closer to reality today than two months ago? Once the FCC begins the process of people talking to each other formally about DAB, the issue gains momentum. The answer may become more clear in months to come.

I do agree with one point in particular made by USADR: Our industry needs a single IBOC standard. Please, Chairman Kennard. In deciding how to advance digital radio, look for guidance to the DTV experience, not the AM stereo debacle.

From the Editor



Paul J. McLane

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◆READERS FORUM◆

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Satcom C5: A positive spin

Dear **RW**,

In your Sept. 16 issue, the article by Bill Sepmeier about the end of Satcom C5 ("Old Satellite, New Receivers?") could have a positive outlook with the help of the Digital Satellite System (DSS).

Since all satellite audio will have a new format, why not use the same technology for radio as it does for television? And the location of the DSS bird is in a prime location (close to dead south), so aiming the new dish will be as simple as it can get. And since we can use the 18 inch dish, cost factor is cut by thousands of dollars, which makes the owners happy. The audio will be digital (any format) so compatibility should not be a problem. And for the stations that don't have the ground space or the roof space, the dish can be mounted on the side of the building or aimed out a window. This also ends the long drives by engineers in snowstorms to sweep out the dish and chip away the ice.

Paul Carroll
Assistant Chief Engineer
WWSW-AM-FM, WJJJ(FM)
Pittsburgh

Bill Sepmeier responds:
DSS satellite slots and services are reserved for direct-to-home uses by statute, and cannot be used for conventional radio network distribution services. Barring this, DSS systems are still Ku-band and subject to some fade, which some stations might find objectionable during critical dayparts.

Consolidation concerns

Dear **RW**,

I just read most of the Tom Hicks interview in the Sept. 30 **RW** ("Chancellor's Man at the Helm").

Every time one of those bigwigs talks about consolidation, they say how great it is, they say they are making more money for their shareholders — Hicks even says, "What's important for us is to increase our profits and our return on investment for our shareholders." The bigwigs say consolidation is good for the customers, the advertisers. What about the listeners? They seem to not give a damn about them. And what about the personalities? What about radio?

'What the big guys are doing is sad. I realize that they are in it for the money, but they are killing radio.'

What the big guys are doing is sad. The listeners and radio in general suffer for their pocketbooks. I realize that they are in it for the money, but they are killing radio.

Remember the American auto industry in the '70s and '80s? All they cared about was making a buck, and the American car was a joke. All these mega corporations care about is getting richer, they don't care about putting out a good product.

American radio is going the way the American car did. Money isn't everything, what about pride in what you do, doing the best and having something worthwhile? Radio is in a sad state of affairs.

Steve Stevenson
Announcer
KRAE(AM)
Cheyenne, Wyo.

Level-headed

Dear **RW**,

Regarding Gary Sharpe's article, "Levels and VU Meters: A Primer" (**RW**, Sept. 30): His point about meter ballistics and interpretation is well-stated — however, he is assuming one is looking at a real VU meter. The meters in the accompanying illustration are not true VUs, as they have different scales. I assume Gary did not supply this photo, as he refers specifically to the +3 VU scale limit.

Many of the meters currently masquerading as VUs have non-standard ballistics as well. Some of the changes are well-intentioned attempts to improve the breed, but many are cost-cutting expedients, making use of an existing movement. As a recording engineer, I find the differences misleading.

Given this confusion, plus the real need to stay within the headroom, some kind of peak indicator is generally preferable to any of the average-reading meters in use today. While I've always gotten along with the good ol' VU (the real one), it's a poor peak indicator. Even staying out of the red isn't always enough: A live snare drum can easily generate peaks 20 dB above the meter's reading. A peak flasher will warn the operator of this (although for some, it may need to trigger a cowbell to get their attention).

John Ward
H-Flat Records
Canandaigua, N.Y.

Gary Sharpe replies:
One of the things I failed to emphasize was that the VU meter is indeed a device designed for reading average program levels. This is the main reason that it does not read peaks.

I felt that many operators and engineers seem to believe that the peaks of the meter are the peaks of the program material, which of course is not true. In radio, virtually all program material has already been at least somewhat peak-limited. Even so, the remaining peaks are much higher than the VU meter will read.

This is not a failing of the design of the meter. The way the true VU meter reads average program levels is most useful in adjusting levels for recording and broadcast. The peak light often included with a VU meter is useful and perhaps in many cases necessary in broadcast operations. But the astute engineer or operator will be aware of the program material and adjust their interpretation of the VU indications accordingly.

As you point out, there are impostor meters. One of the beauties of the standard VU meter is that it is a standard everywhere it is used. Its characteristics are ideal for monitoring average program levels. Impostors may measure levels in one way or another, but do not have dependable and repeatable characteristics of the true VU. This is not to say that they are useless, either. Knowing your equipment is a significant factor in being a good operator or engineer.

Available also are peak reading meters, but using one in lieu of a true VU meter can be misleading when determining average program levels or loudness, perhaps even more so than the VU's indications of peaks. Here at the ABC Radio Networks, we use peak reading meters in conjunction with true VU movements in our master control and transmission control areas. In consoles and recorders, this would mean twice as many meters on the bridges, making for some pretty busy-looking consoles!

A correctly calibrated peak light is useful and perhaps even necessary, but a real VU meter is the best instrument overall for reading and setting program levels; however, one still needs to use it correctly.

More Than A Jukebox

If you expected booths filled with turntables and rotary-pot consoles on the exhibit floor at last month's NAB Radio Show, you clearly have missed a few conventions. Computers run radio today, and the show floor in Seattle proved it.

As expected, the Internet was hotter than ever. Several companies exhibited products that use WANs and the Internet as audio delivery systems. Outside talent can provide voice tracks and spoken content directly to a station's on-air system with little more than a stock PC and Web access.

Radio groups seeking to limit their costs or feeling the effects of stock market wobbles will find this technology appealing. Taken to its extreme, it could allow the programming of multiple stations in many cities with a small cluster of voice talents in one place. And over a free medium such as the Internet, the savings would be significant.

Such a scenario would have a detrimental effect on local programming and community service.

As we have stated in this space before, technology is not detrimental in itself, but used injudiciously, it can be dangerous.

That concern was voiced by broadcasters at the convention. During the "Legends Air Checks" session, Arkansas station owner Buddy Deane said, "I've walked around the floor and seen all this wonderful technology, but I hope we don't lose the ability to communicate one-on-one." He was echoed by John Gehron, Co-COO, CBS Radio, Chicago who told the group they must understand the value of entertainment and not let it get lost.

"Radio has to be more than a jukebox," he said. It was refreshing to hear someone like Gehron express this opinion, against a backdrop of group heads who sing the praises of consolidation.

In the past year or two, we have seen great strides in our ability to deliver remote audio inexpensively. **RW** salutes the companies that have made this possible. Now we urge programmers to use those tools wisely, to think beyond providing identical content to hundreds of stations simultaneously. Listeners are weary of homogenized content and are not afraid to dial away from a boring station.

Radio today must compete harder than ever for the consumer's attention. Localism and one-on-one communication remain our strongest assets.

By all means, use the technology, wisely.

— RW

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November 25, 1998

World Radio History

After Clear Channel/Jacor Merger

by Lynn Meadows

SAN ANTONIO With intense and lengthy speculation behind them, executives and employees of Clear Channel Communications and Jacor Communications now are concerned with the many details of implementing their announced merger. Those decisions include whether and how to merge facilities and staff, all assuming the deal receives regulatory approval.

"It's the same old thing. It just happens to be $4.4 billion," one observer said of the announcement by Clear Channel that it will purchase Jacor for $4.4 billion, including the assumption of $1.25 billion of Jacor debt.

Such price tags and group sales became possible when the Telecommunications Act passed in February 1996. Thirty-three months later, they no longer seem startling. The sale of Jacor was no surprise. For months, the question had been not "if" Jacor would be sold, but "when" and "to whom."

Richard Blackburn, president of Blackburn & Company, said many radio groups that had been active acquirers have "looked for an exit and chose one." He used the Paxson Communications radio group, which Clear Channel bought for $600 million, and SFX Broadcasting, which Capstar Broadcasting Partners bought for approximately $1.2 billion, as examples.

Both those deals occurred last year, as did another that may have changed the outcome of the competition for Jacor. Rumors have circled for the past year that CBS would be the successful suitor in the Jacor sale. But CBS bought American Radio Systems for $2.6 billion last year.

Officially, CBS had no comment on the Clear Channel announcement. One CBS station employee said, "While CBS was mentioned as the best fit for Jacor, we knew that corporate was still busy digesting ARS. Another even larger acquisition, so quickly, would have been chaotic and probably financially irresponsible."

The exact dollar figure paid for Jacor will not be known until the deal closes, which the companies expect to happen by Sept. 30, 1999. Each share of Jacor common stock will be converted into Clear Channel common stock based upon the average closing price of Clear Channel common stock during 25 consecutive trading days ending two days before the deal closes.

The day before the deal was announced, Clear Channel common stock cost $37 per share. By that figure, the merger is valued at approximately $4.4 billion, which includes the assumption of $1.25 billion of Jacor debt.

"The debt figure will shrink by about $250 million," said Houston Lane, vice president of finance for Clear Channel, "once people exercise their stock options."

Randy Michaels will continue to serve as Jacor CEO. Lowry Mays, CEO of Clear Channel, said Michaels and his team "will be a significant asset to Clear Channel and we welcome them to our family."

Clear Channel plans to operate Jacor as a separate subsidiary of Clear Channel. Asked how that will work in cities where both companies own stations, Lane said it will depend on what properties are spun off. The groups compete in Cleveland and Dayton, Ohio; Tampa and Jacksonville, Fla.; Louisville, Ky.; and Houston. Observers said the group definitely would have to divest stations in Tampa and Louisville.

Once the merger is complete, the combined company will own or operate 454 radio stations in 101 markets in the U.S.

Steve Pruett, senior vice president of the investment banker Communications Equity Associates, said he had expected Chancellor Media to be the buyer for Jacor until Chancellor announced its own $4.1 billion merger with Capstar in August.

Pruett said he thinks the merger between Jacor and Clear Channel will "create tremendous value and be immensely successful."

Referring to Mays and Samuel Zell, chairman of Jacor, Pruett said, "Two extremely savvy people made this deal. Both know exactly what they are doing."

Zell became the majority shareholder in Jacor in 1993 as a result of a corporate recapitalization/bailout. According to one source, Zell was involved in the Jacor balance sheet, but never visited the Jacor corporate offices in Kentucky.

While deals last year were made in a market of rising stock prices, this year's mergers have come against a backdrop of a Wall Street shaken and stirred. No group appeared to be immune from tumbling stock prices.

At the beginning of the third quarter, for instance, Chancellor Media stock traded at $51 per share. By Oct. 15, the group's stock closed at $30-5/16 per share. That day, CBS stock was selling at $23-13/16, exactly 10 points lower than at the start of the third quarter. Jacor had fallen from $61-1/4 in early July to $46-1/8 on Oct. 15. Clear Channel stock was around $111 per share at the beginning of the third quarter, but split in late July. By mid-October, it could be bought for $39 per share. © 1998 NAB

Zell reportedly was intimate with the Jacor balance sheet, but never visited its corporate offices.

Top 5 Radio Groups

jacor *The noise you can't ignore.*

	Stations	Est. '97 Revenue
Chancellor	476	$1.60 Billion
CBS	161	$1.49 Billion
Jacor/Clear Channel	454	$1.1 Billion
ABC	38	$ 327 Million
Cox	57	$ 248 Million

Source: BIA

Klotz Opens New U.S. Operations in Atlanta

by Alan R. Peterson

SEATTLE Klotz Digital Audio Communications has established a new U.S. operation and debuted a new broadcast console. The Munich, Germany-based producer of digital audio routers and mixers has established a presence in Atlanta under the name Klotz Americas to provide marketing, sales and support for North, Central and South America.

The opening of Klotz Americas completes the company's goal of worldwide operations; Klotz already has a presence in Australia and Asia, as well as its European operation based in Munich.

Klotz routers and mixers are now in use in the U.K., Finland, Singapore and Russia. In this hemisphere, Klotz has products at East-Coast Radio in South America, Radiopolis in Mexico City, and at Mercury Radio in Buffalo, N.Y.

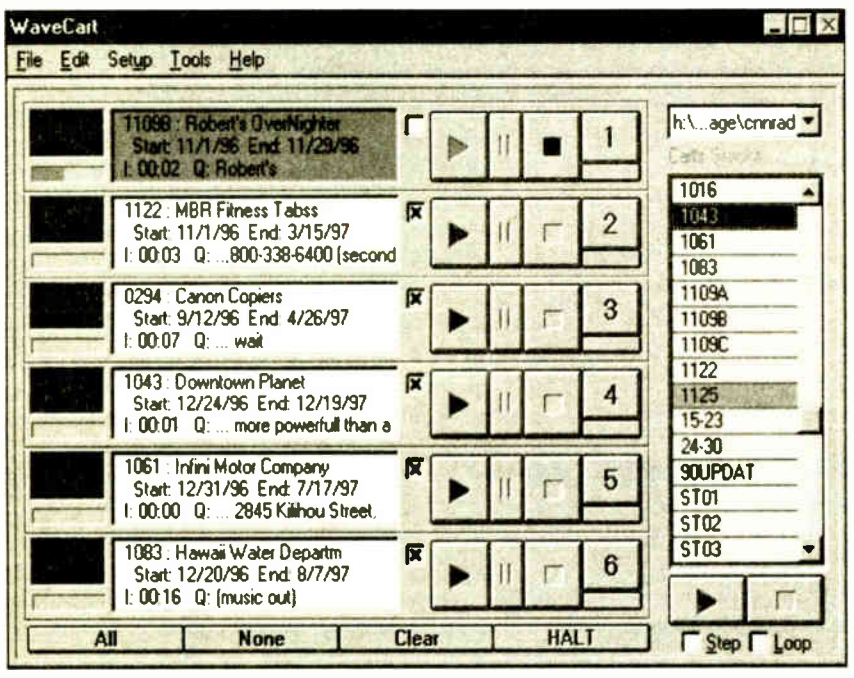
The newest console in the Klotz product line is the Spherion, a digital audio console/controller based on the Klotz VADIS 3d (Variable Audio Distribution and Interface System) audio router.

The company is making the console available in 12-fader or 20-fader configurations. The Spherion can be reset to different configurations via a bank of buttons with built-in LCD readouts that change text depending on function.

The Spherion combines digital control and programmability with a touch of familiarity: the meter bridge consists of broadcaster-friendly mechanical ballistic VU meters and the on/off and fader configuration has the feel of an analog board.

Six months earlier, Klotz Digital introduced the $6,000 Paradigm digital audio console at NAB'98 in Las Vegas. The Paradigm is a self-contained audio engine and controller with full voice processing, a flat-panel LCD display with time-of-day and event timing, and 24 inputs on eight faders. © 1998 NAB

On-Screen Cart Machine



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World Radio History

Lucent, DRE Enhance Systems

▶ IBOC, continued from page 3

competitors are providing.

USADR countered that in order to accomplish that, DRE dipped into the SCA spectrum of the existing FM signal, which broadcasters would rather not touch. FM stations can lease their subcarriers profitably to tenants for paging, ethnic broadcasts and other services.

Kumar said higher modulation is key to offer broadcasters a way to bring in more revenue during the hybrid phase, when stations would be broadcasting in both the analog and analog-digital mode.

He said reports of the death of analog FM have been exaggerated and said that FM will be around for a long time. USADR called for a 12-year hybrid period in its petition.

Lucent PAC

Lucent announced enhancements to its PAC perceptual audio coder. Lucent said PAC delivers near-CD quality audio at 96 kbps. Lucent wants to lower that to 64 kbps. Lucent said PAC at 96 kbps outperformed the MPEG-2 advanced audio coder.

DRE also has added what it called a "DAB support FM subcarrier" to its FM IBOC system. It has a data rate of between 48 and 64 kbps. Kumar said it was compatible with the host FM, as well as RDS and RBDS services.

"It provides us with a form of triple diversity in the worst multipath (interference) environments," said Kumar.

DRE's AM system is using 38-48 kbps, which occupies less than 30 kHz of bandwidth. In recent field testing of its FM system, Kumar said it made "a fundamental breakthrough in FM IBOC-analog compatibility," which improves DRE's signal-to-noise ratio with the host analog station by at least 10 dB.

Kumar said DRE is finished with the field testing of the FM system and would schedule AM tests in early 1999. Lucent and USADR expect to test both of their systems in 1999 and complete field tests by the end of that year.

Signal drop off

To get around the problem of a sudden digital signal dropoff at the edge of a coverage area, USADR is using a "blend with time diversity system" to ensure a graceful degradation of the digital audio.

USADR uses this system in both the hybrid (analog/digital) and all-digital modes. The hybrid uses the delayed analog signal as a backup; the all-digital system contains a delayed, low-bit digital backup signal.

David Monsour, Lucent vice president of research and development, said Lucent is working on a similar system involving "improved robustness to get more graceful signal degradation."

DRE on blending

DRE said it has an analog audio fallback but considers it as a last resort. Kumar said blending to analog is a "crutch."

"We don't see a lot of benefit in trying to blend between analog and digital. We try to keep within the digital domain as much as possible."

With such different systems and testing time frames for the three proponents, observers wonder if the FCC would, in fact, select one system. Some believe the FCC wants the industry to decide that weighty question.

Many in radio look to the television industry for guidance, or at least lessons. Unlike TV, which won new spectrum for its transition to digital, radio is trying to achieve a transition within its spectrum and on the channels that exist today. The digital process in TV moved forward with the creation of a "grand alliance," a body with representatives of the many factions involved.

The FCC told the TV industry to form the group and to pick a standard for digital TV. Even so, observers say, TV is having problems making the transition in a timely way.

Asked whether IBOC proponents would consider cooperating on technical issues that would eventually result in a single IBOC system, Kumar joked that DRE "had never been divorced from someone," an apparent reference to USADR and Lucent. Those companies made a high-profile joint development agreement in 1997, only to discontinue it less than a year later.

"We don't think the FCC will make a decision when faced with three different systems," Kumar said.

USADR has said another alliance with Lucent is unlikely, but did not rule it out. Lucent was similarly lukewarm, but Lucent Digital Radio President Suren Pai said Lucent would consider such an arrangement if it made good business sense.

DRE said it has an analog audio fallback but considers it as a last resort.

Circle (196) On Reader Service Card

World Radio History

NRSC Moves Ahead With IBOC

▶ REACT, continued from page 1

system standard, USADR argued, and eventually develop rules to govern the new technology.

The other public proponents working toward an IBOC DAB system, Lucent Digital Radio and Digital Radio Express, agreed with some of what USADR proposed, and disagreed with other parts. Representatives of both companies said they had yet to read the entire 400-plus page proposal, but shared their initial reactions with **RW**.

Timing questions

Lucent Digital Radio President Suren Pai said he was surprised at the timing of USADR's petition to the FCC. "Anybody can file a petition," he said. Lucent was a partner in a joint development agreement with USADR before announcing its own plans for a DAB system.

Pai would not say whether Lucent would file a proposal with the commission. He believes a better strategy is to wait until a system is near completion before proposing it to the commission. That means waiting until an AM and FM system is fully tested, and IBOC DAB compatible receivers and exciters are ready.

Digital Radio Express Engineering Director Derek Kumar said the USADR petition was premature and that the filing, in effect, circumvented input from representatives of interested industry parties taking part in the DAB subcommittee of the National Radio Systems Committee. When DRE finishes its testing, Kumar said, it will submit test results to the DAB subcommittee and file a petition with the FCC. Despite USADR's action, Kumar said the DRE plan would not change.

The DAB subcommittee of the National Radio Systems Committee met on the last day of the Radio Show. The proponents updated the committee on their lab and field testing for AM and FM systems. The NRSC is a standards setting body operated jointly by the NAB, representing broadcasters, and the EIA, which represents receiver manufacturers.

USADR's Rick Martinson (left) and Glynn Walden confer.

NRSC Chairman Charlie Morgan, senior vice president, Susquehanna Radio Corp., said USADR and Lucent Digital Radio plan to complete both lab and field tests by the end of 1999. Digital Radio Express plans to be finished earlier, by next summer.

Morgan said the results of DRE's recent IBOC test on a station in San Francisco would be filed with the FCC soon. DRE previously had indicated the results would not be made public.

A working group of the DAB subcommittee submitted final lab test criteria to the full NRSC for approval. Morgan said the proposal would be voted on before the next meeting, set for early December.

Soon the group will begin working on field test criteria. Morgan said both lab and field test criteria would be given to the proponents as a single package. The subcommittee has not set time deadlines for test results submissions, nor will it, Morgan said.

At least one committee member would like to see deadlines set, in order to compare systems to each other. The committee so far has not decided to do that.

FCC Chairman Bill Kennard said the FCC would monitor NRSC activities on IBOC DAB closely.

At the FCC, officials have not yet said what they will do with USADR's petition, filed Oct. 7. Most likely, observers said, the FCC would ask the public to comment on the proposal and begin a process leading to rules governing how the new technology would be adopted in this country.

In its filing, USADR suggested a 12-year transition period, during which stations would convert from analog broadcasting, to a hybrid analog-digital approach that supports both analog and digital receivers, to an all-digital system. Both Lucent and USADR said 12 years seems enough time, but reserved final judgment.

Neither agreed that the USADR system is the one the FCC should adopt.

In the filing, USADR said the FCC should publish criteria to evaluate the performance of all IBOC systems by July 1, 1999, and suggested a cut-off date of Dec. 15 of that year for test submission. If that is what the FCC adopts, it would effectively shut out any entity that is not already developing an IBOC DAB system.

Shively combiners

In related news at The NAB Radio Show, USADR said it has signed a cooperative agreement with Shively Labs to develop a low-loss combiner to work with USADR's system. Currently, officials said, combiners are high-loss in nature, which means transmitter power must be higher to compensate for that loss. USADR said the technology is being designed to reduce losses in the combiner to less than 1 dB, which will allow smaller DAB transmitters and lower costs.

USADR also has unveiled prototype IBOC digital test exciters and receivers, which the company said would be used to test DAB at several radio stations across the country.

Lucent said it would begin field testing its IBOC DAB system by early next year and continue throughout the year. Testing would begin with the FM system, with AM field tests to begin by mid-1999.

Lucent also announced improvements to its perceptual audio coder, which converts analog audio signals to digital format. Lucent said its PAC delivers near CD-quality audio at 96 kilobits per second, with ongoing research and development aimed at delivering the same performance at lower speeds, possibly 64 kbps.

Metro Networks Plane Crashes

by Randy Stine

PRINCE GEORGE'S COUNTY, Md. A single-engine propeller plane crashed in heavy fog Oct. 13, just outside the nation's capital. The crash killed the pilot and seriously injured a radio reporter for Metro Traffic.

The Cessna 172-XP was attempting to land at an airport near Bowie, Md., when it missed the runway and struck a house near the airport. Two women inside the home escaped injury.

The reporter and pilot had been in the air nearly an hour preparing traffic reports for WMZQ-FM in Washington at the time of the accident. Eyewitnesses to the accident reported a heavy blanket of fog at the airport. Authorities believe the pilot may have attempted to abort the landing at the last second.

Killed was Doug Duff, 42, from Alexandria, Va., the plane's pilot. He was an employee of Congressional Air Charter Inc. Seriously injured was reporter Robert Edgar, 31, of Arlington, Va. He suffered extensive third-degree burns, multiple fractures and facial lacerations. Edgar is employed by Metro Networks and was the regular morning and afternoon traffic reporter on WMZQ.

On the morning of the accident, Duff and Edgar had been in contact with Metro Networks, but had not aired any reports on WMZQ. The accident happened just before 7 a.m. during morning rush hour.

Charlie Ochs, general manager of WMZQ, said Edgar normally filed four reports per hour. "Rob had been with us for about eight months and had done a very nice job. We considered him to be part of the morning show," he said.

The radio station lost some transmission equipment in the crash and went without traffic reports for several days after the accident. "The Marti was ours. But that is really insignificant when you consider the loss of a life," said Ochs.

This is the third fatal plane crash involving Metro Networks since 1991, including one in Cleveland in 1996. That crash killed two.

"Safety is first and foremost with us," said Benson Riseman, regional vice president for Metro. "We've been doing this for 20 years, with this being only the third time we've experienced a crash that resulted in personal injury. But, as far as we are concerned one is too many."

Metro provides traffic and news reports to 38 radio stations along the Washington-Baltimore corridor and hundreds of other radio stations across the country.

We have over 100 planes in the air across the nation at any given time," said Riseman. "When you consider how many flight hours that is every year, we think our safety record has been very good."

The National Transportation Safety Board is investigating the accident. While early reports seem to indicate poor visibility as a contributing factor, the NTSB can take more than a year to make an official ruling. The NTSB has investigated 22 aircraft accidents that have involved traffic reporting services since 1983.

Photo by Tom Yeatman/Breaking News Network

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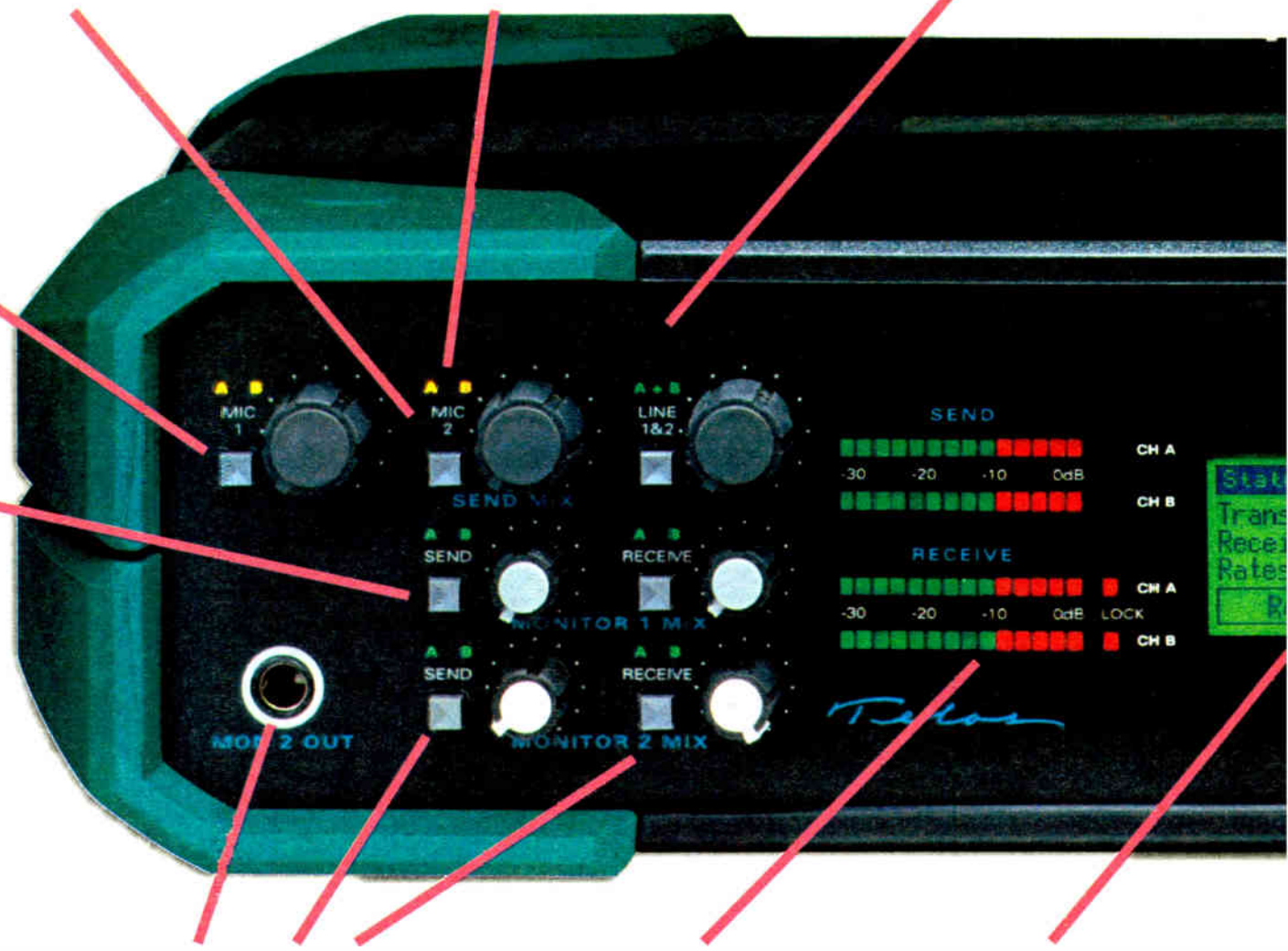

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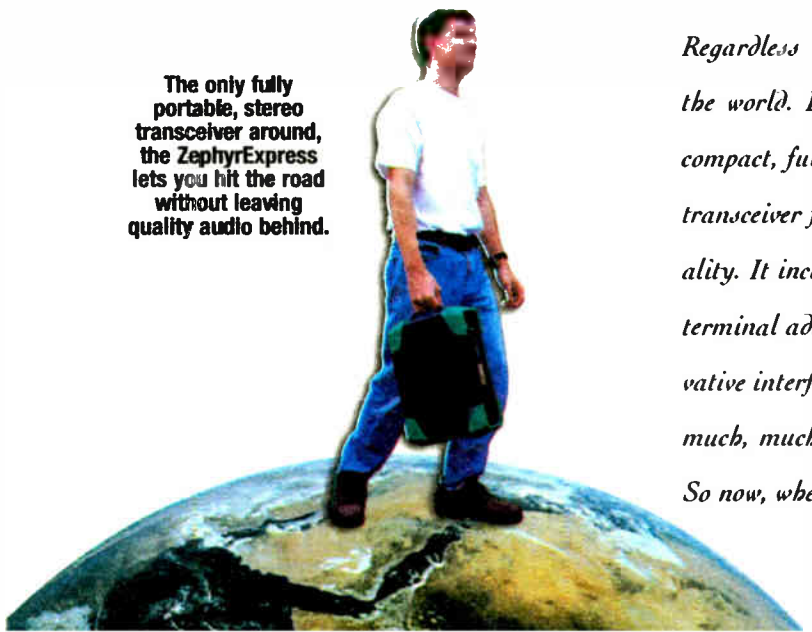

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World Radio History

Executives Downplay Recession Fears

by Brian Galante

SEATTLE The possibility of recession was on the minds of five radio group heads who met here on a high-profile panel at The NAB Radio Show. But these leaders did not seem concerned about the impact of any economic downturn on radio.

Topics ranged from the benefits of consolidation to streaming audio on the Internet. All were related to what moderator Frank Wood of Secret Communications called the continually developing future of radio.

"I was just in New York, and part of the problem is people need to get off that island and see the sunshine," said Larry Wilson, president of Citadel Communications. He was adamant that radio would not feel a recession even if one happens.

Jeffrey Marcus (left) and Lew Dickey

No recession participation

"We will not participate in a recession," he said. "Radio is a beautiful business and it's never been stronger. There's too much panic — radio is not dependent on Asia and Russia. We're going to continue selling spots."

Wilson also referred to Citadel as "the new guys on the block."

Jeffrey Marcus, president and CEO of Chancellor Media, agreed with Wilson's optimism about the outlook for radio.

"If we do see a recession, it may establish once and for all that radio is recession-resistant." Marcus said radio as an industry will "put our heads down and work through it."

Consolidation, pro & con

The benefits and costs of ownership consolidation were discussed. Wood said owners undoubtedly are the ones who feel most strongly that consolidation has been a positive for the industry. But, he said, non-owners may feel differently. At one time, he said, radio "attracted a certain type of personality. Now, no one knows anyone's name."

We will not participate in a recession.
— Larry Wilson

Wilson said that is not necessarily true.

"It's the same great bunch of people as before," Wilson said. "I think we have to work hard not to lose the greatness of radio — the culture. At Citadel, we have a lot of fun together. That's important to the bottom line of this business."

Lew Dickey, executive vice chairman and director of Cumulus Media, said the benefits of consolidation are important to smaller markets. "The verdict is extremely positive to the independent operators of these markets," Dickey said. "We've created more local programming and diversity of programming."

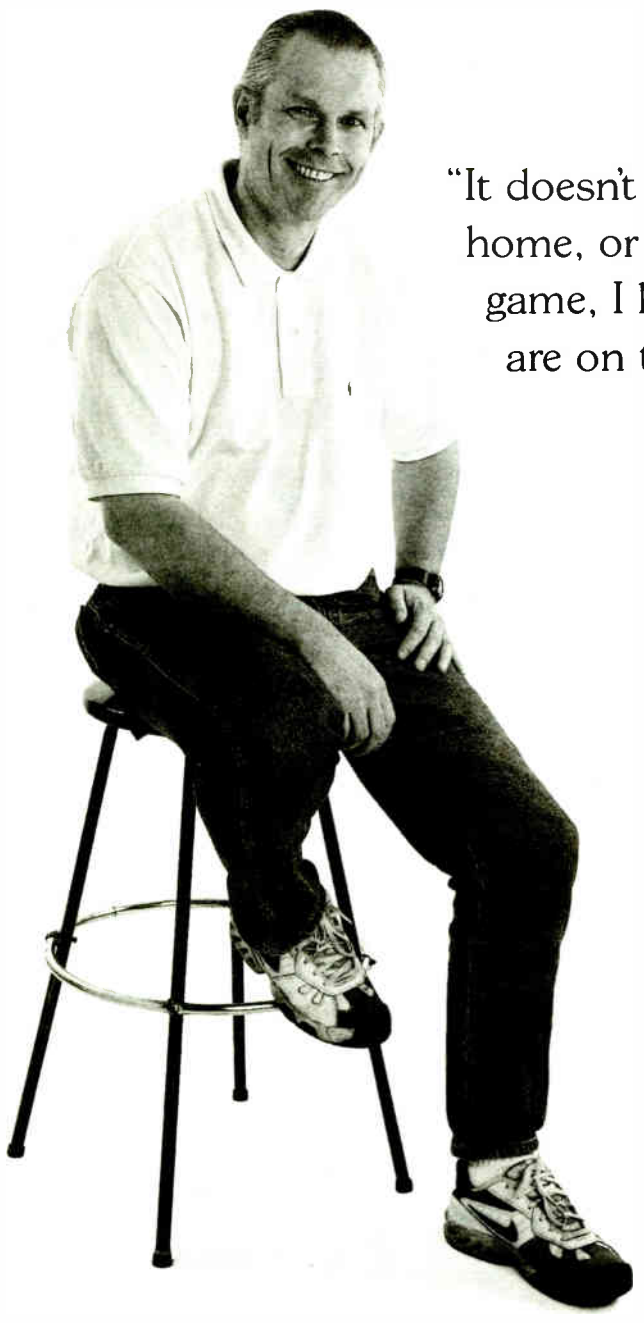
Dan Mason, president of CBS Radio, said the sales arm of radio has benefited from consolidation.

Sales progress

"I'm really impressed with how sales has come along in the last couple of years," he said. "Program directors put research into their projects, but sales was far behind. I think the sales side of the business is really coming along."

"We would all be naïve to say we would not have competition for entertainment values in the future," Mark

See GROUP, page 16 ▶



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World Radio History

After Market Drop, What Next?

Analysts Find Much to Like in Radio Investment Despite Stock Market Downturn

by Ann Schwab and Don Elliot

SEATTLE With radio stocks down substantially through mid-October, the money folks who came to The NAB Radio Show had to tone down the exuberance of past years. Their long-term opinion of radio, however, remains a "buy."

Panelists at a session about the future of radio in public markets were optimistic about its ability to offer value to investors, particularly long-term investors, even though the numbers might appear frightening now.

With fear of recession a bigger motivator than greed for most people, the panelists said, a bearish market provides purchase opportunities for investors who understand the inherent strength of radio.

Taking stock

"The average radio stock is down 26 percent year-to-date, compared to a 106 percent gain in 1997," said Bishop Cheen, vice president of high yield research, First Union Capital Markets. He said a two-month correction in the capital markets for all stocks did not pass over media companies, which have perceived exposure to weakened foreign markets.

On the other hand, Cheen said, "Interest rates are the lowest they've been in 20 years, and the spread between the interest rates and bond yields are the widest they've been in seven years," creating opportunities for investors.

Statistics, he said, indicate station values have increased nearly 100 percent between 1988 and 1997, from an average value of $4.4 million to $8.6 million.

Drew Marcus, senior managing partner of BT Alex Brown, highlighted two strengths that radio offers to investors.

First, advertisers generally are shifting from in-home media, including television, to out-of-home media, particularly radio, because out-of-home media have lower rates, offer greater exposure to consumers and face less competition/fragmentation within their fields.

Second, Marcus said, radio does a better job of selling itself to investors. Consolidation within the industry and the use of local and national radio clusters offer greater rates of return to investors via reduced expenses than do other, unconsolidated media.

Also, radio has increased its percentage of local advertising dollars from 11.6 percent in 1995 to 14.2 percent in 1998, Marcus said.

"Once we're through this period, radio can prove itself to be recession-resilient. My advice to investors is to use this period of weakness to accumulate stock in good companies."

Large discount

Kristin Allen, senior partner of First Boston, said fewer deals were getting done now, and at lower prices. "There is a larger discount now than in bullish markets, and stronger companies will have an easier time getting stock issues than weaker companies," Allen said.

But that should not be taken as a predictor of radio's future strength, she said. "Sixty percent of the radio company figures for the third quarter had a positive surprise in their results, and I expect to see the market gaining courage by the beginning of 1999."

In three years, radio increased its percentage of local ad dollars from 11.6 percent to 14.2 percent.

Capstar Broadcasting Partners Chief Financial Officer Paul Stone reminded investors to look at fundamentals. "Nobody has forgotten the value of a dollar. Radio generates significant cash flow and has overdelivered what it has promised to investors. We don't see gloom and doom in the future. Once the market fear subsides, the investors will return. I don't see fear in the eyes of our investors or analysts."

What investors see

Panelists viewed industry consolidation as a positive factor, and weren't concerned about the possibility of FCC reregulation of the industry.

"Investors are looking at three areas," Marcus said. "Growth trends, deal-making and financing trends and regulatory trends. Right now stocks are reacting to deal trends, and investors aren't worried over FCC plans."

He predicted that as long as Republicans control Congress, the FCC is likely to deregulate further rather than reregulate.

Allen said, "Stock prices are based on value, and consolidation increases value."

Other factors come into play.

"We talk about a company's (purchasing) opportunities in a market not only in terms of radio, but also in other

See FINANCE, page 16 ▶

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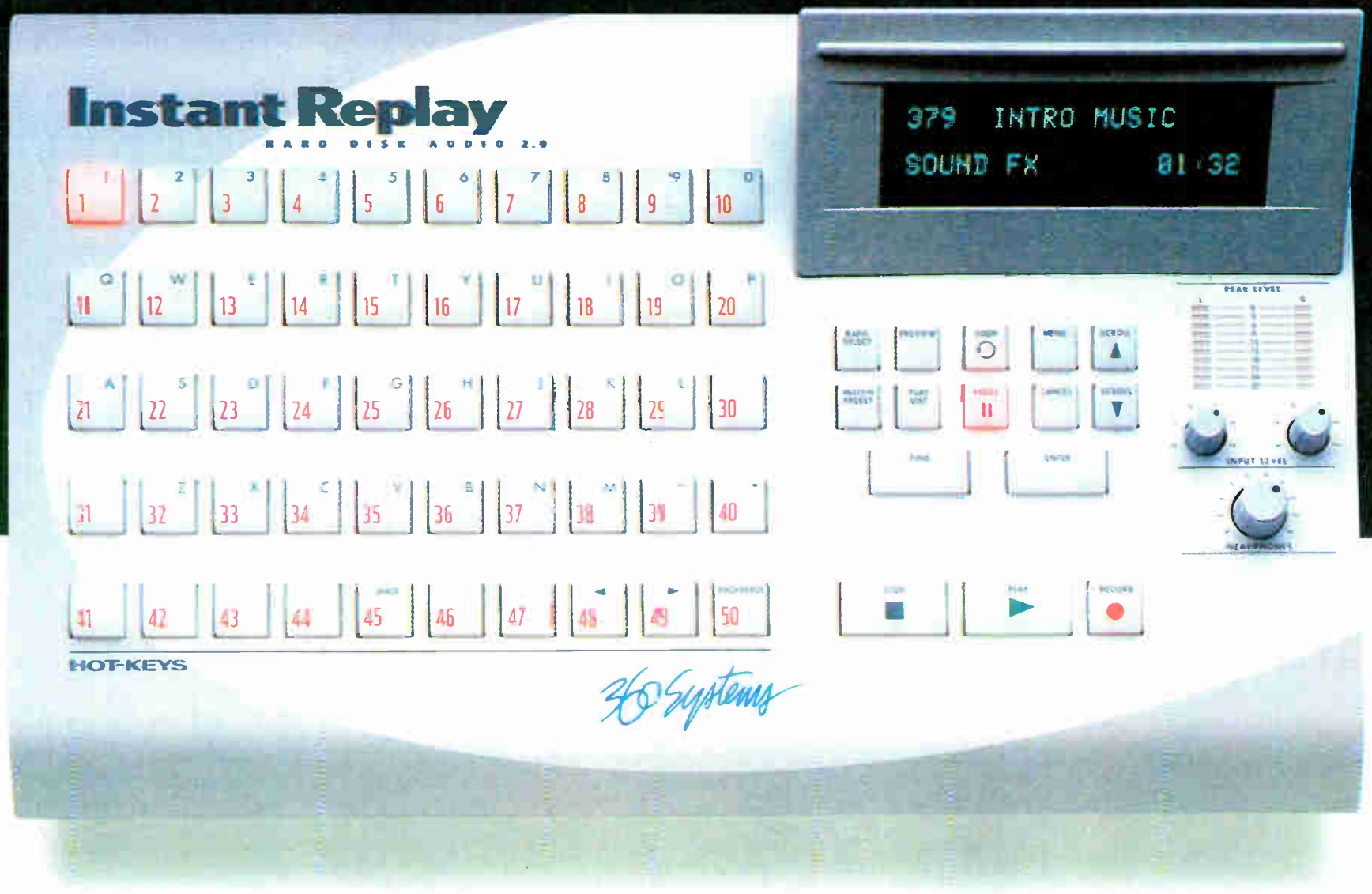

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World Radio History

Execs See Web Positives for Radio

▶ GROUP, continued from page 12

Mays, president and COO of Clear Channel Communications, said. The presenters seemed to agree on the need to provide strong local content. By keeping in touch with an otherwise insular audience, they said, radio has an advantage over other media.

"We need to have good local programming to be competitive," Mays said. Wilson said passion for programming is essential to keeping in touch with an audience. "It takes more than a signal to make a station," he said.

Satellite-delivered digital radio services, planned for launch in the next two years, did not seem to faze the panel.

"We believe radio is fundamentally a local business," Dickey said. "We don't see (satellite radio) as a viable substitute."

Wood said, "The essence of radio is portability."

The group heads expressed awareness of Internet audio streaming, and saw advantages for radio. "I think it's exciting," Marcus said. "We now have the ability to drive people to a Web site." This ability, he said, creates tremendous opportunities for revenue. But he remained cautious of possible intrusions.

"I'm not crazy about having other stations transported into my market. I don't want drop-ins coming into my market on the Internet."

While Mason sees benefits in streaming audio, he said he was not quite ready to venture there with live CBS content.

"We don't use live programming on the Internet — it's our intellectual property," Mason said.

Another issue at the show was ongoing research into in-band, on-channel digital audio broadcasting, which CBS supports through its investment in USA Digital Radio. According to Mason, radio people must learn about the issue and see what it can do for them.

"We see IBOC as a digital standard in the future," Mason said. "Acquaint yourself with it."

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Investors Can Find Value Now

▶ FINANCE, continued from page 14

industries, particularly outdoor advertising," Allen said.

Investor game plan

"Investors like a good, solid game plan," Stone said, "and multimedia companies have a synergy that single-medium companies don't have. Instead of fighting against each other, now we can look to owning outlets in other industries."

The panelists agreed that investors can find value today. Marcus said, "In July, three of the six major radio groups were selling for 14 to 16 times cash flow, while now they're at closer to 10 to 11 times cash flow."

The top 10 companies in the industry control 40 percent of the industry, panelists said, so there's room to grow. Also, radio itself is becoming a consolidator of other industries.

Allen said, "Radio's a great business, with steady growth and limited technical threat to the industry. Radio stocks shouldn't get much lower, and they're very attractive on a relative basis."

Cash flow

Stone said, "Accounting techniques don't tell the whole story." Rather than merely looking at P/E ratios, Stone said, investors should focus on how much cash the properties bring in.

"And radio brings in a lot. Cash flow is cash flow, whether the dollars come from small markets or large markets," Stone said. "The price of consolidation is debt, but as debt decreases, the cash flow increases. The long-term investors will really profit. The market will continue to ebb and flow, and I expect that the prices will be even higher in a couple years than we now think it will be."

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COMING SOON

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World Radio History

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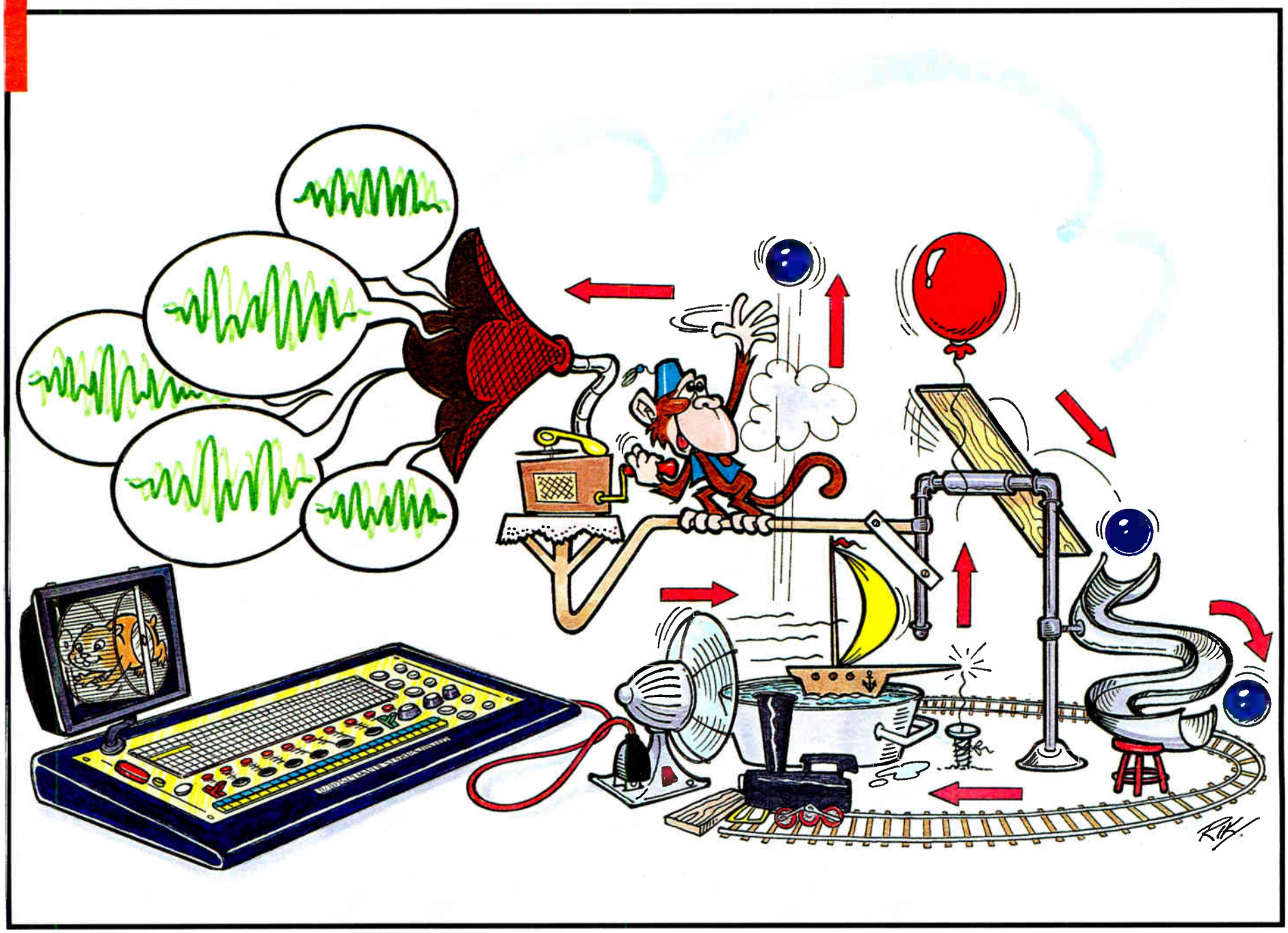

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World Radio History

Irving on the Digital Revolution

Clinton Administration Policymaker Sets Goals of Community, Diversity, Universal Service

The following are excerpts from a recent speech by Larry Irving, assistant secretary of commerce for communications and information and the administrator of the National Telecommunications and Information Administration.

Irving was appointed by President Clinton in 1993 and serves as principle advisor on communications issues to the president, the vice president and the secretary of commerce. He oversees the management of the federal government's use of the radio spectrum, and he was the administration point person in reform efforts that resulted in the passage of the Telecommunications Act of 1996.

In his remarks to a joint luncheon of The Institute of Electrical and Electronics Engineers and The Association of Federal Communications Consulting Engineers in Washington, D.C., he touched on the digital revolution, its impact on radio, the state of minority broadcast ownership and the need to develop more engineers.

On the digital revolution:

I want to talk to you about the future and how we can succeed in the future, because there's no mistake, it's going to be a digital future. More important, it's a digital *present*. When you think about what's happening right now, it's digital. This digital transformation is producing a revolution in our ability to access information and in the way we live. ...

Direct broadcast satellite (for example) ... is a wonderful thing. ... Sitting on top of my television set is a little box that gives me direct broadcast satellite signals, with more processing power than a 1988-era mainframe computer. That's a wonderful, and frightening, revelation. ...

By the end of this year, many viewers can sit down in front of a high-definition television and watch a super-sharp TV. It's already happening in Japan. And those with WebTV or similar Net-surfing devices will also be watching television and making interactive purchases simultaneously. ... Our couches have become command central.

The role of the Net:

The Internet really is the forefront of the digital revolution. I gave a speech in 1994 in front of the NAB board of directors, and I asked them how many had been on the Internet, ever.

None. Nada. Zero. Not a one.

I said "Look, you guys gotta get it. You need to understand it. Either learn how to surf the Web, or you get overcome by the wave that's coming."

My friends in radio say, 'The Net's not really a threat, because you have to be hard-wired into it.' Wrong, my friends.

It is imperative for those members to understand it, but it is also imperative for anybody involved in telecommunications. ... All of these industries are converging so fast. It's not *broadcast* engineers, it's not *cable* engineers, it's engineers who understand technology as they converge. And digital television and the Internet are going to converge and change the world as we know it. It has to, and it should.

When you think about 130 million people using the Internet and the World Wide Web today, when fewer than 1 million were using it when I took my job in 1996, and when you think that number's going to be over 300 million in five years, that's (an) unbelievably rapid pace.

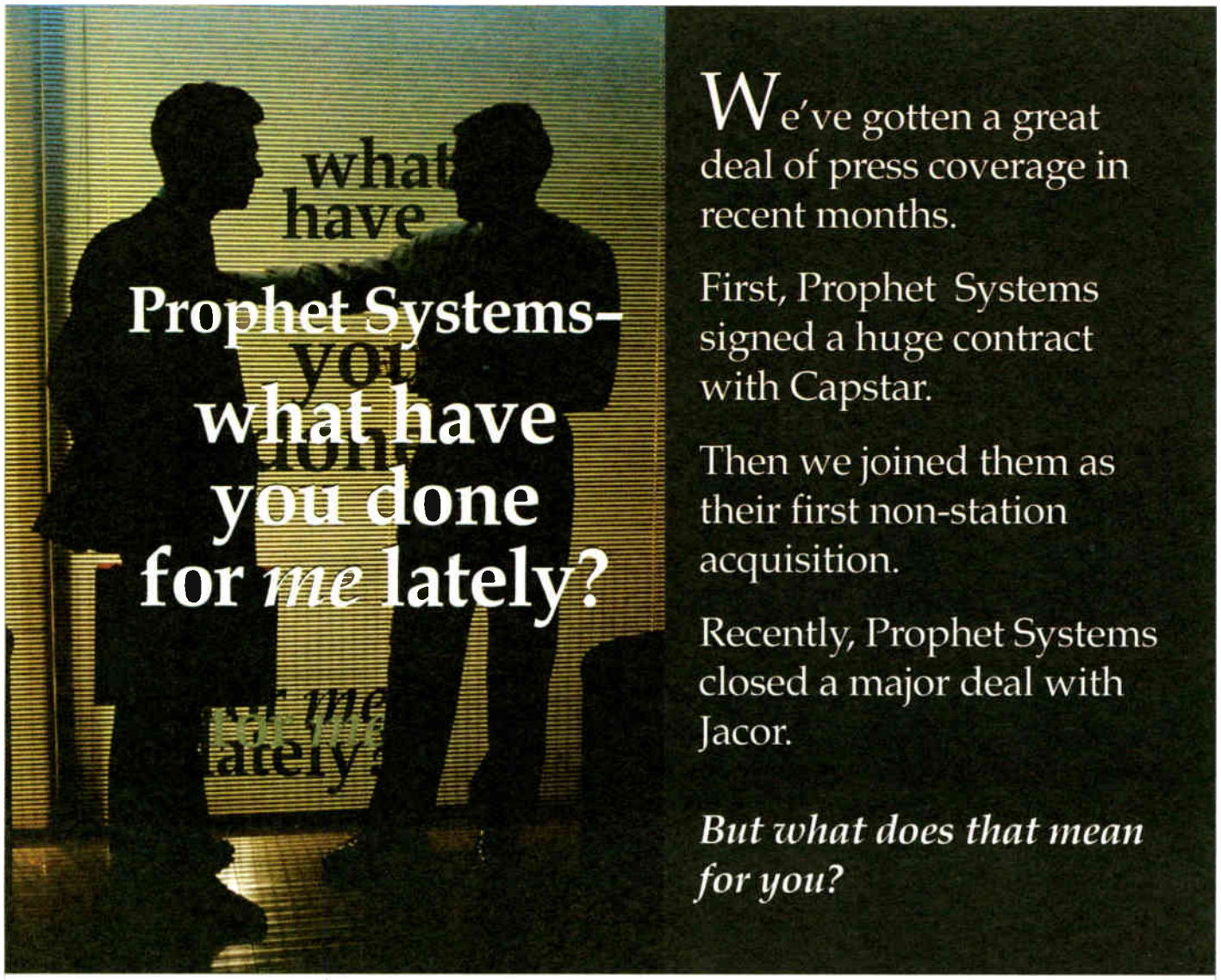
My parents live in a part of Florida that recently had some very bad fires. I was with my parents this weekend. My mother's 67, my dad is 70. When people wanted the latest information about what was happening with Hurricane Georges, they weren't going to their local broadcaster, they weren't even going to the Weather Channel. Dozens of senior citizens were going on the Net to *weather.com* or the USA Today Weather (site), to find out where Georges was. That's a paradigm shift. ...

My 12-year-old niece came to visit me this summer. When she comes into the house, she doesn't head for the television. She heads to the computer, and she's on AOL, she's on *MSNBC.com*'s Web site, and she's on instant messaging with her friends, and they're doing games over the Net. ...

For people in this industry, we need to understand where we're going as a society. We're going (toward) choosing what we want to watch, when we want to watch it, and not having that choice imposed upon us by a programmer. I think that's democratizing, liberating. But for those people in traditional industries, it's also somewhat frightening and daunting.

These new technologies are not just about what George Gilder would call

See IRVING, page 20 ▶



World Radio History

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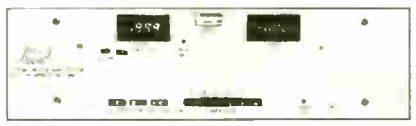

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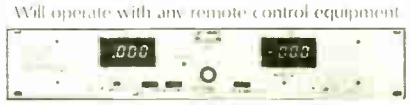

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World Radio History

Irving Lays Out Digital Future

▶ IRVING, continued from page 18

sand, glass and air. They're about creating new opportunities for our society, and we've got to think about how we take hold of our traditional broadcasting values: localism — I call it community — diversity and universal service. That's what your industry has stood for. And broadcasting still plays an important role.

On building community:

A lot of people would disagree that digital technology is bringing people together. But I disagree with them. I watched my grandmother get a WebTV. Why did she buy a WebTV for $199? So she could stay in contact with her great-grandchildren. She's online at 83 years old, arthritic, and she has WebTV and uses it so she can send letters. That brings a family together. ...

Larry Irving

We're talking about college students and immigrants using the Net to make cheap telephone calls. If you want to make a telephone call anywhere in the world right now, the cheapest way to do it is using IP technology. There are literally hundreds of thousands of people who do it every day, and that's going to be become more ubiquitous. ...

When I'm in Singapore, when I'm (abroad), there's two things I do: When I get up in the morning, I go to *www.washingtonpost.com, usatoday.com, newyorktimes.com* and pull down the news. In the evening, I have RealAudio loaded in with a soundcard in my laptop; if I have a robust enough connection I will listen to NPR and find out what's happening.

That's a change in the world. CNN is a wonderful thing, but I don't have to rely on CNN. I can get my local news and I can get NPR, the same way I would in Washington. That's changing your industry. ...

Businesses can cut out middlemen (through the Net). If you're looking for a piece of equipment, you don't have to just go to the NAB show ... Increasingly, trade shows are year-long propositions on the Internet. You're finding lots of new ways to find information. ...

Think about the ways we can use interactive media to connect viewers interested in the same program all over the globe, think about linking Hispanic speakers with each other using a television set and the Net.

There are engineers here who can think of lots of creative ways of using the convergence to bring these interests together, increase the ratings of traditional broadcast networks, at the same time using new technologies to drive more people to use this technology. Policymakers such as myself can ask the questions; but you're going to realize that vision, because you're the guys who really know what we're talking about.

On diversity:

Anyone with a PC can place content on the Net, and that's not true in radio and broadcasting. We need to be careful that diverse viewpoints are heard in the media, particularly in this era of consolidation. We also have to make sure there is credibility in terms of the diverse of information out there, and people aren't getting bad information. ...

It is amazing the number of scams that are on the Net. And we've got to find ways to have the same kind of control of bad things on the Net — we need to find ways to give consumers assurances that they're protected, without the heavy hand of government regulation. ...

We also need to make sure everybody is part of this digital revolution. We (NTIA) did a survey (recently) showing that minorities collectively are 30 percent of this nation, (but) own fewer than 3 percent of the broadcast stations in this country. And that number is declining since the 1996 Telecom Act passed.

Minority ownership and programming is going to be less and less as group owners become larger, the entry barriers get higher. It's harder for new people to come in. (There are) fewer women owners of broadcast stations.

Given those figures, we can find other ways to get disparate voices not just on radio and television, but using new media. Digital technology is going to open up new venues for radio broadcasting. There are 1,500 radio stations on the Internet right now. A young man in Chicago, 15 or 16 years old, (is) making a profit selling commercial time on the Internet. ...

KING-FM in Seattle (was) one of the first radio stations to really capture the Net. I'd listen, not because I liked classical music so much, but because I *could*.

We're going (toward) choosing what we want to watch, when we want to watch it, and not having that choice imposed upon us by a programmer.

I have friends from Canada or France (who say), "We have to control the content of what comes into our country, we want to have 50 percent French or 80 percent Canadian content." I'd say, "You're going to have 50 percent of your population under 25, all with Net connections in five years, who are going to get whatever they want off the Internet."

We cannot control this thing; we shouldn't try to. Let 10,000 radio stations bloom on the Net. We'll begin to get more of what people want. The market will make the decision, rather than regulators, of what the American people really want.

Net threat to radio?

As we begin to get more wireless technologies, you'll also have mobility on the Net.

Right now, when I talk to my friends in radio, they say, "The Net's not really a threat, because you have to be hard-wired into it."

Wrong, my friends. We're beginning to get to the point where mobile technologies, mobile data dissemination will make it ubiquitous. You can get access anywhere.

If I'm riding around right now in a rental car from Hertz, using GPS technology I can navigate my way around the city. It's not going to be too long that I'll be able to get broadcasting streams over that same computer system that's giving me my GPS location, and I'll have access to any radio station anywhere in the world if I want to, over the Internet.

Diversity through microradio, HDTV

What about small communities? What if your church could have their

See IRVING, page 21 ▶

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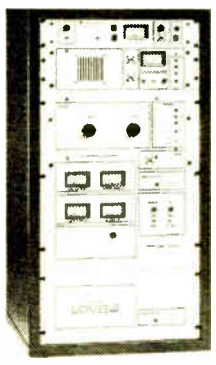

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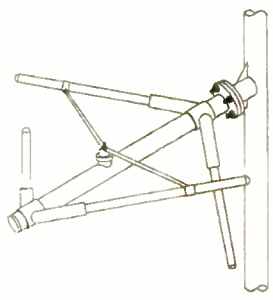

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World Radio History

▶ IRVING, continued from page 20

own radio station that could broadcast seven or 12 or 24 hours a day to its parishioners? I think that would be a good thing, to draw a broad community together. But microradio also causes challenges for engineers in terms of interference, and maybe challenges for broadcasters as it creates some erosion of their audience.

HDTV will open tremendous opportunities for diverse programming in television. ... It gives us a chance to do more for children, for a local broadcaster to do more (programming) about the city and its environs. It gives creative broadcasters a lot more to do.

Universal service

We have to make these technologies as accessible to as many people as possible.

We can find cheaper plane fares, cheaper cars, cheaper houses (on the Net). If you don't have access to a Web site, you're going to lose money. If you're buying a house or a car in the next year, and you don't use the Internet to help you do that, you're going to lose money. You heard it here first: I can find you a cheaper car than you can find yourself (by shopping in the traditional way).

That has an effect on broadcasting, because some of these people advertise on broadcasters, and (when) people go to the Net, it changes the paradigm. ...

People who lack the skills to partake in the digital revolution will be left behind. The unfortunate thing is that, if you are poor, if you are a person of color, if you live in the inner city, if you live in a rural community, you are less likely to be connected.

This is a nation of 270 million citizens. We are only as strong as the weakest of us. If we don't have everybody in this country with the requisite skills of a 21st-century economy, all of us lose, because we're in a global race for jobs and for economic prosperity with the rest of the world. ...

The market will take care of a lot of these problems. You can now buy a PC for less than a 32-inch television. But we need to have computers in classrooms. We also need to make sure (engineers) are thinking about how we're going to use these technologies for convergence.

From a broadcaster point of view, you've got to make sure that when people are surfing the Net, they also think there is some value to the traditional broadcasters and what they're offering over the Net. Because people are going to start surfing for what gives them value in their daily lives.

Engineering jobs and diversity

I happen to be married to one of the few black women engineers I know. I don't say that with pride, I say that with a little bit of sadness. When we were going to Northwestern University, my wife was an anomaly in 1975, when she was a freshman, because she was a black woman engineer. Sadly, if she were 17 years old today, and entering Northwestern University, she'd still be an anomaly as a black woman engineer.

We need to find a way to make engineering and technology not just the province of men, not the province of just non-minorities, but of everyone. People should understand that math and science benefit all of us. ...

I'd like to challenge you to think about more internship programs. ... The value of learning technological skills at an early age cannot be overemphasized.

Let 10,000 radio stations bloom

on the Net. We'll begin to get more of what people want. The market will make the decision.

We are going to have a shortage of workers, of technology workers. We need to get more. There are jobs that pay, on average, $46,000 per year compared to $29,000 per year for traditional manufacturing, and we can't fill them. Just yesterday, Congress reached agreement with the administration about bringing 300,000 more people from overseas into the country to fill engineering jobs. I think we have to change the debate from importing more skilled workers to imparting more worker skills.

About Y2K:

I know a lot of you think you've got the Y2K bug whipped in your office. Can you make sure that your vendors, that the people you sell to and work with have their problems solved, too? If the people you're doing business with don't have it solved, you still have a problem.

I may be preaching to the converted when I talk about the wonders of the digital age. But I don't want to just talk about the bells and whistles, and praise what's happening. What you've helped create is a scientific advancement. But it's more than that. It's a tool to advance the best principles, the best values of this country. We've got to stay strong with community, with universal service, and remember that this nation is great because this nation is diverse.

World Radio History Circle (159) On Reader Service Card

Show On Stocks, FM Spectrum

▶ WRAP, continued from page 1

can only increase interference and also threaten the transition to digital radio," said NAB spokesman Dennis Wharton.

No interference

Kennard said the FCC would not allow a new service to interfere with any conversion to DAB. USA Digital Radio has said its IBOC system is based on existing spectrum allocations and that changing those allocations could hurt the transition to digital. Digital Radio Express and Lucent Digital Radio officials agree.

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William Kennard spoke to his first Radio Show as FCC chairman.

Commenting on the USADR petition for rulemaking, which calls for the creation of an IBOC DAB service, Kennard said the FCC will consider it while it also continues to monitor the activities of the DAB subcommittee of the National Radio Systems Committee. The committee is developing test criteria for all IBOC DAB proponents in order to evaluate the developed technology.

USADR hopes the commission will solicit public comment on its petition quickly. A commission staffer told **RW** that would happen soon.

Kennard made clear the FCC will not ignore the low-power issue simply because "it's inconvenient for incumbents." He said broadcasters need to work with him to develop proposals in a way that will not degrade the FM spectrum.

Up for discussion now at the FCC is how would such stations be licensed, whether through auction or some other mechanism ,and how such a new service could be instituted without creating interference to existing stations.

Kennard said the FCC would not allow a new service to interfere with the digital conversion.

Furchtgott-Roth on mergers

Also in his first appearance before radio show attendees, Commissioner Harold Furchtgott-Roth criticized how the FCC is handling antitrust reviews of radio mergers.

He likened the FCC version of antitrust review to the "junior varsity," saying the effort to enforce the nation's antitrust laws really belongs to the Department of Justice.

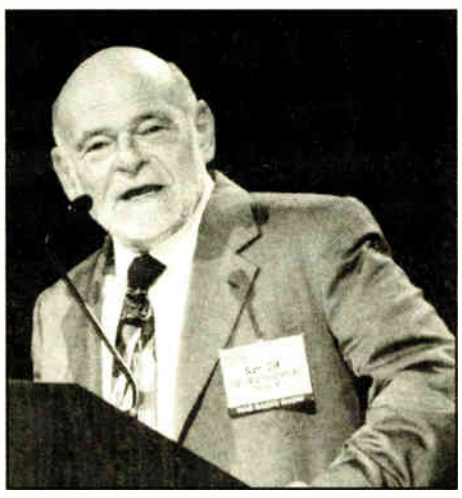
Both the FCC and the DOJ review potential radio mergers. Representatives of both agencies have said their efforts are not duplicated, but Furchtgott-Roth disagreed.

"What set of facts triggers a review? What share numbers does it (the FCC) find acceptable? That information has not been made public," Furchtgott-Roth said.

Recent turmoil in the financial markets was also on broadcasters' minds.

Citadel Communications Corp. President Larry Wilson said concern over lower radio stock prices is overdone. "The world is not coming to an end," he said.

The possibility of a recession was discussed but rejected by the heads of several radio groups. Chancellor Media President and Chief Executive Officer Jeffrey Marcus said, "If we do see a recession, it may establish once and for all that radio is recession-resistant." He said radio as an industry will "put our heads down and work through it."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Jacor Communications Chairman Sam Zell delivered the keynote address shortly after announcing the sale of his company.

Keynote speaker Sam Zell, chairman of Jacor Communications, praised consolidation in his comments about the Jacor-Clear Channel merger. Zell described the combination as a good fit, with mutual respect between the managers of both companies. He said the management integrity of Jacor would be preserved.


© 1998 NAB

Dr. Laura Schlessinger

"We felt that this transaction was a significant one-plus-one equals three," Zell said.

An appreciative audience gave Lowry Mays, chairman and chief executive officer of Clear Channel Communications, a standing ovation when the NAB presented him with its National Radio Award.

"It's a great day for the 10,000 or so employees of Clear Channel Communications," Mays said. "This award is not for me — it's for them." He praised his employees for their entrepreneurial spirit.

Radio personality Dr. Laura Schlessinger preceded Mays with a brief, well-received speech on the value of morals in the radio industry. Schlessinger said the industry has a profound responsibility for what reaches the ears of listeners.

Schlessinger said, "When you have the ability to connect us all, you can be entertaining without providing and supporting ultimately what you're ashamed of." She said some of the most successful shows in radio are able to achieve success without resorting to immoral tactics. "You can have a very successful bottom line without being ashamed," she said.

The NAB Radio Show will take place in Orlando next year, Aug. 31 to Sept. 3.

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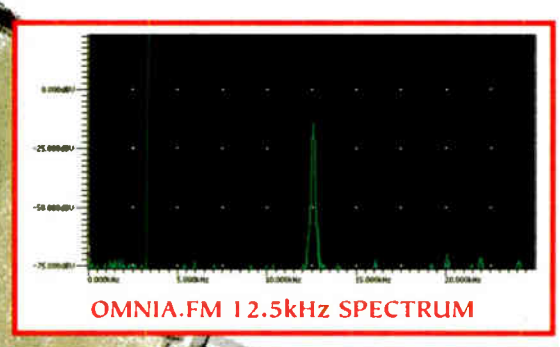
World Radio History

LISTEN

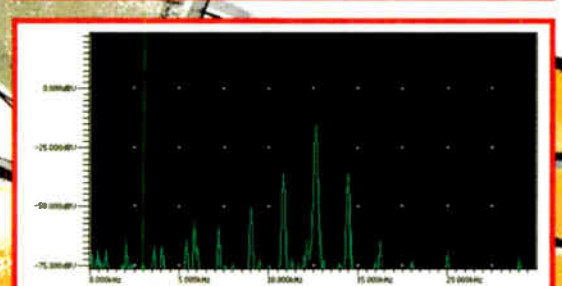
When you hear the Omnia.fm, you'll know why broadcasters the world over choose it: Sound that's as smooth and fluid as analog, with absolutely none of the digital grunge you hear in other digital processors.

So what's digital grunge? Artifacts caused by aliasing distortion in yesterday's processors that lack the Omnia's 48kHz sampling, 192kHz virtual upsampling and unique anti-aliasing final limiter. In the FFT analyses shown below, you can actually see the grunge as well as its absence in the Omnia.

To hear the difference for yourself, contact your Omnia dealer and get your risk-free, 60-day demo*.



OMNIA.FM 12.5kHz SPECTRUM



OPTIMOD 8200 12.5kHz SPECTRUM

Here's how: *The test results were obtained with a Hewlett-Packard Audio Test Set, Model 339A; the audio processor under test; and Rapid Systems R1200 Data Acquisition System for FFT analysis. The processors were set for 75µs pre-emphasis, and were carefully adjusted so the input levels were within the normal range of operation. The unit under test was fed a 12.5kHz test tone using the analog inputs. The discrete left channel analog output was connected to the FFT analyzer input. That's it. No tricks, no disclaimers about the test working only in our trade show booth or only in our lab, under the most arcane, non-real-world test conditions. In fact, you can duplicate the test results yourself in your own shop. Don't have an FFT analyzer? No problem. Just use an oscillator and your ears–you can clearly hear the birdies in the old processor! Of course, this isn't about test tones; it's about music. And Fourier theory says that music–whether it's rap, oldies, urban, country, and yes, even grunge–can be represented as a combination of sine waves. Imagine what this kind of aliasing distortion can do to complex musical signals!*

Here's why: *The Omnia.fm utilizes 48kHz sampling for dynamics processing and virtual upsampling at 192kHz for the final limiter, which is a unique, anti-aliasing design. The test used version 1.02 software and the 'Cranked' preset, which is the Omnia's most aggressive stock setting. The Orban® Optimod® 8200 used for testing operates at 32kHz sampling for the dynamics processing and incorporates (4x) 128kHz upsampling for the clipping/low-pass filtering function. The test used version 3.0 software and the 'Urban/Rap-Dense' preset, which is the Optimod's most aggressive stock setting. Aliasing will occur with input signals above 5kHz in 32kHz FM broadcast audio processors unless mechanisms that cause aliasing are eliminated.*

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

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*Contact your dealer for details on this demo program. Demo requests must be accompanied by a purchase order so our dealers know you're really serious about some serious sound.

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World Radio History

KEYBOARD CONNECTION

PDAs: Smaller Can Be Even Better

Barry Mishkind

Information is the fuel that keeps us moving through our workday. Without phone numbers, addresses, appointments, spot availabilities, part numbers, programming and news sources, things come to a halt.

Most of us use some kind of container of "mission critical" information. It might be one of those "information manager" books, notes on a paper, a typewritten list or even a portable computer. Of course, "information enhancement" comes with a price: the size and weight of what you have to carry.

Choosing the best tools

The explosion in digital devices has given us new options for storing and carrying our data. Perhaps you remember the "Dark Ages" of the 1980s, when your choices were limited to a paper-based system or a bulky portable computer — with "bulky" a more accurate description than "portable."

Now, we are able to carry a notebook computer around the world with megabytes of RAM and gigabytes of storage, and consider it normal. Our biggest fear often is theft at airports.

Not only have prices come down, but choices in size and computing power have mushroomed.

A good way to determine which options best fits your work pattern is to focus on what you need and how you need to see it. For example, if you are in the field a lot, and need access to many of the applications you use in the office, a notebook computer is a practical necessity. However, if you only need to see a database, or enter a few items on occasion, why lug around all that power? That would be like driving an 18-wheeler to pick up a six-pack at your local convenience market.

Recently, I've tested some of the options. Perhaps my thoughts will help you focus on the best solution for your needs.

Handheld (or palmtop) computers feature a keyboard and operating system, with applications that mirror desktop units. This is fine, but unless you have tiny fingers, you are more likely to spend your time correcting entries than being productive. Further, some are as expensive as regular notebook computers.

I'm not dismissing these units. They can help where size is more important than ease of use, or where your task is simple: retrieving and sending e-mail and faxes, for example.

The Avigo from Texas Instruments and the Palm Pilot from 3Com are two examples of the Personal Digital Assistants that have sold in the millions over the past couple of years. Fitting in your pocket, they present information and allow input. Their small size, though, means the input must be done via a "pen." (More on this another time.)

Still, PDAs allow you to make quick notes, including the ability to draw and save a sketch, but they are not suitable for long-form entry.

Of course, the key to moving data in and out of these units is your desktop computer. Realizing that *most* data entry is done at your "normal" keyboard, and most field use is for retrieval, manufacturers have worked hard to provide portable units with the ability to synchronize themselves with the "main" computer.

Enter REX PRO

If you want to get down to the lightest, easiest data source to carry with you, the REX PRO PC-Card Organizer from Franklin Electronic Publishers should make you happy.

Approximately the size of three stacked credit cards, REX PRO weighs only 1.4 ounces. Even when carrying business cards along with the REX PRO in its leather carrying case, you still are looking at only about 3/8 of an inch. This is truly a pocket-sized PDA.

The REX PRO is a second-generation unit. Using the SuperKey Light Data Entry System, the six bubble-type buttons now allow entry of data or short notes wherever you are. Additional TrueSync software from Starfish includes a Personal Information Manager and direct synchronization with Outlook, Schedule+, Act!, Organizer and Sidekick.

The Franklin REX PRO: It doesn't get much tinier than this.

The REX PRO PC-Card Organizer will satisfy fans of small, useful data sources.

With 512k RAM, the REX PRO has enough memory to store up to 6,000 records. The dual-time-zone clock includes an alarm feature, as well as optional reminder alarms for your appointments.

Updating the REX PRO is easy. If your main computer is a notebook, the REX PRO will slide right into the PC-Card slot for updating. For desktop units, a small serial docking station provides a quick connection for updating.

Bits and pieces

As we step toward 1999, many are expressing concern over the potential problems with computers not being able to handle dates starting in 2000 (Y2K). Essentially, computers and software save space by assuming the "19" and storing only two numbers to denote the year. Fourteen months from now, some of them will think it is 1900, which could cause some problems with date calculations.

While predictions that the world will grind to a halt may be overblown, it is worthwhile to review your facility to ensure Y2K compliance. You want to know that software in your equipment won't go "funny" from long-forgotten date functions.

To that end, I've contacted a few broadcast manufacturers, and you will be happy to know that most are already Y2K compliant. In order to help you be more secure about the equipment in your facility, check the Web page I've set up at *www.oldradio.com/current/Y2K.htm* where information received thus far from manufacturers has been summarized. More will be added as received.

Of course, if you are paranoid and want to avoid the whole thing, it may be helpful to try living in the past: 1994 and 1983 both started on a Saturday, just like 2000 will.

On the other hand, if you really *want* something more to worry about, consider the growing list of reports lately in the computer press regarding "security holes" in various mail readers and browsers. Some involve Java scripts, others use e-mail file attachments.

By exploiting such holes, hackers potentially can gain access to your computer and/or server. Not only is it possible that a malicious hacker could read data held in your computer cache, but reports indicate it also is possible to install a Trojan horse program such as "Back Orifice" without you being aware of it. This can permit outsiders to read and take files, or even take control of a server.

While the possibilities of this happening to you are deemed slight, you should check periodically that your computer and system are secure. If you use Netscape, Internet Explorer, Outlook Express or Eudora, for example, ask the manufacturers for the latest updates to plug any holes.

Are such updates necessary? They take some work, especially for a server connected to the Internet, but failure to do so could subject you or your station to the embarrassment of having your Web site hacked and filled with pranks.

Bookshelf

One of the complaints we hear from computer users is how the features of Microsoft Windows work. You may find the book "Windows Annoyances," written by David Karp and published by O'Reilly & Associates, to be the answer to your frustrations.

Covering topics that range from cleaning up the desktop to troubleshooting the Registry and network connections, "Windows Annoyances" will assist you in solving problems and maximizing your system performance.

■■■

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

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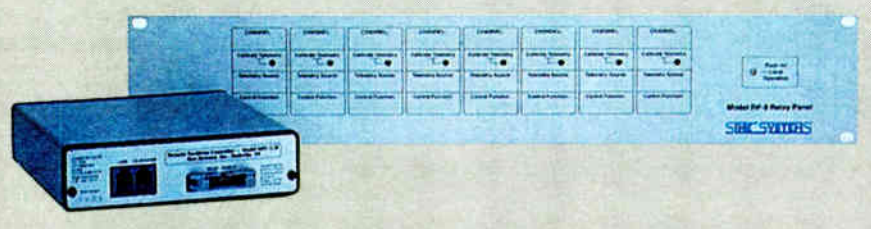

Dial-Up Remote Control: Control and monitor your transmitter from any telephone with the famous RFC-1: the world's most affordable full-featured dial-up remote control. It speaks to you with a natural human voice! It can also telephone you to report out-of-tolerance conditions and can automate transmitter power/pattern changes. It is expandable to 64 channels and has many optional accessories.

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World Radio History

WIRED FOR SOUND

Handing You a Line About Noise

Steve Lampen

It always surprises me how many people don't know the difference between microphone level and line level.

Choosing a cable for microphone applications requires more than just ruggedness. Microphone signals are –50 dBm. Some ribbon mics are even below –60 dBm. When you realize this level is at least one-millionth that of line-level (0 dBm and above), you see why it is imperative to boost mic level signals as soon as possible.

People who design installations such as stadiums, auditoriums and churches are notorious for running very long mic lines. Professional microphone impedances, 50 to 150 ohms, are very low. This means as far as level and high-frequency response is concerned, you can easily run mic lines thousands of feet. But doing so is asking for interference, such as RFI and EMI, and no impedance (and for that matter, no cable design) is going to make that system impervious to electromagnetic noise.

Running mic level instead of line level is like traveling down a dirt road with a superhighway next to you.

Achieving low noise

Some installers believe running quad mic cables everywhere is the answer. While quad designs are certainly made to reject noise, such cables are dramatically more expensive than even the finest line-level cables. Others think that putting cables in conduit will do the trick. While conduit certainly reduces noise — up to 27 dB depending upon the thickness of the conduit and the workmanship of the joints — it is probably the most expensive way to solve the problem. The cheapest way to low-noise system performance is to convert to line level.

Running mic level instead of line level is like traveling down a bumpy dirt road, when there's a superhighway right next to you. Convert to line level as soon as possible. There are a number of line drivers available to do this, boxes that convert low-level mic lines to line level.

Most broadcasters do not run line level at 0 dBm, but more likely at +4 dBm. This makes the noise on the cable even farther away, i.e., increases signal-to-noise on the cable. Some even run at +8 dBm, trading headroom for even lower noise. Of course, the headroom applies to the active electronics, not to the cable. Those levels are even faster superhighways, further from whatever noise floor you are working with.

If, however, you are in a studio installation, then your mic lines are short (less than 100 feet) and you're probably okay. Most broadcast installations rarely have mic cables more than 10 feet long, running from mic to console module input.

Regardless, a broadcast engineer accustomed to 10-foot cords and no noise problems will be surprised when he goes out on a remote with a 500-foot run of mic cable back to the RPU or telco demarc, and then wonders where all that intermittent noise is coming from. The solution is a mic preamp at the mic end. The signal can then be run safely for 500 feet at line level.

Shields and noise

The other problem with mic cables is that they are always braid, french braid or single/double serve (spiral) shields. These shields are all less effective at RFI, where even tiny holes in a 95-percent coverage braid begin to look bigger as the frequency of interference increases. Also, with the over-filled spectrum we have in these days of microwave hops, wireless this, cordless that, satellite uplinks at every venue — well, let's just say that if you go anywhere thinking that RFI isn't a problem, you might be sorely mistaken.

In cable design, the solution for this is a foil shield. Foils exhibit only average shield performance at frequencies below 50 MHz. They lack the bulk and low resistance of a braid. In fact, most foil shields are about 10 times the resistance of a braid.

Only as frequencies rise, and skin effect kicks in, do foil shields really show their stuff. Above 50 MHz, skin effect makes the signal ride on the outside of a conductor. As the frequency increases, the actual area used is so thin that the resistance of the foil is considerably less important. Foil shields continue to be superior way into the Gigahertz range and are less expensive to apply than a braid, french braid or serve.

Therefore, the ultimate shield would be a combination foil/braid. However, this is inappropriate for a mic cable because the foil will open and close, creating capacitive noise as the cable is flexed. This noise can be heard easily; foil shield should only be used where it will not be moved while in operation.

So, in terms of mic cable, you're

See WIRE, page 45 ▶

Circle (121) On Reader Service Card

World Radio History

How to Save an SBE Meeting

▶ WORKBENCH, continued from page 30

only further confuse the issue.

Fair enough. Some new multipair cables come with the number already printed on the jacket in addition to the color, so a chart isn't even needed.

★ ★ ★

Figure 2 is another "What's wrong with this picture?" We got such a good response on the tower photo, I thought I'd include another. This one is easy. Take a look at Figure 2, and list at least five things you ought to check when winter weather is just days away. What kind of routine maintenance can you, or your assistant, do to ensure generator reliability?

For answers, read on.

★ ★ ★

Remember our suggestions for ways to save your SBE chapter meeting when the featured speaker fails to show?

Frank Folsom is a former teacher, and is ready for any curve thrown to him, SBE meetings included. Frank's chapter, No. 113, is aggressive and growing. Each year, the program chairman plans for 11 meetings. Frank prepares one meeting presentation that is kept in the "can."

If someone misses a meeting presentation, the "standby program" is used. Frank brings the script, slides or handouts with him, just in case.

If, by the 11th meeting, the standby program has not been used, Frank delivers it as the 12th presentation. His "standby" programs have included topics such as safety, EAS and transmitter maintenance procedures. They are not time-sensitive topics, as they have a shelf-life of at least 11 months.

The idea is right. Not only does it guarantee a good meeting each month, even in the face of disaster, but you earn recertification credits with programs you present at an SBE meeting.

When he's not on the road consulting for a multitude of radio stations, Frank can be reached at (423) 573-6171.

★ ★ ★

We tend to focus on big things, such as the big generator that backs up our transmitter site. But do you have a studio generator? When was the last time it was serviced? With colder weather coming, a "tune-up," whether professional or done yourself, is time and money well spent. If you are trying to save money, there are some routine things you can do to ensure proper operation. See how many you listed.

1. Proper operating parameters. Do you keep a log of the oil pressure, the current draw, and how much fuel the generator uses an hour under full load (useful when winter weather can bring prolonged outages)?

2. Adequate cooling. What is the condition of the fan? Have the radiator fins been washed lately? What is the coolant level? Low coolant level can cause an engine to run hot, or worse, burn up.

3. Condition of belts. When was the last time you checked the belts? Look for cracks or "glazing" of the inside surface, just as you would on the belts on your car engine.

4. Batteries. Are the battery terminals corroded? Are the connections tight?

5. Filters. Is the air filter clean? When was the last time the fuel filter was replaced?

There are some routine things you can do to ensure proper operation.

6. Hoses. Are hose connections tight? If you squeeze a coolant hose, does it crack or offer resistance? Remember that rubber hoses should be pliable; however, some hoses have a spring wire core to prevent collapse. Don't mistake this for a bad hose.

7. Leaks. Look for fuel or oil spills under the chassis. Leaking engine parts don't correct themselves.

8. Lights. Even small generators usually have some kind of pilot lamp warning system. Do all the lights work? A burned-out "low coolant" warning bulb can really ruin your day.

9. Fuel supply. Do you have a fuel contingency plan should a long power outage occur? If your fuel supplier cannot provide fuel, do you know the location of an alternate?

Well, how did you do? If you thought of other points that I missed, e-mail them to me at *jbisset@harris.com* and we'll include them in a future column.

Thanks to Walt Billings, Total Engine Service and Supply Company, for assisting with the list of things to check. Walt is a respected generator service person. Reach him at (410) 633-4621.

■ ■ ■

John Bisset has worked as a chief engineer and contract engineer for more than 20 years. He is a district sales manager for Harris Corp. Submissions for Workbench are encouraged, and qualify for SBE recertification credit. Fax yours to (703) 323-8044 or via e-mail to jbisset@harris.com

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World Radio History

WIRED FOR SOUND

Handing You a Line About Noise

Steve Lampen

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So, in terms of mic cable, you're

See WIRE, page 45 ▶

The Best Digital Audio Delivery System Just Got Better

More Powerful, Less Cost!

Make the EZ Selection

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EZ-LIB
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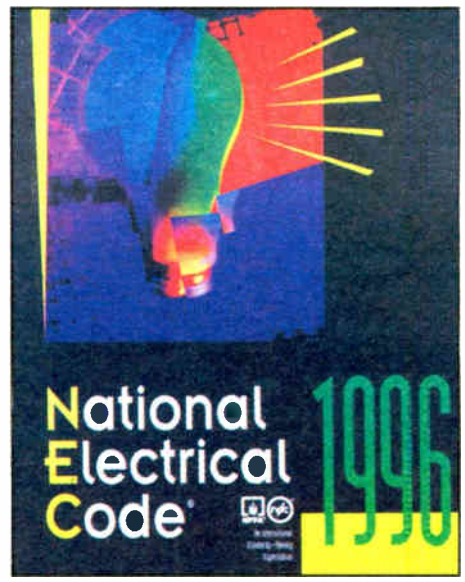
World Radio History

Electrical Code and Conductors



Charles S. Fitch

This is the second in a series of articles explaining the National Electrical Code. The first part appeared Oct. 14 and is available at www.rwonline.com

In our first article about the National Electrical Code, we started with a history of the code and an overview of its position in relation to other codes and the inspection process. Now let's get inside the NEC.

One of my first instructors told me that the major operative parts of any electrical system are the conductors. Let's emulate that logic and start with the NEC definition of a conductor, a discussion of conductors in general, and finally, some of the ordinary wire types available to us.

Surprisingly, the NEC contains no basic definition of a conductor, only of conductor types: bare, covered and insulated. These are good examples of the terse, yet accurate style you will find in the NEC.

Conductor, bare: A conductor having no covering or insulation whatsoever.

Conductor, covered: A conductor encased within material of composition and thickness that is not recognized by this code as electrical insulation.

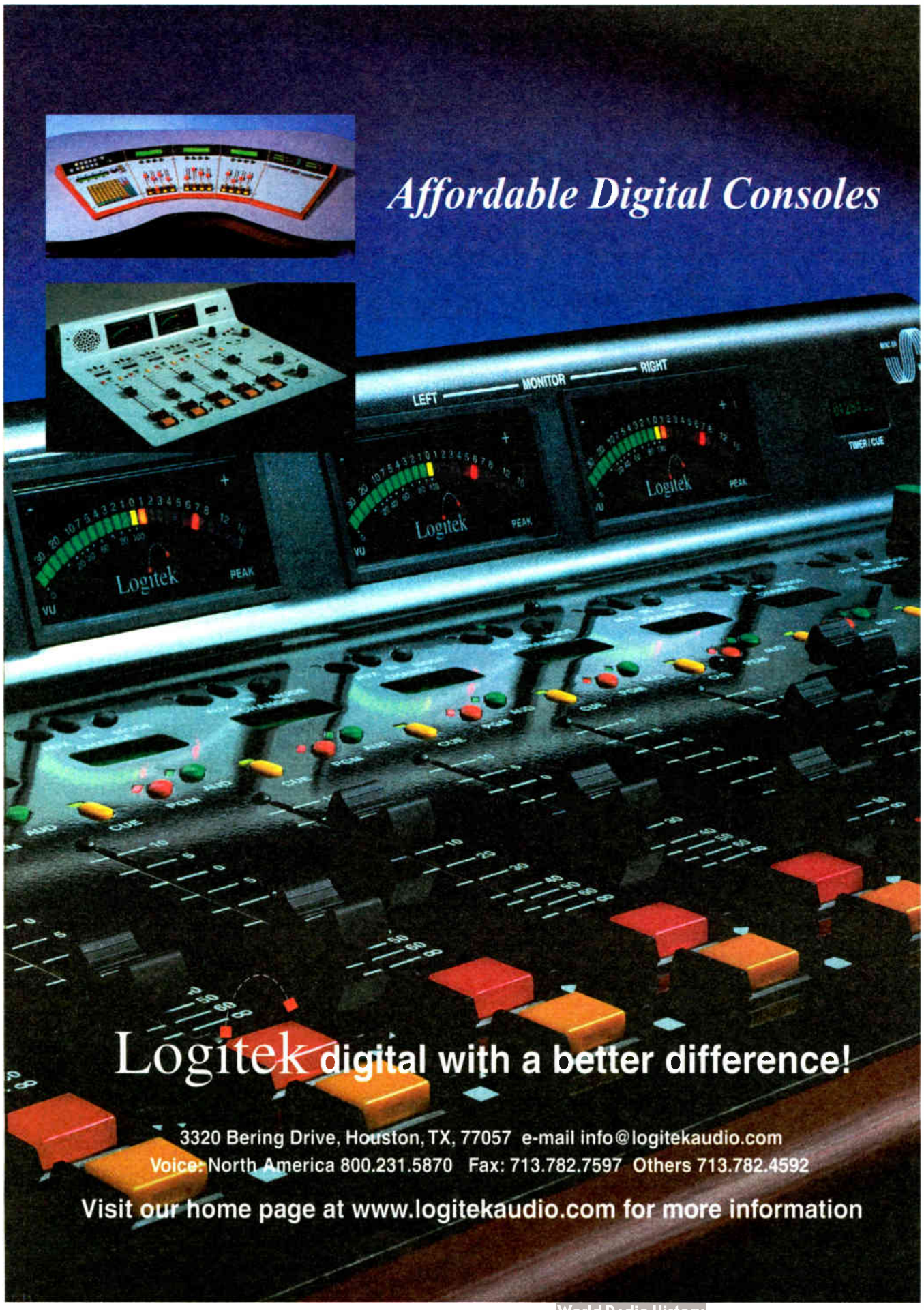
Conductor, insulated: A conductor encased within material of composition and thickness that is recognized by this code as electrical insulation.

We have stated that a primary reason for the introduction of the NEC was to annotate material and installation standards that could be applied on a national level.

It may be amazing to us today, accustomed to standardization on every level (RS-232, DIN connectors, MIDI, and so forth), that at the turn of the century, there were at least as many wire standards as manufacturers.

One of the few purveyors that introduced any logic into its product line was Brown and Sharpe. In the B&S wire gage system, the wire gets larger in area as the descriptive numbers get smaller. B&S wire also doubled the cross-section area of the wire every three sizes, e.g. wire size #4 is 41,740 circular mils and three sizes later #1 wire is 83,690.

Its product line specs included such important data as what that area should be for each gage number, the quality of the wire composition, the maximum deviation from those standards that could be tolerated and the target ampere capacity.



In 1998, we have a wire type for all seasons and all reasons.

For all of the above reasons, the people who instituted the NEC used the B&S system as the national standard, giving it a new nomination as the American Wire Gage, or AWG.

Sprinkled throughout the NEC are various tables indicating the "ampacities" of conductors. This term refers to the maximum amps allowed per wire size for that particular wire type in certain circumstances. Often, either the table heading or footnotes outline the caveats of application.

In 1998 we are blessed with a plethora of wire types to satisfy nearly any installation or application challenge. We literally have a wire type for all seasons and all reasons.

Broadcast applications

In broadcast radio, we most often encounter two classification types of wire used in permanent installation. These usually satisfy our twin design targets of suitability and lowest true cost.

One type is single-strand wire, which is normally installed in raceways (a topic we will discuss later). Ordinarily you will find these in multiple wire groups, with several separate circuits occupying the same raceway. This wire would most often be type THHN. This is thermoplastic covered heat-resistant wire with nylon or eq. outer jacket. (The letters are a reference to thermoplastic high heat nylon.)

A derivative of this is THHW, which is thermoplastic covered heat-resistant wire suitable for use in wet locations. Because

See CODE, page 27 ▶

Circle (160) On Reader Service Card

World Radio History

▶ CODE, continued from page 26

it takes little extra effort to make a wire that satisfies both criteria, most manufacturers make a dual listed wire, THHN/THHW.

THW, THWN and TW are related, similar, special types of these wires.

The second type actually is a permanently gathered wire group or a *cable* (remember a cable and a wire are not ordinarily the same thing). This cable is designated type NM or UF cable, affectionately known as Romex. NM, for non-metallic covered cable, is not waterproof and is used primarily indoors, in dry environs. UF is underground feeder cable, which is Romex you can bury to your driveway pole lamp or "fly" out in the elements to your storage shed behind the studio. It is interesting to note that the only place the word Romex appears in the NEC is in the index, which crosses you to NM, UF, etc.

UV exposure

An aside: In the latter case and in all cases where the UF is exposed to the sun, order versions are resistant to ultraviolet light, or UV. We are jumping ahead in our discussion, but because we mentioned "flying," also keep in mind that all flown cable must be #10 AWG or larger, and supported as needed.

Although all wires listed in the NEC can be stranded wires, only #10 and smaller wires can be solid and be used in raceways. The NEC also assumes that all conductors will be copper.

To complete the rundown of common wire/cable types you may find in your station: If your facility has underground direct burial service, that cable typically is USE cable, for underground service entrance. If your studio is in a building that was once a home, it may instead be URD, which is underground residential and is no longer recognized.

The primary difference between USE and URD is that typically URD has a reduced size neutral. This can be a problem if your new use of the building is primarily 120 V. Most of the big loads in a house are 240 V, such as the electric clothes dryer, range and hot water heater. If you now have a radio station on that service, you can have double the 120 V lighting, business machines, staff heaters and so forth.

With a reduced size neutral and poor balance between phase conductors, line voltage regulation and overall voltage drop can be serious problems.

We'll continue next time with a closer look at the electrical service to your station.

■■■

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

Whence Romex?

As a young man fresh out of college in the late 1920s and early 1930s, my father, John Alton Fitch Sr., was the chief electrical engineer for the city of Rome, N.Y.

One day in the late 1950s, when I was about 12 years old, he told me a story of how Romex got its name.

Most building wiring, even as late as the beginning of World War II, was of the "knob and tube" type. Because insulation of wire left much to be desired, it was considered wise to run electrical wiring in attics, along basement rafters and in walls, keeping separation between conductors and flammable material by suspending and supporting it on ceramic pedestals that looked like door knobs. When passage through walls or other material was needed, the installer would pass each wire through an insulating ceramic tube.

Needless to say, this mitigated against casual connections, speedy installation or any connection where flexibility was needed.

When in Rome ...

Rome is still known as "The Copper City," due to the presence of a copper industry that includes wire manufacturing. During the period that knob-and-tube was ubiquitous, General Cable in Rome introduced a cable that in its earliest form used a pair of paper-covered wires with woven/embroidered cotton covering, enclosed once again with an overall paper and cotton cover.

This innovation was snapped up by America in a big hurry. It was everything that knob-and-tube wasn't.

But the insurance industry and enforcement bodies were horrified with this new cable, especially because it had not gone through any sort of code review before it got into the field. Officials, not wanting to assign fault to any particular manufacturer, issued many rejections, indicating simply that the installation was not approved due to the presence of that wire from Rome, or merely abbreviated ROME-X.

The world needed this cable, and quickly, with some necessary refinement, Romex was approved. And the rest, according to the story, is billions of miles of cable history.

A chief electrical inspector in an eastern state tells me Rome-X was actually the name of the product from the outset. But I like my dad's romantic, outlaw version of the story better.

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FEED LINE

Protect Your Site From Lightning

W.C. Alexander

Fall is an ideal time to inspect and shore up our lightning defenses. Spring may be months away, but the first wave of thunderstorms may come as early as February — and let's not forget about those damaging winter static discharges. In the Oct. 14 issue, we explored some of the characteristics of a "typical" lightning strike and discussed some of the measures that broadcast engineers can take out at the tower to protect their equipment from damage. This time, we'll wrap up with a discussion of protecting the equipment inside the transmitter building.

Central ground

The heart of any effective lightning protection scheme is a central ground system. Some call this a "star" grounding scheme because of the way all the ground conductors return to a central point or reference ground. If the transmitter building is located very near the tower, this ground can be the same as that for the tower itself. In most cases, however, there will be some distance between the tower and transmitter building, and in those instances, another array of ground rods should be provided.

The best place for the array of rods is on the tower side of the building. As at the tower, use four or more rods long enough to reach below the deepest frost line into the water table. The rods should be placed a distance of at least two to three times their length away from one another, and should be joined together with bare copper wire at least 1/0 in size. Cad-welding is the preferred method of connection, as mechanical clamps do not provide a joint with sufficiently low resistance. A cad-welded joint will not oxidize or corrode as a mechanical clamp junction is prone to do.

All conductors operating at ground potential that enter or leave the transmitter building should be bonded to this ground array. That includes the outer conductors of all transmission lines. The method for connecting a ground to a transmission line outer conductor was discussed in the earlier article.

There is no way to lightning-proof a site, but you can take effective steps to prevent damage.

A conductor from the ground rod array should be brought into the transmitter building via the shortest and straightest route possible. The point where it enters the building becomes the center of the "star," or the point to which everything in the building is grounded. We will call this the "station reference ground." All grounds in the building, including the safety ground of the electrical system (service entrance ground) and the ground conductors from all the equipment and outlets, then connect to this point. Figure 1 is a diagram of a properly designed station-grounding scheme.

I prefer to disconnect the service entrance ground from the rod installed by the electricians and connect it to the station reference ground. Check your local electrical code before you do this. You may have to plan the layout of your ground rod array so that one of the rods is driven immediately adjacent to the service entrance to accommodate such a connection. It is worth doing, however, whatever lengths you have to go to. Having a separate rod connected can spell t-r-o-u-b-l-e, as a huge potential can develop between the station reference ground and a separate rod outside the system.

If you have a ground strap or terminus of the ground system coming to the transmitter building from the tower(s), be sure to connect it to the station reference ground. If there is no such strap coming from the tower(s) you do not specifically need one, but an advantageous location for a transmitter building is often at the end of the ground system at the end of the transverse ground strap. If this is the case, that strap may have been extended to connect inside the building.

Direct route

When connecting transmitters, racks and other equipment to the reference ground, do so in such a way that lightning currents will not flow through the equipment cabinets en route to ground. On a transmitter, for example, make the ground connection as close to the RF output connection as possible. In that way, lightning currents coming in on the transmission line outer conductor can flow through the short copper path to the ground conductor and not through the metal of the cabinet.

See LIGHTNING, page 29 ▶

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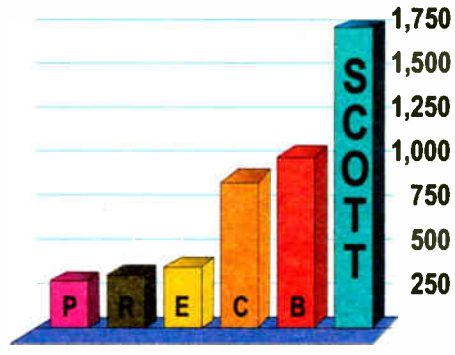

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World Radio History

▶ LIGHTNING, continued from page 28

Remember that such currents create a strong magnetic field that will induce currents into nearby unshielded conductors. By keeping surge currents out of the cabinet steel, you can keep them out of your transmitter's wiring harness as well.

Wye connection

If your site has three-phase power, it is hard to beat a "wye" secondary on your utility power feed when it comes to lightning protection. This type of connection has several advantages, the most important of which are that every leg is referenced to ground (balanced with respect to ground) and the lower voltage (208) is easier to clamp in surge conditions.

Unless you specify a 208 V wye, the utility company probably will provide you with a delta. Worse, they probably will save themselves a transformer and give you an *open* delta, which is terrible from a lightning protection standpoint.

Most all broadcast transmitters will operate just fine on anything over 200 V, so switching to 208 V will pose no problems. A change of taps and you're all set. The thing to watch for is the increase in current. Service conductors and disconnects sized for 240 V operation may be too small for use at 208, so be careful, lest you create a fire hazard.

Surge suppressor

A good surge suppressor is the only way to minimize lightning transients on the incoming utility power. These devices range from inexpensive "kamikaze" devices that work one time and then must be replaced, to expensive series/shunt devices. Somewhere in between is an economical device that will adequately protect your equipment without breaking the bank.

The metal-oxide varistor (MOV) is at the heart of most shunt-type surge suppressors. These devices conduct when the potential across them exceeds a threshold voltage. The devices must be rated to carry most of the anticipated lightning current. This may seem like an impossible specification, but the device only has to carry the current for a very short period of time.

Modern surge suppressors are available with fused MOVs in many voltage ratings that will hold up well under typical lightning surge conditions, clamping the AC line to ground during the surge and thus protecting equipment downstream. The fuses are designed to act slowly, holding their state for the short duration of the surge but blowing if the MOV becomes shorted as a result of excess current. The affected MOVs and fuses then can be replaced and the effectiveness of the surge suppressor restored.

Be sure to install the surge suppressor downstream of the main fused disconnect at the site.

The ground connection from the surge suppressor must connect to the station reference ground. All the conductors to the surge suppressor must be relatively large, as the instantaneous currents that they will be called upon to carry can be substantial.

When it comes to surge suppression, buy all you can afford. If your budget can sustain a $10,000 series-shunt type, go for it. If you can only afford the little "kamikaze" cans, buy and install them. Any working surge suppression is better than none.

In practical terms, the insurance deductibles and premium increases you will save may well pay for one of the more expensive units in just a few years.

The final step in creating an effective lightning protection scheme is to build a low-pass filter into all your power, control and monitor cables. This is easily done by placing a toroid core over the conductors. This effectively forms an RF choke that is a very high impedance to fast rise-time lightning energy. Such cores are available from most mail-order electronic parts houses, and they come in a variety of sizes.

Filter placement

One such core should be placed over each of the cables entering a transmitter cabinet or rack. Run all the AC power wires through a single toroid. Pass the remote control cable through a core, and do the same with any small coaxial feeds (RF drive, mod monitor sample, etc.). Finally, for transmission lines up to and including 1-5/8-inch, install one or more cores on the cable just above the connector.

Larger, rigid transmission lines should be installed so that they form a "trombone" section, making at least three 90-degree turns before connecting to the transmitter. The 90-degree bends also present a high impedance to lightning energy.

When giving your site a lightning protection checkup, you've got to think like a lightning surge. If you were a surge coming in on the transmission line, where would you go? What is more attractive, the short path to ground outside the building, or the path through the transmitter cabinet to the utility ground? This may sound ridiculous, but if you will analyze each and every possible lightning current path at your site in this way, you will begin to uncover the weak spots. Then you can deal with them and harden your site against lightning damage.

Although our focus has been on transmitter-site lightning protection, the same principles can be applied at other locations, such as studios. There is no substitute for good surge suppression on the incoming studio AC power feed, and watch those transmission lines coming in from the STL tower. The studio is a place where multiple grounds can exist easily, especially if the building has been expanded over the years, so pay close attention to this.

There is no way to lightning-proof a site completely, but you can take some effective steps to prevent damage from all but the most severe strikes. Apply these principles and you will have a much happier, more restful storm season.

■■■

Cris Alexander is director of engineering for Crawford Broadcasting in Dallas.

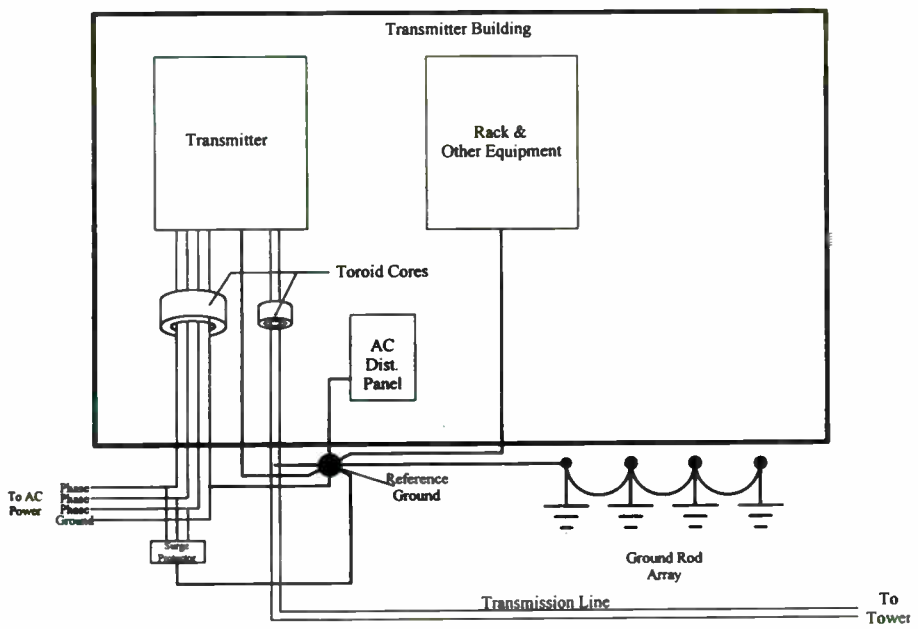

Figure 1: Proper design is important to your station grounding scheme.

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World Radio History

Workbench

Radio World, November 11, 1998

Is Your Studio Generator 'Up to Speed'?

John Bisset

SSAC is best known for tower light flasher modules. Years ago, the company saved the day by eliminating the old motor-driven or cam mercury switches, which flashed the tower beacon.

SSAC has saved the day again, with a new assortment of solid-state relays, called Small Solutions. There are three modules that comprise the Digi-Timer Small Solutions family, and you probably will think of applications for each.

The first is called the KRDS Single Shot, a single-shot time-delay relay with 1 percent repeat accuracy, boasting delays of 100 mSec to 1,000 minutes. The module has isolated 10A SPDT contacts, and is powered with input voltages of 12 to 120 V, in five ranges.

Contestant No. 2 is a "Delay-on-Break" relay, with the same operating parameters and features as described above. Its model number is KRDB.

The final member of this new relay family is the KRD9, which can be used either as a motion detector or retriggerable single-shot relay. SSAC has data sheets on each of these relays, along with a new product selection guide. You can obtain a copy by faxing your request on station letterhead to (315) 638-0333. Tell them you read about them in *Workbench*.

★ ★ ★

Taking time to do a proper wiring job always catches my eye — probably because we all know the engineering effort involved. People who take the time to do it right, as evidenced in Figure 1, are craftspeople.

And proper wiring is a dying art. Figure 1 shows the wiring room for one of West Virginia Radio's stations. Most of the work was done by James Belt, with help from CE Ralph Messer.

Multipair color codes have really irritated me over the years.

Some points to keep in mind: If you are using a P-Touch Labeler for the multipair cable designations, choose a contrasting color. In this case, use yellow against the blue jacket. Multiline labelers pay for themselves in providing the terminal block designations, as well as single-line designation strips not only for wiring, but for console module identification, or transmitter test meter "typical" readings.

The black shrink wrap to "finish" the cable ends, followed by a clear piece of shrink to cover the cable designator, is commonplace. But how about this little note: When you use the wire-ties to secure the cables onto the cable mounts, turn the wire-tie end to the side as you tighten it so it is not sticking out. This will keep you from snagging your clothes as you walk by.

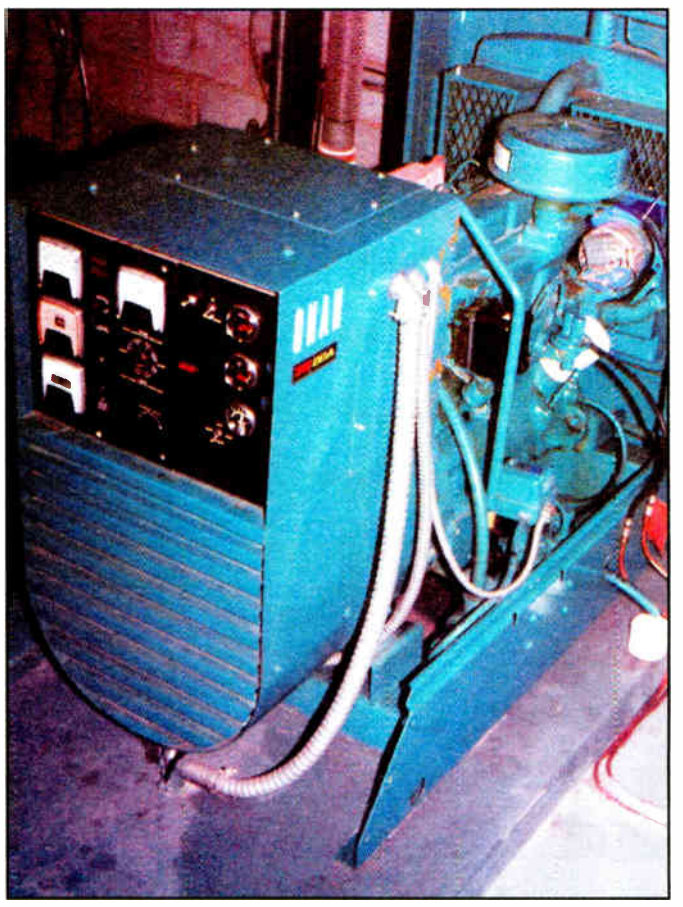

Figure 2: A generator sitting idle. What's your checklist to ensure it will run when it has to?

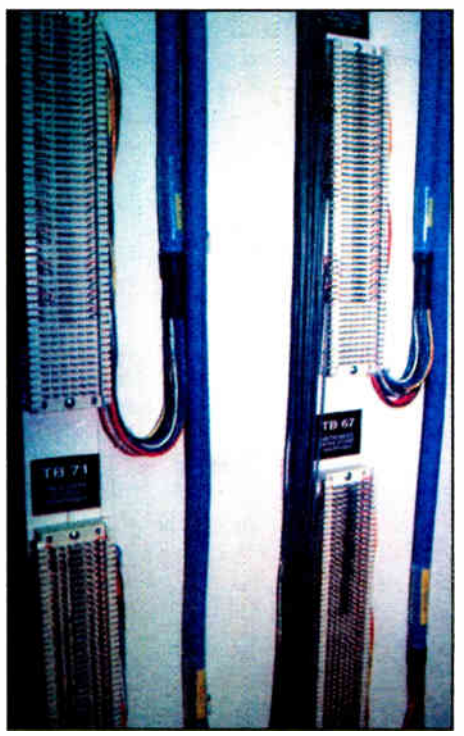

Figure 1: A wiring job takes time, but pays dividends when you try to trace a signal.

Finally, contact the manufacturer of your multipair cable, and get a copy of their catalog. In it is the color code for the order of the wires.

★ ★ ★

There, I said it — I don't know about you, but multipair color codes have really irritated me over the years, mostly because they made no sense. Why the wiring manufacturers couldn't use a color code we were used to, like the resistive color code, was a mystery to me.

A year or so back, I asked Belden's wire maven, Steve Lampen, who also contributes a column to **RW**, why something like the resistive color code wasn't adopted. His honest answer was that, when the multipair colored wires were developed, Belden engineers didn't know the cable was going to be used for radio applications, where a resistor color code was king.

To change the color code, which many had already memorized, would

See WORKBENCH, page 32 ▶

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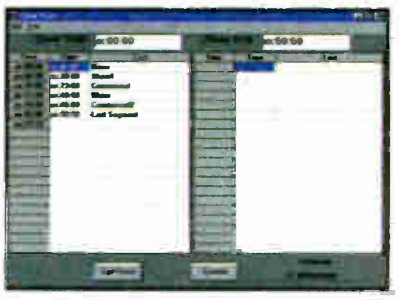
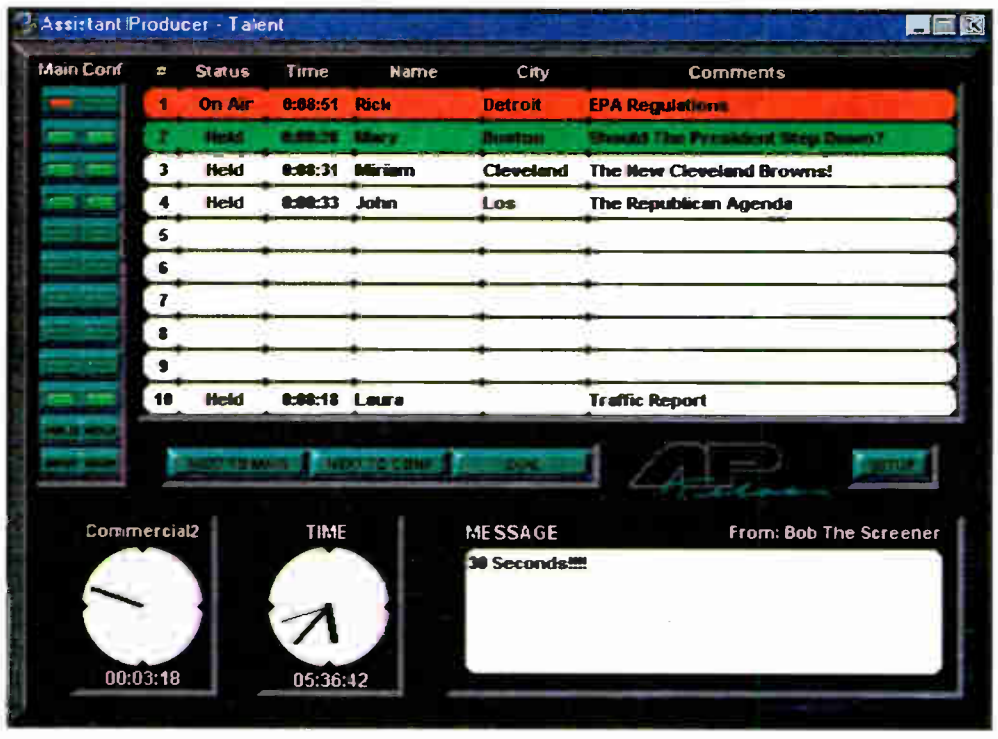
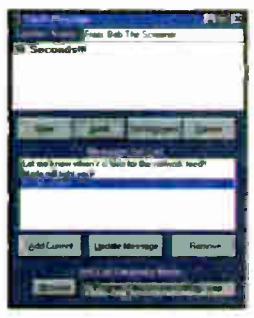
Main and Conference buttons indicate easy-view call status at all times, and provide remote control of a Telos interface. Point-and-click on Conference buttons to pick up calls. The live call will be highlighted as indicated.



The Show Data window is used for scheduling events that occur within a pre-determined time interval—for example, 3:00PM–5:00PM. When an "x" is entered in the hour field, Show Data runs as a generic hourly clock, as shown in the above display.





The Message Window is a helpful tool for communications throughout the Assistant Producer network. To send a message, double-click inside the message box for the Message Entry pop-up box. Type in a message and press "send" to post it. "Send urgent" makes the message background area bright red. A message "hotbox" allows you to store and send frequently-used messages.

The caller menu bar displays lines in use and caller information for each line. To enter caller information, simply double-click on the desired line for the caller pop-up box. Enter Caller Name, City, and Comments, then press "exit" to post information on the screen.

The dialer feature allows you to choose a dailout line, and automatically dial outside calls from the Assistant Producer pop-up dial menu.

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World Radio History

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How to Save an SBE Meeting

▶ WORKBENCH, continued from page 30

only further confuse the issue.

Fair enough. Some new multipair cables come with the number already printed on the jacket in addition to the color, so a chart isn't even needed.

★ ★ ★

Figure 2 is another "What's wrong with this picture?" We got such a good response on the tower photo, I thought I'd include another. This one is easy. Take a look at Figure 2, and list at least five things you ought to check when winter weather is just days away. What kind of routine maintenance can you, or your assistant, do to ensure generator reliability?

For answers, read on.

★ ★ ★

Remember our suggestions for ways to save your SBE chapter meeting when the featured speaker fails to show?

Frank Folsom is a former teacher, and is ready for any curve thrown to him, SBE meetings included. Frank's chapter, No. 113, is aggressive and growing. Each year, the program chairman plans for 11 meetings. Frank prepares one meeting presentation that is kept in the "can."

If someone misses a meeting presentation, the "standby program" is used. Frank brings the script, slides or handouts with him, just in case.

If, by the 11th meeting, the standby program has not been used, Frank delivers it as the 12th presentation. His "standby" programs have included topics such as safety, EAS and transmitter maintenance procedures. They are not time-sensitive topics, as they have a shelf-life of at least 11 months.

The idea is right. Not only does it guarantee a good meeting each month, even in the face of disaster, but you earn recertification credits with programs you present at an SBE meeting.

When he's not on the road consulting for a multitude of radio stations, Frank can be reached at (423) 573-6171.

★ ★ ★

We tend to focus on big things, such as the big generator that backs up our transmitter site. But do you have a studio generator? When was the last time it was serviced? With colder weather coming, a "tune-up," whether professional or done yourself, is time and money well spent. If you are trying to save money, there are some routine things you can do to ensure proper operation. See how many you listed.

1. Proper operating parameters. Do you keep a log of the oil pressure, the current draw, and how much fuel the generator uses an hour under full load (useful when winter weather can bring prolonged outages)?

2. Adequate cooling. What is the condition of the fan? Have the radiator fins been washed lately? What is the coolant level? Low coolant level can cause an engine to run hot, or worse, burn up.

3. Condition of belts. When was the last time you checked the belts? Look for cracks or "glazing" of the inside surface, just as you would on the belts on your car engine.

4. Batteries. Are the battery terminals corroded? Are the connections tight?

5. Filters. Is the air filter clean? When was the last time the fuel filter was replaced?

There are some routine things you can do to ensure proper operation.

6. Hoses. Are hose connections tight? If you squeeze a coolant hose, does it crack or offer resistance? Remember that rubber hoses should be pliable; however, some hoses have a spring wire core to prevent collapse. Don't mistake this for a bad hose.

7. Leaks. Look for fuel or oil spills under the chassis. Leaking engine parts don't correct themselves.

8. Lights. Even small generators usually have some kind of pilot lamp warning system. Do all the lights work? A burned-out "low coolant" warning bulb can really ruin your day.

9. Fuel supply. Do you have a fuel contingency plan should a long power outage occur? If your fuel supplier cannot provide fuel, do you know the location of an alternate?

Well, how did you do? If you thought of other points that I missed, e-mail them to me at *jbisset@harris.com* and we'll include them in a future column.

Thanks to Walt Billings, Total Engine Service and Supply Company, for assisting with the list of things to check. Walt is a respected generator service person. Reach him at (410) 633-4621.

■ ■ ■

John Bisset has worked as a chief engineer and contract engineer for more than 20 years. He is a district sales manager for Harris Corp. Submissions for Workbench are encouraged, and qualify for SBE recertification credit. Fax yours to (703) 323-8044 or via e-mail to jbisset@harris.com

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DOS AMIGOS

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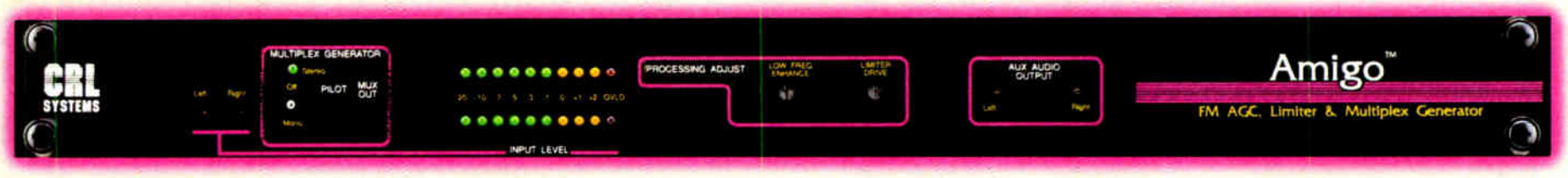

AMIGO FM

- A Complete Processing System Including AGC, Multi-Band Limiting, and Stereo Generator
- Dual Band AGC with more than 25 dB of Range
- Tri-Band Pre-Emphasis Limiting with High Protection Low-Pass Filters
- Digitally Synthesized Stereo Generator with more than 50 dB of Separation
- Includes Both L/R Audio and Low Z Stereo Outputs

The AMIGO FM is a compact but powerful FM Stereo processing system. The AMIGO FM has a wide range dual band AGC, followed by a full tri-band Limiter. Precise high protection audio low-pass filters ensure excellent cross-talk immunity. The digitally synthesized stereo generator provides over 50 dB of drift free separation. Selectable bass boost and stereo sound-field enhancement circuitry are included.

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Digital STL Solution

Harris has joined with **Intraplex** to provide broadcasters with a license-free, digital T1/E1 STL solution based on spread-spectrum technology.

The solution integrates Harris' Aurora 2400 spread-spectrum radio and the

Intraplex STL PLUS to provide an alternative to congested analog STL frequencies, conventional analog leased lines or public T1 circuits.

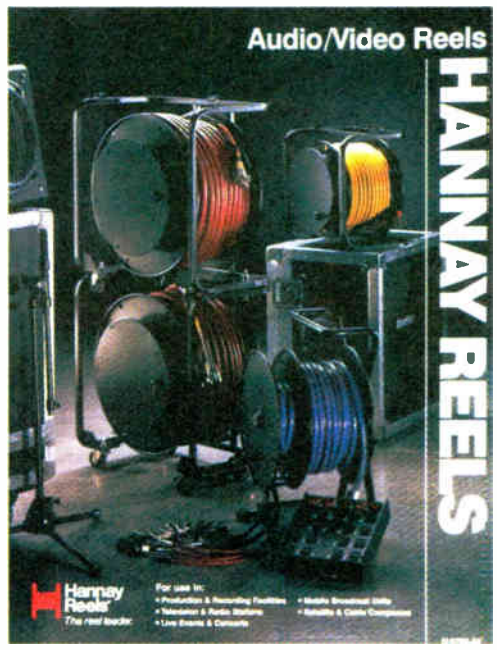
"The Harris Aurora/STL PLUS solution offers easy installation and bandwidth efficiency and is a cost-effective alternative to using multiple individual circuits," said Dave Burns, Harris Broadcast Studio Products Manager. "Aurora provides completely bidirectional channels for transmission and backhaul of uncompressed digital program audio, plus voice and data over microwave links."

By using special coding techniques and "spreading" the transmission signal to minimize interference, the Aurora is able to provide reliable links in the 2.4 GHz band without requiring a dedicated frequency.

For more information, contact Harris in Indiana at (217) 221-7577; e-mail Martha Rapp at mrapp@harris.com *or circle* ***Reader Service 28.***

Cable Reel Catalog

Hannay Reels offers the full-color Audio/Video Reels Catalog, with information and specifications on its new line of cable reels to simplify set-up and tear-down in audio production applications.



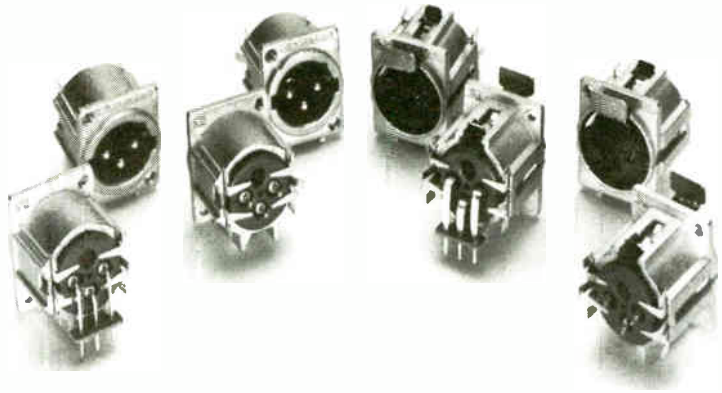
AV, AVX and AVC Series reels are suitable for recording facilities, radio production and live or mobile broadcasting events. Durable and light in weight, the non-reflective black reels offer carrying handles for one or two people to transport.

AV models are stackable and offer removable side panels for customization of XLR and BNC connector patterns. AVX models have a convenient tray for stage box units, and AVC models work for storage and payout of long lengths of lighting or sound cable.

For more information or a free copy of the catalog, contact Hannay Reels in New York at (518) 797-3791; fax (800) REELING or circle ***Reader Service 11.***

Shielded Receptacles

Switchcraft rolled out its F Series, a line of durable receptacles with rugged metal shells that are satin-finished.



Each receptacle features a ferrite disk for additional EMI/RMI shielding and a heavy metal housing which contains a through-the-shell ground connection for greater shielding effectiveness. A PC board retention feature holds connectors firmly to the board prior to soldering.

Available in male and female three-pin connectors, as well as straight and right-angle PC terminations, the F Series has locking receptacles and silver-plated contacts, and a design that allows male and female receptacles to fit in similar panel cutouts. Additionally, the F Series complements Switchcraft's Q-G and QGP connectors.

For more information, contact Switchcraft in Illinois at (773) 792-2700; fax (773) 792-2129 or circle ***Reader Service 12.***

Spacious Cabinets

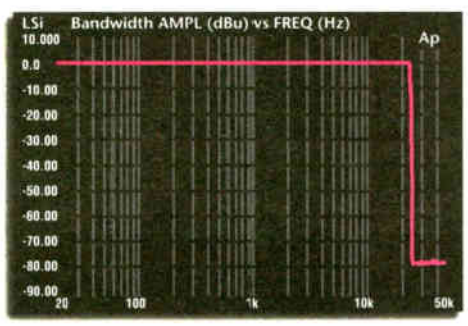
Equipto Electronics manufactures the "Heavy Duty" line of vertical racks and sloped-front consoles.

For shock and vibration, the line meets Mil-Std 810D and Mil-Std 901. Cabinets can be reinforced to meet earthquake resistance through Zone 4, the most severe level.

Standard models meet many FCC/VDE requirements without gaskets. The models can be safely transported on casters or with four standard lift eye bolts with more than 3,000 pounds of electronic equipment inside.

Models come in 17-, 24-, 29- and 36-inch depths, 19-, 24- and 30-inch panel widths, and 37 panel heights to 84 inches. Thousands of options and assembly alternatives are available with custom modifications and colors.

For more information, contact Equipto Electronics in Illinois at (800) 204-RACJ; fax (630) 897-5314 or contact ***Reader Service 13.***



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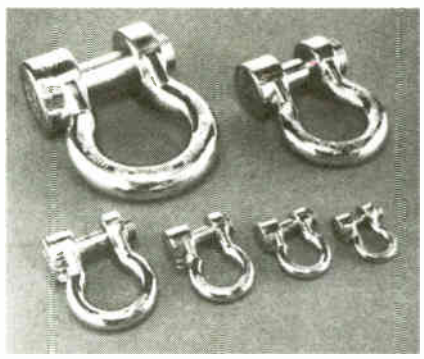
Safety Shackles

Sur-Loc Safety Shackles help to increase safety while working on towers and other areas where overhead lifting is a factor.



As opposed to being held in by an independent pin, Safety Shackles have a patented, one-piece design with a locking pin that won't become loose and disappear. The shackles can installed or replaced without tools, and can be opened in 10 seconds and closed in eight.

For more information, contact Sur-Loc in Indiana at (219) 495-4065 or circle ***Reader Service 50.***

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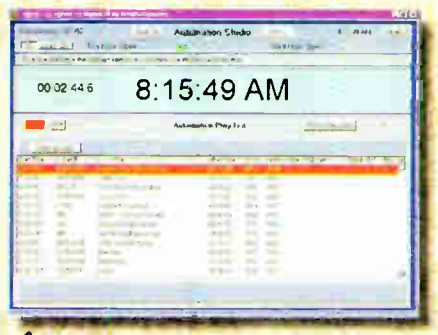

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World Radio History

SATELLITE NEWS

Bits of Satellite Radio Network History

Bill Sepmeier

Audio transmission over satellite began with an analog aural subcarrier with video carriers — television programming needs to have sound, and conventional AM TV had long used an FM carrier to deliver it. Satellite TV was all FM, so audio was transmitted on a subcarrier.

People soon realized they could add an extra subcarrier or two to a video channel, and radio networking re-emerged as a programming source after its near death with the advent of high-fidelity FM broadcasting in the early 1960s. With satellite subcarriers, one could get FM's 15 kHz quality, and music programming began to reappear at the network level. The first of those radio networks are still among the largest: the Satellite Music Network and TranStar Radio.

It wasn't long before entrepreneurs put up satellite signals containing no video at all — just audio (and quickly, FSK data) subcarriers riding atop full-transponder FM carriers. Named "FM Squared" by its champion, United Video/SpaceCom Systems, and commonly called FM/FM by other service providers, this type of analog audio transmission was very efficient in its day. Programmers could backhaul their programming to a central satellite transmission hub, where many programs would be combined onto one FM carrier.

Receivers were easy to manufacture and relatively inexpensive, since acquisition of the powerful analog FM carrier required a simple design and manufacturing.

We have the technology

Shortly thereafter, analog SCPC, or single channel per carrier technology, enabled National Public Radio to deploy many smaller, inexpensive satellite uplinks around the country. Each SCPC FM carrier could transmit a single channel of audio in a small amount of satellite bandwidth rather than requiring a full or nearly-full transponder. This enabled many uplink locations to share a single satellite resource without interfering with each other's transmissions.

FM SCPC delivered up to 15 kHz audio fidelity per carrier, with two carriers required for stereo audio transmission. Signal-to-noise performance was acceptable with companding techniques and maintenance of high carrier-to-noise signal levels. Influenced by high C/N requirements, C-Band satellites were chosen for analog SCPC networks because of their inherently low rain-fade susceptibility.

By the early 1980s, digital SCPC satellite audio transmission became popular with the adoption of Scientific Atlanta's DATS technology by several major commercial American radio networks. DATS utilized a "straight" PCM analog-to-digital format, and could transmit 15 kHz audio channels at T1, or 1.544 mbps, data rates. These large digital carriers utilized a new form of modulation in the private satellite industry, known as BPSK, or Bi-polar Phase Shift Keying, to digitally transmit the ones and zeros that contained the audio information.

DATS still used the lower-frequency C-Band satellite band, but due to the digital format, had greater audio signal-to-noise performance than analog FM/FM or analog SCPC services. In addition, low-speed data services could be easily multiplexed into the audio data stream.

The DATS service still required a large shared hub. Therefore, programming had to be delivered to the hub before it was uplinked to the satellite network affiliates.

New developments

During this time, Linkabit, a small southern California company, began developing a revolutionary new satellite transmission system: the digital PSK (phase shift keyed) Ku-Band VSAT, or Very Small Aperture Terminal. Led by Dr. Andrew Viterbi, Linkabit envisioned a new, all-digital, Ku-Band satellite network architecture that would permit large businesses to establish inexpensive low-to-medium speed data communications enterprise networks linking thousands of locations across the country.

The original Linkabit VSAT network concept survived and grew from about 150 digital VSATs in 1986 to more than 150,000 installed worldwide in just 10 years. These TDM/TDMA VSAT networks are now manufactured by many leading space and microwave technology companies.

By the mid 1980s, several former Linkabit engineers left the company and founded a new manufacturing firm in San Diego called ComStream. The new company quickly became known for its high-quality Ku-band digital PSK satellite modems and small VSAT earth stations.

In 1989 and 1990, ComStream introduced the world's first Ku-Band real-time CD-quality digital satellite audio system, using a new form of psychoacoustic digital audio bit rate reduction named apt-X. Apt-X delivered CD quality stereo audio within a 256 kbps data stream — about one-sixth of the old DATS rate of 1.544 mbps. The driving customers behind ComStream's apt-X development were ABC Radio Networks and Gannett Broadcasting, both of whom needed a small, inexpensive means to originate satellite programming from multiple locales.

By 1992, ComStream had abandoned

See HISTORY, page 44 ▶

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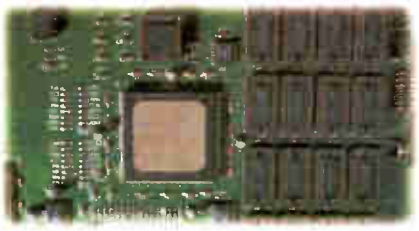
The LCD displays audio levels, time-of-day clocks, session status and event timers with a Windows® interface to powerful configuration management and session-based features.

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

World Radio History

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Radio and Its Weather Problem

Gary Timm

*Six times a year, as a service to the industry, **RW** offers space to the Society of Broadcast Engineers to update readers on issues of importance to the organization.*

The author is an SBE EAS Committee Member.

The SBE EAS Committee continues to be made aware of nationwide problems with NOAA Weather Radio sending incorrect event codes, undefined FIPS location codes and wrong time-of-day. The committee also has received comments from broadcasters that they do not intend to rebroadcast the current NWR synthesized voice due to its poor quality, an issue that has been reported here in **Radio World** as well.

If you are concerned enough about these problems to take action, you can be part of the solution. Recently, SBE EAS Committee Chairman Leonard Charles and I requested a meeting at the local NWS office. We gained some valuable insights into the causes and solutions to these problems.

New consoles

Problems in most areas started only recently. This is due to the nationwide deployment of the Console Replacement System. CRS is a computer-based system that generates the EAS/SAME codes and voice messages heard on NOAA Weather Radio. CRS replaces the old, cart-machine-based sequencer system previously used on NWR.

We found in our case that the new Console Replacement System equipment itself was causing many of the problems we were experiencing. A corrupted database caused the CRS to send only some, but not all of the county codes that the operator had selected on the screen.

The cause of incorrect event codes was presumed to be operator error. We suggested they implement some type of "double-check" procedure before sending an alert.

We also at one time received an undefined event code, "NOW." We are told that in the future this code will represent some type of forecast. Be aware that, eventually, NWS plans to precede nearly all NWR products with a SAME code. This will, for instance, enable farmers to buy a special radio to record the agricultural forecast whenever it is sent. Our EAS units will need to be able to deal with these new event codes.

The final complicating factor to the new Console Replacement System is its sheer size in each local office. After demonstrating the CRS operator's console, consisting of a computer monitor and CPU, staffers asked if we wanted to see the *rest* of the system. There was an entire 19-inch rack sitting back in their computer room, filled from top to bottom with more associated CRS processing units.

The CRS even has its own LAN, connecting this processing rack to the primary and secondary CRS operator consoles. If you are working with your local NWS office on solving CRS-related problems, be aware of the enormity of the system.

The problem of NWR sending undefined FIPS location codes was again traced to the implementation of CRS operation. It seems the CRS consoles are programmed with location codes which, we understand, the NWS plans to implement in the future.

In our case, the Console Replacement System sent "055999" as the first location code of every alert. This undefined location code caused the CG message on TV screens to read, "The National Weather Service has issued a Required Monthly Test for ???, beginning at ..."

Our National Weather Service staff had no idea of the devastating effect these codes had on EAS broadcasts until we explained it to them. They immediately eliminated these codes from the CRS to alleviate our problem.

New marine codes coming

The other undefined area codes we encountered were codes NWS came up with to represent the coastal and open waters of Lake Michigan. Again, they had no idea of the effects on our EAS equipment by just throwing these codes into the CRS warnings.

Our NWS office removed these lake codes from use also, because the codes are not yet defined for broadcasters, or for boaters. NWS has always sent lake codes as part of warnings sent on the NOAA Weather Wire Service (NWWS). The logical progression for them was to add these codes to NWR. It is impossible for your local NWS to know these codes are confusing your EAS box unless you tell them.

On Dec. 1, 1998, NOAA Weather Service Headquarters in Washington will implement a reconfiguration of the marine location codes used on the NWWS to represent all open and coastal waters of the Great Lakes. Our NWS office is expecting Weather Service Headquarters to follow up these new NWWS codes with new corresponding codes for use on NWR. Broadcasters in Great Lakes regions should keep an eye out for these changes.

The statement I saw made no mention of changes in codes for the seaboards, but stations in those areas might watch for possible reconfigurations in those areas as well.

See SBE, page 45 ▶

Tascam & Bradley Turn The DAT World Upside-Down

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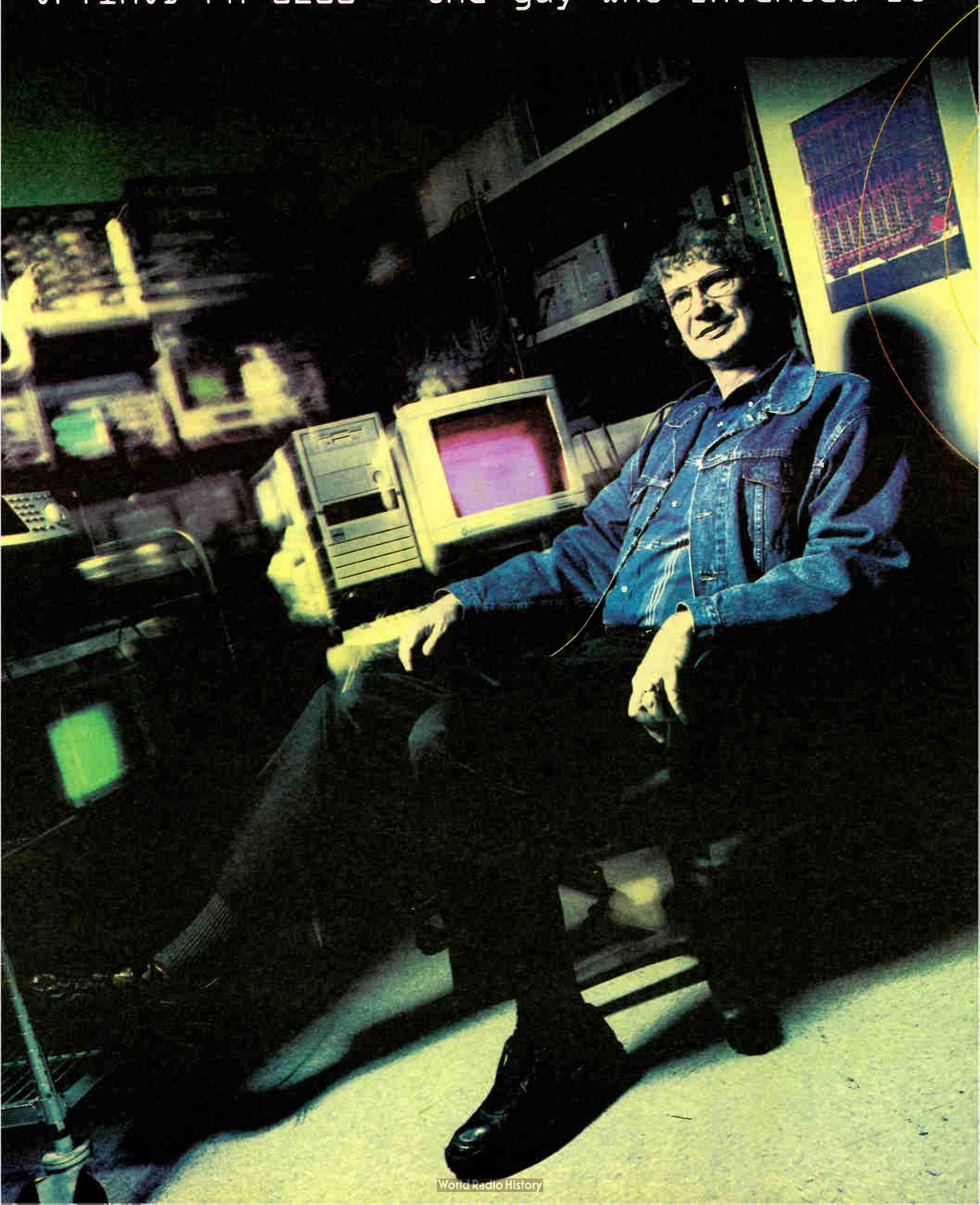
A challenge from the greatest critic of the OPTIMOD-FM 8200 - the guy who invented it.



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Circle (7) On Reader Service Card

World Radio History

Past and Future of Satellites

▶ HISTORY, continued from page 38

the apt-X algorithm, and adopted an updated MPEG digital audio compression standard. MPEG provided the same stereo audio fidelity of apt-X in a 128 kbps data stream (1/12th the old T1 rate), using a newer QPSK (quadrature phase shift keying) modulation and sequential error correction format. The National Supervisory Network of Colorado, also known as NSN Network Services, installed the first MPEG digital audio network in the United States in early 1993. (Note: The author co-founded NSN in 1988 but is no longer involved with the company.)

The impact of MPEG Ku VSAT technology on the radio broadcast industry has been nothing short of revolutionary. This new MPEG QPSK digital transmission required only 200 kHz of satellite bandwidth, at minimal power levels (typically under 18 dB/W Ku-Band satellite downlink EIRP) to deliver 20 kHz CD stereo audio, 9,600 bps ancillary data, digital relay control signals, and even over-the-air satellite network management signals with 99.9 percent network availability.

Satellite networks at this power and bandwidth could be operated at incredibly low costs — only about $1,500 per month for nationwide coverage. (Older FM/FM analog costs averaged some $30,000 per month for lower fidelity service at that time!) Uplinks could be located anywhere, using antennas as small as one meter in diameter, and licensing was simplified since the Ku-Band required no prolonged terrestrial interference studies. No central shared hub or backhaul was needed.

Updated services

In 1995, National Public Radio opted to abandon its obsolete analog SCPC system and adopt Digital SCPC MPEG transmission on its C-Band satellite transponders. Likewise, most commercial radio networks previously using analog FM/FM or DATS shared hub services began to update their services to new digital MPEG PSK subcarriers, or to partial or full transponder-shared MCPC (multichannel per carrier) services. Other satellite manufacturers, such as Wegener and International Datacasting, began to deliver QPSK digital audio product. ABC Radio and Scientific Atlanta adopted a proprietary digital audio compression format called SEDAT, to increase space segment availability and provide lower transmission costs.

These days, the satellite term SCPC no longer means Single Channel Per Carrier in the old audio or data sense. Today's SCPC audio systems do contain one digital data stream, but this digital stream typically contains two audio channels, coding and decoding information, ancillary and control data, and network identification data. So why call it SCPC? Habit — plus the fact that in most cases, the data content belongs to a single format or customer.

"Digital FM Squared" is a misnomer, since the former FM subcarriers are now PSK digital subcarrier signals riding atop a conventional FM main carrier.

Digital MCPC, used by background and commercial-free subscription music programmers like DMX, multiplexes more than 100 CD-quality audio channels into a single 30 mbps aggregate full-transponder carrier. With the full-transponder digital modulation format, inexpensive receivers are manufactured easily, offsetting the high satellite transponder time charges over immense receiver and subscription bases.

Narrowband (2 to 10 mpbs) digital MCPC also is becoming popular, because in a C-Band application, less than full transponder segment and power may be used, resulting in lower hub operations costs, while keeping receiver costs somewhat less than narrowband SCPC prices. Also called DVB/MPEG MCPC, because the majority of systems being developed today use a spin-off of the DVB multiplexing format developed for DTH, or direct-to-home, TV, DVB MCPC probably will become the standard format used by radio network programmers worldwide within the next few years.

Narrowband MCPC becomes problematic in the Ku-Bands, because greater carrier-to-noise ratios are required than in C-Band to maintain network availability during atmospheric attenuation events, or as the average person would say, during rain-storms. Link budget calculations for MCPC show that Ku-Band power/bandwidth ratios become completely unbalanced; for example, a 10-stereo-channel MCPC carrier would occupy about 15 percent of a transponder, but require almost 50 percent of the transponder's power. Obviously, because SCPC networks run at a balanced power/bandwidth cost, MCPC doesn't add up in the Ku service.

On the horizon

There is an interesting technology under development by an Israeli company, Gilat Satellite Networks, that would permit operators of Ku-Band DVB MPEG systems to gain back some use of the excess bandwidth created by the inherent imbalance of power DVB imposes in partial transponder application.

Using Gilat's full-duplex "VSAT on a PC Card" technology, network operators will be able to add an "outbound" data stream to their existing DVB aggregate, which would then contain VSAT network customer data. The little PC-based VSATs would transmit back on low-powered "inbound" channels contained within the previously unused bandwidth near the DVB carrier, which would run at slightly lower power to accommodate the new return channels. This means Full-Duplex VSAT network services with "free" return channels.

■ ■ ■

Bill Sepmeier is a systems engineer and communications network consultant, free-lance writer and public speaker. He can be reached via e-mail to bill@mountainmax.net

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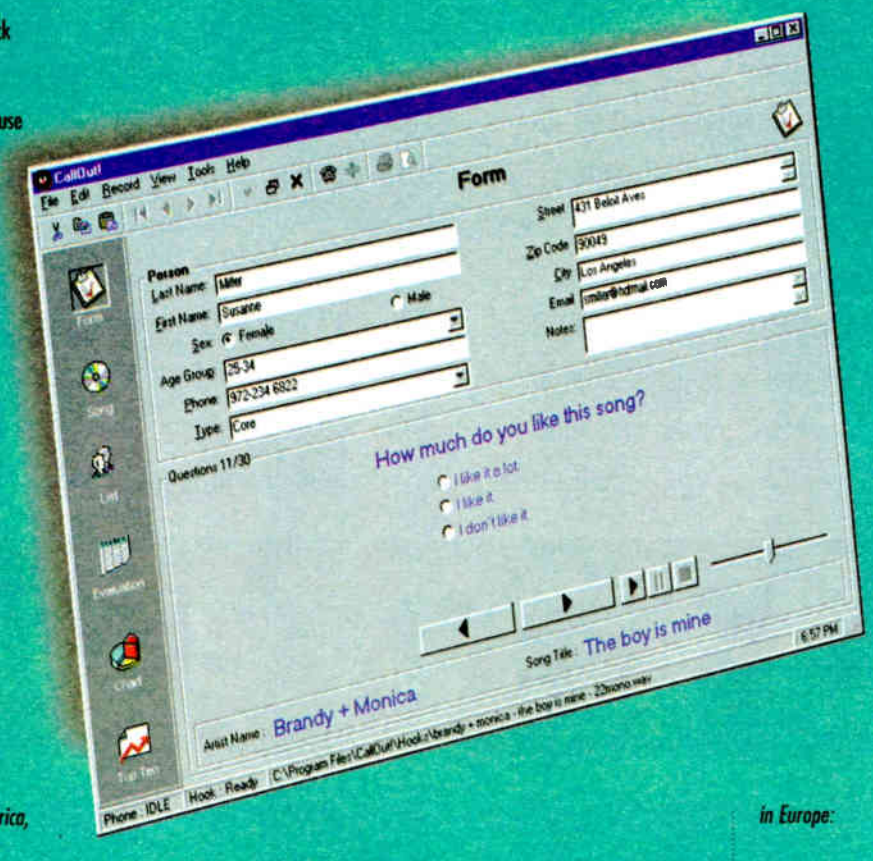

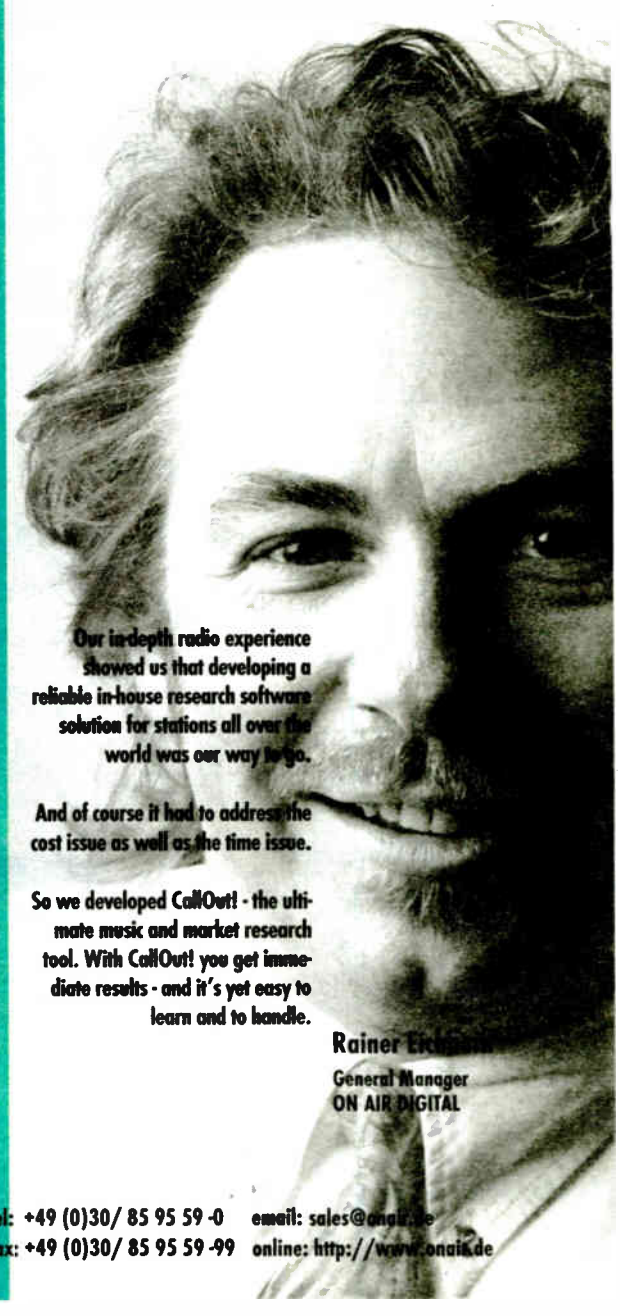
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NWS 'Robot' Speech to Improve

▶ SBE, continued from page 41

We will definitely be dealing with these codes in the future. That is because NWR is slated for total automation. The CRS will read the header codes issued in the NWWS alerts, assemble an EAS/SAME header and synthesized voice message, and broadcast the entire alert message on its own. Because marine codes are part of the NWWS system, we will need to get them defined and entered into our EAS boxes.

That synthesized voice

The news regarding the current synthesized voice is somewhat encouraging.

Neither the NWS people in the field nor the staff at WSH like it any more than broadcasters do. They are strongly considering what is called a "concatenated" voice. The new voice, not computer generated like the present one, would be the playback of an actual human voice. They would use long-phrase segments, which means the recordings would consist of partial sentences, rather than just individual words. This should make the speech flow more naturally.

The National Weather Service plans to model the new voice after the one used by Canadian weather radio. To hear a sample of this voice, dial Montreal weather forecast at (514) 283-3010.

There are two caveats. NWS probably won't have the money for this upgrade until 2001. Second, the decision to go to a new voice rests not only with WSH, but also more directly with the individual NWS regional directors. If you favor a change to the improved voice, contact both national and regional National Weather Service personnel. Perhaps with enough broadcaster pressure, the timetable can be sped up.

This point was stressed to me: Implementation of the improved voice will have a direct effect on whether broadcasters will rebroadcast warnings issued by NWR.

To contact WSH in Washington, write John J. Kelly, Jr., assistant administrator for weather services, National Weather Service (NOAA), 1325 East-West Highway, Silver Spring, MD 20910 or e-mail *john.kelly@noaa.gov*

For the address of your regional director, go to *www.nws.noaa.gov/regions.shtml* or contact me at *gteas@execpc.com*

A good rapport with your local National Weather Service people will go a long way to alleviate the problems outlined above. At the meeting we requested, NWS freed up five key people to attend, including the meteorologist-in-charge of that office.

Although your NWS office may not be quite as enthusiastic, we found one common thread ran through all of our appeals to them that might help you get through to your NWS staffers. They are concerned about getting their warnings out to the greatest possible number of people. Show them that something they are doing is inhibiting that mission. This seems to get their attention.

If you don't have luck at one NWS office, try another. They are somewhat autonomous, and each office has its own atmosphere of cooperation. Establishing a policy at one office can lead to spreading it to other local offices by example. For a starting point, try contacting the Warning Coordination Meteorologist at your local office by calling ext. 726. This usually is the person involved with NWR coding and procedures.

In addition to helping with EAS-related problems, a good relationship with NWS personnel will become more important as time goes on. The future mission of NWR is to become All Hazards Radio, when NWR will be relaying local emergencies rather than just weather. A solid relationship with your NWS staff now can lead to a stronger local EAS in the future.

■■■

Tell us about your experiences with the National Weather Service at radioworld@imaspub.com

Gary Timm is chairman of the Wisconsin State Emergency Communications Committee (EAS Committee), a member of the FCC EAS National Advisory Committee, the SBE EAS Committee and the SBE Chapter 28 Executive Board. He has worked at WTMJ(AM)-WKTI(FM) since 1973.

Upping Mic Levels Avoids Noise in Studio

▶ WIRE, continued from page 25

damned if you do and damned if you don't. Use braid/french braid and you'll suffer with reduced RFI protection. Use a foil and have bad self-noise problems.

The solution? Run only as much mic cable as necessary to be flexible and convert to foil shields as soon as you can. (And that's a good place to convert to line level too!) This makes sense because the mic cable is much more expensive than the line level cable.

It also allows you to convert from single mic cables into a multipair snake. But now we're getting ahead of ourselves ...

The hot wire of 1960

If you were a manufacturer (say, RCA) in 1950, and you went to your local wire manufacturer and said, "Give me some cable to wire up my latest audio console," the wire manufacturer would have essentially given you mic cable. That's all there was! Rubber-insulated twisted pairs, braid shields and rubber jackets were used for everything.

Around 1960, with the growth of plastics technology, my employer Belden came up with the idea of a foil-shielded twisted pair cable (8451). To say this was revolutionary is an understatement. It's still described in the catalog as a "miniature" cable. Compared to what? Compared to those clunky, rubber-insulated, mic cables of yesteryear!

The plastic chosen (polypropylene) gave the cable capacitance equal to or lower than any mic cable around. The foil shield made it inexpensive and small and also made it the first "install-only" cable.

Manufacturers and installers immediately recognized the advantages of a small, high-quality and inexpensive cable. Now, anybody who makes wire could probably make a copy of that cable; there are dozens of variations in different gauges, different insulations and different jacket compounds.

But with an idea as simple as a foil-shielded twisted-pair audio cable, these variations are a definite case of "Caveat Emptor," or "Let the Buyer Beware!"

It's easy (*very* easy) to take the original design (polypropylene) and substitute PVC. The latter cable will have some wonderful properties. It will be more flexible, very easy to color, will not shrink back when soldered ... all wonderful things. Plus, it will be priced about half of the original cable.

The bad side? The new all-PVC design will be almost *half* the performance of the original polypropylene design. You get what you pay for!

The performance in a twisted pair in analog audio can be summed up in one word: capacitance. We'll look at capacitance, and a few more specifications for analog audio in our next installment.

■■■

Stephen H. Lampen is the author of "Wire, Cable and Fiber Optics for Video and Audio Engineers" (McGraw-Hill) and is the technology development manager at Belden Wire and Cable.

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

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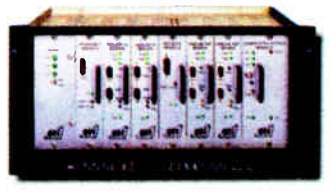

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GM Journal

Radio World — Resource for Business, Programming & Sales — November 11, 1998

Radio vs. Drunk Driving
Page 48.

NEWS MAKER

Cuban on Radio and the Net

Innovator of broadcast.com Pursues Business From Managers Unsure of Their Net Strategy

Laurie Cebula

"Radio and television organizations that start learning how to sell the Internet today are going to be the leaders that are ahead of the curve. Those who don't are going to lose business."

The speaker is Mark Cuban, co-founder and owner of broadcast.com, whose company has garnered many headlines recently thanks to its business strategies, a name change and a highly publicized stock offering.

Broadcast.com seems to be everywhere. The company formerly known as AudioNet carries more than 370 radio stations and networks, 30 TV stations and 420 college and professional sports games on the Internet.

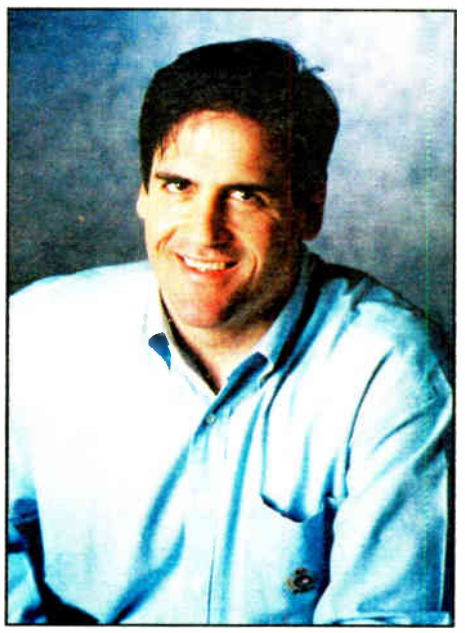
Cuban and partner Todd Wagner began webcasting only three years ago. Frustrated at not being able to hear a live broadcast of an Indiana Hoosiers college basketball game, they set up AudioNet, one of the first online radio broadcasting services.

Today, broadcast.com employs 205 people. The Dallas-based organization offers turnkey services to let customers provide streaming audio and video broadcast solutions on the Internet and via intranets. Revenue in the third quarter was up 134 percent compared to the same period last year.

According to the company, broadcast.com ranks 11th of all news information and entertainment sites on the Web, drawing a larger audience than destinations such as NBC.com, MTV.com, Sportsline USA and NYTimes.com

Streaming media

Broadcast.com knows that Net streaming faces limitations. It advertises that it can help an Internet service provider upgrade its network to handle more simultaneous streaming users.



Mark Cuban

The primary appeal of streaming media, Cuban said, is that they let stations reach listeners where they are.

"We just did a study that said only 30 percent of white collar office workers have radios in their offices, but 95 percent have PCs on their desk. That means 63 percent of those who want to listen, can't. By being the station that's enabling someone to listen over the computer, without signal interference, you can reach those people — those P1 (listeners) you spend so much money for."

In the Internet business, Cuban said, there exists a huge "first mover" advantage, and he pushes that angle in his pitch for radio clients. He said broadcast.com can generate listeners by directing Web traffic to a station's site.

"People use the Internet as both an entertainment and news medium. They're becoming more and more used to using audio and video. Eventually they will expect it. They look to broadcast.com as a source. We're like the Yahoo! of audio and video on the Net."

Success story

Cuban is a technology-era success story. In 1983, he founded Micro Solutions, a systems integration firm It was ranked in the top 20 of the LAN 100 and made the Inc. Magazine list of the top 500 fastest growing privately held companies. Cuban sold Micro-Solutions to CompuServe in 1990 and later became president of Radical Computing, a venture capital and investment company specializing in high technology companies.

He and Wagner have built

See CUBAN, page 50 ▶

broadcast.com

Company: broadcast.com

HQ: Dallas

Founded: 1995, as AudioNet

Employees: 205

Revenue: $11.4 million through Oct. 12

Stock symbol: BCST (NASDAQ)

Business statement: "Broadcast.com is the leading aggregator and broadcaster of streaming media programming on the Web. The company has the network infrastructure and expertise to deliver or 'stream' hundreds of live and on-demand audio and video programs over the Internet or intranets to hundreds of thousands of users."

Contact *www.broadcast.com* or call (800) 342-8346

Gary Fries: Grasp New Openings

Brian Galante

To Gary Fries, the future of radio is bright, but radio can accomplish more.

During his annual "State of Future Radio Sales" speech at The NAB Radio Show, Fries, the president of the Radio Advertising Bureau, said radio revenue is up 11 percent this year over last.

Such increases, he said, are becoming business as usual. While the most dramatic revenue increases have taken place over the last several years in large markets — specifically the top 25 — similar increases are seen in smaller markets.

"No longer is it (revenue increases) just in the top markets," Fries said. "It's starting to filter down." National advertisers are taking notice and embracing radio, he said.

Shining sun

"We are in the brightest time ever in the radio business," Fries said. "There is very little going on in our business that is not under construction."

To Fries, radio is in the process of reinventing itself, and its challenge is to change its focus to take advantage of new opportunities like the Internet.

By advertising through radio stations on the Internet, Fries said, businesses can reach a wider audience.

"Internet is going to change radio," Fries said.

"Streaming audio while sitting at a desk at work can have dramatic increases in time spent listening," Fries said, pointing to recent research by Arbitron into Internet

See FRIES, page 56 ▶

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World Radio History

Radio vs. Drunk Driving

Alan R. Peterson

The National Commission Against Drunk Driving is honoring the NAB for its efforts to promote drunk driving awareness and prevention.

The NAB recently joined with the Ad Council, recording artists, the U.S. Department of Transportation and the National Highway Traffic Safety Administration to produce "Friends Don't Let Friends Drive Drunk," a 48-cut CD in support of National Drunk and Drugged Driving Prevention Month in December. The campaign was announced during The NAB Radio Show in Seattle.

PSAs on CD

The CD features PSAs by stars from sports, music and television. Among the notables: former Beatles Paul McCartney and Ringo Starr, members of Aerosmith, country artists Trisha Yearwood and Clint Black, pop group Hootie and the Blowfish, basketball star Shaquille O'Neal and TV performers Dennis Franz and John Larroquette. Cuts were recorded for seasonal and year-round use, with several in Spanish by Jon Secada and David Lee Garza.

"Your lifestyle is your business, but if you take it on the road, it becomes everyone's business," Meluso said.

S. Murray Gaylord, COO of the Ad Council, commented on the success of the "Friends Don't Let Friends Drive Drunk" slogan, introduced eight years ago.

"When it comes to drunk drivers," he said, "more people are intervening now and asking for the keys than they did before. They don't tolerate it anymore.

Radio campaign

"Radio has been a great supporter of the Ad Council," Gaylord said. "Radio broadcasters contributed $573 million worth of airtime in 1997. And drunk driving prevention was the second-most aired radio PSA campaign last year."

'Friends Don't Let Friends Drive Drunk' CD

William McElveen, NAB Radio Board Chair and executive vice president of Bloomington Broadcasting Corp., said NAB member stations contributed more than $6.8 billion worth of community service in 1997.

"Broadcasters focus on issues that are important to the communities they serve," McElveen said. "Preventing deaths and injuries by drunk drivers is an issue that everybody can support."

Richard Ferguson, Murray Gaylord, Erin Meluso, Terry Schiavone

© 1998 NAB

For its part in promoting drunk driving awareness and prevention, the NAB and the broadcast industry will be honored by the National Commission Against Drunk Driving at its 14th Annual Awards Luncheon in Washington next month.

"Getting people to change the way they behave is incredibly difficult, time consuming and expensive, but we've done it," Terrance Schiavone, president of the NCADD, said.

"Society no longer tolerates 'one for the road.' Designated drivers are not only commonplace, they are respected. Social drinkers have gotten the message that alcohol and driving

See PSA, page 54 ▶

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World Radio History

PROMO POWER

Tapping Your Target's Lifestyle

Mark Lapidus

The next time you're having a few beers with a couple of fellow radio professionals, ask them what they remember most about one of the favorite stations of their youth. It's quite likely that they'll say something like, "I always felt that if I wasn't listening, I would miss out on something."

Everything that station did seemed so important. We can learn much from this notion which I have heard voiced by so many people.

It's vital for programmers and marketers to strive to create on-air events and tap into the lifestyle of their target audience.

While this seems elementary, why do so few stations do it? Because it takes an understanding of what that lifestyle really is, as well as hard work in planning and excellent execution. Let's take this a step at a time.

Twenty years ago people had more shared experiences and therefore more shared interests. There were three major TV networks, few computers, no video rentals and no Web.

How do you find out about the lifestyle of your audience as it stands now? Even if you have perceptual research, you still need to ask your sales department. Your station probably subscribes to psychographic information for your advertisers.

It's when you hit lifestyle issues that you tap into that, 'I have to turn that station on or I'll miss something,' feeling.

When an agency places a buy for 25-49- year-old males, they may also want to know how many of those people that listen to your station also have bought a new car in the last two years. Your rep has that information.

You can find out extremely important information about your target just by asking the right questions: What percentage are married? How many kids do they have? How many times a year do they go to movies, concerts, sporting events? What percentage own a computer and how many use e-mail?

You get the idea by now. Don't make absurd assumptions based on personal experience. (Only a few exceptional morning show personalities have the instinct to pull this off.) This is especially dangerous for programmers who are in their own age target groups.

For example, I've previously written about the overemphasis many stations place on concert presentation with no listener benefit.

This may occur because people at radio stations get lots of free concert tickets, go backstage to meet the stars, and are treated like royalty at shows.

They love the experience so much and do it so often themselves that they figure listeners feel the same way. They may be shocked to learn that the average listener attends three concerts per year, but watches at least 20 movies. Wow!

With that kind of knowledge, you have a much better ability to tap into your target's real lifestyle. It's when you hit lifestyle issues that you tap into that, "I have to turn that station on or I'll miss something," feeling.

Just the facts

Now that you know more about what your target audience cares about, devise a plan that takes advantage of the facts.

For example, if you find that 70 percent of your audience has young kids, maybe your prize packs should contain money for a sitter.

Do this every time, not just once in awhile. If you discover your audience buys a large number of CDs a year, CD promotion should have a regular place on your station.

Make an enormous deal out of a new CD release from a superstar artist. This means devising a plan that's repeated. Each time this happens, run promos for a day or two saying you'll debut the CD.

Debut some cuts on a set date throughout the day. Have a CD release party that night, where the whole CD is featured and many are given away. Do this regularly and you will become known for it. Do it once and it doesn't mean much.

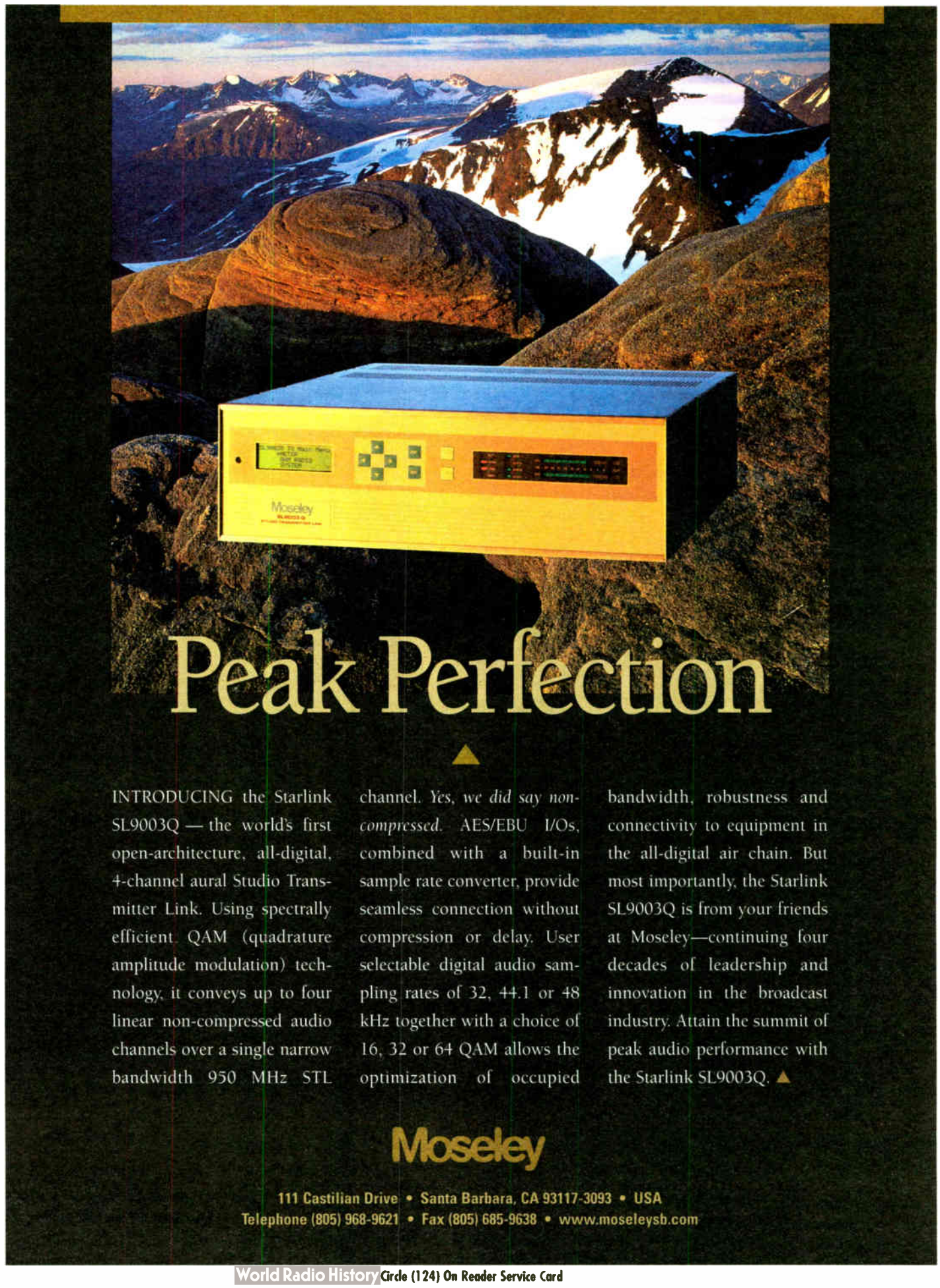
It also helps to give an on-air event like this a regular name that you use each time, so you brand the promotion to your station.

If you found that a large percentage of your audience has pizza delivered at least twice a month, perhaps you would want to increase the number of pizza giveaways you do or cut a deal where you advertise a specific radio station benefit on the top of the boxes.

Finally, to capture an audience you must be able to seize on the topics of the day.

With the political scandal lately, a few newcomers in our business have learned a little lesson on how that works.

They'll do well not to let it stop once Monica leaves the headlines. When you program a station that constantly mirrors what your target group is talking about, you too can become one of those radio stations that people have to listen to, or they might just miss something!



Circle (124) On Reader Service Card

World Radio History

Focus on Radio Web Site Sales

▶ CUBAN , continued from page 47

broadcast.com into a recognizable brand on the Net. Conduct a random search on the Web with the keyword "radio," and chances are that broadcast.com comes up high on the list.

Cuban argues that a presence on the World Wide Web costs a station little compared to the amount of marketing dollars it spends to maintain loyalty among listeners through direct mail and billboards. A station can operate a Web site profitably for $1,500 to $3,500 a month, he said.

New competition

The Internet also presents stations with the reality of new competition. Instead of being the only rock station in a 30-mile radius, a station now is one among hundreds with such a format on the Internet. But the potential audience for each is global.

What does this Internet entrepreneur think radio managers should do in such an environment?

"The two things a radio station has that no one else on the Internet can replicate are their signal and their personalities. That's what you really focus on selling," Cuban said. "It's not smart for a radio station to try to compete in selling banners with the Yahoos of the world."

The two things a radio station has that no one else on the Internet can replicate are their signal and their personalities.

— Mark Cuban

Stations should focus on selling sponsorships of their Web presence, special events and events built around their personalities, Cuban said.

"Radio stations do a lot of locally driven events and those can easily be sponsored on the Net. That's non-traditional, non-spot revenue."

Skeptics of Internet radio broadcasting say national advertiser support is unproven.

Emmis Communications President Jeff Smulyan, for example, recently told **RW** he believes in smart technology, but he echoes the reservations many broadcasters experience in Internet radio.

"It's nice to be able to broadcast your signal around the world, but we haven't seen proof that national advertisers will support it. And I'm not convinced that at-work listening will increase through the use of computers," Smulyan said.

"The fact is, radio is the most readily available medium. The glory of transistor radio, after all, is that has always been consumed on the go. If you're not listening to the radio, it's probably because you don't want to. It's a whole lot easier to turn the switch and move the dial than using a computer to get a radio signal."

But Cuban says the Internet offers something radio desperately wants: the ability to track listeners. Radio spends a great amount of time and money striving for that.

Unlike traditional audience measurement systems, Internet software programs not only can tell a manager how many qualified Net listeners her station has, but also where those listeners are, when and how often they listen and what they like to listen to.

"I know exactly how many people are listening to something, and when," Cuban said.

Cuban said radio business people can thrive on the Net if they take advantage of these tools to collect demographic information.

Multimedia experience

A key finding in a new Internet listening study by Arbitron is that radio Web sites provide only a small part of the experience listeners desire.

Believers in radio Web sites say such sites should provide a more compelling, interactive experience rather than the simple data most offer now.

The potential global reach of a Web station, at least, is unquestionable.

Eric Ward, program director and general manager of station 100 Jamz FM in Nassau, Bahamas, said the station has only recently begun to consider the possibilities for marketing itself on the Web.

"One option," he said, "is to split my signal and tailor advertising to each region I am hitting," he said.

"I can tell you, for example, that in mid-February, when we first went online, we had 2,500 listeners. Today, I have exactly 29,932 listeners. And that's real listeners. Our database doesn't count people who stumble into our Web site by accident and leave immediately. Only those who visit more than once or bookmark our site and visit regularly are counted," he said.

"I have audiences now all over the world, including The Czech Republic, South Africa, Italy and many listeners all over the United States. Our local listening audience is also very healthy."

Interactive advertising, Cuban said, is essential to marketing online radio stations.

"Unlike radio and television, which is just one-way, Internet multimedia advertising allows you to interact," he said.

"If you're listening to a radio station and they ask a question, invite you to sign up for a contest or conduct a survey, you're likely to respond — it's only a click or an e-mail away."

Cuban thinks radio clients will raise their expectations in years to come.

"I think interactivity and accountability will be required and expected by advertisers. They will want to know who their customers are, in detail. As the compression gets better and bandwidth gets better, you'll get better signals over the Internet than you will in your home," he said.

"You'll see devices in the home that become part of the stereo and television that connect to the Internet. As more people gain access to cable modems, the higher-speed connections will allow us to offer more options and create more opportunity for broadcast.com and our radio stations."

Broadcast.com offers demographic information to its radio clients. This information is not recorded in real time; however, Cuban said demographic information is quickly moving in that direction.

National advertisers

Many radio managers remain reluctant to invest in an online presence, or they cite reluctance from advertisers to support it.

In response, broadcast.com can point to an advertising success of its own. It signed First USA to a multi-year advertising and marketing agreement.

James W. Stewart, executive president of partnership marketing for First USA, said the partnership allows First USA to market a variety of credit card products directly to consumers most likely to want them by tracking people through their individual preferences.

"Broadcast.com users can immediately and conveniently apply for a First USA credit card that is perfectly suited to their interests, while enjoying their favorite audio and video programming," Stewart said.

While broadcast.com does not control a station's Web site, Cuban said his firm will make introductions between national advertisers and its client stations, and try to help those stations obtain support.

"Companies are realizing that there is value to advertising online," he said. "Radio has to realize they have to be here, selling, because this is where there is a lot of money coming in."

keyword search: RADIO'S BEST READ NEWSPAPER
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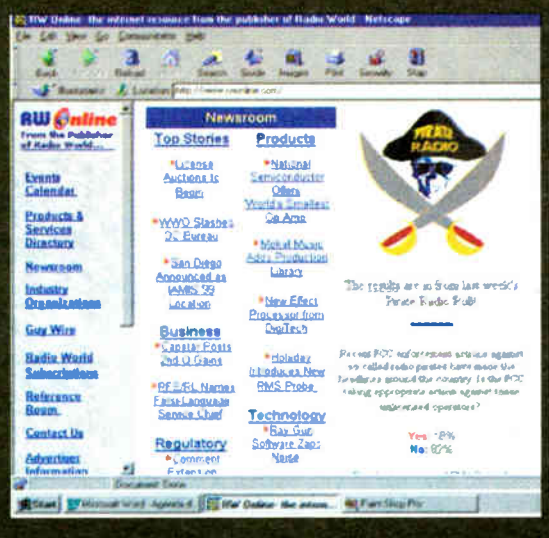

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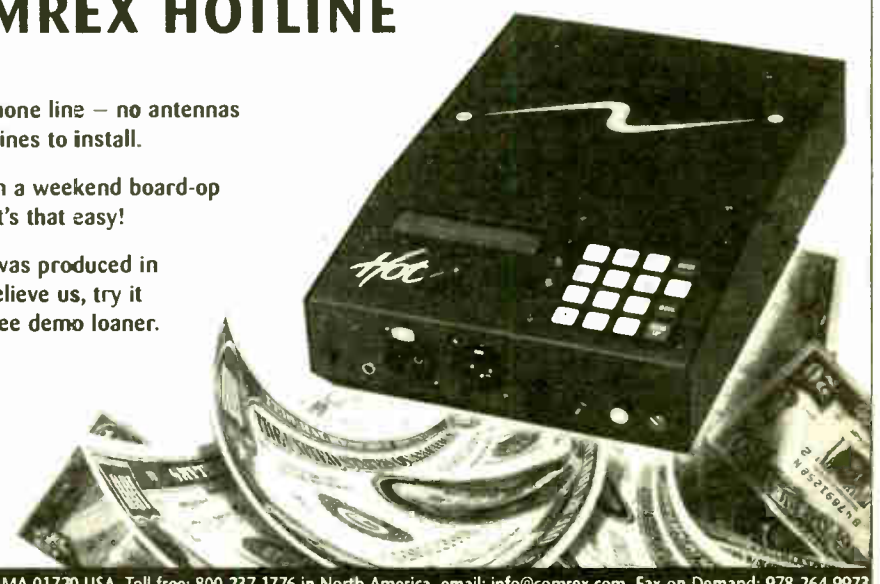

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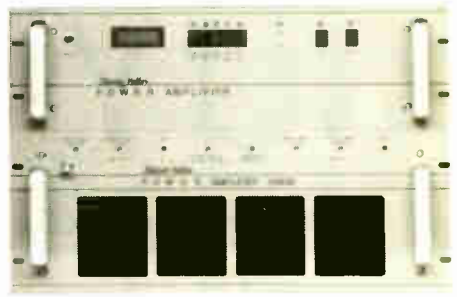

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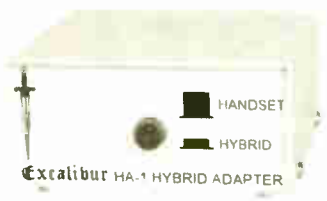

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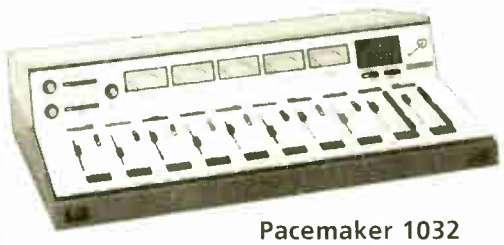

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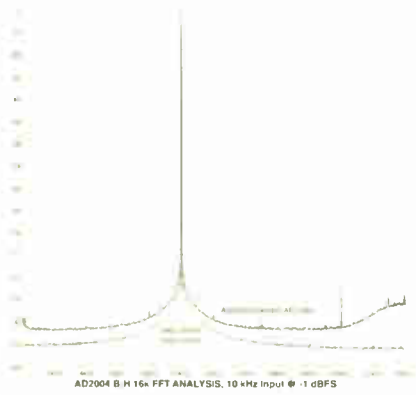
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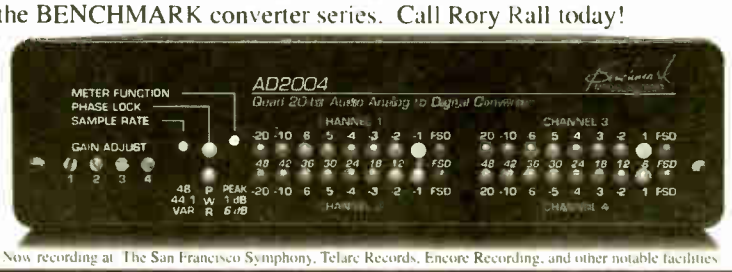

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READER SERVICE NO. 75

World Radio History

BOTTOM LINE

WorldSpace to Launch Satellite

Frank Montero

What started off as a dream just eight years ago was slated to become a reality late October when WorldSpace was scheduled to launch the first of its three satellites designed to deliver satellite digital direct audio and multimedia broadcasting services to the emerging and underserved regions of the world: the Middle East, Africa, the Mediterranean Basin, Asia, the Caribbean and Latin America.

The launch of WorldSpace's AfriStar Satellite will be the first step in delivering this service to the African continent. Later, in early 1999, WorldSpace will launch its AsiaStar Satellite to deliver the service to Asia, with the third satellite, AmeriStar, slated for launch later in 1999 to deliver programming to Latin America. Broadcast operations are scheduled to commence in December of 1998.

WorldSpace was founded in 1990 and is the dream child of Noah A. Samara, founder and CEO of WorldSpace and its subsidiaries: AfriSpace, AmeriSpace, AsiaSpace, and CaribSpace. An attorney, Mr. Samara, according to the company's profile, is a veteran in developing the regulatory and business regimes for international satellite services. Before founding WorldSpace, he advised numerous global telecom and broadcasting concerns including the ITU, on a wide range of issues regarding global business and regulatory regimes of mobile and portable communications.

Once in operation, WorldSpace says its satellites will offer broadcasters the ability to deliver their programming to vast geographic areas. One beam from a WorldSpace satellite will cover 14 million square kilometers. The system will also offer the ability to broadcast data, text, software and images in a digital format.

The marketing objective of WorldSpace, which has purposefully avoided delivery of its service to North America and Europe, is straightforward: the economic middle classes within most of the WorldSpace coverage area are growing steadily. According to WorldSpace, even if one takes a highly conservative view, the sheer number of consumers in the targeted service area provides assurance of a viable market. WorldSpace estimates that there are more than four billion people in its projected coverage area.

Specialized receivers

Reception of the WorldSpace satellite system will require the audience to purchase specialized receivers. These receivers are small portable radios which will be available in 1999 in Africa, the Middle East and Asia, corresponding to the start of service of the AfriStar 1 and AsiaStar 1 satellites. The receivers will be sold through WorldSpace, but will also be available through select retail outlets in Europe and North America. The receiver will enable consumers to get digital broadcasts directly from the WorldSpace satellites. They will also pick up shortwave, AM and FM broadcasts

The wrinkle comes with the projected retail price of the receivers. The manufacturers are going to price the receivers depending on the features. However, at the outset, the lowest cost will probably be about $200 each. Later, it is anticipated that the retail price may drop to $50 within two years given the traditional consumer electronics economies of scale. Still, such prices are steep even for the average American radio listener. So how can WorldSpace distribute these radios in the emerging markets, even with their expanding middle class? WorldSpace's marketing plan focuses on various strategies, which include enlisting the assistance of local governments, U.N. agencies, non-governmental organizations and private donors. They are also relying on differences in the way listeners tune into radio in developing regions. There, according to WorldSpace studies, communal listening is far more prevalent than it is in industrial countries, thus even one or two receivers in a village could bring substantial benefits to the community. According to proprietary research commissioned by WorldSpace, more than 180 million people would buy the WorldSpace radios over a period of ten years even if the unit costs $100 more than current radios.

WORLDSPACE

The company intends to offer a broad menu of programming options to its subscribers. These include the retransmission of established programming formats and networks as well as originally produced programming. WorldSpace has been aggressive in trying to sign up programming commitments for its system. A number of broadcasters have signed channel reservation agreements with WorldSpace, including Bloomberg Financial in the United States, as well as a variety of radio networks and program suppliers in countries covered by the service area, such as the Kenya Broadcasting Corporation, the National Broadcasting Authority of Ghana, New Sky Media of Korea and Radio Cadena Nacional of Colombia.

Rod Calarco, a former executive vice president for Westwood One, who was once president of the New York State Broadcasters Association and served on the board of RAB, joined WorldSpace in 1997 and is now senior vice president for programming and sales. He said, "After almost a decade of careful planning, we're incredibly excited to be launching our first satellite. We've identified an untapped market of nearly 500 million people worldwide who can afford our service and are thirsty for the kind of exciting programs we'll be delivering."

The WorldSpace project is a gamble. The company has already raised close to $1 billion for start-up costs without generating any revenue. Moreover, the system will not begin to generate revenue until mid-1999, nearly a decade after its founding, and is not expected to turn a profit at the earliest for three to five years. It has been described as a $850 million start-up company. Still, if successful, WorldSpace could revolutionize and globalize the way in which the world listens to radio. No matter where you travel, you would be able to listen to recognizable programs off a WorldSpace receiver with digital quality.

As Calarco said, "With the WorldSpace service, we hope to revolutionize radio broadcasting for an entire continent with the push of a button – something that's never been done before ... . It's an exciting time."

■■■

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World Radio History

Beyond the Katz Memo

Craig Johnston

The Katz memo.

Say that in radio advertising circles, and any listener will know what you're talking about.

"On May 12, everything changed," Corey Davis, vice president and general manager of Spanish Broadcasting Systems, said during a session at The NAB Radio Show. He spoke on the topic of revenues not keeping pace with ratings at radio stations catering to minority audiences.

"We always knew it was going on, but now it was out in the open."

Internal memo

Davis was referring to the infamous Katz Radio Group internal memo discouraging advertisers from buying spots on urban and Hispanic radio stations. The controversy it produced gave birth to a session called "Urban vs. Hispanic."

"I was embarrassed," Stu Olds, president of the Katz Radio Group, said. "I wondered how this could happen to us, with our tradition of multicultural diversity."

"It is a complex, emotionally charged issue which transcends media and business," Olds said. "There's advertiser bias out there. There's also bias in agencies and stations. Although many organizations have diverse staffs, we still don't all live together."

Once the shock had subsided, Olds and Katz worked on a long-term solution to the problem. Olds spoke of forming special units at Katz for urban and Hispanic station representation. "As marketers, we must view these minorities as a tremendous marketing opportunity."

> **'I wondered how this could happen to us, with our tradition of multicultural diversity.'**
>
> — Stu Olds

Sam Chisholm, president and CEO of the Chisholm-Mingo Group of New York, began his presentation by playing the well-known Abbott and Costello "Who's on first?" movie clip. "People haven't been listening to what one another are saying," he said.

"Minority spending dollars are continuing to grow," Chisholm said. And minorities are listening. He cited research showing African Americans listen to the radio four hours a day, on average. But he said it's necessary to go beyond the numbers. He listed several steps for radio managers to take:

- Value the programming and the marketplace.
- Understand the market.
- Create relationships and educate your buyers as to how and what's available to them, and the importance and value of the market.

The keys, he said, are to document your successes, then adjust your pricing and stick to it. He noted that the BET cable channel has declared it will hold its rates to those other cable channels get.

"To sell, you educate," Sherman Kizart, director of urban marketing at Interep, said. The company has became proactive in educating advertisers about the relationship between listeners and urban radio. It has created a research handout: "Urban Radio, Approaching the New Millennium."

"Blacks in the U.S. represent a $446 billion market, equivalent to the 11th-largest country of the world," Kizart said. He calls it a country within a country.

Single station

African Americans watch TV and read newspapers, but when it comes to radio, "They identify themselves with a single station. Radio is the media of choice for African Americans." He said four black radio formats have expanded to eight in recent years. He also said the power ratings of urban radio is growing.

"The FCC had already begun studying ratings in relation to revenue for minority stations," Carey Davis said. But when the Katz memo surfaced, "that was the moment we were waiting for."

Davis' Spanish Broadcasting Systems and others formed a coalition to confront what they called racism, discrimination and exploitation.

"I'm No. 1 in ratings, No. 9 in revenue." He said at companies should not be able to have it both ways: to have 20 percent of their revenues from Hispanics and not be reaching out by supporting Hispanic radio.

He credited the Rev. Al Sharpton for getting deeply involved and for accompanying him when confronting advertisers and agencies about this disparity. Davis has had face-to-face meetings with agency heads, charging discrimination in their buys. He claimed a success rate of five for five in changing their behavior.

Moderator John Douglas of Douglas Broadcasting summed up the panel's observations: "The best way is to hit it head on. If you don't do anything, it will be business as usual."

During the question-and-answer period, at least one attendee questioned whether Katz had addressed the problem sincerely. For instance, Katz had not released the employee believed responsible for the memo.

Olds again expressed embarrassment that the memo was produced at his company, but said Katz has taken the path toward a long-term solution with diversity training and a policy of recruiting for diversity.

A general sales manager from Portland, Ore., asked what could be done to improve ratings information about Spanish listening. Several panelists told him to be encouraged that the new census may put him over the 10 percent threshold cited by Arbitron. Interep's Kizart said his company has produced a Hispanic radio companion to its urban radio research piece. © 1998 NAB

STAR Campaign A Success

▶ PSA, continued from page 48

do not mix."

Schiavone said the organization could not have achieved such a widespread change had it not been for the support of the broadcast industry. "Your dedication to this cause, your incredible commitment to helping us educate consumers has been nothing short of spectacular."

The NAB will receive the "Media Awareness Award" for the STAR Campaign (Stations Target Alcohol Abuse Reduction). The campaign educates the public about alcohol abuse topics, including drinking and driving, underage drinking and responsible hosting.

The CD was promoted by Gaylord, McElveen, Schiavone and Erin Meluso, president of Recording Artists, Actors and Athletes Against Drunk Driving.

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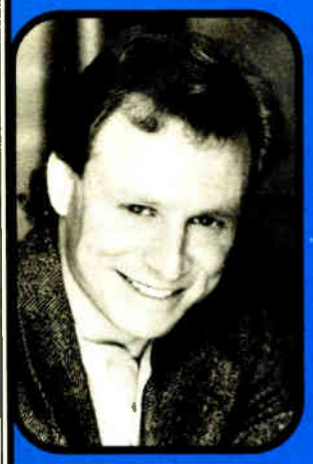

DBA is proud to introduce **BOB HARRIS**, an award winning humorist and commentator for **KNX Radio - Los Angeles**, whose loopy humor and keen journalistic eye earned him a **1998 Associated Press award** for ***Best Radio Feature*** and the L.A. Press Club award for ***Best Specialty Feature Reporting***.

Bob's credentials for capturing the attention of young adults is impressive:

- Nominated five times as Lecturer of the Year by Campus Activity Today... Bob has appeared on stage at over 250 college campuses.
- Widely published newspaper and magazine columnist including Mother Jones On Line, The Funny Times, Z and National Lampoon.

Want more? - Bob is a five-time *Jeopardy* champion, author of "Cramming 101" and has received accolades like these: "wickedly observant" - (Chicago Tribune), "One of the most talented political comics performing today" - (Cleveland Plain Dealer)

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World Radio History

So Far Yet So Very Close Away

Alan Haber

When I was a kid, everything seemed to be as far away as the end of a rainbow. My bicycle — a no-speed jobbie capable of one mile an hour as long as the wind pushed me from behind — was my only mode of transportation. Riding it to a record store off the local highway or into town for the latest run of comic books seemed to take every ounce of energy I had.

Although I look back on those days with great affection — for 50 cents I could get into the movies and feast on a seemingly endless supply of candy, after all — I'm just as glad they're gone.

And I suspect you are, too. I remember sending away for stuff as a kid and it always seemed to take forever for that stuff to arrive. Today, you order a CD or a book or a gross of steaks and you can have them delivered to your door overnight, as long as you're willing to pay the price.

Yes, everything has its price, even on the Internet. But the cost of doing business, whether that business is having a life outside of work or working so you *can* have a life, is nothing compared to what you get in return.

Really, the world has become much smaller since the Internet came into our lives. When I was growing up, I had a snail mail pen pal in New Zealand. I remember that my buddy's father worked at a milk factory. We exchanged letters every couple of months for about a year until the novelty of having a friend across the world wore thin and the drive to send our hopes, cares and dreams to each other withered away.

Even if your station only has a Web site, it is reaching the world.

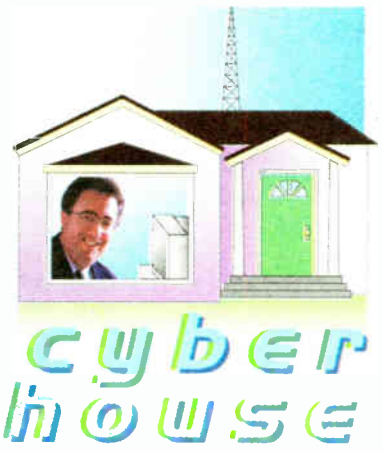
Distance can take its toll. I've got several friends on the east and west coasts whom I haven't seen in years. I wish we were closer. As it is, we only talk every couple of months and I wish it were much more often, but packed tight along the miles that separate us are family and work obligations that are admittedly more important — a whole other life that has evolved and prospered as time has marched on.

E-mail, I hope, will ultimately bring us closer. I know that it has given life to new friendships that would be similarly challenged if the phone or traditional letters were the only ways to communicate. Many of these friendships started on the Net; I have met nearly every one of these people and am proud to count them as close friends.

Rocket science

I know that my life has been completely changed for the better by the Internet. I don't know how I got along without the ability to send e-mails to people with the promise of a nearly immediate answer at hand. Of course, people can choose to ignore an e-mail, but that never happens to me, more than likely due to my gushy, gooey charm.

Radio has been changed by the Net, too. You may not see it if you're stuck in meetings all year long, huddled over rickety conference tables, wondering what your station's big cyber-splash is going to be about. It doesn't take a rocket scientist to



see the possibilities. And make no mistake, there are many possibilities.

Most importantly, perhaps, is what the Net will do to help redefine your audience. It simply will not be enough to have a Web presence and stream your signal to a handful of listeners. And it certainly will not be enough to stream to listeners who have moved away from your local listening area and want to keep in touch with what's happening at home.

No, having an Internet presence will take on a new meaning for your station. The migration has already started, in fact, even if you don't know it yet. Think about it — the world is indeed your oyster. Outside of various legal issues, there isn't much you can't do on the Net.

But it is important that you know who your audience is out there. Those of you who believe with all your heart and soul that you have no audience outside your local coverage area — that a handful, or even a couple of handfuls of listeners around the world won't have a whit of an effect on your business plan — had better think about reserving a plot of land for your dream fast-food emporium.

If you're Webcasting, you're Webcasting to the world, and you'd better come up with a methodology for reaching it that doesn't count out listeners in foreign climes even as your local audience is satisfied. Even if your station only has a Web site, it is reaching the world. Stock your site full of information only locals will appreciate and be able to use, and you'll crowd out everyone else who may stumble upon it. But approach your site with global wisdom, and the opportunities are endless.

Wipe the slate clean, folks, and get ready to rumble. Hugging the world and making it work for your station is our topic for the next couple of months. Until next time, think about what this means, and whatever you do, don't blink or the world might pass you by.

CNN Radio's John Holliman Dead at 49

Randy Stine

CNN Radio National Correspondent John Holliman died from injuries sustained in a car accident near his home in suburban Atlanta on Sept. 12. He was 49.

According to Gwinnett County, Ga. Police, Holliman was attempting to pass another car in a no-passing zone when he hit a pick-up truck head-on. Holliman was killed instantly.

Authorities said there was no indication of alcohol use or excessive speed. An original hire for the Cable News Network in 1980, Holliman began work for CNN Radio at the time of the network's inception in 1983.

"Words cannot explain how much we're going to miss John," said Robert Garcia, general manager of the CNN Radio Network. "He was a wonderful friend, generous person, and very talented at his craft. He had a curiosity about him that served him well in his job."

Holliman's reporting duties for CNN Radio included coverage of space exploration. He had reported extensively on Pathfinder's mission to Mars last year. Among Holliman's upcoming assignments was to cover Senator John Glenn's return to space on the space

John Holliman

shuttle Discovery Oct. 29.

Co-workers said Holliman was excited about the chance to co-anchor coverage of the launch with his boyhood idol Walter Cronkite on CNN. Their coverage was to have been simulcast on CNN Radio.

Noble news career

Maybe best known as one of the "boys of Baghdad" for his coverage

See HOLLIMAN, page 56 ▶

Circle (203) On Reader Service Card

World Radio History

Selling Shoes, Selling Radio

Alan R. Peterson

What can radio salespeople learn from the successes of a large retail outlet like Nordstrom?

"You are not in the radio business, you are in the customer service business," author Robert Spector replies.

Spector delivered his talk, "America's Customer Service Capital," at The NAB Radio Show to a room filled with radio managers and sales executives. He urged radio to adopt the customer-service philosophy of the Nordstrom retail store chain.

Spector, co-author of the book "The Nordstrom Way: The Inside Story of America's #1 Customer Service Company," began his talk with samples of exemplary customer service companies and their philosophies. One such company was the Internet book dealer *amazon.com*

"That organization adopted old-fashioned values in a cutting-edge business," he said. "They believe if you make somebody unhappy, they don't just tell six friends, they tell 6,000 people."

Spector warned the crowd that the talk would lean heavily on shoe metaphors — "A shoe mentality," as he put it — and that he would tie it all in to radio by the end of the session.

Spector spoke of the key rules that made the company a leader in customer service. Among them, the idea of hiring a smile before the skill.

"Hire motivated people," he said. "Better to hire a nice person and teach them how to sell than to hire someone who could sell and teach them how to be nice."

Spector also spoke of the need to hire people with an entrepreneurial slant. "Empower employees to take ownership. At Nordstrom, people on the sales floor have the power and freedom to make decisions that management will back up." Spector took some moments to relate in-house Nordstrom anecdotes, including tales of sending $2,000 worth of replacement shirts to a customer in Sweden and giving an Alaskan customer a refund on tires bought at a store that had later been acquired by Nordstrom (the store does not sell tires).

A point made by Spector was selling a relationship before selling the product. Using another shoe metaphor, he said, "Measure both feet. Know your customer and his business. That is what people are looking for."

As for how all of this related to radio, Spector concluded with, "What does it take to connect with someone? To get them to buy on your station? It's another way of saying the Golden Rule. Customers want service, always be nice."

After the session, Spector was asked about one difficult client who demanded a spot air with improper language, threatening to take his business to another station. "In a situation like that," Spector replied, "it's best to tell the client he is abusing the relationship and not to feel bad about letting it go." Quoting from the one-page Nordstrom employee handbook, "Use your good judgment in all situations." © 1998 NAB

Holliman: Longtime Radio Newsman Remembered

▶ HOLLIMAN, continued from page 55

with Bernard Shaw and Peter Arnett of the bombing in the Iraqi capital during the Persian Gulf War, Holliman began his career in radio after earning a bachelors degree in journalism from the University of Georgia.

Early career stops included newscaster and reporter for WSB-AM-FM in Atlanta, WASH-FM in Washington, and Metromedia Radio News.

From 1974 until 1980, Holliman was agriculture editor at The Associated Press Radio Network. He also wrote a daily agricultural column for AP's broadcast wire.

Holliman received a Peabody Award in 1976 for his documentary, "The Garden Plot — Food as a Weapon in International Diplomacy."

"John Holliman was one of a kind," said Tom Johnson, chairman of CNN News Group. "He was simply one of the most-loved members of the CNN family."

In remarks delivered in his eulogy of Holliman, Johnson said it was hard to come to grips with the fact that, "John had survived Baghdad with bombs falling all around him, only to be killed on an errand to the grocery store to buy syrup for a breakfast of pancakes with his wife and son."

Garcia said more than 800 messages of condolence for Holliman's family had been recorded on CNN's Web site.

Holliman is survived by his wife, Dianne, and his five year old son, Jay.

■■■

Randy Stine is production director at WXIK(FM) in Lansing, Mich. Reach him via e-mail at cstine@voyager.net

New Industry Money And Value for Radio

▶ FRIES, continued from page 47

listening to support his arguments. If these listeners can hear their favorite stations at their desks, they will listen more often and be exposed to more commercial spots.

Gary Fries

"If a pizza shop can sell 50 pizzas (through streamed audio), how can they not afford not to advertise?" Fries said.

Streamed audio also gives listeners the chance to hear many stations, thus boosting competition. While the Arbitron study confirms that people want to listen to their favorite station, Fries said, the challenge for stations is how to hold onto these listeners.

According to Fries, managers must get more aggressive with spending. "This is not the time to cut back on spending," Fries said. The Internet "will be a huge revenue stream for this industry. This is new industry money for us and a new value for radio."

Fries urged the radio industry not to listen to those who consider radio a dying medium.

"As we go forward, let's not get caught in the negatives," Fries said. "This is not television. Don't listen to analysts who don't understand our business."

Fries said many sales people rely on ratings, rather than atmosphere, as their main selling point.

Sales people need to make advertisers understand the relationship between radio and its listeners and not negotiate with the calculator, he said.

"Start selling the feeling instead of selling the body count."

Sales people also must find the real decision makers at various stations. "Stop whining about the media buyers — concentrate on the decision makers," Fries said. "Go straight to the top." He urged attendees to "stop whining about commodity spending and do something about it."

While Fries believes that 1999 could bring a nine to 10 percent increase in revenue, there are other issues to watch out for, specifically the Y2K question.

"One year from now, the recommendation is to stop buying (radio spots) in the fourth quarter for stations who can not guarantee compliance," Fries said. "This is not something that will go away." Fries said radio managers must understand the situation and act now to reach compliance.

Still, Fries predicted yet another strong year in 1999 for radio sales.

"Radio has the opportunity to have a fabulous year in 1999," said Fries. "We as an industry have to be cohesive and not withdraw. It means each one of you carrying your mission forward and going for it. There is a tremendous appetite for radio information. The time (to go for it) is right now."

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World Radio History

Ultra-Clean Earthworks Preamp

Tom Vernon

Let's be honest: Engineers love to fantasize. Besides fantasizing about the usual stuff, visions of ideal studio equipment often romp through their heads.

Such a fantasy is this: How would you design a piece of equipment if time and money were not issues?

For instance, the fantasy mic preamp might have balanced transformerless inputs, no coupling caps to degrade sound, unlimited frequency response, and no noise or distortion. Phantom power would be nice, too.

While the folks at Earthworks in Milford, N.H., are not in the fantasy business per se, they may have come close to designing the ultimate mic preamp. The specifications and performance of their new LAB 102 microphone preamplifier are exceptional.

From the bench to you

This product started out as a piece of in-house test gear for evaluating Earthworks microphones. It sounded so good, they decided to bring it to market.

This is exactly the type of gear that we lust after at the World Cafe, a nationally syndicated program that features live performances and interviews from singer-songwriters.

The LAB series of mic preamps includes the LAB 1, LAB 101, and LAB 102. All are basically the same preamp in different packages.

The LAB 1 is a monaural half-rack box intended for measurement applications. The LAB 101 is a monaural half-rack unit, and the LAB 102 contains two channels in a single rack unit. This is the device intended for pro audio applications.

In keeping with the Earthworks philosophy, the frequency response of this and other equipment extends way beyond the usual 20 Hz to 20,000 Hz spectrum. That is because while you may not be able to hear outside this range, the other sensations that can be perceived and felt contribute to the realism of the listening experience.

The Earthworks LAB 102 mic preamp: Ever experience 400 kHz response?

The published response of the LAB 102 is 2 Hz to 100 kHz, ±0.1 dB, 1 Hz to 200 kHz, ±0.5 dB. EIN is rated at -125 dBV @ 20 dB gain, -133 dBV at 40 dB gain, -136 dBV @ 60 dB gain. This is at 20 Hz to 20 kHz, unweighted, with a 50-ohm load.

In layman's terms, the internal noise is pretty darn low to begin with, and gets even better with increased gain. THD is 0.02 percent max with 8 V RMS out over a gain range of 6 to 54 dB, 10 Hz to 20 kHz.

Of course, a good fantasy never comes cheap. The list price of the Earthworks LAB 102 is $1,500.

The LAB 102 is contained in a solid 1 RU black box. Power (18 VAC) is provided via an external transformer through a three-pin Molex connector.

Each channel contains a polarity reverse switch, 48 V phantom power switch with LED indicator, a standby switch to mute the output when mics are being moved or unplugged, an LED overload indicator, a precision attenuator to adjust gain in 6 dB steps, and a variable gain control facilitating 20 dB gain reduction from a switched setting.

The rear apron contains Neutrik XLR connectors for inputs and a total of three separately driven outputs per channel. The stepped gain control adjusts the output of the XLR output, while the other XLR and quarter-inch TRS jack are driven by the variable output control. Each of the three outputs can deliver up to 8 V RMS into a 600-ohm load.

Earthworks is not in the fantasy business, but came close to designing the ultimate mic preamp.

Near transparent

No expense has been spared in providing a near-transparent signal path for the electrons flowing through this preamp. All connectors and switch contacts are gold plated. Capacitor types have been chosen with care. Large caps are polypropylene, while smaller capacitors are mica or GOC ceramic. The few electrolytic caps in the LAB 102 are for DC restoration only.

While other companies have recently designed fantasy equipment with vacuum tubes, Earthworks has stuck with solid-state devices.

The input stage is an Analog Devices SSM2017, an eight-pin, self-contained audio preamplifier IC. Each of the three outputs also has its own

See EARTH, page 63 ▶

SHORT TAKE

Library has 100 Cuts, 100 Bucks

Alan R. Peterson

Smaller market stations often have the problem of selecting a production music library that is affordable and versatile. Not all can swing the license fees or buy-out costs of a large collection and have been known to build smaller libraries made up of inexpensive discs from several independent production music companies.

More than one production director has said, 'I'd pay $100 for 100 beds.'

From Valley Sound of Mount Pleasant Mills, Pa., comes such a disc: "100 Beds, Volume I." This CD contains 89 music tracks and 10 drum/percussion cuts in the clear, for a total of 99 tracks. Valley Sound calls it "100 Beds for 100 Bucks."

Before you scold the company for bad math, one track on the disc contains two cuts. That is how Valley Sound got around the 99-cut limitation of the CD format.

Rather than include a cut list

See BEDS, page 63 ▶

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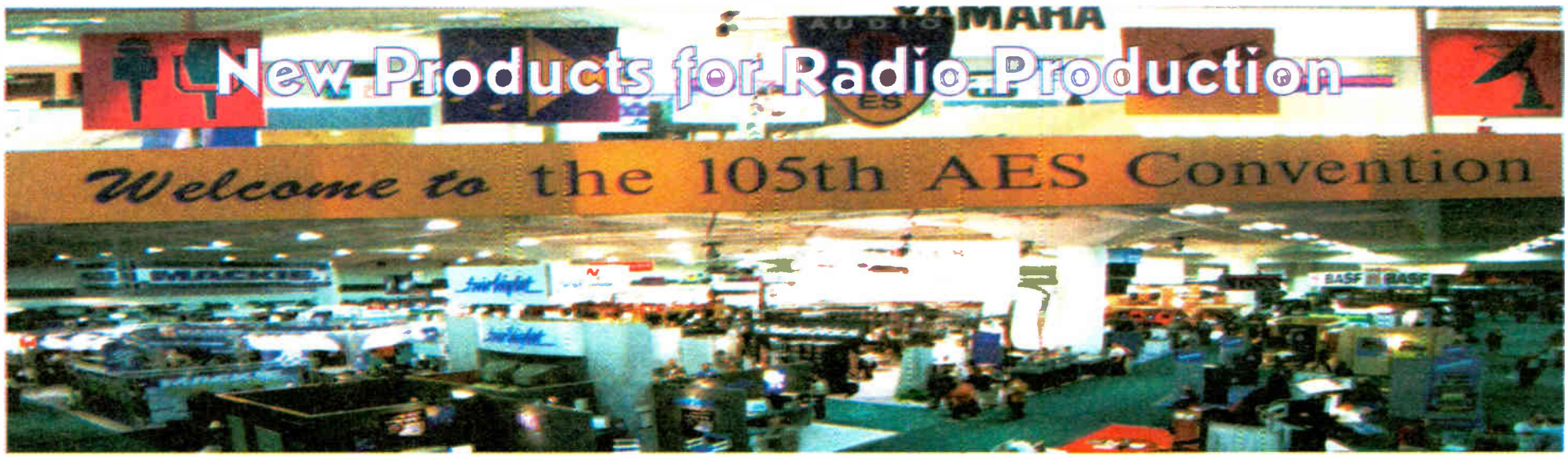

Audio Engineering Society Roundup: Plenty for All

Alan R. Peterson

Chalk up another successful gathering for the Audio Engineering Society. The 105th convention, held in late September at the Moscone Convention Center in San Francisco, brought in 17,700 participants over the four-day period.

The majority of products on the exhibit floor reflected the current state of the technology, with emphasis toward multichannel surround-sound audio, DVD and the new 24-bit/96 kHz sample standard.

At present, there are few, if any, applications for these technologies in terms of radio production or broadcast (see "Playing the 24/96 Numbers Game," **RW**, Oct. 14, page 60), although many recorders and audio processors shown now utilize the greater bit depth for internal signal processing.

The AES Convention was definitely the place to see the latest in workstations, mics, speakers and digital mixers. It was also the place to find a few surprises, including a new microphone that runs on light, the world's first 24-bit DAT recorder, a digital reverb that looks like a cigar humidor and a highly precise multimode signal generator that fits in the hand and costs less than $150, as shown in Figure 1.

Fig 1: The Neutrik Minirator MR1 is a complete audio generator in a handheld package.

Despite the proliferation of audio technology designed for music, video and film, a few companies presented radio-specific products in San Francisco. CBSI exhibited its NT-based Digital Universe for radio station audio storage and retrieval, while Logitek took the occasion to exhibit the Roc-10 digital broadcast console. Calrec Audio of England brought along its X Series line of digital on-air radio consoles, as did Studer with its On-Air 2000 digital broadcast board (Figure 2).

Fig 2: Studer On-Air 2000 Digital Radio Broadcast Console

Testing ... is this on?

Stepping up to the microphone stand were numerous offerings from the major mic manufacturers, including an intriguing new technology from Sennheiser.

The new microphone operates by bouncing light from an LED off a reflective mic diaphragm into a photodiode. As the diaphragm reacts to sound striking it, it modulates the light from the LED, which the photodiode converts to an electrical signal. Connections to the mic capsule are done with optical fibers rather than wires. See Figure 3.

Attendees at the AES convention commented that the sound of the experimental optical mic is comparable to a small-capsule electret-style condenser microphone.

Another new microphone that drew attention was the KSM32 from Shure Brothers. This side-address cardioid microphone has a resemblance suggesting a blend between Sennheiser 421 and Neumann styles (see Figure 4). The Shure company is promoting the mic for vocals, ensembles and low-frequency sound sources such as drums and bass instruments.

Condenser mics were evident everywhere in the exhibit hall. CAD Professional Microphones displayed its new VSM-1, with a 1.10-inch capsule, constructed in the company's own clean-room facility. CAD also handles Equitek and ASTATIC microphones.

Representatives from Neumann USA held a memorable dinner cruise around San Francisco Bay during the convention, but also used the show to debut the M 147 tube condenser microphone. This mic is built around the company's K47 capsule, already in use in the U 47 and U 47 FET model mics. The mic exhibits low self-noise and a balanced frequency response, in addition to being able to handle SPLs of up to 130 dB.

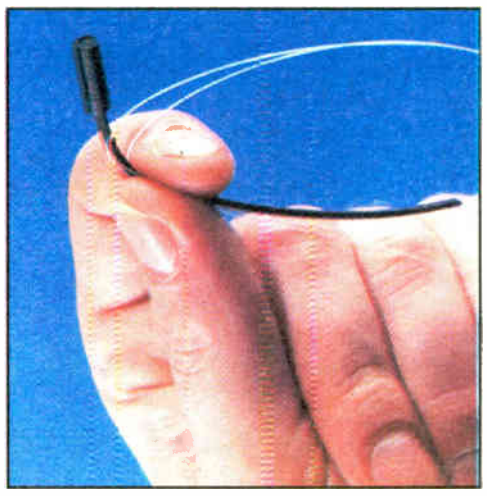

Fig 3: Shown is an experimental optical microphone from Sennheiser. Note the fiber optics in place of wires.

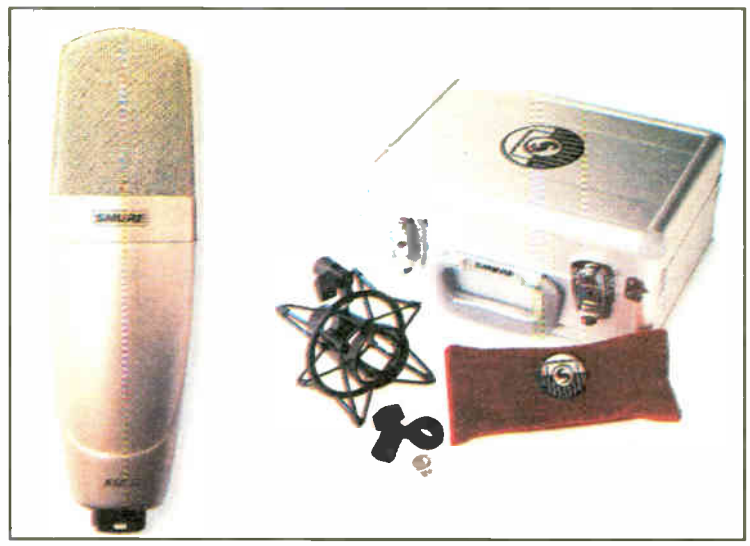

Fig 4: The New Shure KSM32 Studio Condenser Microphone

Making its AES debut was the Audio-Technica AT4060 cardioid tube microphone, a studio-quality condenser mic with a large-diaphragm capsule and vacuum-tube circuitry. Flat response from 20 Hz to 20 kHz and high SPL handling of up to 149 dB is assured in the AT4060. The mic retails for $1,695.

Visitors at the AKG booth noted the new finish on the C3000 mic. The scratch-resistant silver finish now found on the two-pattern, large-diaphragm condenser mic have resulted in the mic now being dubbed the AKG C3000 Sterling. AKG also rolled out two new headphone models: the K55 closed-back and the K66 open-back headsets. Both headsets owe their styling to the design firm of Peschke + Skone and both are finished in a soft anthracite color scheme.

New from Audix Corporation were the CX-101 and CX-111 large capsule studio mics, both available for less than $600; and the TR40 Test and Recording microphone, a $249 flat-response electret mic with response to 20 kHz.

Groove Tube microphones turned up in a new booth with a new look. Alesis debuted its

See AES, page 59 ▶

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World Radio History

▶ AES, continued from page 58

new GT Electronics division by rolling out a series of tube and FET large-diaphragm microphones, priced from $549 to $1,299.

Independent Audio of Maine went out of its way to find the most unique-looking microphones available in the audio industry today. The Pearl microphone from Sweden is offered in stereo and mono configurations, in condenser and dynamic models. Several condenser models are built around a rectangular capsule and spec out at 18 Hz to 25 kHz.

Also from Independent Audio is the Coles line of dynamic ribbon microphones for studio and live reporting use. The model 4115 Broadcaster's Ribbon Microphone includes a "lip-rest" atop the element, allowing close miking of the reporter's voice.

Fresh from the design board was the Rane TTM 54 Performance Mixer, designed in conjunction with several club DJs and "turntableists." The mixer appears minimalist, but included features asked for by turntable performers — including deep-cut EQ, gain trimmers and a pair of "hamster" switches that reverse the response of the linear faders.

The Behringer Eurodesk MX9000 eight-bus recording console came to San Francisco sporting a new look and 24 dual-input channels, an integrated meter bridge and four-band EQ on the main channels. There are eight balanced sub-groups and six Aux sends per channel.

Tascam was among the companies rolling out new and affordable digital mixing consoles for project studios and production. The $4,299 TM-D4000 console, seen in Figure 5, has 32 mono and two stereo inputs, feeding eight busses, with four-band EQ and full dynamic control on each channel.

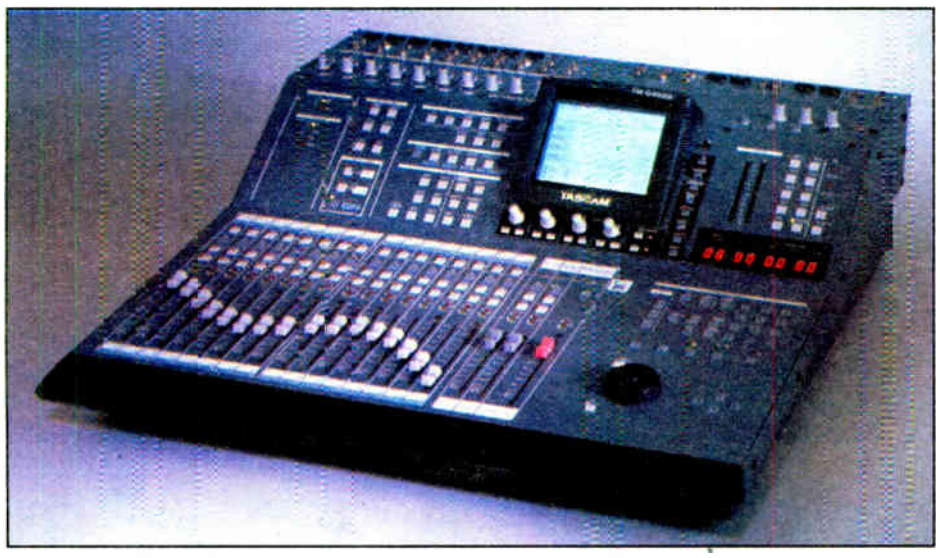

Fig 5: Tascam TM-D4000 Digital Console

Fig 6: The crowds gather around the Digital 8-Bus mixer at the Mackie exhibit.

Panasonic/Ramsa displayed the WR-DA7 digital mixing console with 16 analog mic/line inputs and access to another 16 optional channels. An LCD screen shows channel assigns, dynamics and EQ control. There are 50 EQ and 50 dynamics memories available for storage and recall of favorite settings.

The mixer that does not *look* like a mixer came from the newly-partnered Emu-Ensoniq company. The Mantis modular digital mixing system is a 112-input engine with configurable inputs, 24-bit A/D-D/A with 32-bit internal processing. Control over the engine is done via software or by a dedicated control surface. Emu-Ensoniq also introduced new versions of the PARIS workstation and Darwin hard disk recorder.

The Solid State Logic Axiom-MT multitrack production console took up a large footprint and garnered its share of attention. The Axiom-MT has up to 96 channels with faders and surround panpots dynamically automated. The board has 48 multitrack busses, 12 main mix busses, 12 Aux busses and more than 200 mix returns — plenty of mixing power for your basic radio promos!

Mackie Designs (Figure 6) came to San Francisco with its Digital 8-Bus mixer, the HUI controller for Pro Tools and new HR824 powered monitor speakers. In amusing contrast to numerous other booths in the exhibit hall, the Mackie display was one of the few not actually using a Mackie compact mixer as part of its demonstrations.

The Digital Three-Two-Eight mixer from Spirit by Soundcraft (Figure 7) features double-duty faders that control 32 inputs. Built-in Lexicon effects offer sonic flexibility by eliminating external DSP boxes.

Fig 7: Spirit by Soundcraft brought out the Three-Two-Eight digital mixer with built-in Lexicon effects.

Mini-mixers were evident at the Audio Technologies Inc. (ATI) booth, with the Micro Amp and Nano Amp Series of mixers for field use. ATI also has a new line of AES/EBU distribution amplifiers.

Workstations and digital audio

Audio soundcard manufacturer Digigram unveiled XTrack version 3.10, which combines a new user interface with the capability to be used with a JLCooper CS-10/2 controller interface. XTrack now also features ActiveMovie plug-in compatibility with effects software from Steinberg, Waves, TCWorks and others.

Additionally, Digigram released a Sound Manager driver to allow its PCXPocket card to run on Apple PowerBook laptop computers.

Tascam kept its sights on tape-based technology with the launch of the industry's first 24-bit DAT recorder, the DA45-HR, seen in Figure 8. This

See AES, page 60 ▶

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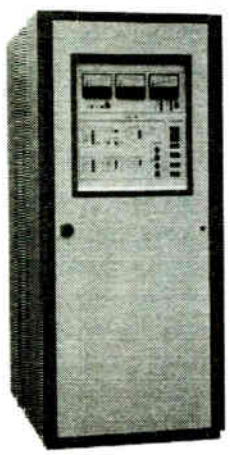

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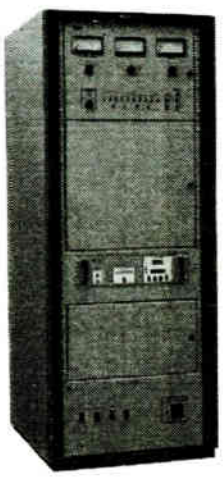

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World Radio History

Digital Audio Big at AES Show

▶ AES, continued from page 59

recorder is backward-compatible with current 16-bit tapes and will record one hour of high-resolution audio onto a standard 120 DAT tape.

Tape manufacturer BASF still put a lot of faith in tape. The brand, now handled by EMTEC Pro Media, introduced pre-

Fig 8: Here is the first 24-bit DAT recorder, the DA-45HR, courtesy of Tascam.

formatted ADAT tapes in varying lengths. The idea is to save the studio operator time by not having to format an ADAT tape before use.

Quantegy likewise remained faithful to oxide-based recording technology. The successor to 3M and Ampex recording tape used the show to launch its GP9 analog mastering tape, a medium with an improved noise floor and the durability to stand up to several thousand passes. GP9 is offered on a highly visible red metal reel. Quantegy also devoted space to its own new ADAT product and recordable MD media.

Fostex unveiled the big brother to the FD-4 digital multitrack recorder recently profiled in **RW**. The FD-8 now places a full eight tracks of 44.1 kHz audio onto the computer-style SCSI media of the users choice, including Syquest Syjets or Iomega Zip drives.

The DPS12 Digital Personal Studio from Akai Musical Instruments was recently reviewed here in **RW**. At the AES show, Akai introduced the version 1.1 operating system for the DPS12, which now includes an additional stereo bus, new shortcut location options and disk optimization utilities to minimize disk error messages in the display.

For the radio reporter, the new PCMCIA-based field recorder from Marantz was shown, although a delivery date is still to be determined. The ARES-C from Nagra, also based around PCMCIA card technology, was evident at the AES convention, as was the Sonifex Courier, with its built-in communications protocol and scrub-edit wheel. Nagra also displayed the Nagra-D, a 24-bit, four-channel digital recorder.

Fig 9: Shown is the Yamaha D24, with eight digital tracks on an MO disk.

MetaLithic Systems used the AES convention to introduce the Elite Studio, a multiple-channel audio interface based around a PCI computer card and a 10-in/10-out breakout box. The Elite Studio is compatible with nearly all popular DAW software programs, including SAW, Sound Forge, Samplitude, Cakewalk and others. Similar multichannel cards — the Layla, Gina and Darla — were shown by Event Electronics

SADiE jumped on the 24/96 bandwagon in a big way with the release of the SADiE Portable, a Pentium-based workstation capable of the new sample standard and Dolby 5.1 surround sound. The big version — the SADiE 24•96 — was also on display. The 24•96 DAW is capable of 192 kHz editing and mixing and can be configured with up to 32 inputs and outputs.

New software from Cakewalk lets PC users take advantage of 24-bit, 96 kHz audio as well. Cakewalk Pro Audio 8 mixes MIDI and high-resolution audio while synching to AVI, QuickTime or MPEG video, providing a complete recording studio in a single PC.

Also on the 24/96 trail is the German company SEK'D with its latest version of Samplitude 2496. This software package offers high-resolution recording, unlimited tracks (hardware dependent), DirectX compatibility and CD authoring.

Lucid Technologies provided the way to get from analog to digital and back again, with the debut of the ADA8824 converter, the AD9624 24-bit A-to-D converter and its companion DA9624 D-to-A converter, both cruising at the new 24/96 standard.

Yamaha exhibited the long-awaited DSP factory audio interface for PC, combining a mixing matrix and 02R-quality

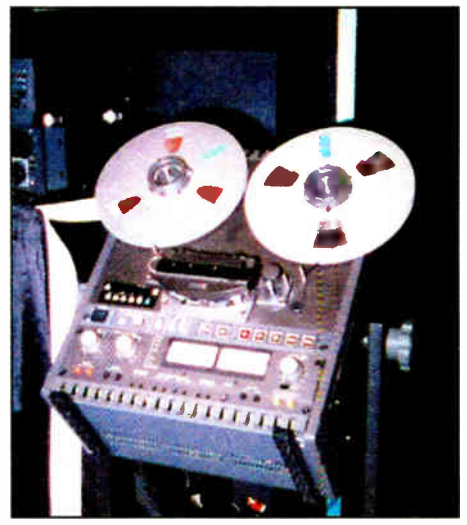

Fig 10: The radio favorite Otari 5050 is still popular and still being made.

effect processing on a single card and compatible with many popular DAW programs. Also new from Yamaha was the D24 multitrack recorder (Figure 9), a $3,000 magneto-optical disk recorder with full non-linear function and the capability of recording at up to 96 kHz sample rate. Up to eight units can be synchronized to create large recording systems. Delivery is anticipated in early 1999.

Alesis displayed an extensive line of products based around its ADAT system, in addition to processors and synthesizer keyboards. The M20, a 20-bit ADAT recorder, was the showpiece of the display.

Sony took the wraps off its MDS-DRE1 MiniDisc recorder/player, which includes features normally found on club CD players and turntables. The MD player includes the latest version of the Sony ATRAC compression technology and a

See AES, page 61 ▶

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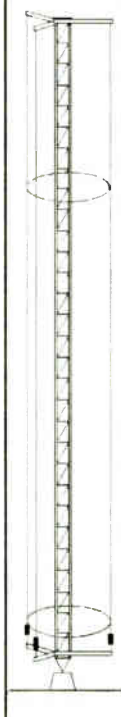

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READER SERVICE NO. 69

World Radio History

▶ AES, continued from page 60

Backtracking function that lets DJs record and synchronize tracks on the fly. Turntable-style scrubbing and a set of hot-start buttons round out the features on this $1,200 portable tabletop player.

tive walnut-burl woodgrain chassis and integral CD-ROM drive further set the S777 apart from other reverbs, and give the device an almost furniture-like appearance. One visitor commented on its resemblance to his cigar humidor.

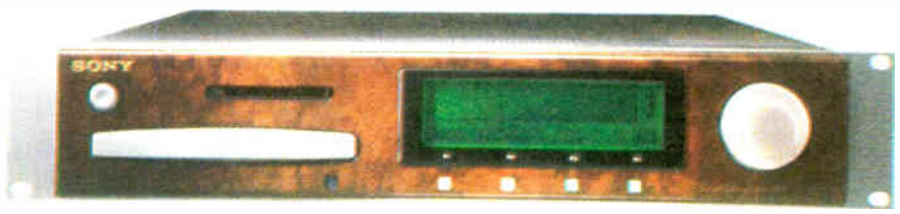

Fig 11: Sony DRE-S777 Digital Sampling Reverb

Denon Electronics spun some discs of its own with the DN-M1050R Pro MiniDisc Recorder and its latest-generation DN-2000F MK3 dual-CD deck.

CD authoring was big at the AES show this year. Companies such as CopyPro, Microboards and MediaFORM all exhibited automated CD/DVD authoring and duplicating devices. Otari, Marantz, HHB, Fostex and JVC featured standalone CD recorders, while Sonic Solutions, WaveLab, SEK'D and Sonic Foundry highlighted software solutions for in-PC CD burning.

Also in the upper strata of processors, the Eventide DSP 4500 Limiter Edition Harmonizer was shown, combining features from three prior models as well as an 87-second sampler.

Aphex Systems unveiled a new digitally controlled, eight-channel microphone preamplifier, the model 1788, in addition to its full line of compressors, EQs and on-air processing. See Figure 12.

Behringer made improvements and upgrades to the Autocom Pro compressor with dynamic enhancer and the Composer Pro MDX2200 interactive compressor-limiter-gate-stereo expander.

Lexicon has developed a Pro Tools plug-in, the LexiVerb. The company also rolled out the MPX 100 dual-channel processor, with 24-bit performance and 240 presets. Lexicon also announced a WAV driver to bring the functionality of the PC-90 reverb to most any WAV-based audio software, including Cool Edit and Sound Forge.

Speaking of Sound Forge, parent company Sonic Foundry released ACID pH1 at the AES show. This software may be considered "ACID Lite," placing some of the best features of ACID in a $99 package, minus the real-time DirectX effect plug-ins. Sonic Foundry also exhibited Sound Forge 4.5, with the ability to author audio for Netshow 3.0 and RealMedia 5.0.

Event Electronics invited convention-goers to "create their own reality" with the DSP-FX Virtual Pack, combining 10 desirable plug-in effects, including reverb, pitch shifting and an analog flanging simulator.

Loud is good

Speaker and amplifier technology was also well represented at the AES show.

JBL Professional rolled out the MPC

See AES, page 62 ▶

There are few applications for the 24-bit/96 kHz standard in terms of radio production.

In the swirling midst of the digital revolution, the venerable Otari 5050 analog reel recorder (Figure 10) still had a presence at the AES convention. Otari has discontinued nearly all of its reel machine manufacture, but reports a high demand still for the production-room veteran.

Processing getting better

The list of Digidesign Pro Tools development partners gets longer every year. The companies offering plug-in modules for the popular workstation platform include Focusrite, Waves, Aphex, DUY, Gallery and Steinberg.

If you have $2,499 for an audio processor and want something more than a simple budget reverb box, the M3000 from TC Electronic may be right for you. The dual-engine stereo processor runs at 24-bit resolution and includes an entire complement of reverberation, chorusing and flanging, with the means to save programs and presets to PCMCIA memory cards.

TC Electronic is also a Pro Tools development partner, with a number of products released for that platform, including the MegaVerb reverberation plug-in, MasterX digital mastering software and the TC Reverb.

If you have $5,000 to part with, the new Sony DRE-S777 processor may be more to your liking (Figure 11). This is a 24-bit sampling reverb that reads an actual acoustic space and recreates it digitally. This has been done in the past as software by several plug-in companies, but the S777 is the first device that can calculate and apply the response in real time and in high-definition audio. The attrac-

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These companies have announced support for DSP Factory in their Windows® products. Macintosh software coming soon.
Visit our Web site @ www.yamaha.co.jp/product/proaudio or call us at 800-937-7171 ext. 683 • ©1998 Yamaha Corporation • Yamaha, DSP and DS2416 are registered trademarks of Yamaha Corporation. *Not all software supports all of DS2416's features.

Circle (126) On Reader Service Card

World Radio History

Monitors and More in Frisco

▶ AES, continued from page 61

Series of amplifiers in power levels of 175 to 600 W per channel, to be teamed with its line of studio monitors and sound reinforcement speakers.

Hafler showed off its new TRM6 two-way bi-amplified active monitors (Figure 13). These are based on Hafler Transnova amplifier technology and incorporate a one-inch tweeter driver with a 6-1/2-inch low-frequency driver. Response has been measured at 55 Hz to 21 kHz.

Fig 12: The Aphex 1788 eight-channel mic preamp and limiter can be controlled digitally.

Powered nearfield monitors were heard and seen at the Yamaha exhibit. The MSP5 is a bi-amplified monitor featuring a 5-inch low-frequency driver and a one-inch tweeter. The MSP5 can take on +4 or -10 signals and is shipping now for about $300 each.

Powered speakers were also heard over at the Alesis booth, as the company introduced the M1 Active nearfield monitors. These speakers are also bi-amplified, with 75 W driving the woofer and 25 W providing the highs through the 1-inch tweeter.

English manufacturer PMC displayed a number of monitors, including the TB1S with its 25 kHz response; the larger IB1S with its three drivers and tri-amped wiring configuration; and the narrow LB1 designed for smaller control rooms and production spaces. The PMC monitors were seen with Bryston amplifiers, in power ranges up to 500 W per channel.

KRK, makers of trapezoidal monitor speakers, introduced the V-8 powered monitor system and demonstrated popular favorites K-ROK, RoKit and M6000 speakers.

Tannoy rolled out some colorful speakers, including the red Reveal monitors, while Audix highlighted its line of Reference Series Studio Monitors.

Dynaudio Acoustics exhibited both active and passive monitors. The powered BM6A boasts response to 21 kHz and dual 100 W amplifiers driving the speaker elements. A built-in slow-attack optical limiter keeps high frequencies in check. The unpowered BM15 can be driven by a 400 W amplifier and has a response of 43 Hz to 20 kHz.

Genelec OY moved some air with its 1034B dual 12-inch control room monitor system, along with a full line of bi-amped and tri-amped active monitors.

Testing and measuring

Representing the "oh wow" element of the show was Neutrik. Directly across from the booth displaying connectors and cables was a special table showing off the Minirator MR1, as shown earlier in Figure 1.

This is a handheld analog audio generator under digital control that provides a comprehensive set of audio test signals, including sine and square waves, white and pink noise, dedicated polarity test and 20 Hz to 20 kHz sweep at variable speeds and audio levels. Estimated cost of the Minirator MR1 is $150.

Dorrough Electronics booked its traditional table to exhibit its line of Audio Loudness Meters, showing both peak and average signal levels.

Some manufacturers have proven they have a sense of humor when it comes to the names of their products.

Prism Media Products introduced the Dscope-III, an oscilloscope/diagnostic device that converts a common PC into a highly precise measurement tool.

Metric Halo Laboratories combined several powerful TDM plug-in modules for the Macintosh platform to create a versatile audio diagnostic and metering device. The MLM module is a master level meter that provides sample-accurate metering of audio channels. The SpectraFoo range is a combined spectrum analyzer, phase meter and envelope tracker. The TDM bundle can meter up to 24 channels with only one DSP.

Manufacturers have proven they have a sense of humor when it comes to the names of their products. Acoustics First came out with a four-foot-long, foam-based corner trap for correcting studio acoustics which it calls the Bermuda Broadband, because "sound enters the corner triangle and is never heard from again."

Fig 13: Hafler TRM6 Monitors: Stand Up and Be Heard

Acoustics First had the same product in two-foot lengths, called — what else? — "Bermuda Shorts."

Not to be outdone, microphone manufacturer Earthworks packaged its high-quality SR71 cardioid microphone in a clear plastic cylinder. Earthworks owner Eric Blackmere cheerfully held up the container and proclaimed it to be his company's very first "tube" mic.

Sound effects and production music were well represented by numerous companies, such as Non-Stop Music and its extensive collection of audio on CD for commercial and program production. Network Music displayed the new Short Trax Library, consisting of broadcast-length edits of themes, while Sound Ideas officially rolled out the Rocky and Bullwinkle sound effects library, and the Series 8000 Science Fiction collection.

Circle (165) On Reader Service Card

SHORT TAKE

Mass CD Duplicator

MediaFORM of Exton, Pa., introduced the CD-3707 spindle-based, seven-drive CD-R copier. This device simplifies the process of CD duplication for program syndicators and short-feature radio producers.

The CD-3707 provides one-button duplication of up to 200 CD-Rs in all formats. CD formats (ISO, Mixed Mode, Red Book etc.) are detected and automatically identified.

Pre-scan features scans for errors prior to burning the duplicates. A six-digit password lockout prevents unauthorized use. Up to four CD-3707 units can be networked for a total of 28 drives.

The CD-3707 can check the finished product and will direct completed CDs to separate Accept and Reject bins. The optional Easi-DAT or Easi-Audio features allow the importing of digital or analog audio.

For information, contact MediaFORM in Pennsylvania at (610) 458-9200 or circle **Reader Service 89**.

— Alan R. Peterson

World Radio History

Preamp Exceeds Expectations

▶ EARTH, continued from page 57

IC. Input protection is via back-to-back zener diodes, outputs are protected with rectifiers and zener diodes. All ICs are socketed, and easily field-repairable should one fail. The mechanical fit and finish of the LAB 102 is superb, as is the paint job. Even the knobs are solid metal — no wimpy plastic stuff here.

Removing the top cover of this preamp reveals something you do not see very often today: hand-assembled circuit boards. All board work is precise and well done.

Bench-testing the LAB 102 taxed our Potomac Instruments gear to its limits. All measurements exceeded the published specs by a good margin. Frequency response was flat from the 10 Hz bottom limit of our analyzer out to *beyond 400 kHz*, where it was down only 0.5 dB.

The LAB 102 taxed our gear to its limits. All measurements exceeded published specs by a good margin.

Distortion at 1 kHz was .0025 percent at 20 dB gain and slightly higher with increased gain. I measured distortion of .01 percent at 20 kHz. Not bad. Noise at normal gain settings was barely measurable with our gear.

Not mentioned by Earthworks but vital nonetheless is phase response. Our unit's response was too good to measure with the Potomac analyzer, which showed zero phase difference from 20 Hz to beyond 200 kHz.

For all to see

What is surprising is that there are no "secrets" to the specs or sound of the LAB 102. There are no encapsulated mystery modules, no proprietary ICs and no patented circuits. Earthworks has achieved an outstanding sound with thoughtful circuit design and attention to detail.

Our initial listening tests were lackluster, but I soon determined this was due to the microphones. Our old microphones simply lacked the high-end response to do justice to the capability of the LAB 102. You really need a mic with extended frequency response and a tight transient response.

I called Earthworks and they sent me a pair of Z30X cardioid mics. These babies have a flat response from 30 Hz to 30 kHz. When used in conjunction with the LAB 102, we got startling results.

World Cafe producer Joe Taylor Jr. was consistently enthusiastic about the quality of sound from this combo, whether it was in vocal or instrumental applications. A bright, crisp high end with that something extra was always present.

I find the sound of the LAB 102 hard to put into words. Yes, the high end is suddenly there, but the midrange and low frequencies also have a texture most folks are not used to hearing.

Some of the bands that we recorded were not quite sure what to make of the Earthworks sound. They said they had never heard themselves like that before. Not that they sounded bad, just different. Perhaps the Earthworks gear forces us to re-educate ourselves as to what top quality sound really sounds like.

Special thanks to World Cafe producer Joe Taylor Jr. for loaning his ears and expertise to the LAB 102 evaluation.

■ ■ ■

For information on the LAB 102 or other Earthworks products, contact the company in New Hampshire at (603) 654-6427; Internet www.earthwks.com *or circle* ***Reader Service 166.***

Tom Vernon is a multimedia consultant working in Philadelphia. Reach him at TLVernon@blazenet.net *or call (717) 367-5595.*

Affordable Library for Small-Market Stations

▶ BEDS, continued from page 57

on the reverse of the CD jewel box, Valley Sound categorized music by tempo and style. The breakdown includes Medium, Upbeat, Jazz, Slow, Country/Comical, a series of Themes and the drum cuts, in both 30- and 60-second lengths. If you have a feel for the music that the commercial copy is calling for, just jump right to the category you believe will fit best.

Computer-assisted

The arrangements are done on synthesized instruments, but do not come across as fake or plastic. The percussion is reasonably elaborate and does not sound like a typical boom-clap drum-box set to run with no variation. The cuts are more textural than melodic, so they remain unobtrusive behind commercial copy.

Cover Art From the '100 Beds' CD

To the knowing ear, parts of this collection may sound familiar and possibly dated. Half of the CD was produced with a Roland Sound Canvas chipset, with several of those cuts driven by a piece of music software called "Band In A Box."

This is a popular software package that automatically arranges music after entering some chord symbols and picking a musical style from a menu. Having worked with the software myself for five years, the patterns were instantly recognizable. The other 50 or so cuts were produced on other synthesizer gear.

Too old?

This in itself is not a bad thing, but the Sound Canvas samples are showing their age and have since been surpassed by more contemporary sounds.

Also, Band In A Box is a relatively inexpensive ($88), easily obtained software bundle. Savvy production directors have figured out that an existing office computer with a soundcard can be loaded with the same software and recreate a great deal of what is on the 100 Beds CD, and even more, for less than the price of the disc.

The demo sent to **RW** for review appears to be a one-off CD-R, which led me to believe Valley Sound dubs each disc on demand for each order, a belief that was corroborated by Valley Sound owner Martin O'Michael.

According to O'Michael, "This is a burn-as-needed collection. We feel as if we are fulfilling a need that some stations appear to have. More than one production director told us, 'I'd pay about $100 for 100 beds.' We felt this was a fair price at a dollar a bed, with minimal repetition."

With the popularity of CD recorders increasing, watch for more independent production companies like Valley Sound to emerge.

O'Michael's observation is indeed correct. Smaller stations require affordable production music. The alternative is to raid the collection of soft jazz CDs in the back of the station, which is a one-way ticket to legal troubles with the artist that created the disc.

Besides, the listener or client doesn't know, much less care, whether the music was produced on a computer, or with what software. There are stations that have wanted a library such as this for awhile and word is out that Volume II is being produced.

A sample of "100 Beds" can be heard at the Valley Sound Web site www.xoom.com/vsound

For information, contact Valley Sound in Pennsylvania at (888) 593-2227 or circle ***Reader Service 205.***

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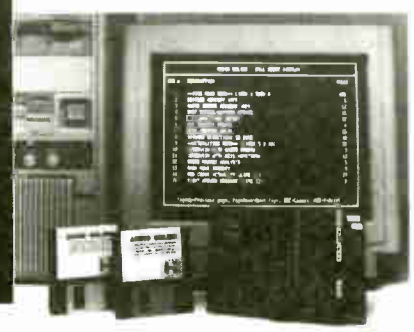

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World Radio History

Hollywood vs. the 'Real World'

Travis

The article "Could the V/O Life be Right for You" (**RW**, Aug. 19) certainly generated a lot of e-mail. I still have not come up with a good way to keep track of it all, but I think I finally responded to everyone. If you wrote, thank you. My apologies to anyone I missed.

One of the more common questions asked, "Would it be a smart thing to move to Los Angeles or New York in order to get more work, or to get more 'big-time' jobs?"

I do have a unique perspective on this, due to the fact that I work two markets. My primary voice-over market where I get the most work is Orange County, Calif. Orange County is part of the greater Los Angeles metropolitan area.

We rely on Los Angeles to provide us with our television, most of our radio, and one of the two major newspapers. The Los Angeles population also spends considerable time in Orange County, as that is where Disneyland is.

Two towns

However, in terms of voice-over work, Orange County really is a separate market. Except for its close proximity to Los Angeles, Orange County is a typical medium-sized market. Although producers do have access to major "Hollywood talent" — a few stars live here — the tendency is to use local people on most Orange County-produced projects.

There are about 75 video production companies and several cable companies here, but not much radio. There are only about 12 people who consider themselves full-time voice-over people, and perhaps about 200 actors and others who find some voice-over work each year. Advertising is big in Orange County, but its focus overwhelmingly is in print.

If I am working with other announcers or actors in Orange County, chances are I know them. I seldom record in a studio I have not been in many times before. I will know the engineer and producer/director.

On any given month, I usually will have something running on Los Angeles radio or television, but most likely it will have been recorded in Orange County. In Orange County, most people in the industry know me.

Getting crowded in here

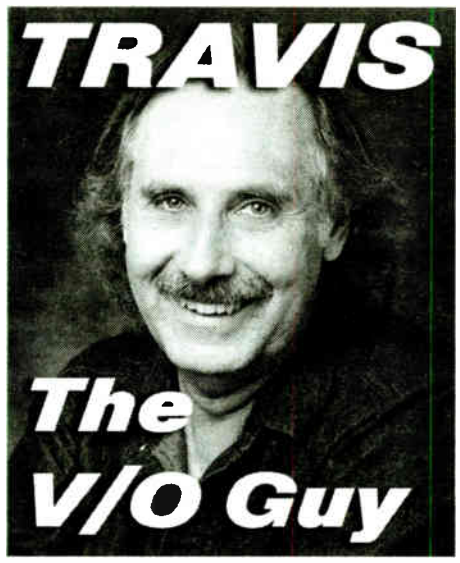
Los Angeles or Hollywood, on the other hand, is another story. By my rough estimation, there are approximately 2,500 people who consider themselves full-time voice-over performers. Add to that another 1,200 performers who work full time at radio or television stations.

Then add in another 35,000 or so actors and other individuals in town who have recorded, and have, a voice-over demo tape ready to hand out. Factor in another 120,000 actors who may not have recorded a tape, but consider themselves suitable for voice-over work and will jump at the chance to perform on a spot.

You are now just beginning to understand how many performers there are and how much competition a voice-over performer faces in Hollywood. Here, I am just another performer.

Of course, it's not that bad, because there is also a tremendous amount of work, too. Hollywood is huge. In fact, the sheer size of the business is one of the biggest problems for a newcomer to Hollywood. Hollywood is so big, that whenever you hear anyone attempting to tell you what it is really like in Hollywood, you can be sure that that person has not a clue.

I spend, on average, about 10 hours a week in Hollywood. Four of those hours I spend in an acting class, rather than voice-over classes, because that is what I feel will help me the most in my voice-over career right now. I spend about three hours on auditions, and, on average, probably about 10 minutes a week actually working in Hollywood.



My kind of town

I love Hollywood. I find it is every bit as exciting as you might expect. I find it is also a very twisted, and in many ways, a "sick" town. I love coming into Hollywood, but I am also glad when I leave it, heading back home to Orange County.

The most disagreeable thing about Hollywood is that everyone is scared. This is not just my conclusion; many others have written and expounded on the point. Because most jobs are either freelance or short-term, everybody is either out of work or is soon to be.

When I record a spot in Los Angeles, everyone is tense and has a world-is-coming-to-an-end look on their face. On the rare occasion that someone smiles, it is usually forced. Throughout the entire recording process, even when the director really likes what I am doing, he or she will not look at me through the studio glass. The director's head will be in his or her hands, the eyes fixed on the floor.

When the spot is finished and actually comes in under 30 or 60 seconds, you can literally hear a huge sigh of relief.

But when I record a spot back home in Orange County, everybody is relaxed. If things get a little tense, usually someone will shout, "It's just a radio commercial!"

We have a good time, joke around a bit, finish the job then say goodbye, and you feel that everyone is looking forward to the next time we work together. In L.A., even when things go very well, there is a good chance you will never see those people again.

'Trust me'

Another thing about Hollywood is, due to its sheer size, it is relatively easy for those with less-than-honorable intentions to take advantage of inexperienced performers. There is an entire industry built up to support performers — acting classes, photo and résumé services, talent management *et al* — and the boundaries of what is appropriate and what is inappropriate, or even illegal, often are blurry.

However, for all its shortcomings and problems, if you want to work at the top of the voice-over industry, this is where it's at. This is where you will get the best scripts, the highest production budgets, the best direction and the best talent.

What should I tell people who want to come to Hollywood to see if they can make it in the "Big Time?" Well, remember that every day there are probably about 2,000 people arriving here by bus, plane or train to "make it" in Hollywood.

And every day, about 2,000 people leave to go back home.

Even those who make it in Hollywood often find that they have lost something by coming here. One DJ I knew that came here from Detroit to find success in Hollywood summed it up:

"Back in Detroit, I was a star," he said. "People would come just to see me do a remote at a restaurant opening. I came here, had success beyond my dreams, but you know, here in Hollywood, I'm not a 'tar, I'm just another performer."

A year later, he left to go back to Detroit.

If you need to see how far you can go, Hollywood is where you need to be. If you are looking for *success*, there are many other places to find that.

■ ■ ■

*Travis the V/O Guy can be reached c/o **RW**.*

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Nakamichi PA7 200W chnl, original box & manual, $750 +shpg. P Paquin, 508-385-0805.

Ramsa WP9055 pwr amp, 2x50 W rms @ 8 ohm, 100 W rms bridged, new in box, $550/BO; Ramsa WP9220 pwr amp, 2x200 W, 300 W stereo @ 4 ohms, 600 W bridged mono @ 8 ohms, $600; Rauland Borg TAX125B (3) 125 W rm pwr amp, $200 ea; SAE MK-IIIC amp pwr amp 200+/st/8 ohm, blk, $400; Symetrix A220, 1 space 20wpc, balanced inputs, great headphone amp, $200; Spectra Sonics pwr amps (3 sets), rack mount pwr amps open frame, 8 chnls of amps in 3-1/2I rackspace, 75 W ea chnl w/pwr supply to run 8 chnls, 5-1/4I rackspace have 3 of ea amps mod # 700, pwr supply mod #402RS, amps are bridgable to 150 W, sell sets of amps & supply, 23 amps one total & one xover module, $100 ea. M Hughes, 301-962-6823.

Technics SEA7 pro series stereo DC pwr amp, 1 space, no ears, hefty, weighs a ton, sounds like 200 wpc, killer for headphones, speaker switches of 2 sets of speakers, dual range meter switch, $300; Visual Electronics M725, 25+ w/p/c, 1 space, industrial quality, a hefty amp, dual mono w/sep on/off switchers, $150. M Hughes, 301-962-6823.

Want to Buy

Audio dist amp suitable for stereo, each chnl must have level adjustments, needs to be in gd cond. H Kneller, 941-494-4111.

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ERI FML 3E 3 bay rototiller antenna w/DC stub & heaters, vgc on 104.1 MHz, $3500; Shively 6810 2 bay on 99.1, like new, $1000. C Gennaro, 906-932-2411.

Jampro JHCP-4 4-bay circ pol FM antenna, BO. S Perez, 323-882-8000.

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Want to Buy

Cablewave 3 bay antenna tuned to 104.3. J Andrist, 509-826-0100.

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ESE digital countdown timer, gd cond, $75; Matchbox 2 chnl stereo line mixer, gd cond, $75; Excalibur dual stereo line amp, gd cond, $75. P Wolf, 941-458-3777.

Koss LV-20 stereo headphones, new in box, will trade for older pair of working AKG K-144 or K-240 headphones; Fostex 3180 stereo reverb w/24 mS pre-delay, rack mountable, vgc, will swap for UREI Cooper Time Cube (920-16); Sennheiser HD 414 light weight, open-ear design headphones, new pair, $50, used pair $30; AKG RR-25 remote control w/33' cable & connector for AKG BX-25 reverb unit, will trade for Teac RC-71, RC-170 or RC-190 remote; Burwen TNE 7000A stereo transient noise eliminator, gd cond, will trade for working UREI Cooper Time Cube (920-16). J Roper, 812-877-2663.

Tascam 15, 24x8, $1650; 2 trk model 42 rcdr, $450; 2 trk model 52 rcdr, $750; 16 trk model 85-16B w/remote, $2995; MCI JH110C, $850/BO; UREI dip filter set, $1150. D Elliot, 213-427-7236.

Audiometrics voice-over booth on wheels w/XLR/phono inputs, $975 +shpg. J Baltar, 207-623-1941.

Energy-Onix AM protector/enhancer for NRSC, $100; CBS 411 Volumax stereo FM, $50; CBS 111S Audimax FM stereo, $50. B Kennedy, 616-394-1260.

Lang PEQ-2 (2) EQs; Valley People MaxiQ EQ; Urei 537 graphic EQ; Urei 530 graphic EQ. A Polhemus, 212-302-9010.

Ramsa WZDE40-20 bit true stereo digital effects processor, graphic, parametric, notch Eqs, compressors, speaker delays, spectrum analyzer, excel, $2000. 301-962-6823.

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Format Sentry FS12C w/CD interfaces for up to 16 CD players, w/3 FS data latch cards, vgc, $1000. C Gennaro, 906-932-2411.

Schafer 800-T controller for use w/r-r equipment, $500 +shpg. J Bahr, 340-719-9336.

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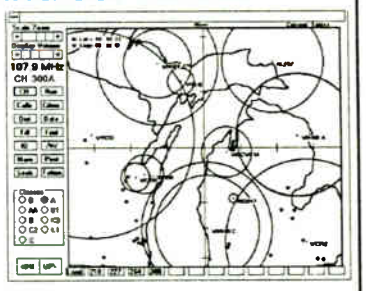
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ITC 3D triple deck stereo cart player, vgc, $500; Audicord A Series reproducers (2), fair cond; Audicord DL Series mono recorder, great cond, BO . C Gennaro, 906-932-2411.

ITC SP recorder/reproducer in working order, mono w/service manual, $125. D Nuechterlein, 517-652-6863.

BE 2100 Series R/P & PB stereo in rack tray, need one VU meter, $525; ATC mono R/P spare cans, $60; Ampro stereo R/P, one chnl needs repair, $75. B Kennedy, 616-394-1260.

IGM 48 tray stereo instacarts (2), $500. J Hardee, 919-875-9100.

Tapecaster X-700RPS stereo rcdr & PB, like new cond, $400; Tapecaster X-700PS stereo PB, gd cond (6), $150 ea; Fidelipac ESD10 Dynamax eraser/splice detector, excel cond, $300. M Gollub, 410-535-2201.

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Ampex MR70 tape recorder console. J Price, 214-321-6576.

UREI 1653, missing one fader knob, vgc; Sparta AS-15B in fair cond. H Kneller, 941-494-4111.

Auditronics 1100 frame w/(4) DA6LC modules, $400. J Hardee, 919-875-9100.

Ramsa WR-8210A 10x4x2 mixer, ea chnl has 3 selectable inputs, 3 band sweepable EQ, 2 pre- or post-fader aux sends, insert in/out, direct out, $1300/BO. M Hughes, 301-962-6823.

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.

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Inovonics 716 David II integrated FM audio processor, stereo gen, excel cond, $900. M Gollub, 410-535-2201.

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RCA mics, DX-77, 44, $400 ea. R Schminke, 541-344-3812.

Neumann U47, $3900; U67, $3300; U87, $1800; KM83 or 84 pairs, $1400; KM88s, $950 ea; RCA 77DX, $1200; BK5, $700; BK1A, $300. W Gunn, POB 2902, Palm Springs CA 92263. 760-320-0728.

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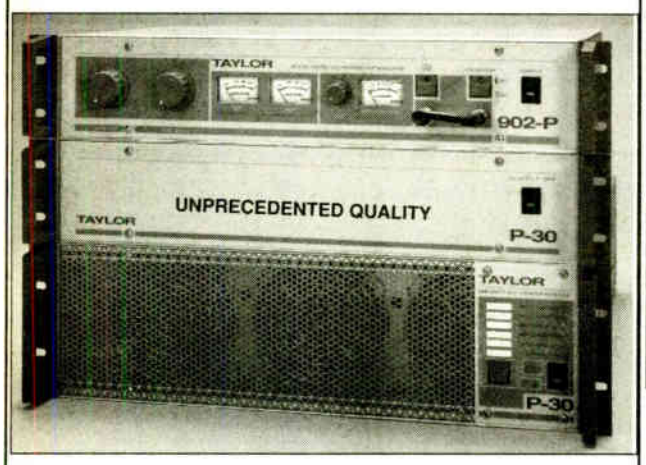

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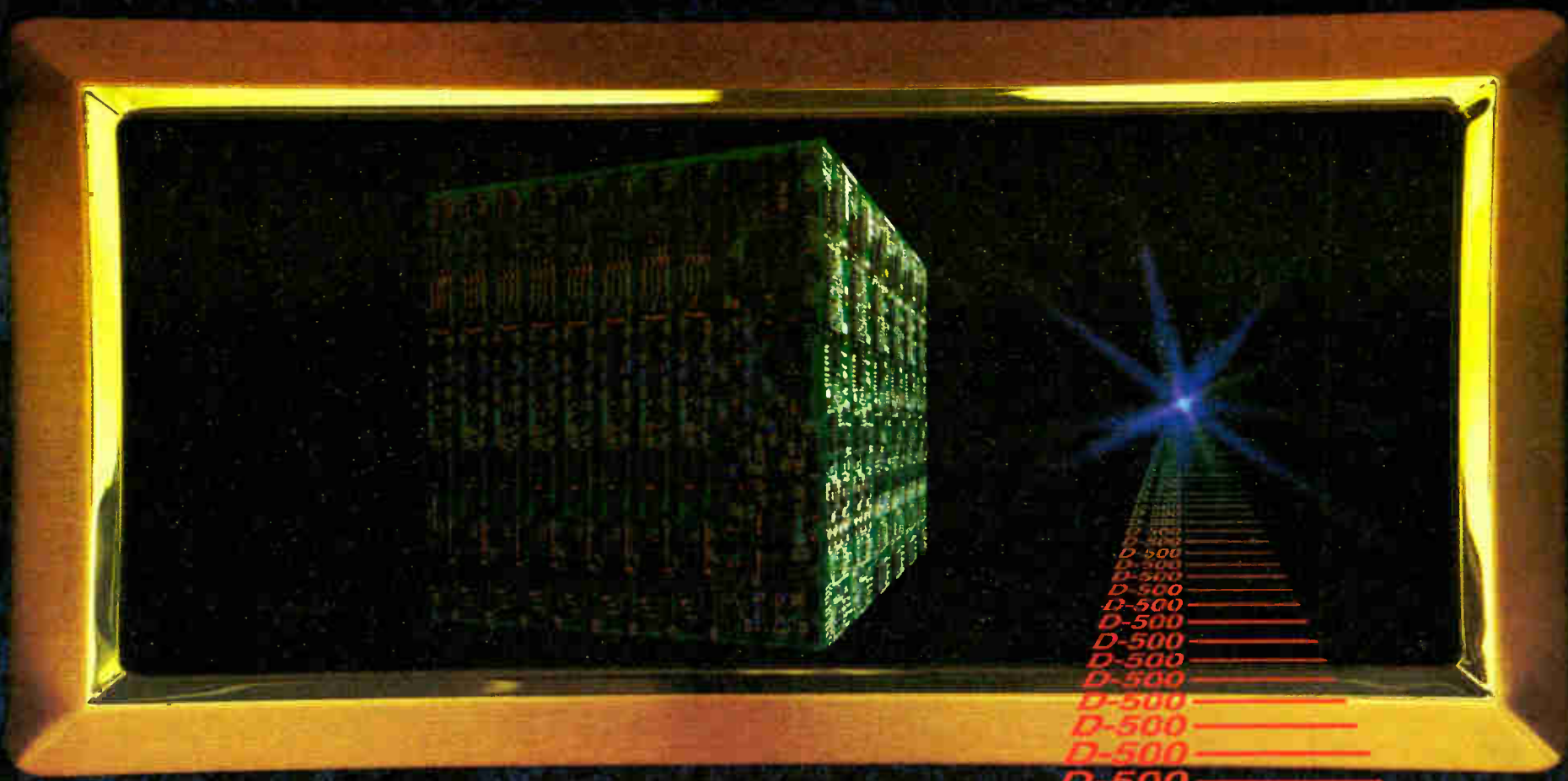

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