

Urban Looks Ahead

A major-market engineer finds that the newest Optimod overcomes his analog prejudices.

Our Next Winner

We give away a Symetrix prize package in our 25th Anniversary Silver Sweepstakes.

Page 73

Page 4

Radio World

The Newspaper for Radio Managers and Engineers

March 30, 2001



NAB 2001
The Convergence Marketplace

SHOW PREVIEW
P.10

COLIN MORROW

WHEATSTONE A-2000

EFT 50M POLE

Photo by J. T. Anderson

KKHJ AM TOWERS IN LOS ANGELES

NEWS MAKER

Laird, on the Cusp Of Digital Radio

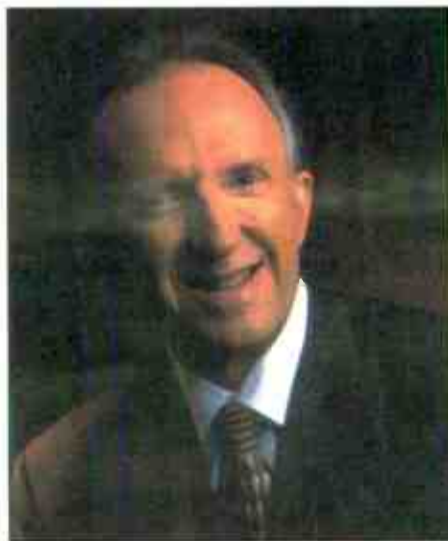
Journal Broadcast's Engineering Executive Takes High-Profile Role in DAB Test Process

MILWAUKEE Andy Laird, newly promoted to vice president of radio engineering for the Journal Broadcast Group, oversees technical operations for 36 radio stations. The 57-year-old has had a varied career, starting as a musician and disc jockey in Illinois, progressing to station engineer, to group engineer and running his own studio design/construct business.

Since 1991, Laird has been involved in the development of digital audio broadcasting, serving in various capacities as a volunteer for the National Radio Systems Committee, where he now chairs the Test Procedures Working Group of the DAB Subcommittee.

His group is developing test procedures it hopes will prove, once and for all, whether in-band, on-channel DAB is superior to analog, and whether the United States should adopt IBOC as its digital broadcasting standard after a decade of debate.

Laird spoke to Radio World News Editor/Washington Bureau Chief Leslie Stimson about his career and pressing technical issues affecting radio.



Andy Laird

RW: Your test procedures group is developing AM IBOC test criteria now?

Laird: Yes, in fact we have a very good broad outline of how we think the AM system will be tested. iBiquity has been busy getting their FM testing running smoothly.

See LAIRD, page 5 ▶

AM Antenna Tests Suffer Setbacks

Weather, Bureaucratic Tangles Beset CFA, EH Antenna Experiments

by Ted Nahil

Broadcasters who had hoped to have seen some test data on the controversial CFA and EH Antenna systems may need to wait a little longer.

The weather and construction crew injuries have delayed CFA tests in England, while the company developing the EH Antenna has had problems getting a test permit from the FCC.

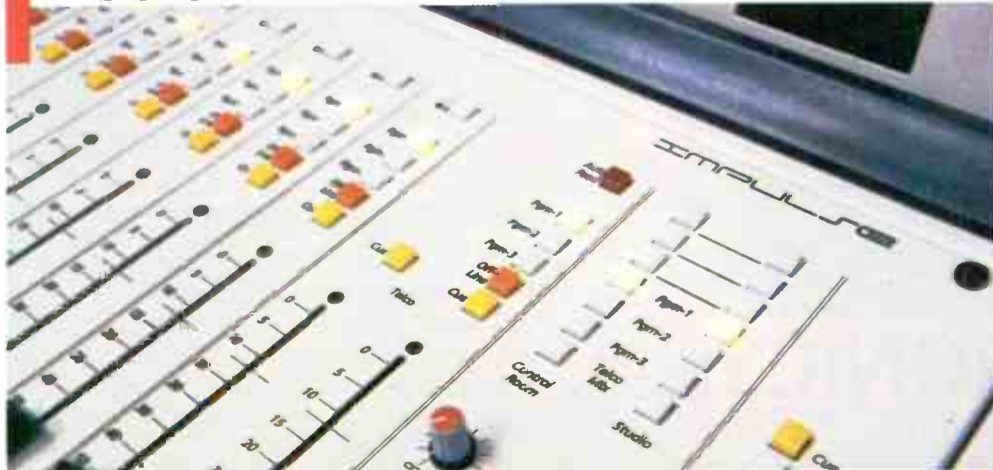
Next-generation AM?

Engineers are trying to determine if claims made by the developers of the two new antenna designs, being touted as the next generation of AM antennas, are valid. Both designs are radically different from conventional AM antenna systems built in the United States.

Although testing on both antennas has been delayed, it appears the CFA tests would get underway first.

See ANTENNA, page 3 ▶

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◆ NEWSWATCH ◆

FCC Drops Indecency Fine ...

WASHINGTON The Federal Communications Commission rescinded a Notice of Apparent Liability against Sagittarius Broadcasting Corp. for three broadcasts of indecent material on radio station WXRK(FM), New York.

The material in question aired in 1995 and 1996. Because so much time had passed, the agency decided not to issue a Forfeiture Order, but stated the decision "in no way condones the broadcast of the material at issue."

... But Upholds Phone Decision

WASHINGTON The commission has twice rejected requests from EZ Sacramento Inc. and Infinity Broadcasting Corp. to review the \$4,000 fines levied against both KHTK(AM), Sacramento, Calif., and WJFK(FM), Washington, for apparently airing a recorded phone call without the caller's knowledge on "The Don & Mike Show."

"When an individual is informed during a broadcast conversation that he or she is being put on hold, the pri-

or notification that the call is being broadcast or recorded ceases," stated the FCC.

If the station wants to record and air later anything the caller says while he or she is on hold, said the commission, the station must notify the caller it intends to air the recording.

Commissioner Harold Furchtgott-Roth supported the order, but questioned whether the FCC should need to enforce telephone privacy laws and suggested that individual states "have extensive remedies" to do so. Relying on state law would also place radio on the same footing as other media, such as newspapers, he said.

Arbitron, Ceridian Split Final

NEW YORK The split between Arbitron and soon-to-be-former parent Ceridian Corp. was to be final March 30. Ceridian's board set March 16 as the record date and March 30 as the distribution date for a tax-free, reverse spinoff to leave Ceridian as two independent, publicly traded companies: Ceridian Corp. and Arbitron Inc. Arbitron will trade on

See NEWSWATCH, page 8 ▶

Index

NAB SHOW PREVIEW

NAB2001: Something for Everyone by Sharon Rae Pettigrew	10
Computer Session Aimed at Engineers by Randy J. Stine	10
DAB Here, Elsewhere at NAB2001 by Leslie Stinson	14
Radio World at NAB2001 by Ted Nihil	15
Forum Is Engineering Smorgasbord by Alan R. Peterson	15
Linux, MP3 Among Digital Topics by Peter King	16
Streaming for Broadcast Engineers by Laura Dely	17
Radio Is Tougher and Prettier Now by Ken R.	18
Conference Helps Keep You Legal by Lyssa Graham	20
Management Conference Points Ahead by Tom Osenkowsky	22
Station Automation Revelations by W.C. Alexander	23
Mixing It Up, Console-Style by Michael LeClair	24
For FMs, Antennas, IBOC Filters by Bernie Cox	28
AM Radio: Highly Efficient by Paul Kaminski	30
Web Tools to Help Radio Stations by Harold Hallikainen	32
Test and Monitoring at NAB2001 by Ty Ford	33
Radio Mic Market Heating Up by James Careless	36
Traffic Looks to Net by Jeff Johnson	38
Transmitter Firms Eye DAB, LPFM by Mark Croom	40
Processors Pack More DSP Power by Michael LeClair	42
Let's Go to the Telephones by Michael LeClair	44
DAWs, Editors and Cards, Oh My! by Bernie Cox	46
You Name It, They've Got It by Paul Kaminski	48
The NAB Show, Back in the Day by Mark Durenberger	50
Past and Present by Lyssa Graham	52
Exhibitor Listings	53

FEATURES

The 8400: Orban's 'Best-Ever' by Phil Simon	73
Workbench: Little Things That Mean a Lot by John Bisset	75
Susquehanna's Big Production by Scott Fybush	77

GM JOURNAL

Dot-Coms Fall, Radio Sales Slow by Scott Fybush	81
The PD Chronicler Speaks to RW by Peter King	81
Take Stock of Your FCC Compliance by Barry D. Umansky	86
A Slice From 'The PD Chronicles' by Jack James	89
WSJM.com: Radio News You Can See by Steve Sullivan	91

INTERNET RADIO

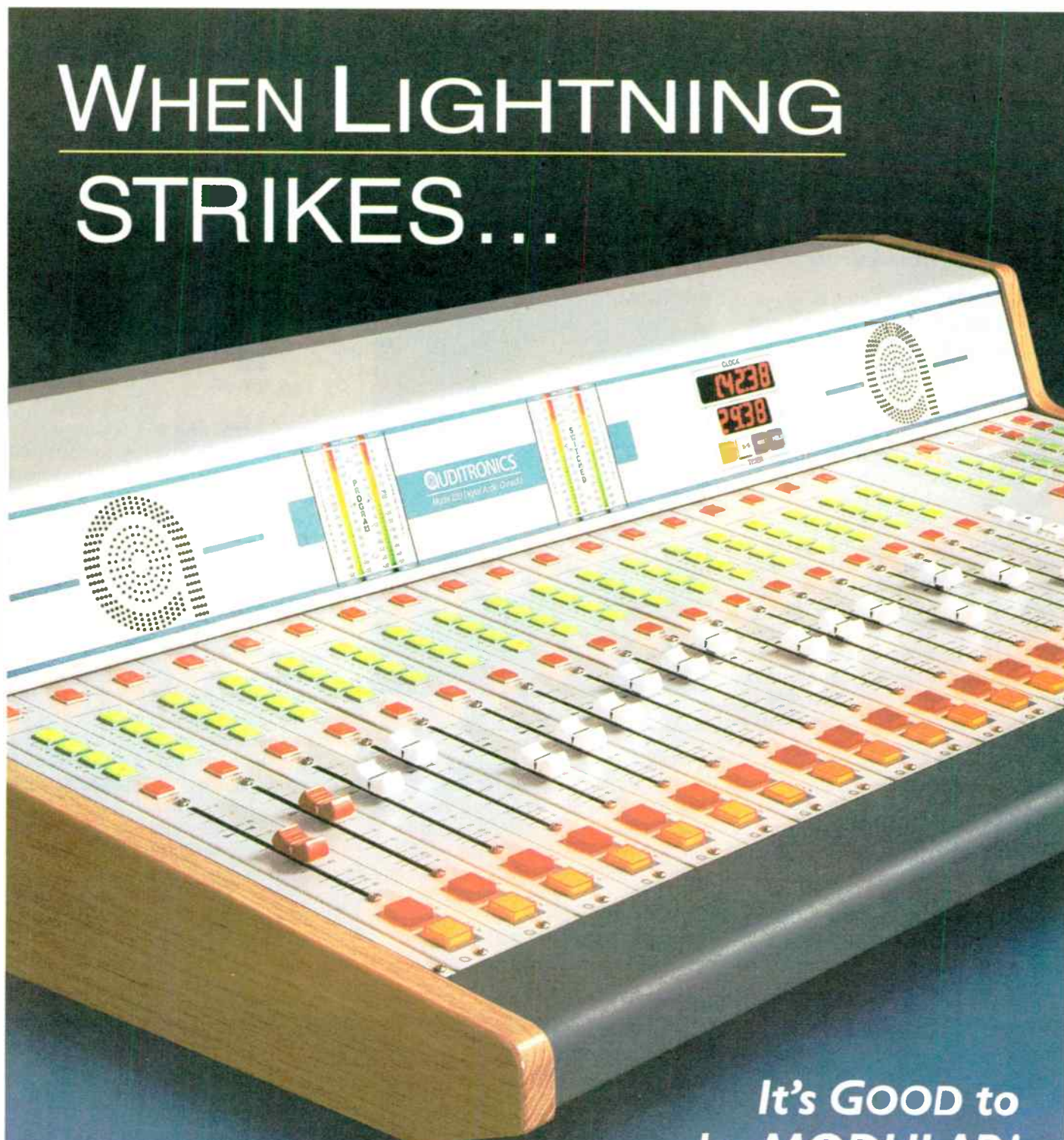
Web Watch: From the Ruins, Net Radio Streams by Carl Lindemann	91
Web Wins: Baby Your Web Site and See It Grow by Dave Casper and Mike Mahone	94

STUDIO SESSIONS

KORC(FM): At'sa One Spicy Pizza! by Ken R.	99
Sound Forge 5.0 Continues Code Line by Carl Lindemann	99
AJ's Boss Picks Up Big Honors by Alan R. Peterson	102

OPINION

110



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World Radio History

Antenna

Continued from page 1

Dr. Fahti Kabbary, one of the CFA's principal developers, is supervising construction of a test CFA in Shropshire, England.

An American joint venture between two engineering consulting firms, headed by Ben Dawson of Hatfield & Dawson, had hoped to take extensive field measurements on a 1 kW antenna system and release its test data to the broadcasting community in December 2000. But the weather in the test area has been "abysmal," said Robert Richer, president, CFA Limited, Farmington, Conn. The company intends to pursue worldwide distribution of the antenna with the exception of Egypt, where it does not hold distribution rights.

"It's the worst rain since they started measuring, 400 years ago," he said. Snow and freezing temperatures have

Richer hoped to have test data analyzed in time for the NAB2001 convention. Results will be made available through the trade press, Richer said. LBA Technology makes and installs broadcast antennas; it has FCC experimental authority to conduct CFA tests. CEO Lawrence Behr said he would hold off on tests until the U.K. tests are complete. "Our continued interest in the CFA is dependent on some successful testing, either ours or at Shropshire," he said.

In the United States, EH Antenna Systems, Eatonton, Ga., has suffered its own share of setbacks.

Permit woes

Ted Hart and Bob Zimmerman both designed the antenna and founded the company. The EH Antenna is similar to the CFA in that both use small discs and round radiating elements to create an RF signal.

The EH Antenna has its opponents, too, among them the inventors of the CFA who claim that the EH design is an

The situation looked brighter for Hart in early February. Graham said he was talking to the staff of the FCC's Office of Engineering and Technology. "They have been helpful and we hope to have an experimental authorization in the near future," he said.

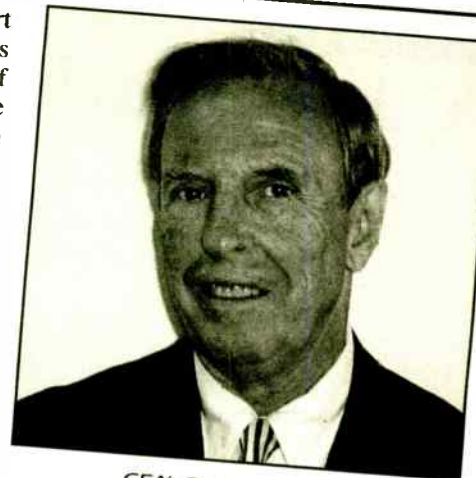
The experimental license would allow the company to test the antenna in Georgia. Aside from its struggle to get a test permit, Hart's company has experienced internal changes. Bob Zimmerman, vice president of engineering, left EH Antenna Systems after initial test measurements he made on the antenna operating in the amateur band showed efficiencies in the 1- to 2-percent range, which is considered unacceptable.

Hart disputed Zimmerman's results. Zimmerman, now a project engineer at Rockwell Collins Radio, Cedar Rapids, Iowa, declined to comment on the EH antenna, its design, or its effectiveness as an AM radiator.

Although the EH antenna data depends on the granting of an experimental authorization, the CFA data should be available soon. Richer hoped that Kabbary could be back in the U.K. by mid-March to complete the installation of the phasing network for the antenna.

Hard test data is crucial to back up claims made by the companies developing both antennas.

The efficiency claims of both designs are controversial. Conventional antennas have been modeled using computer programs that predict their performance. Proponents of both the crossed-field and EH antennas maintain their designs are



CFA's Robert Richer

so radically different in the way in which they produce signals that conventional models do not apply.

The only way to verify the performance, they say, is through empirical data.

One of the advantages both designs claim is that, due to the smaller size of the structure, the antennas have the potential to save broadcasters considerable money in the land required to operate a standard broadcast facility. The CFA and EH antennas are small enough to be mounted on building roofs, saving considerable space.

Once the CFA test data from the U.K. site are analyzed, the information will be submitted to the FCC in the United States. The commission will determine if the information meets technical requirements in areas such as radiation efficiency and sky-wave protection, critical for acceptance as a replacement for the AM broadcast tower.



San Remo, Italy CFA Installation

accompanied the rain.

Employee accidents and illness have beset the test group as well.

The lead welder for the project, brought in by Kabbary, slipped and broke an arm. In mid-January, Kabbary came down with a "vicious attack of the flu," Richer said. Maintaining a sense of humor, Richer said they were "just waiting for the locusts now."

Despite setbacks, antenna construction was nearly complete in February.

Phasing network installation remained the last task. Kabbary, or one of his staff members, planned to fly to the U.K. to perform the final tuning in early March.

Richer hoped the installation and testing of the phasing systems for the antenna could be completed by mid-March. Then, Ben Dawson planned to travel to the U.K. and perform field tests on the system, a 1 kW station, using a helicopter provided by the BBC. The measurements will include sky-wave tests.

Since the CFA has its critics, the gathered data would then be used either to refute or sustain the claims that this antenna out-performs a conventional AM tower in areas such as efficiency and bandwidth.

old, discarded CFA design.

In August 2000, EH Antenna Systems applied to the FCC for a permit to construct a test antenna on the EH antenna farm in Georgia.

After weeks of not hearing whether the request had been approved, Hart became frustrated and enlisted the help of one of his U.S. Senators, Max Cleland, D-Ga.

"By not acting on my request to test the antenna, I have been, and am being, denied the opportunity to sell the EH Antenna; thus I am prevented from starting a small business and providing employment for numerous persons," stated Hart in a letter to Cleland.

According to a letter written to Cleland by FCC Mass Media Bureau Chief Roy Stewart in January, Hart's application was under "active consideration."

Hart felt he was losing time, so he and his consulting engineer, Stuart Graham Jr. of Graham Brock Inc., filed a different application for a station in Tallahassee, Fla., to operate under a Special Temporary Authorization with an EH antenna.

The FCC rejected the application because the antenna has not been tested and approved for use on the AM band, said Hart.



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FROM THE EDITOR

NAB, Radio and E-I-E-Dot-Com

'Tis NAB show time again. How can that be? My feet are still raw from the Radio Show! Can anyone actually absorb everything there is to see, hear and touch at this event? Reading Mark Durenberger's story on page 50 makes me wonder what it was like when the entire show had just dozens of booths and a few thousand attendees. Tell me your memories at pmclane@imaspub.com ...

NAB time also is Name-Game Time. What hot buzz terms will the marketing gurus of radio use to describe their products this year?

com venture in the works. Dot, dot, dot. Everyone from Sony to my neighbor's cat suddenly had a Web site and was trying to figure out what to do with it.

Marketing people have little patience, though: so then we got the E buzz: stick an "e" in front of your magazine, Web site, company or software, and you were electronically cutting-edge.

This is the year of the "i." The folks at iBiquity Digital will tell the world about how yes, at last, after 10 years, IBOC is really about to happen (and radios will have an iDAB sticker on

Broadcasting, iNews and iVast. (Also IMAS Publishing, but we were here first.)

Then there's the clever folks at ATCi/Antenna Technology, who sneakily put the "i" for Incorporated at the end of their initials.

Don't these companies know how complicated my life as an editor becomes when the first letter of their name begins with a lower-case "i"? We have to issue a whole new editing policy: "When a company name begins with a lower-case letter, do not capitalize it *unless* the company name appears at the beginning of a sentence. Or in a headline. I think."

Of course, companies with names like beyerdynamic and mediatron have been giving me headaches for years.

What's next? Look for word plays on MP3, telematics and broadband. We already have MP3.com. How about MP3Vault? Radiomatics? iBiqu-band? Opti-broad?

Maybe it's time to rework the old Radio World masthead too. Hmm. How about eRadioWorld. iRadioWorld ... or

e-i-RadioWorld.com ... ah, yes. iRadioWORLD. Or should that "i" be capitalized? ...

Speaking of which, visitors to our Web site will notice a new look.

Webmasters Marta Ribeiro and Richard Farrell have made the navigation easier, and we're updating our content more often. You'll also find useful news headlines every day, so visit www.rwonline.com and check it out, before we change it to some other cool marketing buzz word. It's i-catching!

★ ★ ★

Sharp-eyed readers noticed an error in the captions for our story "Paying Tribute to a Radio Giant" in the March 1 issue.

It told of Tommy Bolack's efforts to rescue the "Big 50" RCA transmitter at KOB(AM) in central New Mexico. But the captions on the photos were reversed. The image on page 12, labeled as the transmitter, actually shows a museum display of a power switchboard.

The photo on page 24 is a closeup of the actual art deco-styled transmitter. The museum could not supply a full-view photograph.

— Paul J. McLane



RW Online has a new look and easier navigation.

In recent years, we've seen run-on names, giving us brands like AudioVAULT, PanAmSat, AccuWeather and RealNetworks. It's almost like we're all in such a hurry that we can't spend time reading the extra little spaces between words.

(My favorite run-on name from this year's exhibitor listings is Livestockfilm. I assume they provide stock video images, not photos of cows and sheep.)

Then came dot-com fever: your company was nothing if you didn't have a dot-

the front). Give 'em credit for a good name suggesting ubiquitous information technology. It's as lucent as can be.

MediaTouch, which is itself a run-on name, makes a logger called, natch, iMediaLogger. At NAB, they'll have an ad substitution system called iMediaAdCast.

RCS will show iSelector, a customizable version of a terrestrial radio station, based on the Selector music scheduling system. And the show floor will include companies like iKnowledge, iBeam

Congratulations to our latest winner in the Radio World 25th Anniversary Silver Sweepstakes.

Harold Richards wins two prizes from Symetrix.

The 506E is a comprehensive control center for headphone monitoring, featuring a stereo program input, a mono cue input, discrete direct inputs to each of six outputs and an internal power supply. His prize comes with an HR-1 adjustable headphone remote for use with the Symetrix 506E. Included hardware allows the HR-1 to be



Symetrix 506E

used as a desktop box, mounted into studio console furniture in multiple positions or mounted on a microphone stand. Retail value: \$608.

The winner of this week's prize is the director of biblical counseling for the Bible Broadcasting Network in Charlotte, N.C. In addition to broadcasting, the organization streams in five languages.

We still have more than 20 great broadcast prizes to give away. Have you signed up yet? Go to www.rwonline.com to register.

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World Radio History

Laird

► Continued from page 1

The laboratory test bed is finished. ...

Meanwhile, the issues of the field-testing of the FM system have also been debugged. We're hearing now that issues that have come up with the test vans have been solved. iBiquity has been very open to discuss the difficulties of getting everything running properly in a repeatable manner. ...

The NRSC has two paid observers overseeing the data collection process in the vans. Stan Salek of Hammett and Edison is overseeing the van process in the west, and in the east our observer is Alan Rosner of Denny and Associates. (Note: Tom Keller is the NRSC observer for the lab tests. iBiquity hopes to complete FM field-testing before the NAB2001 show and begin AM immediately after.)

sonnel in the vehicles.)

RW: What are the quality tests?

Laird: The absolute: how high-fi is it? How does it sound unimpaired? What we're able to do is the impairment testing.

RW: What it sounds like when it's hit by interference?

Laird: Exactly, and the compatibility testing now.

RW: Are you also able to do coverage tests now? Some broadcasters have had questions about whether they'd still have the coverage area with digital that they do now.

Laird: Yes, that is also part of the waveform test.

RW: iBiquity predicts its manufacturing partners would have receivers in the marketplace in late 2002 to early 2003.

out distorting it. Headroom — to not destroy the digital waveform — it has to be shot out of the antenna like it was put into the transmitter. In essence, it has to be very linear. Or, you have to understand the non-linearities and be able to correct them and have the corrections be stable.

RW: How can stations handle the inherent delay in iBiquity's system? For instance, an engineer at an AM station recently expressed concern to us about the delay for remotes and other live events. What do you tell him?

Laird: You'll have to have some kind of IFB, a real-time feedback to your remote location. Interruptible foldback. Maybe you make use of an SCA channel on your FM station that is transmitting the program real-time out to your remote site. That's one way of doing it.

But it does bring up an interesting thing: what about a station that does real-time sports? And how are we going to deal with a football game in a stadium where people are listening specifically...

RW: In the stadium listening to a portable radio?

Laird: Yes, and the game is five seconds behind what you see on the field. How do you deal with that? That's just something we are going to face in the broadcast business. ...

I appreciate the fact that they've examined everything and optimized it. The decisions they've made are not arbitrary.

RW: What are you looking for at Journal Broadcast Group as far as planning capi-

Journal Broadcast Group

Journal Broadcast Group is an employee-owned company. It dates to 1927, when its first radio station, WTMJ(AM), signed on in Milwaukee. It employs approximately 900 people at four television and 36 radio stations in 12 states.

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Company principals:

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Jim Prather, President — Television

Ron Kurtis, SVP/CFO

Randy Price, VP — Engineering

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tal expenditures for IBOC?

Laird: Being ready for IBOC is a major component in our planning. All of the facilities we're remodeling, we're addressing the infrastructures to take advantage of IBOC.

For instance, all the new studios are digital: digital boards, digital networking. We are on the path to being able to deliver, in our newer facilities, an all-digital stream. Once we get from analog to digital, like a microphone, we're working

See LAIRD, page 6 ►

'If we have a pipe, there will be people wanting to use it. And pay broadcasters for it.'

RW: When would you have the AM test criteria to iBiquity?

Laird: Our goal would be to have this complete and approved by the NRSC (meeting) at or before the convention.

RW: Was it a surprise to hear it would take iBiquity several months to integrate the PAC compression algorithm into its system?

Laird: No, it's a hardware issue, mostly. The important thing to understand is that it's very possible to test all the waveforms independent of what the compression algorithm is.

In this IBOC system, you can determine how rugged the system is in terms of multipath, interference and compatibility and its effect on the host station and on adjacent stations, because the transmitted waveform is the same. It doesn't matter what compression algorithm is used. ...

The thing that will impact PAC or AAC will be absolute quality and we will spot check to make sure that, in changing the algorithm, there hasn't been a change in some aspect of the system. But if we confirm that nothing has changed, great. If we find a difference, than that part of the test will have to be re-done.

RW: Given all of this, when do you think all of the testing and the evaluation of the material would be completed?

Laird: iBiquity is saying they should have their integration done, and ready to begin quality tests in the fall, probably 4th quarter. We'll begin evaluations when we get data from the Advanced Television Technology Center, an independent organization hired by iBiquity to perform lab and field testing. (Field tests are being conducted using iBiquity vans and employees, with oversight from ATTC and NRSC per-

On the transmission side, some manufacturers are calling their equipment "IBOC-compatible" now, before there's a standard. How is that possible?

Laird: I believe iBiquity has put the transmitted waveform to bed. ... Therefore, receiver manufacturers and transmitter manufacturers know what it's going to take to transmit the waveform, even though it may be a couple of years before they have to.

The same would be true for receiver manufacturers. They have a pretty good idea of what it's going to take to receive the waveform.

RW: How does the waveform affect implementation costs?

Laird: It has an impact on power consumption and cost of the transmitter. The waveform that the final IBOC system creates and the ability of a manufacturer to come up with feed-forward processing to null out distortions of the power amplifier of the transmitter will have a real impact on implementation cost ... (in other words) how easily the waveform transmits ... or how demanding it is on the on the transmitting facility.

RW: One transmitter manufacturer a while back told us his company had figured out what the power increments would be for an FM IBOC transmitter, but not for AM yet, and that the crest factor is critical.

Laird: Power levels will change: say you have a 20 kW transmitter, depending on the crest factor, (which) will determine how that new transmitter has to be designed and how much head room or spare power capacity that transmitter has to have, to be able to transmit it.

You may wind up having a transmitter that puts out an average of 20 kW but it takes a 200 kW transmitter to do it with-

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Laird

► Continued from page 5

toward being able to deliver to an IBOC transmitter, in the digital mode, never going back to analog.

RW: How will you handle combining the analog and digital signals when you begin transmitting IBOC?

Laird: For our transmitter plants, in some cases we have fairly new stations that we've purchased that don't have auxiliary transmitters. Perhaps what we do is we buy an all-digital transmitter for them, then we have the analog transmitter as a backup.



Laird is shown in 1997 in the combined rack room of the former Heritage Media Corp.'s Virginia stations WGH(AM) and WGH(FM) in Newport News and WVCL(FM) in Norfolk. Sinclair acquired the stations in 1998.

Meanwhile, we have some stations that have new analog transmitters that we sized to be able to take the filter loss when we combine digital into (them) with a second transmitter. We've been planning our transmitter plants to have about 15 percent extra oomph on the analog transmitter. ... I believe they're thinking about a 10-percent (power) loss on the FM for the hybrid system.

RW: How long will we be in the transition period, before radio goes all-digital

and stations turn off their analog transmission?

Laird: I have no idea. I think one of the things that drives a faster transition is the success of satellite receivers (for Sirius Satellite Radio and XM Satellite Radio). ... It will be a digital receiver, whether terrestrial or satellite. Once you've optimized a receiver for digital, it might be digital on all bands.

RW: How far away is that?

Laird: The first generation of receivers, of course, will have the problem of compatibility between the two satellite systems. And IBOC is not ready, so it's not designed into these. Hopefully, IBOC

and compatibility between the two satellite companies will be in the second-generation receivers. We're probably looking at 2003 for the second generation of digital receivers. ...

It looks like there's going to be an easy way to deal with the Perceptual Audio Coder for satellite radio and IBOC. Let's say the PAC is built into the radio, adding the decoding front-end may not be that big a problem.

RW: You've been working on IBOC tech-

nology for so long, what would you say to those who believe IBOC technology will be surpassed by other technology, especially in the car?

Laird: No, as a delivery system, it will have applications beyond just getting nice-sounding audio to everybody.

RW: Yes, with devices such as personal digital assistants. But is IBOC happening too late?

Laird: I believe that we're highly bandwidth-restricted. Finding the spectrum to do these things is really hard. If we have a pipe, there will be people wanting to use it. And pay broadcasters for it.

RW: What would you say to those who believe we can already do this with RDS?

Laird: It's way too slow a baud rate. Not fast enough.

RW: IBiquity says it will be up to stations how much of their bandwidth to allocate to programming and how much to data. How would this affect FM subcarriers?

Laird: The NRSC is investigating the impact that implementation of IBOC might have on services like reading services, and they've been attending our meetings.

RW: Some would say the quality of FM subcarrier channels is not great, and anything would be an improvement. Is that fair?

Laird: It's the whole thing about RDS data throughput. It's like, "OK, that's what we've got and we're using it." ...

What we're hoping for is that we don't create more problems for existing SCAs. We don't know what the impact is yet once it goes hybrid. Once it goes all-digital, then there's no such thing as an analog SCA anymore. ...

You can transmit a subcarrier that has a nice, clean space of its own within an FM station. It, like so many other reception issues with FM and AM, is receiver quality-dependent on what it sounds like — how well that receiver can separate the subcarrier from the main channel and from adjacent or second-adjacent interferers.

A lot of these receivers are shockingly poor. ... There's an amazing array of old-design stuff being used today. We're trying to assess the impact on those.

RW: Now that there's one company developing IBOC, how has this affected the test procedures?

Laird: We have been more specific about what we want to see. ...

That was one thing we learned from the first procedure. We learned we needed to define what it is we were really trying to get. We've achieved that, I think, with coordination with our other subgroup, the evaluation working group, chaired by Dr. Don Messer.

RW: When does his group kick into high gear?

Laird: When the reports are delivered from the Advanced Television Technology Center. ... As soon as we get data from ATTC we'll begin the evaluations. The NRSC will weigh in with an opinion, if we can generate one, on the performance of this system to the FCC.

RW: Are you going to have enough data to make a decision? Before, the proponents turned in the data they wanted to, and the NRSC said it wasn't sufficient to reach a conclusion.

Laird: ... We've changed the thrust of our testing to be more subjectively

focused. ... Basically the tests in the past have used systems that were kind of based out of Europe, some standards for how to do subjective measurements.

We're looking at other ways of doing this now that may be more efficient, allow larger samples. ... That doesn't mean we set aside pure lab measurements, but there has to be a substantial subjective component because these systems are designed to mask problems. ... It's important that we have subjective testing that looks at absolute quality

See LAIRD, page 7 ►

Andy Laird

B. S. degree in physics, with math and music minors. Chief engineer or greater responsibility in radio since 1967.

Vice President, Radio Engineering, Journal Broadcast Group, 2001 to 2000

Director of Engineering, Radio, Journal Broadcast Group, 1998 to present

Vice President, Engineering, Radio, Heritage Media Corp., 1988-98

Chief Engineer, KDAY(AM), Los Angeles, 1972-89

Chief Engineer, KLAK(AM-FM), Denver, 1967-72

Staff Engineer, KWGN(TV), Denver, 1966-67

Laird Audio, audio and studio designs for more than 100 radio stations nationwide, 1978 to 1988. Nine turnkey recording studio design/constructs, Los Angeles, 1972-78.

Part owner KKON(AM), KOAS(FM), Kilauea Kona, Hawaii, 1978-81.

Has presented technical papers and spoken to national gatherings including the Audio Engineering Society, National Public Radio, NAB, Country Music Seminar and the SBE.

Co-authored the SBE/National Public Radio Technicians Training Manual.

Volunteer, 1992-97, to the former Electronics Industries Association (now called the Consumer Electronics Association) for the evaluation of digital audio broadcasting.

Volunteer, DTV Grand Alliance, audio test materials sorting group.



Volunteer, 1991 to present, National Radio Systems Committee, a standards committee co-sponsored by NAB and CEA.

Chairperson of the NRSC, Digital Audio Broadcast Subcommittee's Test Guidelines Working Group.

Chairperson of the NRSC, Digital Audio Broadcast Subcommittee's Test Procedures Working Group.

Laird also is a member of the NRSC DAB Subcommittee Evaluation Working Group. It evaluated the test data submitted by the USA Digital Radio and Lucent Digital Radio comparing in-band, on-channel compatible digital systems with current AM and FM quality. This committee will evaluate the results of data collected from laboratory and field-testing of iBiquity, the company created by the merger of USADR with LDR.

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Laird

► Continued from page 6
 along with the system delivered quality under normal world listening conditions. (The NRSC plans to have two listening groups, one comprising "trained" listeners and another group of broadcast industry representatives.)

RW: Will consumers be able to tell the difference between IBOC and analog in the car?

Laird: I've been called a golden ear, and my personal opinion after riding around in proponents' vans, to me, the difference is startling.

First, there's a huge difference in signal-to-noise ratio. I would argue that's the largest flaw in broadcasting today is the interference levels and motion artifacts.

RW: Those will be less noticeable with IBOC?

Laird: Yes, hopefully none. Basically, it will have the dynamic range and interference similar to a CD.

Another effect is we as broadcasters have spent a lot of effort working with audio processing vendors to mask the problems of existing analog broadcasting. In other words, denser audio, trying to keep the music reasonable-sounding but to cover all the flaws that are in the broadcast system.

One of the big effects is the dulling effect of the FM pre-emphasis curve. As you process hard, the end result is either high-end distortion or blur or reduction. That is not an issue with digital. All of a sudden, you can have real bright, high-impact high end in the digital world. The analog processing artifacts will be gone. ...

The preemphasis curve won't be there. That can help in the overall sound.

On the other hand, we're dealing with perceptual audio coders, and they have their own artifacts. We're giving up a series of artifacts in the analog world, for a different set of artifacts in the digital world.

For example, if you listen to some of the Internet players now, you hear echoing. That's an artifact in their digital coder.

RW: What are Journal's technical goals for 2001?

Laird: We're still working on getting our cluster infrastructure together. I've got a lot of studio projects, moving going on, within the company to get all our stations within a market into a clustered facility. That's heavy on my plate this year and next year.

Within those moves and remodels, space-planning and all that, we're upgrading technical facilities. Basically, most of our transmitter sites have been re-done, certainly all of what we consider to be the important stations.

RW: You mean upgraded?

Laird: Yes, antennas examined. Good transmitters, STL, exciter changes ... and our focus now is the studio side. We have plans in place in most of our cities. We're building new facilities in three of them. (Note: the markets are Boise, Knoxville and Wichita).

RW: Did you go with any one particular manufacturer on the transmitters?

Laird: No. In some cases, I was looking for the knowledge base that existed and commonality of maintenance parts.

For example in Boise, Idaho, we have a huge transmitter plant revision. We're

literally redoing four FM stations, three of them co-located on Deer Point. Most of the transmitters we own there are Continental. So it makes sense to me to match that so you can have the same tube in stock and same spare parts in essence.

Yet, we recently bought a Harris solid-state, a 7.5-kW in another market. In some of our other markets, we have exclusively Harris transmitters. In another market, we have a lot of BEs.

RW: How are you handling Journal's digital storage and editing systems?

Laird: We had seven different systems in the company. We now have three: Scott Studio Systems, Computer Concepts and Dalet. ...

Some (of this) was determined by how much engineering personnel we could have. If for instance, in an eight-station

cluster where we have three full-time engineers, I can't have a system that's going to require a lot of maintenance.

RW: How many engineers do you have at each station?

Laird: It varies with the cluster. Our smallest engineering staffs are at our three station (clusters) where we have a chief engineer and we supplement with a contractor of some kind.

RW: And more at the larger stations?

Laird: Yes. For instance, three full-time broadcast engineers and a full-time IT person in Omaha, where we have eight stations.

RW: How do they buy equipment? Do they need to approve it through you?

Laird: We make capital plans. We do not

do group negotiation. We don't put a pile of stuff together and go to one vendor and ask for a deal. We plan each market individually. ... I've been involved in the design and contract negotiation for a building remodel we're doing in Wichita, (a) \$1 million project. But when it comes down to a transmitter, the chief engineer does it.

RW: What are the most important technical decisions your group has to decide in the next five years?

Laird: How to transition to digital. If you're looking at the five-year scope, how should our facilities be laid out to take advantage of the doors that digital is opening up? Right now there is no vendor that has a through-the-facility solution that makes financial sense for the

See LAIRD, page 8 ►

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Laird

► Continued from page 7
medium-market group.

We're seeing inklings like Klotz or Logitek. Or Computer Concepts Epicenter. You kind of see ideas of how an all-digital facility might look. To try to build one today for a medium market is very expensive. So the decisions we have to make right now is where we absolutely have to do something.

In most of our facilities, we're doing hybrid-digital things: maybe a digital console that drops in using both the analog and digital outputs to feed different devices such as the hard-disk system, analog-in at this time, and perhaps digital, to a digital STL or digital processor.

What I mean by expensive is that to just gut a facility to go all-digital is difficult because of cost. So we've put together an evolution plan that will get us there over time.

RW: How did you get into radio?

Laird: Through college. My roommate was president of the college radio station that the student body had voted to build. This was AM carrier current in 1960 at a small college in Illinois, College of the Principia. I started off as a physics major, math minor.

RW: And then it was on to L.A.'s 50 kW KADY(AM)?

Laird: It was an RF snake pit. The antenna didn't work . . . You didn't know if the transmitter would run for two minutes, two hours or two days without a

massive explosion. They had been at the site for four years. They had operated at 10 kilowatts for over two years because of the failures at full power.

The first night, I'm listening to this thing and it sounded like feedback. . . . I asked the transmitter supervisor for a roll of shielded wire. I got a roll of 8454 Belden and I went into the studio and disconnected the output of the audio console and hooked the wire up, ran it down the hall, into the transmitter room, and connected it directly into the input of the limiter. It was like magic.

So for three or four months, there was duct tape on a piece of wire about 150 feet long running from underneath the studio door, down the hall into the transmitter room as we rebuilt and redid the wiring of the radio station to get rid of RF. 📡

NEWSWATCH

► Continued from page 2
the New York Stock Exchange under the symbol "ARB," and existing Ceridian common shares will become Arbitron shares. Stockholders will also receive a dividend of one share of "new" Ceridian Corp. common stock for each of their existing shares.

Ceridian Arbitron Division President Stephen Morris becomes Arbitron's CEO, while Ronald Turner becomes chairman, president and CEO of Ceridian Corp.

License Revocation Hearing Ordered

WASHINGTON The FCC plans to schedule a hearing before an administrative law judge to determine whether licenses held by Family Broadcasting Inc. relating to the operation of stations WSTX(AM) and WSTX(FM), Christiansted, in the U.S. Virgin Islands, should be revoked.

At issue is whether the company operated the stations with unauthorized antennas and at improper power levels, and whether WSTX(FM) was operated from an unauthorized transmitter site. The FCC stated the hearing would also determine whether the company misrepresented facts submitted to the agency about the relocation of the WSTX(FM) transmitter from its authorized site.

The judge will decide whether the company is qualified to remain a licensee at the hearing, which had not been set by February. Family Broadcasting will have the opportunity to appeal any adverse decision.

\$327,000 in Tower Fines Proposed by FCC

WASHINGTON The FCC's Enforcement Bureau has proposed fines totaling \$327,000 for antenna violations. Of the four firms facing fines, American Tower Corp. was cited for 36 separate violations, totaling \$212,000 in penalties. ATC manufactures a variety of antenna towers, including broadcast products.

FCC Enforcement Bureau Chief David Solomon said the commission doubled the penalty against ATC because of the number of cited violations that could impose a threat to air safety. The Enforcement Bureau also intends to conduct an additional and more thorough investigation of ATC's tower compliance, beyond the several-month probe that resulted in the fines proposed in January.

Some of the violations were failure to let the FCC know of tower ownership changes, failure to register antenna towers with the commission and improper lighting.

ATC had not yet responded to the NAL by mid-February, the FCC stated.

The other tower companies notified of the proposed fines were Telecorp Communications, AT&T Wireless Services and SpectraSite Corp.

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NAB2001: Something for Everyone

Sharon Rae Pettigrew

- IBOC concerns? Check.
- Streaming questions? Check.
- Networking opportunities? Check.
- Management tactics? Check.
- Regulatory issues? Check.

Whether you're an engineer, supplier, manager, jock or student, the workshops, sessions and keynotes at the upcoming NAB2001 convention in Las Vegas April 21-26 probably include something of interest.

This special 60-page section of Radio World will help you survive and thrive at the

Management, Broadcast Engineering, Business Law and Regulation, RAB Sales and Marketing, and Satellite and Telecommunications.

"We think of this as the greatest technology show on earth," said Dennis Wharton, NAB senior vice president of corporate communications.

Super Sessions

"We're going to have several Super Sessions dealing with a variety of technical issues," said John Marino, NAB vice president of science and technology.

Chairman John Sidmore will present the opening keynote.

Another Super Session is called "Interactive Lifestyles — Personalizing the Net" to be held from 2 to 6 p.m., also on April 24 in The Venetian.

"We're going to be talking a little about personalizing the Internet," said Marino. "We'll have some research delivered on how consumers interact with the Internet and what they traditionally would be looking for on the Net."

Marino said session organizers would like to tie in what broadcasters envision the Internet becoming for them.

"Will it be a revenue-generating platform?" he asked. "By coupling this consumer research with what we know about broadcasting, we hope to generate some ideas on how broadcasters can generate revenue from the Internet."

Creating new revenue streams is not the only opportunity allowed by the Internet, according to Wharton.

"The Internet is changing the way many companies do business," he said. "It also offers a lot of opportunities for enhancing service to listeners."

Other Super Sessions include "Communications and the Net in the New Economy: Who Will Tie It All Together" and "Media on the Net — From Small Streams to a Sea of Revenue?" at which Lou Dobbs, chair and CEO of Space.com will deliver the keynote and Peggy Miles, president, Intervox Communications, will serve as a sub-session moderator.

On the floor

Upwards of 115,000 people are expected at this year's show. More than 27,000 of those attendees are from abroad.

Booth space has increased — according to Wharton, approximately 1,600 vendors

See OVERVIEW, page 12 ▶

Computer Session Aimed at Engineers

Randy J. Stine

Logical segmentation. Ethernet. Network topologies. Latency.

These are a few of the topics experts will discuss during the NAB/Ennes "Broadcast Networking Workshop: Putting the Pieces Together" on Saturday, April 21, at the Las Vegas



Moderator Richard Farquhar

Convention Center. The six-hour session is part of the Broadcast Engineering Conference at NAB2001. The conference is co-produced by NAB and SBE.

Computer networking technologies have made it necessary for broadcast engineers to broaden their professional skills. Engineers today are expected to understand things like system standards and media-based network platforms.

See NETWORKING, page 12 ▶



Las Vegas Skyline

show. Stories in this section include previews of radio engineering and management sessions; a look at other conferences of interest; a dozen or so stories about new products at the show; and listings of exhibit booths.

Here's a peek at the show's major events and themes.

Issues from the transition to digital and broadband to programming and satellite radio will be discussed during the event.

Conference tracks include Radio

"One of those issues is broadband technologies and how they might affect traditional radio broadcasting."

According to Marino, some of the new or pending wireless technologies might eventually be useful to broadcasters as another platform for delivering broadcasts.

The Super Session "Broadband — The Dawning of a New Era in Communications" is scheduled for April 24 from 9 a.m. to noon in The Venetian. WorldCom Vice



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Networking

► Continued from page 10

Moderated by Richard Farquhar, vice president of RAF Associates Inc., the tutorial will focus on information technology, network installation, network hardware support, hardware requirements and connectivity.

"A lot is asked of engineers now. The point of the Ennes workshop is to provide current technology information to broadcast engineers so that they can go back to their facility with the ability to fluently discuss networking issues," Farquhar said.

"The profession has to embrace the technological advances to make the most of the opportunities."

A quick scan of help-wanted ads in publications like RW shows the need for broadcast engineers to master this evolving technology. Today, ads for openings with major broadcasters may ask for broadcast engineers experienced in networks, client server architecture and network protocols.

Connectivity

Farquhar said the broadcast industry has reached the point where everything has to be tied together. The challenge becomes interfacing information technology with the traditional audio and video platform.

"You have to understand how different systems communicate. It's all about transfer. Business and media systems have to understand the same protocol that allows for that communication," he said.

Networking protocol refers to a set of rules that govern communications. One of the biggest challenges with media-based networks is conversion, Farquhar said.

Engineers will learn about two basic categories of networks: Local-Area and Wide-Area Networks, or LANs and WANs. A subset is computer network types, like Ethernet, ARCnet and Token Ring, said presenter Terry Baun, president of Criterion Broadcast Services and certification committee chair for the Society of Broadcast Engineers.

Ethernet, Token Ring and the Linux-based ARCnet are local-area technologies. WANs are simply interconnected local networks, Baun said.

Baun said the SBE has discovered that most traditional broadcast engineers need further training on information technology.

"That's simply because engineers were not trained in that specialty. It has become absolutely essential that they have some familiarity with basic networking issues."

"Engineers should be in the loop on the decision-making process along with a MIS

person when it comes to networking. Then they should be able to do some maintenance and troubleshooting after it's installed," Baun said.

The session's focus will be on network hardware, Baun said, beginning with the basics. "We start out with the OSI (Open Systems Interconnection) network model and the different layers involved in building a network," he said.

OSI consists of seven layers across which data must travel to get from one computer to another computer. The layers are split into two sets: the Application set and the Transport set.

Common computer network components like hubs, switches and bridges will be covered, Baun said. "We talk about cabling, connectors and doing a proper install. Things like coax, Cat-5 twisted pair and fiber optics."

Issues specific to media-based systems will be addressed, Baun said. "Things like sizing your UPS, grounding and surge suppression, and the advantages and disadvantages of the various kinds."

Also to be explained: Audio Engineering Society/European Broadcast Union digital audio standard protocol. AES/EBU is the most common method for transmitting digital audio around a broadcast plant, Baun said.

Baun said the reliance of the broadcast industry on computers means engineers must learn about redundancy and how to back up systems when hard drives fail.

"With media platforms it's so critical to have the support there because we have become so dependent on the PC to run the radio or television station. A computer crash or a network going down is no longer an option," he said.

The broadcast engineering profession has gone through "basic break points" before, Baun said. This is when engineers need to develop new skills.

"For example, from tubes to transistors and from analog logic to integrated circuits and digital logic. This move into information technology is really no different. Engineers move ahead and learn," he said.

The intent of the workshop is not to replace Novell- or Microsoft-specific courses, Farquhar said, but to put engineers in a position to learn basic network hardware issues "so that engineers can discuss network projects and serve as a resource to station management."

Anyone attending the workshop can take the SBE Certified Broadcast Networking Technologist (CBNT) exam upon the completion of the workshop. Contact SBE to register for the examination. ●

Overview

► Continued from page 10

will be on the floor, compared to about 1,500 at last year's NAB. Booths and demonstrations will be spread out over 1 million-plus square feet of exhibit space.

"We have seven different exhibit areas this year," said Wharton. "Satellite and telecom companies; TV, video and film vendors; the Internet streaming exhibit area; MultiMedia World, made up of 145 exhibitors; E-Topia — these are new-to-market companies and comprise all segments of exhibiting companies, but these (E-Topia) are some of the new ones; the radio/audio exhibit area; and the final area is called Mobile Media, made up of companies that specialize in antennas and vehicle production systems."

Technical trends, including the latest IBOC DAB developments, will be discussed at several conference sessions.

"We're trying to educate radio broadcasters, particularly engineers, on what they have to do to implement this technology if, in fact, it rolls out over the next few years," said Marino.

With engineering jobs dwindling, does the number of engineering attendees drop as well?

According to Jeff Littlejohn, vice president of engineering services for supergroup Clear Channel Radio Inc., more of the company's engineers will attend.

"We'll have about 80 engineers at this show," said Littlejohn. "While that's more than last year, you have to take into account that our company is a little larger than last year as well."

Widget gadget

Littlejohn favors hitting the floor and seeing new products.

"While I like to see what new stuff the established vendors have out there, I also like to go to the booths that nobody has ever heard of. Some company that makes some widget gadget that makes your life a little easier."

The Radio Opening Reception is set for April 22 from 4 to 5:30 p.m. at the Las Vegas Convention Center. This is a good time to connect with colleagues to set appointment dates.

NAB President and CEO Eddie Fritts will deliver a State of the Industry address at the "All Industry Opening" on April 23 from 9 to 10:30 a.m. Jack Valenti, chair

and CEO of the Motion Picture Association of America, will deliver the opening keynote address.

The MultiMedia World Keynote will be held April 23 from 5 to 6 p.m. at The Venetian featuring Yahoo! President and COO Jeffrey Mallett.

The FCC Chairman's Breakfast, always a large draw, is set for April 24 from 7:30 to 8:45 a.m. at the Las Vegas Hilton. Wake up to remarks from new FCC Chair Michael Powell as he lays out his agenda. His legacy of pro-deregulation could mean changes for our industry.

The Radio Luncheon slated for April 24 from 12:15 to 1:45 p.m. at the Las Vegas Hilton Barron Room offers broadcasters a look at some radio greats, such as Bruce "Cousin Brucie" Morrow, Mort Crim and the 10 winners of the NAB Crystal Radio Awards, honoring an exemplary commitment to community service.

Morrow, the legendary WCBS(FM) talent, will be inducted into the NAB Broadcasting Hall of Fame. Crim, chair and CEO of Mort Crim Communications and creator of radio's "Second Thoughts" daily motivational series, is slated as the keynote speaker at the luncheon.

Vinton Cerf, better known as the "father of the Internet," will keynote the Technology Luncheon on April 25 from noon to 1:45 p.m. at the Las Vegas Hilton Barron Room. Cerf will offer a look into the future of technology. The NAB2001 Engineering Achievement Awards for Radio and Television will be presented during the luncheon. Belar Electronics Laboratory President Arno Meyer will pick up the honor for radio.

Managers and recruiters will be on hand at the NAB-BEA Broadcast Career Fair on April 22 from noon to 5 p.m. At press time, the LVCC room number had yet to be announced.

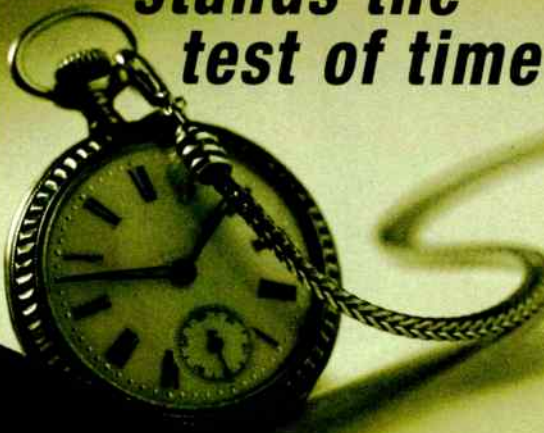
Beyond the official agenda, many organizations hold their own events in Las Vegas to coincide with the convention.

For instance, the National Association of Gay & Lesbian Broadcasters will hold its annual dinner at an area restaurant on April 24 at 6:30 p.m. The price is \$20 and will be collected at the door. For information, send e-mail to UtahDude@writeme.com

If you would like to include your own event in our pre-show coverage of upcoming conventions, send e-mail to radioworld@imaspub.com ●

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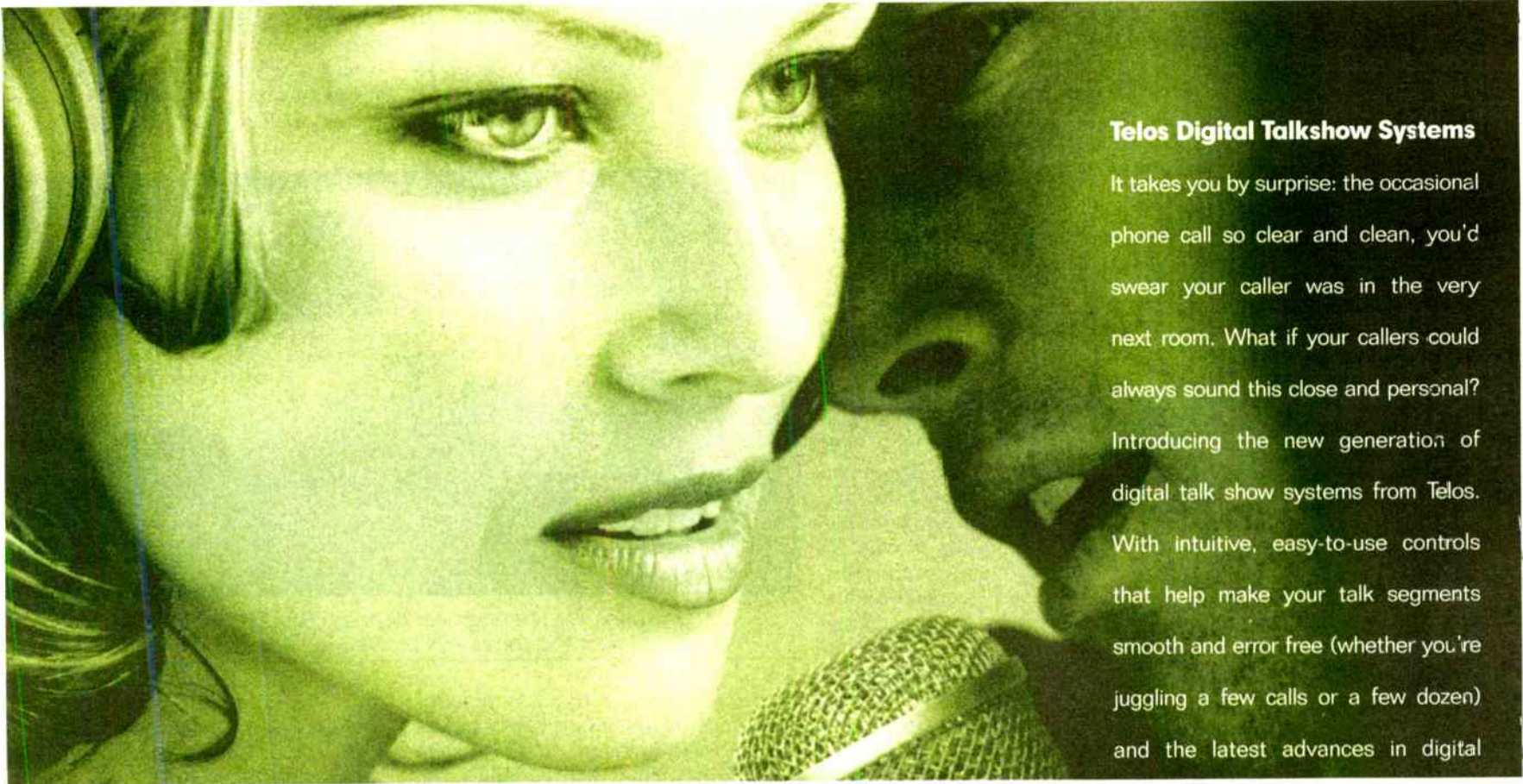
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DAB Here, Elsewhere at NAB2001

Leslie Stimson

What a difference a year makes.

Last year at the NAB show, there were still two companies developing in-band, on-channel digital audio broadcasting. Now, there's one, iBiquity Digital Corp., which says it has combined "the best of the best" of the systems from the former USA Digital Radio and Lucent Digital Radio.

**iBiquity hopes
'a ton' of IBOC
stations will be
on the air in 2002.**

At this show next year, iBiquity expects some stations in the major markets to be transmitting both analog and IBOC signals.

"We fully expect to have a ton of stations on the air in 2002 and all the major manufacturers to be selling IBOC transmitter equipment at NAB2002," said iBiquity President and CEO Robert Struble.

Several things need to happen before this can be accomplished regarding testing for a standards-setting process and eventual commercialization.

iBiquity has development agreements in place with RF, receiver and chip manufacturers and is now trying to secure manufacturing deals.

The IBOC development company has been focused on field-testing its FM system. Its vans are being used by the Advanced Television Technology Center, which is conducting the tests under the auspices of the standards-setting body, the National Radio Systems Committee. iBiquity hoped to have its FM field tests completed by this show and begin the AM field tests immediately after.

Although iBiquity has "put the waveform to bed" as one engineer described it, both iBiquity and the initial companies involved developing equipment have a good idea of what it will take to transmit and receive the IBOC waveform, the Perceptual Audio Coder has not yet been integrated into the system. iBiquity hopes to integrate PAC by the fourth quarter of this year. Currently it's using the former USADR's AAC as the audio codec.

Still, many of the tests the NRSC wants conducted to determine if IBOC performs significantly better than analog can be conducted in the meantime, said NRSC DAB Subcommittee

Chairman Milford Smith.

"There's a large number of tests, probably the majority, that are not codec-dependent," said Smith. "Tests having to do with ultimate audio quality are codec dependent. ... There will be a subset (of tests) that will have to be re-done with the new coder."



Photo by Leslie Stimson

iBiquity test engineer Kenneth Brockel stands with the company's Las Vegas field test van.

iBiquity plans a live AM demonstration of its system on KSFN in Las Vegas. It will broadcast its FM system on KWNR. Demos will be held in its booth and those of several vendor partners.

Several DAB panels are planned for

the show, including an all-day seminar on Sunday as part of the Broadcast Engineering Conference. This year, more sessions are devoted to the ways different countries are implementing DAB technologies.

"The NAB2001 DAB sessions will provide a unique opportunity for broadcasters to ask questions regarding the benefits of DAB, the sluggish rollout in many countries, implementation costs, availability of low-cost

receivers, and regulatory issues surrounding this new technology," said John Marino, vice president, NAB Science and Technology.

NPR also plans to hold two days of DAB sessions for its members just before NAB2001 (see page 23).

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Radio World At NAB2001

You'll have a chance to hear from and talk to some of your favorite Radio World contributors during NAB2001.

Editor Paul McLane brings his popular engineering round-table format to the spring show on Sunday, April 22, at 9:30 a.m., with a 90-minute, free-form discussion of technical issues that face radio engineers today, including DAB, big buildouts, satellite radio and the job crisis.



Paul McLane

The power panel features Al Kenyon, vice president of projects and technology for Clear Channel Radio; Tony Masiello, vice president of operations at XM Satellite Radio; Tom McGinley, director of engineering for Infinity Broadcasting's Seattle stations and technical consultant to RW; Margaret Bryant, director of engineering and technical operations for ABC Radio Networks; and Frank McCoy, vice president of engineering for American Media Services.

It's part of the Broadcast Engineering Conference.

On Sunday at 2:15 p.m., Paul McLane will take part in the panel "Radio Streams Into the Future," part of the Broadcast Education Association Conference in the Las Vegas Hilton.

The "Radio Engineering Professionals Forum" on Monday afternoon, April 23, features several RW contributors, including W.C. "Cris" Alexander, who writes our *Feed*



John Bisset

Line feature; Steve Lampen, author of *Wired for Sound*; and Mario Hieb. RW's Tom McGinley moderates this Broadcast Engineering Conference panel. Details in the article at right.

On the morning of Tuesday, April 24, learn about "The FCC Enforcement Bureau: What's Going on With Broadcaster Liability?" Lawyer Barry Umansky of Vorys Sater Seymour & Pease LLP, who writes RW's *Broadcast Law Review* column, appears. It's part of the Business, Law & Regulation Conference.

Later on Tuesday, the RAB Sales and Marketing Conference features "Radio & The Internet: What Do We Do Now?" with Dave Casper and Mike Mahone, who write the new *Web Wins* column in our *GM Journal* section.

And the ever-popular John Bisset of *Workbench* fame holds forth on transmitter tips and strategies with his "Radio Transmitters: A Practical Workshop" on the morning of Thursday, April 26.

Forum Is Engineering Smorgasbord

Ted Nahil

"DSP is not voodoo. We merely need to learn how to use the new design tools and begin experimenting."

The words are those of Michael Gay, engineering services manager at the Division of Instructional Services at Purdue University.

Gay is just one of the speakers and Digital Signal Processing is just one of the technical topics during the "Radio Engineering Professionals Forum," Monday afternoon at NAB2001, part of the Broadcast Engineering Conference.

Moderator Tom McGinley, the director of engineering for Infinity Seattle and technical adviser to RW, said this year's session offers "a smorgasbord of pertinent goodies to pick from."

DSP tips

A common theme to the session this year is digital signal processing and its impact on today's broadcaster.

As our technology focus moves from hardware-based implementations to software-based implementations, engineers will need to adapt to the changes these new approaches bring to radio broadcasting.

Topics include DSP, shared tower sites and new RF coax designs.

Digital transmission of audio and data will require broadcast engineers to understand concepts previously left to our network and telecommunications colleagues.

Knowledge of the principles of T1, ISDN and DSL transmission systems will help engineers make more intelligent and efficient decisions when it comes to consolidation of facilities, dealing with reduced- or no-RF STL spectrum availability and ensuring that facilities have access to, and can take advantage of, everything the Internet offers to today's broadcast operation.

Steve Church, president of Telos Systems, will address these transmission issues and discuss how they apply to today's broadcast facilities.

DSP is becoming more prevalent. As analog audio takes a back seat to digital audio in stations, engineers must learn how to test and troubleshoot an entirely new set of problems.

Thomas Lund, TC Electronic A/S, Denmark, and Michael Patton, Michael Patton & Associates, will address issues associated with maintaining the quality of and troubleshooting digital audio.

Frank Foti, president, Cutting Edge Technologies, will discuss the migration from hardware to software-based digital processors. Engineers have new

options when it comes to updating their production and program audio-processor equipment.

According to Foti, much of today's audio processing takes place inside a computer.



Cris Alexander



Mario Hieb



Steve Lampen



Tom McGinley

"The personal computer...can provide us with the required machine cycles of power to accomplish many of the tasks we ask DSP chips to perform," Foti said.

As noted above, Michael Gay at Purdue University maintains that understanding the principles of DSP chips isn't that difficult. Development boards can provide the tools with which today's chief can learn how these devices operate.

Wide menu

New solutions for conventional problems will be highlighted in papers presented by Mario Hieb and W.C. Alexander.

Hieb, RF coordinator for the Salt Lake Organizing Committee for the 2002 Olympic Winter Games, will present a new design for a digital AM phasor.

This patent-pending design uses virtual power dividers and digital RF envelope delay to produce a directional AM pattern. The circuitry is controlled by a phasor control unit, which will monitor and control power and phase ratios and calculate a virtual common point current.

Alexander, director of engineering for Crawford Broadcasting and a columnist for Radio World, will discuss issues relevant to sharing directional and non-directional antenna sites between two or more AM stations.

"With land in and around urbanized areas becoming more and more valuable, AM broadcasters often have a difficult time locating and holding on to parcels of land large enough to support their tower and ground systems," Alexander said.

Presentation topics include new RF coax designs, presented by Steve Lampen, technology specialist for Belden Electronics and a Radio World contributor; and adapting a shortwave transmitter for digital broadcasting, presented by John Keeley, principal engineer, RF systems Merlin Communications International.

These papers will show approaches that are being used to improve existing equipment and facilities as the digital issues in RF transmission systems begin to come to the surface.

Alan Rebeck, director of engineering, R.O. Associates, will address an issue that will remain important at every facility, digital or not — telecommunications grounding practices.

Rebeck will discuss the concepts of single-point grounding systems and the applications of isolated, ring and halo grounding.

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Audio & Video Testers

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Linux, MP3 Among Digital Topics

Alan R. Peterson

The latest innovations in digital audio technology are the target of the session "Audio Asset Management and Storage," Monday morning, April 23, at NAB2001. It will highlight case studies involving audio archiving and retrieval in the broadcast environment.

Radio Free Asia

In the first part of the session, "Archive Audio Using Linux and MP3," Tom Hallewell and Andrew Janitscheck of Radio Free Asia in Washington, will describe how RFA

uses three Linux servers to archive multilingual audio for its facility, cap-

encoders. Janitscheck, manager of production

The session also looks at MPR's efforts to create an infrastructure to handle the storage, retrieval and definition of archived digital audio.

turing MP3 feeds directly from a rack of Telos Systems' Audioactive support for RFA, and Hallewell, manager of RFA networked information

systems, will explain the basics of MP3 and Linux, and how they are applied at RFA.

"We have three Linux servers," said Janitscheck. "One server stores MP3 files at 16 kb/16 kHz, or about 6.8 MB per hour. This allows us to burn an entire month of Cantonese programming onto one CD-R."

Another server captures higher-quality audio for rebroadcast if necessary, while the third unit tracks a reduced-bandwidth Internet feed at 14 kb/12 kHz compression. Besides the robust nature of Linux, Janitscheck observed another attractive aspect of the operating system: "It's cheap, and in some cases, it's free."

Shared language

Then Alan Baker, broadcast systems analyst for Minnesota Public Radio, presents "Digital Archiving: A Road Map for Content Producers."

Baker will discuss efforts at MPR to create an infrastructure to handle the storage, retrieval and definition of archived digital audio — an effort that may have a positive effect in both non-profit and commercial radio circles.

"We would like to foster a shared language, so we are all talking the same," said Baker.

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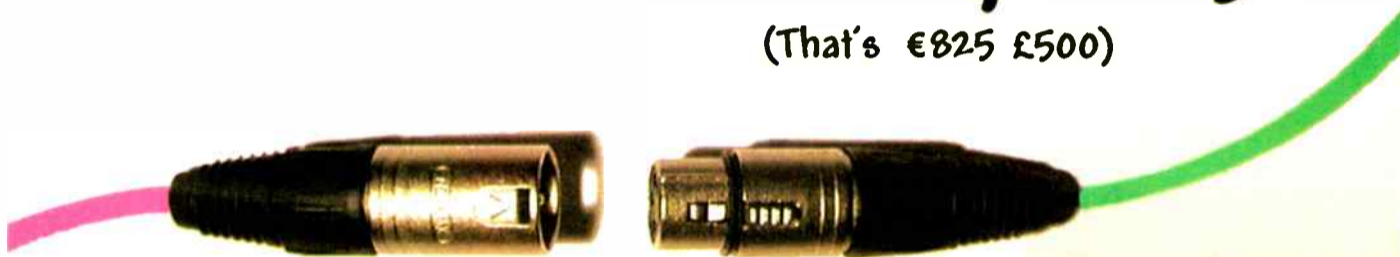
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We want to turn the spoken word into something as valuable and searchable as text.

— Michael Miller

The efforts taken by MPR have been revised several times over the past few years, owing to new developments in hardware and software. "Our functional specification has been updated at least five times," said Baker.

After Baker, the topic turns to "Phonetic Searching of Digital Audio," presented by Michael Miller, senior VP of business development for Fast-Talk Communications in Atlanta.

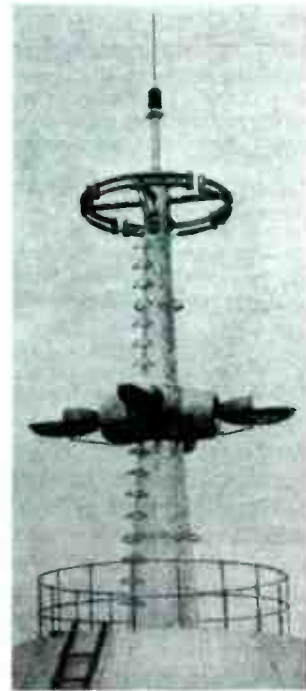
Miller's company has developed a combined system, process and product that can search digital audio files for certain keywords or phrases by spoken word. Should the need arise to recover all archived digital audio material containing the name "Bill Clinton," a producer need only speak the phrase into a computer. All pertinent audio files containing the phrase are accessed and retrieved.

"We want to turn the spoken word into something as valuable and searchable as text," said Miller. "Our system preprocesses stored speech, creating a 'search track,' which allows us to scan up to 10 hours of audio in only one second."

Earlier search efforts were done with speech-to-text converters similar to commercial products used in personal computers. This new breed of phonetic searching actively seeks the audio itself within a file.

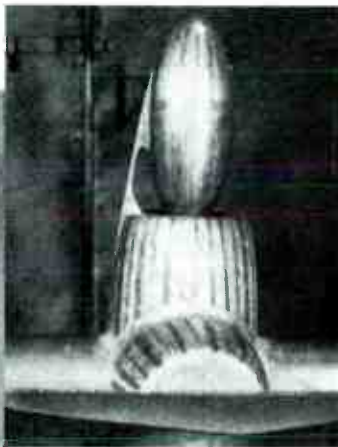
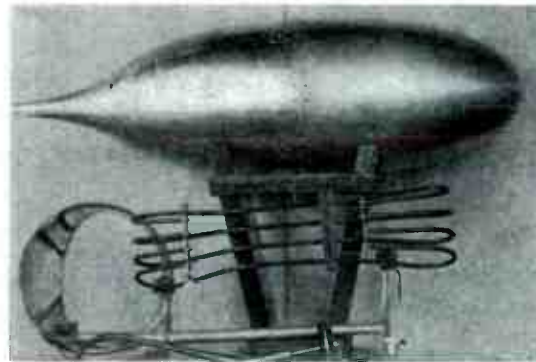
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A Newsletter from Electronics Research, Inc.

Spring 2001

Your Single Source Advantage for News at ERI

Welcome to the premiere issue of *The Source*, a publication with new ideas and new products from Electronics Research, Inc. As a leading manufacturer of high-performance antennas, combiner systems and towers, we're always working on ways to improve our innovative product line and help our customers optimize their broadcast operations. With this newsletter, we hope to keep our current customers informed of new developments at ERI, and show those of you who are not customers why you might want to give us a look. We'd appreciate any feedback on this new publication, so please email us with any comments or suggestions at TheSource@ERInc.com



FM wireless technology for civilian use and constructed a transmitter, tower and antenna for one of the earliest experimental FM stations, W9XEV in Glenwood, Indiana. Over the next five decades, ERI continued to lead the FM wireless development with innovative product designs and meticulous fabrication processes.

In 1978, Tom Silliman (who is now the company president) received a patent for his design of the FM RotoTiller circularly polarized sidemount antenna. Those of you who have been in the industry for a while will remember that the RotoTiller was truly revolutionary. Today it is used by nearly half of all commercial FM radio stations in the United States.

Last year, ERI developed one of the first digital radio combiners that was successfully used in experimental field tests of simulcast transmission of In-Band On-Channel (IBOC) digital radio signals with existing analog transmission.

Although ERI is known for innovative antenna products, our staff of electrical, mechanical and civil engineers also provide total turn-key solutions including Lambda mounting systems, towers, filters, combiners, lightning protection and grounding systems. Our mechanical engineering staff can also provide structural analysis and reinforcing for existing towers. At ERI, we truly believe that we can be your Single Source Advantage for all your Antenna and Tower needs.



INSIDE:

- Trivia
- Product Spotlight
- Technical Features

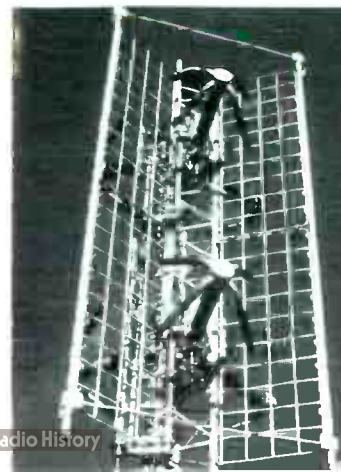


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If you're considering mounting additional antennas to your existing tower, a structural engineering analysis is an essential first step in optimizing available tower space. ERI's Structural Division can perform a complete structural analysis and recommend reinforcing if needed.



ERI'S STRUCTURAL ANALYSIS

1. Review original tower plans and foundation design.
 - Determine tower geometry through field inspection, photography and measurements.
 - Determine type, size and condition of members and foundations
 - Identify elevation and orientation of existing appurtenances.
2. Communicate with tower owners to avoid delays caused by off-air or reduced power requirements.
3. Determine environmental data required for site location and minimum design values as indicated by owners and regulators.
4. Perform calculations with state-of-the-art analytical software, including ERI's own tower analysis program, **ERITower**. Download a free trial version of the program that is becoming the industry standard at www.e-conceptsinc.com/page2.html.
5. Evaluate results with a licensed professional engineer.
6. Make recommendations based on cost and feasibility projections.
7. Finish by performing the necessary tower modifications with the assistance of ERI's Structural Division and Installation Company.

ERI FM Master Antenna Systems

ERI is proud of the extraordinary success our Master Antenna concept has achieved over the years. We perfected and manufactured one of the first Master Antennas, starting what one broadcast historian called "an expansive new era in broadcasting." Other manufacturers have entered the master antenna field, but ERI's experience and technical know-how have proven to be invaluable to our customers.

In today's changing broadcast market, optimal use of tower space is critical. ERI designs structures for its FM antennas that will accommodate a top-



ERI Test Range

mounted DTV antenna, with additional space for the necessary coax feed line. And ERI's engineers can optimize pattern, input match, and structure size/wind loading with any antenna structure. For multi-station combining, our constant impedance combiner systems are the best in the industry.

Product Spotlight



ERI RotoTiller Sidemount Antennas

ERI enhanced its reputation as a leader in FM antenna development with the introduction of the RotoTiller. The RotoTiller Sidemount Antenna Systems from ERI combine the exceptional engineering of an internally fed, fully pressurized system with totally welded feed connections and rugged brass construction. Our unique configuration and the large diameter of the radiating elements contribute to the excellent impedance bandwidth while inhibiting corona discharge. When used with a filter/combiner system, ERI's RotoTiller Sidemount Antennas can accommodate multiple station broadcasting. And by combining the ERI RotoTiller with an ERI Lambda Mounting structure, Pattern Measurement service and Installation service, you'll be assured of antenna/tower interaction that will meet your highest performance expectations.



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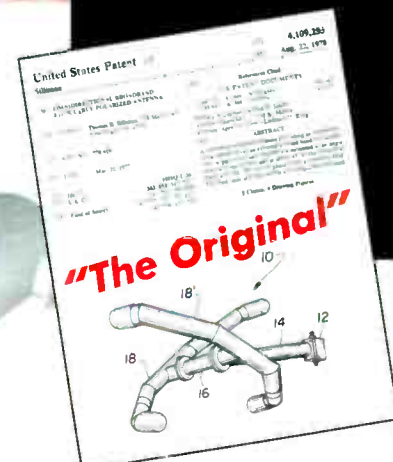
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Streaming for Broadcast Engineers

Peter King

The days of scratchy audio and fuzzy video are long gone from the Internet: this is a new age of synergy between broadcast, print and the Web, as reflected by the NAB's sessions on streaming on Tuesday, April 24. What sets this series of presentations apart from others is that they are targeted to radio and TV technical folks.

"Streaming Media for Broadcast Engineers" is part of the Broadcast Engineering Conference. You can look forward to hearing about everything from bandwidth to budgets, compression to cross-channel management, wide-area video browsing to the convergence of traditional and virtual broadcast technology. Barry Thomas, director of engineering for Comedy World Inc., will moderate the all-day event.

Distribute to many

Management of multimedia content will be addressed in the session "Cross-Channel Content Management" with Robin Wang, director of marketing for Dalet Digital Media Systems, on Tuesday morning.

"It's a notion of being able to acquire and produce a whole variety of content once, and then fine-tune it for a variety of different media," he said. "Produce once, broadcast or distribute many."

An example, he said, is taking a concert audio feed and storing it in a digital system. As the concert is recorded, editors and producers begin editing out breaks and focusing on the most relevant parts of the program. The final pieces are saved and the next day, a radio station can broadcast the concert.

Dalke said he's 'absolutely convinced' that there will be a major migration of radio to the Internet, and that it will be led by talk shows.

"At the same time, they can take it and stream it on the Internet, perhaps including pictures or video of the show, the stage, the audience, whatever."

The program also might be sold or indicated through the Internet.

"Affiliates could log in with a password, preview whatever concerts they have and download what they want, incorporating it into their own programming, along with the pictures and other content."

Wang says it's not just about the Internet anymore:

"There will be new devices to receive content. The beauty is that with a properly designed content-management system, you'll have broadcast engines that'll allow you to add other media relatively quickly as they come up, whether it be an MP3 player or a new phone that allows the consumer to

receive content. You can get content out there faster."

As technology improves, Wang said, content management will be more reliable and more cost-effective.

The toughest challenge? Fitting a

acknowledges it could be a while before it's financially viable.

One company failed in part, he said, because listeners had to sign on and subject themselves to being spammed with unwanted mail and other sollicita-



KIISFMi is an example of radio's online ventures, mixing established broadcast brands with new media.

content-management system into an existing environment.

"It's very risky for any company to ditch what they have and start with a brand new system," he said. "That's crazy. There are many things that are intertwined."

Wang feels customers should start small, perhaps with Web streaming, then adding Web publishing, building up a system over time rather than diving in headfirst.

Some of that content might consist

of talk programming, perhaps the original interactive medium. Jim Dalke, a media technology consultant for Salem Communications/Inspiration Media Inc., will address "The Web-Enabled Talk Show" Tuesday afternoon.

Dalke said he's "absolutely convinced" that there will be a major migration of radio to the Internet, and that it will be led by talk shows, "because they're most suited for the Net." He said many talk shows are streamed on the Web already, attracting listeners and callers from far beyond their normal coverage areas.

"Australia is now next door, instead of halfway around the world," he said. "I think we're just on the edge of streaming really taking off."

He expects to see more talk programming on the Internet, although he

tions.

Dalke says it's not just about talk: more programs are using listener e-mail as a tool. He expects to see more stations using streaming video and other visuals to enhance their sites. He cites Don Imus as a prime example, with his Westwood One radio program simulcast on MSNBC cable. Why not on the Web too?

Dalke wants to see more talk programming use chat rooms and Web phone technology to encourage participation. Sometimes, he said, the best use of a Web site can be as simple as providing a link to a guest's site, or in the case of an author, for example, to an online bookseller for those interested in buying the book.

Broadband will help in the coming years, but the worst thing, Dalke feels, is having a cheesy-looking site that doesn't give surfers a reason to come back.

Spending too much?

Once you're all fired up to get that Web site going, the general manager's question will be, "What will it cost?"

"How to Create a Popular Streaming Media Site on a Budget" will be presented by Sandi Woodruff, president of Hit Comedy Inc., on Tuesday afternoon. Woodruff said you can create a great site without going broke if you spend money on the right things.

"A lot of broadcasters have been sucked into spending a ton of money on the looks of a Web site: people are spending way too much money on the visual effects," he said. "There are way too many sites that look nice, but are really all flash and no substance."

"Once you get there and look at the funny cartoon, there's nothing there to hear and it hasn't been updated in weeks. There should be something new there every day or several times a day, in some cases. Some sites are



Moderator Barry Thomas

really dull, and once you've seen that show, there's no reason to go back again and again."

Woodruff also said people are spending too much money on bandwidth.

"I'm totally amazed that some companies are getting \$1,000 or \$2,000 per megabit of monthly throughput. You just don't have to pay that kind of money."

He said you can spend as little as \$250 for the same kind of service if you shop around carefully.

Woodruff acknowledges that in six years of Web design, he hasn't had any "beauty-contest winners," but, he said with a laugh, "We've created a lot of standards for Web sites. People are ripping us off all the time!"

Three-click rule

For example, "Yahoo takes credit for it, but we created the three-step or three-click rule — when you get to the site, everything should be a maximum of three clicks away. If it isn't, you've failed as a designer, because people aren't going to be able to find what they need."

His basic rule: keep it simple.

Woodruff said a streaming site doesn't necessarily mean "simulcasting" your on-air signal: news-talk stations, for instance, could stream their newscasts or other information features on their Web sites, even if they don't want to stream the entire day's programming. These could be bits from a morning show, promos and of course, features that could be sold with built-in commercials.

"A great way to showcase stuff that people are paying to put on the air in the first place. But you have to give them value instead of giving the spots away."

Other topics to be discussed during the Tuesday session: "Delivering the Promise: Wavelet Compression, Broadcast, IP and Digital Television," "Developing the Full Potential of MPEG-4 Broadcast Systems," and "The Convergence of Traditional and Virtual Broadcast Technology," featuring David Baden and William Eldridge of Radio Free Asia.

Also: "Streaming Media and Webcasting," "Eight Steps to Optimum Live Streaming Media," "Extreme Netcasting: Convergence without Compromise," "Optimizing Content for Streaming" with Dave Harris of Furman Sound, "Digital Content in the Broadband Revolution," and "Wide-Area Video Browsing." ●

Radio Is Tougher and Prettier Now

Laura Dely

From the dot-com drop-off to the slowing economy and the slide in consumer confidence, many uncertainties face radio.

Times certainly have been good in recent years, from the business perspective. But there are questions about the future of the Internet and radio — will the Net be a threat or an integral part of radio business? Is it even possible to ever make money online if each listener costs you more money?

As we prepare to pack our bags and load our laptops for travel in preparation for the big show — NAB2001 in Las

Vegas — RW asked three respected industry analysts and the Radio Advertising Bureau's president for their views on the state of the industry.

Overall economy

Mark Fratrik is vice president of BIA Financial Network and a former vice president and economist at the NAB. He also will take part in "The Future of Radio: Technology, Regulation and Your Business" panel on Tuesday, April 24 in the Las Vegas Convention Center.

He said radio is well-positioned to roll with a downturn in the economy.

"Since consolidation, radio has strengthened its position. The groups that

are buying radio are running it in a better fashion than before. They have generated tremendous cost efficiencies and now radio is a bigger player in the advertising marketplace."

RAB President and CEO Gary Fries said the consolidation era is just about over. With that, the radio industry is beginning to experience true efficiencies.

"With better management in place in the consolidated companies, radio is better prepared for the economic slowdown," Fries said.

Fratrik said the time of double-digit revenue increases is over, at least for now; but that with radio's stronger and more prominent position in the advertis-

ing marketplace, gained since deregulation and consolidation, it will do well.

"The overall economy is solid — not growing as fast as it was in '99 and 2000, but it's still growing, so I don't see any reason why radio shouldn't maintain its advertising revenues and increase slowly over the next six to nine to twelve months," Fratrik said.

Fries said that he sees that ad demand is down in the first quarter, but the end of the year should be better than the start.

"We're at the bottom of this slide; 2001 will be 'back-loaded' revenue-wise."

The first quarter will be the toughest part of radio's year, according to Fratrik.

"There may be some negative effect of the dot-com, Internet correction. So many dot-coms are going down that were advertising on radio, especially in the large markets. And if automobile sales cut back too, that could have an impact," Fratrik said.

He said the industry should see an increase in radio revenue in the range of 3 to 5 percent over last year by year's end, with each quarter better than the last.

Linda Bannister, senior media analyst at Banc of America Capital Management, agrees that radio will be fine, once out of the first quarter.

"The first half of the year will be difficult for radio," Bannister said, "because they're facing difficult comparisons on a year-to-year basis. Last year they benefited from an inflow of dot-com advertising dollars, especially in major markets, and there is clearly an economic deceleration impacting advertising across the board, which will have an impact on radio."

But Bannister said radio will rebound in the second half, relative to 2000, because dot-com ad spending was strongest in the first half of last year.

"We don't have difficult comparisons due to dot-com ad spending in the third and fourth quarters," Bannister said, "because last year at that time is really when dot-com advertising started to trail off."

Yeah, Q-1 is bumpy

Prudential Securities senior broadcast analyst, James Marsh Jr. also believes that the start of this year will be the hardest for radio. Marsh said those radio companies that limited their exposure to dot-com dollars last year are in the best position now.

"Dot-com comparisons set the bar very high for the first quarter," said Marsh in his Winter 2000/2001 Media Quarterly Report. "What was once a seller's market is now clearly a buyer's market. Last year's unprecedented surge in dot-com advertising has set the stage for difficult comparisons (exclusive of any typically cyclical slowdown in advertising)."

But investors will not be surprised or thwarted by the tough comparisons through the beginning of the year, Marsh said, although the potential for revenue comparisons to dip into the red could unsettle some investors.

"We believe that most (radio) investors have already written off the first half of 2001, looking six months ahead to easier comparisons in the

See RADIO BIZ, page 19 ►



James Marsh

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► Continued from page 18 second half of the year.

Adding to the analysts' general optimism about the overall strength of the economy is the anticipated positive effect of the Federal Reserve Bank's recent moves to cut interest rates. The overall economy is expected to see a lift in the second half of the year, if for no other reason than the Fed is cutting rates now.

Lower projections

"Broadcasters are well-positioned to benefit as the Fed lowers interest rates after two years of rate hikes," Marsh said.

His previous estimate for 2001 radio ad revenue was for an 8-percent increase, but Marsh has now revised that estimate to 6.5 percent, an adjustment required because the economy is slowing even more than Prudential Securities' economists expected.

Bannister believes the central bank's moves will have a positive effect on the economy overall that radio is sure to experience, especially in the second half of the year.

"The Fed has been cutting the interest rates and so many economists, including our own, are expecting a pick-up in the economy and in the Gross Domestic Product, which should help advertising growth," Bannister said.

RAB's Fries believes that radio will capitalize on its gains in the past few

years over other media and that this will help the industry remain strong through this tough period.

"Radio is winning its battle with newspapers. Agencies realize the radio is the most efficient buy and that radio reaches consumers out of the home," Fries said.

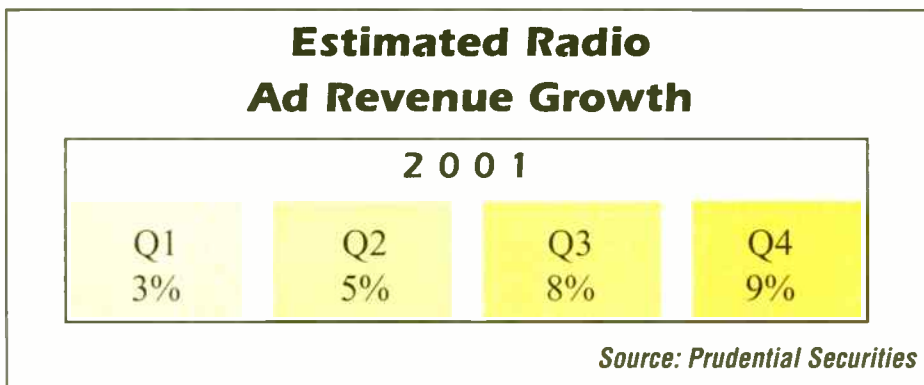
Fries also said that "new media" denizens consider radio a "hip group," that they realize radio has a loyal relationship with its listeners that can compel listeners to go to Web sites or to brick-

consolidation to allow "one-stop-shopping" for radio ad inventory on a local, regional or national basis, at attractive rates compared to other media, will make it stronger.

"Although we see a slight slippage in radio consumption in the period between 1990 and 2000, radio consolidation has clearly allowed the medium to win an increasing share of domestic ad dollars, growing from 6.7 percent of total 'adspend' in 1990 to 8.2 percent in 2000."



Mark Fratrik



and-mortar stores.

"People say 'That's my station' when they talk about their favorite radio station, but no one talks about 'my TV station' or 'my newspaper.' This is radio's tremendous asset that no other media has and advertisers are more aware of it. Radio has to do a better job of educating advertisers about this."

Marsh estimates that radio's cost per thousand, or CPM, is offered on average at about a 50-percent discount to competing media. He said radio's ability after

According to the Prudential Securities report, over the same period, newspapers' percentage of the total ad pie dropped from 25.1 to 20.7 percent and its consumption rate fell from almost 11 percent to 4.8 percent last year.

Streaming signals

The future of streaming for radio stations is a hot topic right now. But Bannister said the U.S. Copyright Office's December decision that terrestrial broadcasters will have to pay separate

rights licensing fees to stream programming online is not important for radio investors at this point.

"Today, streaming over the Internet is not really a part of the radio business. Although eventually it will be a viable business or portion of it, right now it just isn't significant enough to have an impact."

So if economists and analysts are correct, radio is fine, even as it experiences a tough first quarter. But any increase over last year's record-breaking numbers will be a historical high.

Laura Dely is Radio World's business and Internet radio editor. Contact her via e-mail to ld@imaspub.com

Omega_FM

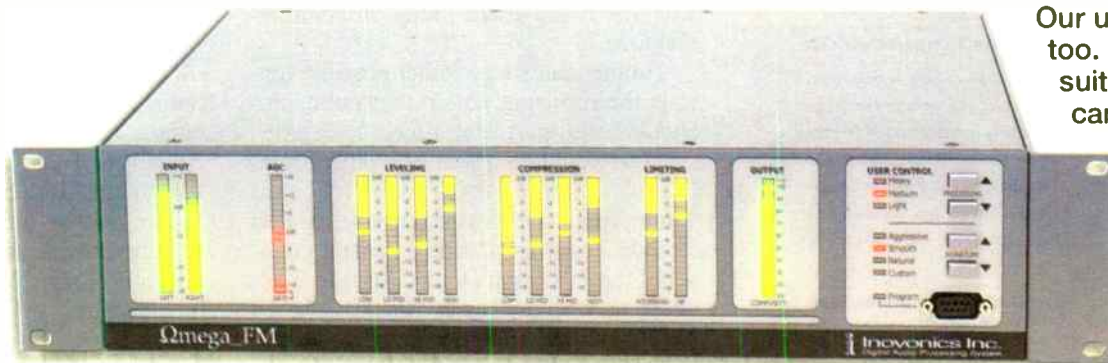
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See It... Hear It...

NAB Booth R-1953

Conference Helps Keep You Legal

Ken R.

With the election of Republican George W. Bush as president, broadcasters and regulators expect changes in how the industry is governed, both on Capitol Hill and at the FCC.

Participants in the NAB2001 Business, Law and Regulation Conference plan to discuss regulatory agendas and the impact the new administration could have on the radio and television industries.

Republican Michael Powell, elevated to chairman after serving as a commissioner for three years, will address attendees for the first time in his new capacity at a breakfast on Tuesday, April 24.

NAB President and Chief Executive Officer Eddie Fritts will moderate the event. That afternoon, Commissioners Democrat Susan Ness and Republican Harold Furchtgott-Roth will participate in a regulatory dialogue on communications policy developments.

At press time, Democratic Commissioner Gloria Tristani had been invited to the show but was not confirmed.

In addition to a new chairman, the commissioner make-up will change this year as well. Both Ness and Furchtgott-Roth plan to leave the FCC once transition plans can be worked out.

Where to draw the line

Chairman Michael Powell has begun to discuss his ideas for FCC reform, specifically continuing what the past two chairmen before him have done.

He hopes to eliminate duplicative functions within the agency and merge some functions into one unit that are now handled in several areas of the commission. The changes would mirror the merging of the industries the agency regulates.

One of the issues carried over from the last administration that remains to be implemented is the new low-power-FM

service. Powell has said that when he voted for the proposal, he was unsure whether it would create interference problems on the FM band.

Congress passed a provision late last year restoring full channel protection to existing stations from LPFMs, and require the FCC to obtain congressional approval before changing channel spacings. Senate Commerce Committee Chairman John McCain has introduced a bill that would reverse that language.



FCC Chairman Michael Powell

The bill also directs the FCC to implement rules to allow stations to begin to transition to digital by Feb. 23 of 2002.

Increasing the number of engineers and other technical employees is one of Powell's immediate goals; several commission engineers have retired recently. The agency, like radio, is finding it tough to attract and retain top engineers, when pay has not kept up with that of technical talent in other fields.

Ownership will also be on the conference agenda. The commission recently asked for comment on a portion of the local ownership rule.

"It's a hot topic," said Dick Bodorff, partner, Wiley, Rein & Fielding. "They are proposing to change the way stations

are counted, which will affect the number of stations that can be owned by a single entity in a given market."

Some commissioners believe the current method for determining the number of stations in a market, counting overlapping signal contours in a geographic area, allows one company to control more stations in a market than intended by the radio ownership limits spelled out in the 1996 Telecom Act.

Jerianne Timmerman, associate general counsel for NAB, will moderate "Eeny, Meeny, Miney, Market: The Numbers Game of Broadcast Ownership," on Tuesday and elaborate on this subject. Bodorff will be a speaker in this session.



Howard Weiss

"It's actually a range of options which is being presented," said Howard Weiss, partner, Fletcher, Heald & Hildreth.

Weiss, another speaker in this session mentioned the so-called Arbitron proposal. "It's the most radical and it would involve changing our market definitions to coincide with those of Arbitron," said Weiss. "I think most broadcasters feel the current rules should remain in place, but this thing has been percolating for years."

Sex, violence and politicians

In the age of shock jocks, broadcasters want to know more about how the new commission will view the issue of indecency.

A panel discussion entitled "Regulation of the Broadcast Media: Is Content King or Does Government Reign?" will be presented Tuesday morning, to be moderated by Timmerman.

"There is some talk about resurrecting the NAB Broadcaster's Code of Conduct, which was dismantled in the '70s," she said. "The main reason it was dropped was that it suggested limits on commercial time."

Timmerman said another possible topic is the recurring notion that politicians should be given free air time.

"This could be a part of a larger campaign finance reform bill," said Timmerman. Other speakers scheduled include Jane Mago, acting general counsel of the FCC, and Donald Verrilli, managing partner, Jenner & Block. Covered in the session will be topics of interest to both radio and television broadcasters.

Ann Zuvekas, staff attorney at NAB, will moderate "The FCC Enforcement Bureau: What's Going On With Broadcaster Liability?" on Tuesday morning.

Part of this seminar will be devoted to tips for avoiding fines from the FCC.

"Last year we held separate discus-

sions on enforcement and advertising, and this year we are merging them," said Zuvekas. "But certainly tower registration, zoning and lighting will come up this year."

Another perennial topic that seems to grow more complex is sponsorship identification.

Teasers

"Sometimes it's in connection with advocacy spots from political organizations," said Zuvekas. "You don't have to announce where the money is really coming from, but you do have to include the name of the organization paying for the spot."

Another wrinkle in the sponsor identification issue is the "teaser" ad.

"Let's say the first spot you are asked to run just says 'Bob is coming,'" said Zuvekas. "If the listener doesn't find out until the fourth spot that 'Bob' is a car dealer, you are in violation."

A Notice of Proposed Rule Making has been issued regarding public inspection files.

"It's been suggested that, because broadcasters are ostensibly serving the public, that they should place their entire file on their Web sites," said Zuvekas. "The rules proposed mostly pertain to TV, but this one could sweep into radio as well."




Dick Bodorff

Jack Goodman, senior vice president and general counsel of NAB legal and regulatory affairs, will moderate "The Future of Radio: Technology, Regulation and Your Business," on Tuesday afternoon. With guests representing the FCC, BIA Financial Network and iBiquity Digital Corp., this session will include topics such as satellite radio, LPFM and DAB.

The latest court proceedings involving BMI and ASCAP will be discussed in "Music and Money: The Radio Music License Committee Update," moderated by Ben Ivins, senior associate general counsel, NAB. Speaking on that panel will be Keith Meehan, executive director, Radio Music License Committee. The session will be held Monday afternoon.

Another Ivins-moderated session is "Copyright/SHVIA — A Broadcaster Update," to be held Monday morning. Although it will include discussion of the Satellite Home Viewers Improvement Act, primarily of interest to TV broadcasters, the radio side will not be ignored. Topics will include how record companies will be compensated when radio stations stream audio.

An updated list of all the Business, Law and Regulation Conference sessions can be found on the Web at www.nab.org/conventions/nab2001

Leslie Stimson contributed to this story. 

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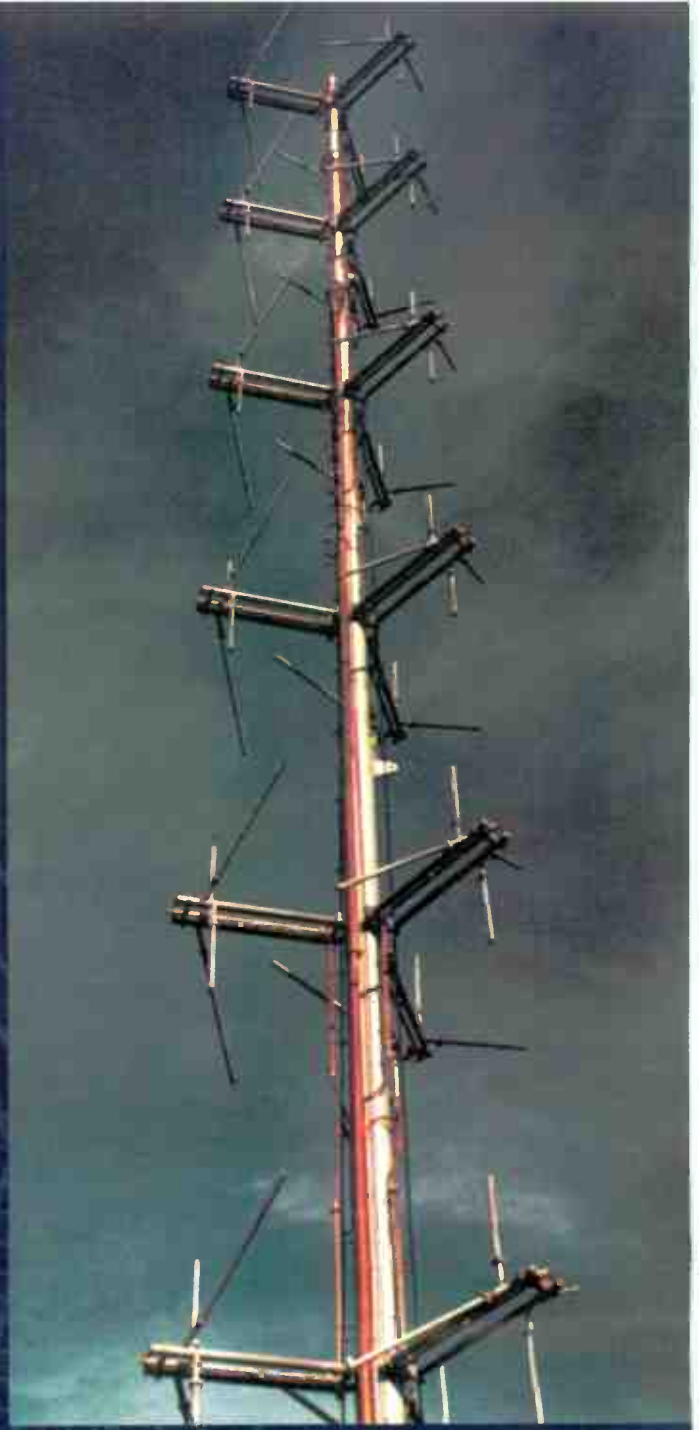

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World Radio History

Management Conference Points Ahead

Lyssa Graham

It's all about the newest tricks, technology and trends. The NAB Radio Management Conference will explore the latest in radio with sessions on Web programming, digital audio and satellite radio. Also scheduled are sessions covering voice tracking, streaming audio and a roundtable discussion to foster an exchange of ideas between small-market broadcasters.

The conference opens with Los Angeles-based programming consultant Dan O'Day on Sunday April 22. He has been conducting jock seminars since 1987 and continues to speak to radio personalities, programmers and production

personnel. O'Day will present tips and research to help stations use their Web sites to attract and keep listeners.

sites and attempting to use a station Web site as a "shopping mall," O'Day teaches simple lessons about Web realities.

Radio people have been ... told that the way to make money is either to become a portal ... or to sell junk. That's wrong.

— Dan O'Day

Managing a Web presence is not supposed to be hard, O'Day said. Fed up with the trend towards creating portal

"The bottom line is that radio people have been sold a bill of goods. They've been told that the way to make money is

either to become a portal, which is inappropriate for 90 percent of the radio stations in the world, or the way to make money on a radio station is to sell junk. That's wrong."

Dirk Freeman, director of SteeleBoy Productions in Denver, will moderate the Monday morning session, "Producing Effective Radio Ads: The New Bag of Tricks." It is a direct result of a technology session Freeman moderated at last year's show.

"It just so happened that a professor, Paul Bolls, was in the audience. He and another professor, Robert Potter, have done a study over the past four years looking at the effects of production features and how they actually affect the listener. In the last 20 or so years that I've been playing this game, one of the things that's always been in the back of my mind is when someone hears a spot or an image element or a piece of production, what is it doing to them?"

Profs. Bolls and Potter may have the answer to that question. The two measured heart rates, skin temperatures and other bodily reactions after certain sounds and effects were presented to the study subjects. Freeman said that his hope is that attendees can "walk away with a bit of knowledge from the world of science to take into our everyday lives, whether it be a production situation or for a production director who has radio production or imaging to do."

Although a self-proclaimed "production geek," Freeman said his session should appeal to a wide audience.

"I think it cross-platforms to just about everybody who is looking to produce messages, whether they be in radio, TV or the multimedia world."

DAB for managers

For the latest on digital radio, iBiquity president and CEO Bob Struble will appear on a Monday afternoon panel moderated by John Dille of Federated Media. Struble and Dille will discuss the latest in digital audio and present a status update on iBiquity's research efforts into in-band, on-channel digital audio broadcasting.

"Broadcasters are our primary constituency. They formed the company. They own the company," Struble said. "To a large degree, they direct the company, and we're developing technology which we believe is critically important to radio broadcast future."

"We're trying to tell them what their company is doing for them and what they can expect and need to plan for," said Struble. "Any time we're in front of a group of broadcasters it's kind of like we're going home. Those are the people who formed the company, who gave us a bunch of money and whom we're trying to help bring into the digital age."

Other sessions on the management track will look at the possible impact of satellite radio; the art of voice tracking; a consumer's view of new technology; and the elements of streaming.

Attendees will have the opportunity to learn how to make full use of the technology and potential in place in their radio stations.

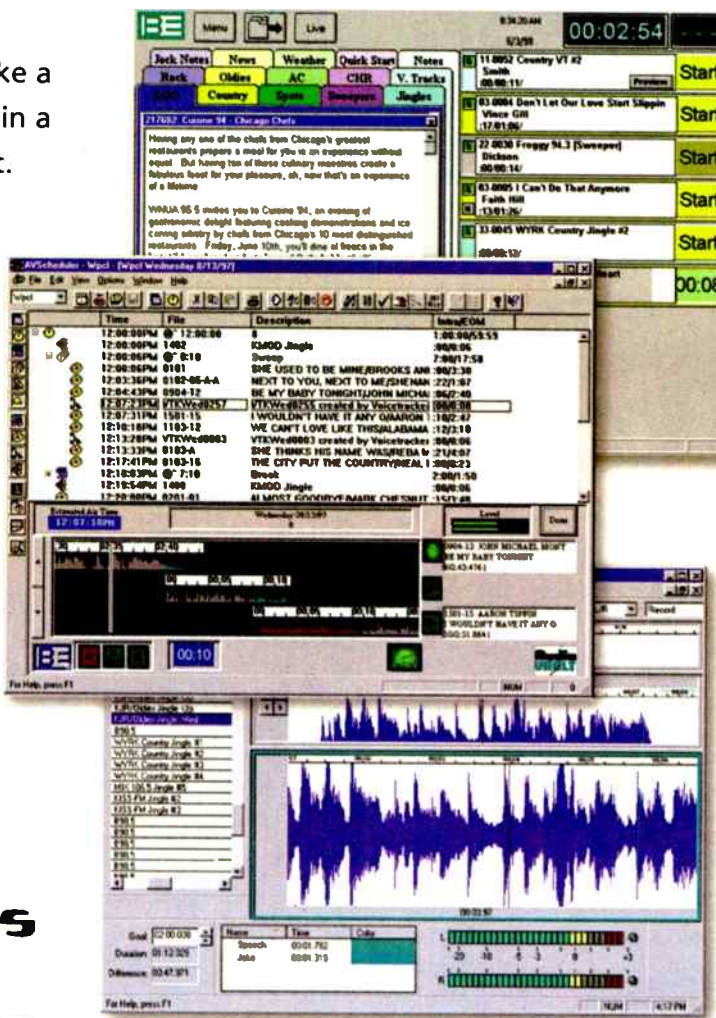
"Broadcasters coming to the NAB 2001 Radio Management Conference will be pleased with their investment," said NAB Vice President of Radio John David. "You'll more than pay for your trip with just one idea or connection that you'll make at the NAB. I know that from personal experience."

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NPR Looks At DAB

Leslie Stimson

National Public Radio is trying something new. The network is piggy-backing two days worth of engineering panels just before NAB2001 in Las Vegas, hoping that its engineers choose to go to both.

Although NPR will offer some engineering panels at the upcoming Public Radio Conference in May, the bulk of its engineering effort to member stations will be comprised of panels on April 20 and 21 at the Las Vegas Hilton Conference Center.

The two-day event tentatively is titled "Public Radio Engineering Conference 2001 and IBOC Digital Radio Workshop."



NPR's Mike Starling

"IBOC has got to happen in some fashion for radio broadcasters or else we'll be stranded as the last analog medium along with the cassette," said Mike Starling, vice president, NPR Engineering. "It looks like this could be the year IBOC will be approved by the NRSC and the FCC as well."

The conference begins Friday morning with opening remarks from Starling and then an overview of IBOC's 10-year development and what iBiquity Digital Corp. plans for this year with a presentation by iBiquity's Glynn Walden, vice president, broadcast engineering.

Harris Corp. has committed to discuss IBOC transmitter systems and plans were underway at press time to include an IBOC receiver panel on Friday. Visteon was expected to discuss how many IBOC receivers it plans to manufacture and distribute in 2002. The capabilities of several generations of IBOC receivers is expected to be discussed.

Friday afternoon's sessions end with a panel on NPR's future planning for its satellite distribution/interconnection system with Marty Bloss, director of technical operations for the Public Radio Satellite System.

Lunch is included in the two-day conference and for \$25, attendees may go to the Public Radio Engineering Dinner on Friday night.

Saturday's events begin with a look at iBiquity's plans for station data-casting opportunities and presentations by IBOC combiner, STL and audio processor manufacturers.

Sessions on standard-setting and how pubcasters can plan to pay for the digital conversion are planned.

For questions about the sessions, send e-mail to cljones@npr.org

Station Automation Revelations

Alan R. Peterson

At one time, managers and engineers would have been happy with an automation system that simply was stable and

Kits, which bundle software and high-end audio cards for ready installation into a user's computer, and offers WaveStation at its new price of \$1,499. A company representative hinted at a new product

VIO vision-impaired jock interface, has also gone the do-it-yourself route by offering a software-only alternative to its music-on-hard-drive system.

George Thomas, CartWorks president, said, "This year, we have also added Cart Chunk support as well as Web updates. The system can upload information to the station website." CartWorks also handles voice tracking and supports MPEG Layer 2 and MP3 files.



MediaTouch QuicPix

Overlapping plays

Watch too for the "Instant 3-Play," a DJ jingle box that Arrakis says has greater capabilities than other standalone devices on the market. "Triple playback," said Rod Graham, vice president of the broadcast division. "Instead of one play, this gives you three overlapping plays."

The news at Enco this year is the Air Play virtual machine. "It's a machine within a machine," said Don Backus, vice president of sales and marketing. "It features virtually anything the jock would want."

Developments in the Enco DADpro32 line include compatibility with the Cart Chunk standard and MP3 storage and playback.

Prophet Systems Innovations is looking to automate as much of the station's background processes as possible with an expanded Auto Phone Call system that offers up-to-the-minute weather, commuter and traffic reports without station

See AUTOMATION, page 24

crash-resistant. The digital automation systems of today offer features and Internet capabilities many of us would not have expected a mere five years ago.

Audio can be rocketed across conventional computer networks. Proprietary file formats are giving way to the widespread acceptance of MP3s. Listeners can buy CDs right from the station Web site. Companies are cozying up to the Cart Chunk, and the magic number for a software-only, entry-level automation system is holding at less than \$1,000.

For example, Scott Studios' recent acquisition of BTSG Software allows the company to offer the \$999 AutoMax 2000 software bundle under its "Scott Studios D-I-Y" banner. For the price, managers get stable walkaway operation but little else.

"People need to get at the databases," said President Dave Scott. "They need to get to the spots, the music, the traffic. It's the difference between a Razor scooter and a car."

The acquisition of Computer Concepts by Scott Studios allows the company to offer the Maestro product line. The newest is a touchscreen system for satellite or music on hard drive with a voice tracker, CD ripper and multitrack editor. The Epicenter Digital Audio Engine provides up to 1,024 stereo digital channels to any studios simultaneously.

Scott also is expecting finally to present full Linux versions of Computer Concepts and Scott Studios systems.

At press time, Computer Concepts and Harris announced a deal under which Harris becomes exclusive dealer of Computer Concepts products to most U.S. broadcasters, and global customers except those in Australia, England and Mexico

More D-I-Y

Broadcast Software International (BSI), the originator of under-\$1,000 software solutions, now sells fully built systems based around rackmount PCs as well as its software-only product line.

BSI recently began offering Studio

rollout at NAB2001, but kept details close to the vest at press time.

CartWorks, a 1998 recipient of the Radio World Cool Stuff Award for its

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Mixing It Up, Console Style

Tom Osenkowsky

Shopping for a new audio console? Here's a peek at the new products or features to expect at the show in Las Vegas.

Wheatstone will debut several new consoles. Its new Auditorics Model 2600 promises economic design with maximum flexibility. This analog, modular design features 12 input channels, a monitor module with control room, studio, headphone and talkback functions, and an output module that provides program, audition, pre- and post-fader mono outputs, plus independent meter selection. Additional line selector or tape remote modules are offered.

Wheatstone's new A-2000 Linear Audio Console is targeted for large group applications where both functional uniformity and cost optimization are desired. The analog console supports two stereo and two mono program busses, plus two phone callers using Wheatstone's Simple Phone automatic mix-minus technology. It supports both control room and multiple studio monitors and comes standard with timer and a clock that can read most popular time codes. It is offered with failsafe power supplies and a selection of accessories.

Also from Wheatstone, the debut Auditorics 1214-D is a digital console that combines onboard routing with 14 faders. It has 12 input faders that can assign any input (analog, digital or mic) to any fader, plus two phone-caller faders with any input available to the callers as well.

There's a dot-matrix alpha character display above each fader and the caller fader pair. Control room, studio and headphone outputs, plus DSP metering are provided.

Keeping pace

Autogram Inc. will debut a digital upgrade package for the Pacemaker III series consoles. The upgrade will allow six AES/EBU or S/PDIF stereo digital audio inputs and two AES/EBU or S/PDIF stereo digital audio outputs, all employing 24-bit/96-kHz Crystal Semiconductor Transceivers and Analog Devices SHARC 60 MHz 32/40-bit digital signal processors.

Two upgrade systems may be used in the PM-228 to double inputs and outputs. The upgrades feature Autogram Dual-Mode processing and automatic sample rate converters on inputs along with many clocking options. Also promoted: its established line of MiniMix, RTV, AC, IC and PM series of consoles.

Automation

► Continued from page 23 intervention.

The company also has instituted an intriguing "self-heal" mode that automatically sends e-mail to the support center should there be an audio server or file server failure. Support is offered for WindowsNT, Windows 2000, Novell and Linux-based systems.

New money, new ideas

MediaTouch recently received an infusion of new capital. According to Marketing Director John Davis, it means bringing products to the market that may otherwise would have languished.

"You know how it is when you have ideas and no money?" he posed. "Now we have the money to make it happen." This infusion will help bring the new iMediaTouch to Las Vegas.

"iMediaTouch is an all-in-one automation product for small and medium markets," said Davis. "It networks, does live assist, includes its own log tools and is ready to stream." MediaTouch will offer this product for less than \$1,500.

MediaTouch recently shifted emphasis on its QuicPix software from a station fixture to an air talent's personal jingle box. Calling it "a morning show to go," Davis said, "This is a product

Building on its Pacific BMX Series of analog on-air consoles, Harris Corp. is launching the BMXdigital, its first high-end, fully digital console. It is designed for networks and major-market stations.



Wheatstone A-2000

"As our customers in major markets have begun making the transition to digital, they've expressed an emotional connection to their BMX analog mixers," said Jay Adrick, vice president, studio products and systems at Harris. "They want next-generation digital technology, but they don't want to give up the extensive feature set, reliability and ease of use of their analog consoles."

Harris says the BMXdigital offers great functionality, including twice the number of busses for mixing versatility, and simultaneous analog and digital inputs and outputs to accommodate analog or digital sources without reconfiguration or switching cards. All modules are hot-swappable.

The BMXdigital is available in a variety of frame sizes (22, 30 or 38 inputs) to handle complex production demands.

that jocks can buy for themselves," said Davis, noting the plunge in price from \$999 on initial release to its present \$399 price point.

This year, RCS adds SplitStream to its RadioShow Webcasting package. SplitStream sends different commercials that target the individual interests of Internet listeners. An interactive advertising feature provides a click-through to the advertiser's Web site.

The company will also promote MasterControl, the only digital automation system that fully integrates Selector music scheduling software. Features include supervised access to the Selector database, Living Log, instant HotKey audio, "real-feel" voicetracking in the studio and over the Internet, and Log-Linked Web Browser.

Audion Labs, makers of the Mac-based VoxPro audio editor, recently ported over a PC version, which will join the Broadcast Electronics AudioVault line of automation systems. The popular telephone-call editor will be offered as an integrated part of the AudioVault or can be made available on a standalone computer.

Dalet Digital Media Systems is poised to show a new content management and digital media broadcast system at NAB2001. According to Director of Marketing Robin Wang in the Dalet New York office, "This system will

Radio Systems will debut an upgrade for the many users of its RS Series of consoles.

"Owners of our RS Series Consoles can upgrade their consoles to our current model, the Millennium Series, with an inexpensive, easy-to-install kit," said Gerrett H.A. Conover, vice president of Radio Systems. Features include all-new metal and red mahogany arm bolster and

side panels, 10-million-operation urethane switches, LED indicators for all switches, BBC Ballistics VU metering, eight-position remote switcher and upgraded clock/timer.

Radio Systems also will display its Millennium Series. Available in 6-, 12-, 18- and 24-channel sizes, this line features three-output busses, remote control and metering, a comprehensive monitor section with standard eight-position selector and a clock/timer. Millennium Series consoles are microprocessor-controlled, with soft-touch rubber keypads and VCA technology.

Radio Systems also markets the StudioHub interconnect system, which employs CAT-5 cable for connection and routing of studios.

Klotz Digital America debuts a digital

See CONSOLES, page 26 ►

allow radio broadcasters to do more and reach more... to distribute their content over different media, including but not limited to Webcasts, interactive and enhanced TV, Web portals and other new media outlets."

Spain's AEQ has enhanced its MAR product line with newswire capture, multitrack audio editing, remote broadcast loading and music playlisting.

D.A.V.I.D. GmbH of Munich, Germany has the DigaSystem, which began as a news production system but has spawned the DigaROC and DigaAIRrange modules for real time playback and music scheduling.

D.A.V.I.D. is handled in the United States by Management Data Media Systems, which will have products in five booths at NAB2001. Marketing manager Tom Richardson hinted at the company's newest Web streaming product, the Lab1, which handles all content management for a station's Internet presence.

"Webcasting is the old economy broadcast vs. the new economy," he explained. "The Lab1 will personalize the content for the Internet listener."

From Italy's AEV comes Virtual Radio, a Windows client/server networked automation system with optional Digigram Xtrack MPEG audio editor and the ability to work with Digigram or Sound Blaster audio cards. ◉

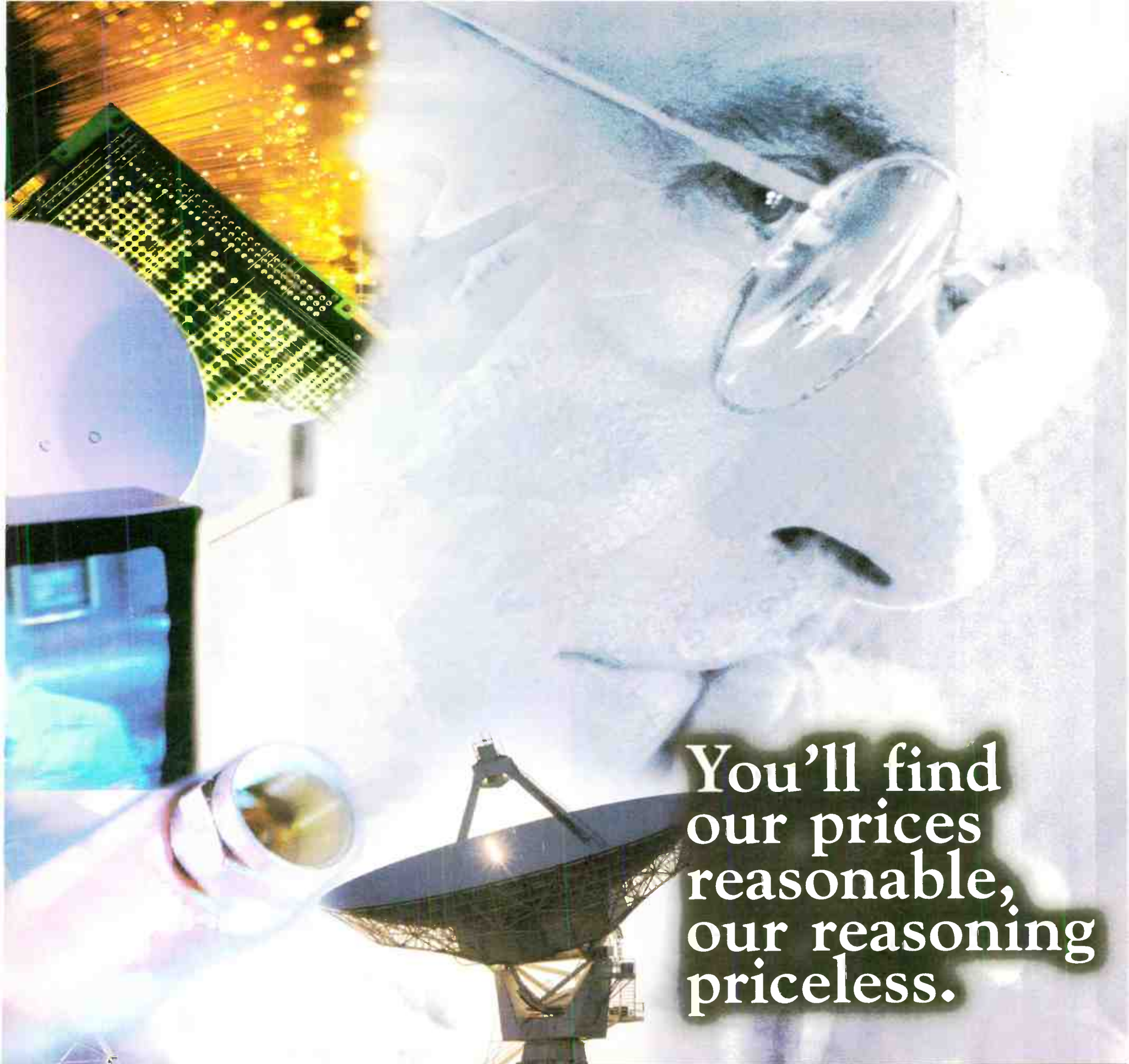
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World Radio History

Consoles

► Continued from page 24

console for on-air radio called the Paradigm 16. It includes voice processing and three-band EQ on mic inputs; sample-rate conversion on digital line inputs, machine control on line inputs; mode, pan and phase reverse on all inputs; 12 faders with A/B switching; and four faders with analog/digital six-source selectors.

The LCD flat-panel screens display a large clock and event timer. The Paradigm 16 accepts 48 sources and has both digital and analog outputs. The console layout can be configured, saved and retrieved for each operator.

System foundation

Klotz also will exhibit the D.C. II digital audio mixing console for live broadcasting and production. The foundation of the system is the company's Vadis 880 digital audio/media platform.

"Any source connected to the Vadis D.C. II console can appear on any fader, and at the push of one button, entire console presets can be recalled. Old-fashioned designs require audio and logic routers in addition to the actual console in order to provide such a feature," said Ramon Esparolini, managing director of Klotz Digital America.

The system incorporates the functions of a console, an audio router, logic-fol-

low capability and distribution of digital audio sync. Logic follows each source no matter where it appears on the console, and any source can appear on any fader of the D.C. II. The one-button store-and-recall of the console setup is designed to

LPB Inc. will exhibit its low-cost Blue 5c, its 7000 Series and long-established Signature III consoles. The Blue 5c features five stereo channels, 10 stereo inputs, remote starts and mono telephone bus. The 7000 Series is available in 12-

AES/EBU and S/PDIF digital formats. A sample rate converter is included.

The company also will show enhancements to its Numix Control Surface digital console. They include a blank Numix wedge, a blank top panel with empty pan for mounting custom devices or control hardware, and the Button24 Wedge, a 24-button wedge version of the Button12 / Vbutton controllers.

AEV S.p.A will unveil the Matrix, a Motorola DSP-powered 24-bit digital console with 24 input channels, eight faders and sampling rate up to 96 kHz. Features include four voice processors on the mic inputs, on-board dynamics, RS-232 and 10/100 Base-T Ethernet Controller, 105 dB dynamic range and analog and digital program outputs with SRC. Additional features are analog and digital telco outputs, talkback microphone, clock and timer.

Personalized settings

Studer Professional Audio plans to promote its On-Air 1000 digital console, featuring 10 faders, 20 inputs and two Master faders. Two models are available, one predominantly digital, the other analog. Mixer settings can be personalized for individual users.

Another debut digital console is the Studer D950 M2. This is a large-scale mixing console with a great amount of flexibility and customization. The Route 5000 is a digital audio routing system with DSP power distribution, open control system structure and the ability to detect critical errors before the system is affected.

Studer will also exhibit the Studer On-Air 2000 digital console and the Studer 928 compact design analog mixer.

Solid State Logic will display its line of mixing consoles. The Aysis line of digital consoles are suitable for remote broadcast or compact studios. Offering maximum control in minimum space, the Aysis has 48 faders and up to 96 simultaneous inputs.

Arrakis will exhibit its line of Revolution digital consoles, which are either console or PC controllable. Also



Klotz D.C. II

be switched on the air.

The D.C. II is modular. There are mic, analog line and AES/EBU and S/PDIF digital line inputs. It has four stereo busses, with various mix-minus DSP options.

or 18-channel models, three stereo busses and one mono mixdown. LPB consoles feature balanced transformer operation for high RF immunity.

Ward-Beck Systems Ltd. will exhibit its line of professional consoles. New to Ward-Beck will be the Serialboxx, a rack-mount frame and a series of cards for routing, distributing, converting and monitoring analog and digital audio signals.

Logitek will unveil a line of Router controllers for the Logitek Audio Engine (a digital audio mixer/router) such as Route3, a rack-mounted routing controller that gives input selection control for three devices with an easy-to-learn interface. Also new is a PC version of Route3 named Vroute, which gives full menu selection control for one to 12 Audio Engine outputs with a simple "point-and-click" interface.

Consumers want next-generation digital technology, but they don't want to give up the extensive feature set, reliability and ease of use of their analog consoles.

— Jay Adrick, Harris

Vbutton is a software implementation of the Button12 Panel (see below) that provides "point-and-click" selection of any function that a user has set up on the "buttons."

Another introduction is the Button 12, a rack-mounted programmable control panel for the Audio Engine or other devices.

Also look for new Logitek Supervisor software, a powerful supervisory and scripting tool for the Audio Engine, along with new I/O cards for the Audio Engine. The IO24A I/O card features 24-bit analog input card with six stereo inputs and six stereo outputs. The IO8D card provides eight stereo digital inputs and eight stereo digital outputs. Cards handle both

on exhibit will be the 1200 and 12,000 series of analog consoles.

Euphonix Inc. will debut the System 5-B, a 24-bit high capacity console targeted for the broadcast station that requires multiple channel paths; it offers up to 96 kHz sampling and eight-channel mixing. The 5-B incorporates the PatchNet built-in I/O router, capable of directing 672 x 672 sources and destinations at a rate of 48 kHz or 336 x 336 at 96 kHz. On-screen diagnostics and hot-swappable modules are featured.

RAM Broadcast Systems hosts an array of consoles including the On Air 2000 Series, R2K and Mark I, II and III lines and an array of other broadcast

See CONSOLES, page 28 ►

FUTURE PROOF

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On The Air

A Monthly Newsletter from Broadcast Software International

Issue 3

Quote of the Month

"I went to WaveStation Weekend and thoroughly enjoyed it. Ron's demos are a must-see."

Dan Kolenda
WVIJ- Port Charlotte, FL

Calendar

Apr 24, Demonstration of a hot new product at the NAB by BSI President Ron Burley. Call for an invitation.

Aug 16-18, WaveStation Weekend Training Session

Birthdays:
Apr 3 1942, Wayne Newton
Apr 10 1984, Mandy Moore

News

BSI Joins the Cast of CBS' Y&R

In an industry crowded with broadcast automation options, CBS' eye met BSI. It was love at first sight. CBS Television City had their choice of digital audio systems, but they selected Broadcast Software International's Series 200.

"When I saw a demo of the BSI software, I just thought 'Wow'," said Ray Lignowski, Audio Supervisor at CBS Television City. "With BSI, we can work the way we want to. The BSI system is very versatile and easy to use. No other digital workstation does what BSI does."



CBS engineers cite several reasons for choosing Broadcast Software International. BSI's ability to provide quality systems at prices that fit CBS's budget was important. CBS was also looking for a system that was easy to operate and could satisfy the demands of live entertainment production.

BSI will furnish digital audio systems for CBS' live entertainment programming, which includes the daytime drama The Young and the Restless. CBS will be using BSI Series 200 automation systems. The \$15,999 Series 200 system includes 2 rack-mount Pentium class PCs and flat screen monitors. BSI is providing their broadcast and production software, as well as Cool Edit Pro from Syntrillium. The system also includes dual ASI 4113 audio cards from AudioScience. In coming months, BSI will provide systems for additional CBS productions.

"We are proud to be chosen by yet another company recognized worldwide for quality broadcasting," said BSI President Ron Burley, "Working with CBS is a great opportunity. Live broadcast support is a unique challenge. We love finding new ways to improve our products."

Tip

Email Remote Control

BSI's WebConnect accessory allows you to send files to your automation system using regular email. Unlike FTP or pcAnywhere, WebConnect requires only email capability on the sending machine. You can create and email a file to your automation system for air play. Radio groups can update every station with one email. WebConnect can also notify you via email or pager if there is an out-of-date or missing item. You can do it with WebConnect!

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User File

KLEY - Matt Clark

Matt Clark started at KLEY about the time when they decided to get a new automation system. "I researched up and down all the different systems. By far, for the price and features, the best solution was WaveStation."

KLEY really depends on their \$1499 WaveStation system. "Because we're such a small operation, with only two full-time employees, having a reliable automation system is very important to us," said Matt. "And WaveStation's ease-of-use really simplifies our work all the way around. It's very flexible, allowing us to instantly be running live-assist or fully automated."

Matt finds that BSI's tech support after the sale is great too. "I remember one time late on a Sunday night. We had a problem with our system, but couldn't figure it out ourselves. The tech guy at BSI was great. He walked me through step-by-step to fix our problem. He was patient and asked the right questions. It was just such a smooth and fluid process. If you've ever spent any time on the phone with your typical tech support guy, you know that that's very hard to come by."

Matt's advice to people looking at BSI's WaveStation, "It's a 'can't-go-wrong' type of purchase."



Send us your story.

888-BSIUSA1 WWW.BSIUSA.COM
Broadcast Software International

Consoles

► Continued from page 26 products.

Fairlight On Air will introduce the Fusion console. Designed for on-air broadcasting, Fusion offers digital mixing, routing and control with comprehensive DSP functions on all inputs and outputs.

The console can handle up to 96 digital or analog inputs per unit and can be scaled up 264 x 264 input and outputs per DSP frame. Featuring a modular fader control surface, the console is available with Windows configuration and routing software.

Soundcraft will display its established B400 and B800 analog broadcast and production mixers; RM1d digital broadcast

console; 328 eight-bus digital mixing desk; and Spirit M Series compact analog mixers, each offering four stereo channels and S/PDIF output.

Based on the B800, the B400 input frames can handle any combination of mono, stereo and telco modules. Eight mono or four stereo groups can be specified while the individual monitor, communications and stereo master modules, fitted to the B400 as standard, offer a range of features. Other specs include 24-, 32-, 40-, 48- and 56-module frames, stereo and three mono auxes, and LED indication on switches.

Calrec will debut the Alpha 100 digital audio mixer, its fifth-generation mixer to feature an assignable digital control surface. Providing 48 multitrack/matrix outputs, 20 auxiliary busses, eight audio groups and four main outputs — each of

which can simultaneously be mono, stereo or Surround — all desk functions are memorized to snapshots and a system reset can be done without audio interruption.

Also new at NAB2001 is the C2, equipped with a flexible system design that enables group slots to be populated with channels to provide a choice of console formats. With a maximum 56 inputs, six Auxiliary sends (one stereo) and four VCA groups, each C2 module has surround panning and a mix-minus output.

Another new product is the Minimixer 3, which has chassis sizes for up to 10 or 24 channels and is available in two frame sizes: the rackable 10/2 and the larger 24/2. With comprehensive monitoring facilities, the M3 has mix-minus facilities on every channel, stereo and mono auxiliaries routing to four optional groups and two main outputs. ●

For FMs, Antennas, IBOC Filters

W.C. Alexander

In many ways, the state of the art in FM broadcast antennas leveled off many years ago. There have been on quantum leaps, no magic formulae, that have resulted in the perfect FM signal, free from multipath and artifacts.

The easy thing for antenna manufacturers would be to keep on cranking out their tried-and-true designs without wasting any money on new product development. Fortunately for broadcasters, this has not been the case.



ERI IBOC Filter

Manufacturers have been aggressive in their new product development, building on proven existing designs to meet the needs of broadcasters in an ever-changing landscape. Many such products will be in evidence on the exhibit floor at NAB2001.

Dielectric Communications has been around for a long time, first manufacturing for such companies as RCA and then selling antenna and transmission line products under its own name.

This year, Dielectric will introduce a new antenna design with its FMVee, a top-mounted FM master antenna with a full 20 MHz bandwidth. The antenna features high power handling, excellent bandwidth and circularity, making it a unique solution for master antenna applications. Also new this year is a combiner/filter for in-band, on-channel digital audio broadcasting. It will allow broadcasters to inject a digital signal from a separate transmitter into its existing transmission system, permitting single-antenna IBOC operation.

A new technology combiner, the Dielectric Opto-SXFM, permits combining two FM amplifiers into a common line without the use of antennas, also allowing hot-switching under power. Finally, Dielectric will introduce the DCR-Q, the world's first 20 MHz bandwidth ring-style antenna.

ERI — Electronics Research will introduce a line of IBOC filters that feature excellent sideband rejection level, low group-delay variations, high isolation between digital and analog

See ANTENNAS, page 29 ►

Never Go Off the Air! Get Scott Studios' INVINCIBLE Fail-Proof Digital Audio System

Scott Studios Delivers Radio's Only Self-Healing Redundant Digital System

Major stations in major markets choose Scott Studios' *Invincible*. It's a *mirrored* pair of top-of-the-line SS32 digital audio systems, plus Scott's *exclusive* diagnostic watchdog that double-checks everything several times every second by fast USB. At any *hint* of trouble, the backup automatically starts playing where the problem unit left off! *Invincible* switches so fast that most listeners hardly hear a glitch. In fact, one touchscreen controls both systems seamlessly so some announcers don't notice a switch.

Hands-free redundancy is one of many reasons why major stations in New York, Chicago, Los Angeles, Houston, Dallas, Philadelphia, San Francisco, DC, San Antonio, Phoenix and Toronto installed Scott Studios' SS32 recently. 3,500 stations in the U.S. have Scott systems and those of our sister company, Computer Concepts Corp. More stations use our systems than the second and third largest digital vendors combined! Our customers benefit from the biggest and best service and support staff in radio's digital audio industry, with 105 people at your service.

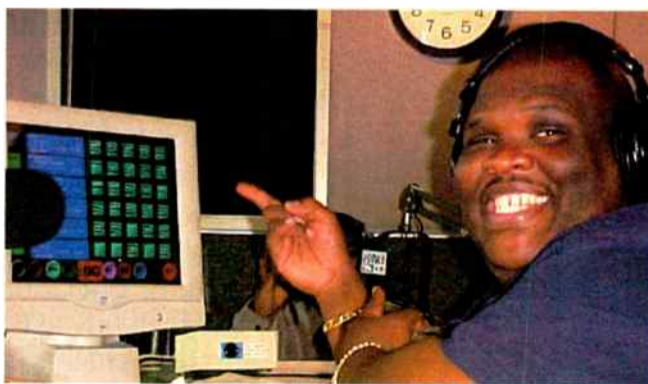
Scott's *Invincible* SS32 is the most robust digital system of all! SS32 delivers more streams of perfect uncompressed and MPEG audio than any other system. You get industrial rack computers, the fastest CPUs, mega-memory, hot swap redundant power supplies, ultra-fast RAID mirrored hard drives, extra cooling, NT networking, two premium four-output stereo audio cards per system, the best flat panel touchscreens and up to a 5-year exchange warranty! Nothing else gives so much peace of mind as Scott's *Invincible*.

Scott Studios SS32's user-friendly intuitive touchscreen is the simplest for announcers to use and gives all the features that creative major market air talent demands.

For example, SS32 delivers:

- 30 sets of 30 hot keys for instant play of jingles and effects.
- Cart walls that play song requests within 1 to 3 seconds.
- Display of last play and next scheduled play dates/times.
- Ripper puts CD music on hard disk digitally in 18 to 28 seconds!
- Easy voice tracking in context in air or production studios.
- Fast "no-dub" production uploads from Sound Forge.
- Phone recorder with audible scrub and waveform editing.
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For details about SS32 *Invincible*, go to ss32.com or call toll-free at 1-888-GET-SCOTT.



Shown above is the top-rated "Big Boy" morning drive personality pointing to the SS32 touchscreen at KPWR, Power 106 FM in Los Angeles. For details, visit ss32.com or call 1 888 GET SCOTT.

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(972) 620-2211 FAX: (972) 620-8811
1-888-GET-SCOTT

Antennas

► Continued from page 28 transmitters and great filter efficiency.

The company also is introducing the GPA series of gin poles, designed to the proposed TIA/EIA-222 Gin Pole Standard. The poles feature structural ASTM A-500 square steel tubing. Charpy V-Notch Testing for cold-weather ductility, versatile load charts for accurate predictions in varying circumstances, roller bearings on pulley sheaves to reduce load line drag, and a 360-degree rotation of the "Rooster Head." Safe picks of up to 60,000 pounds are possible with the GPA series.

Nicom LLC will feature its line of FM broadcast antennas, including the BKG/88 circularly-polarized narrow-band FM antenna, the BKG/77 circularly-polarized broadband FM antenna, the BKG1/P portable broadband FM dipole antenna and the BKK/2 broadband FM directional panel antenna.

The BKG/88 and BKG/77 are constructed of stainless steel and are suited to medium- to low-power applications, up to 5 kW. The /88 is factory-tuned to the desired frequency but is tunable in the field. The BKK/2 can be installed on any tower face, can be made highly directional and has a high gain. The BKG/1 is broadband and can handle up to 2 kW input power.

Propagation Systems will premier its new FHR-series of high power "rototiller" FM antennas. This antenna is a series-fed design with an internal feed point and is capable of handling input power levels exceeding 60 kW. Multistation (combined

operation with the antenna is possible.

For low-power FM applications, the Propagation Systems FL-series of antennas will be rolled out. The FL-series features a lightweight design with many of the same features as full-service antennas at a fraction of the cost. It can handle up to 500 watts input power.

RFS Broadcast (Cablewave) will display its established CFM- and 828-series of FM antennas. The company will tout its RD Series antenna for digital television.

Shively Labs, in anticipation of the roll-out of IBOC, has developed a new IBOC filter injector system. This IBOC system was designed with crowded transmitter facilities in mind, with a filter suitable for a full Class C facility occupying a mere four square feet of floor space and standing only four feet high.

Tight spaces

It is designed to be plumbed easily in tight spaces and can be stacked or hung from the ceiling. A number of iBiquity test sites have used the Shively IBOC filter systems. In addition to this new product, Shively will display a line of FM antennas, combiners and accessories.

Kathrein Inc. will show its Model 754 154 circularly-polarized broadband FM directional antennas. These antennas are constructed of hot-dip galvanized steel and are suitable for triangular or round masts. Heavy-duty construction and fiberglass feed-point covers keep the 754 154 functional in severe icing conditions.

On the AM side, Kintronic Labs will be displaying a new lower-cost version of its FMC-0.1 isocoupler for 950 MHz STL

applications. This isocoupler exhibits wide-band characteristics, allowing the company to offer them as an off-the-shelf in-stock item for immediate delivery. Kintronics will also display examples of its line of custom RF products and components.



Kathrein Model 754 154 Broadband FM Antenna

Valcom Limited will display a new line of fiberglass self-supporting AM antennas in 75- and 112-foot lengths. These antennas are coil-loaded and feature high efficiency, a high-strength filament-wound fiberglass base, low-cost installation and low maintenance. They are usable on frequencies from 100 to 1500 kHz. A "Valcosphere" capacity hat is available to further improve performance.

Altronic Research will debut a new line of air-cooled dummy loads for digital RF applications. These loads are available in 5, 10 and 15 kW ratings.

Bird Electronics has developed a new Broadcast Power Monitor (BPM), an advanced Thru-Line RF power meter that measures true average power in digitally-modulated systems, digital/analog hybrid systems and analog systems. It can provide VSWR, return loss and match efficiency calculations using hardware or PC-based software displays and includes an alarm function to signal transmitter or antenna problems. The BPM is available in popular line sizes, for power levels up to 150 kW. Bird also will show a new line of high-power Digital Air loads in 10 and 25 kW models for VHF.

Myat says it has taken a new approach to FM combiner design with its E-Star fault-tolerant, high-efficiency hybridless power combiner. Because it does not use a hybrid, full power of the remaining power amplifiers can be maintained at the output during failure or maintenance operations. Myat features a full line of RF transmission line products.

Delta Electronics will exhibit its line of operating impedance bridges, receiver/generators, RF ammeters, AM stereo exciters and monitors, meter jacks, splatter monitors, transfer switches and toroidal current transformers.

Marsden will be in the Superior Broadcast Products booth, introducing a line of corrugated coax connectors made by Genex of Italy.

SpectraSite Broadcast Group will promote its Community Broadcast Facility approach to tower planning, in which it handles site acquisition, zoning, construction and management.

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ECO - 25

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AM Radio: Highly Efficient

W.C. Alexander

The landscape for AM transmitters has changed a great deal over the past decade or so. High-efficiency tube-type rigs employing what was once avant-garde circuitry gave way to bipolar solid-state designs, which have since been replaced by MOSFET designs.

In just the last couple of years, AM transmitter manufacturers have further refined their designs into true masterpieces of technology. These rigs can produce very high fidelity with efficiency approaching 90 percent. If only such rigs had existed when AM was king and better receivers were commonplace!

In some ways, digital audio broadcasting has been like so many other promising technologies that seemingly take forever to become reality. Over the past year, there have been significant developments in that arena, and in-band-on-channel DAB could become a reality in the near future.

Your Destiny

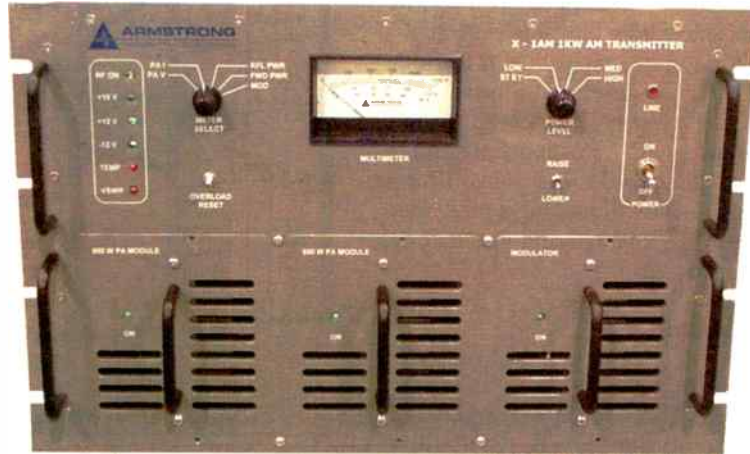
Manufacturers have been sensitive to this yet-to-emerge technology, working closely with iBiquity Digital and its predecessors to insure that their products would be IBOC-DAB ready.

At last year's spring NAB convention,

Harris Corp. rolled out DX Destiny, its new digital AM transmitter.

Harris will again feature this product.

Serial Adaptive Modulation, Parallel/Serial Integrated Control, and "hot serviceability", what Harris calls



Armstrong Transmitter X-Series

The DX Destiny is a completely digital AM transmitter that incorporates new, patent-pending features to keep radio stations on the air at the highest level of performance, under a multitude of conditions. These features include Direct Digital Drive (3D) technology, Digital

next level of hot-pluggability. The DX Destiny is IBOC ready.

Familiar names

Broadcast Electronics will bring its family of AM transmitters to the show, including models from 500 watts to 10 kW. All BE AM transmitters feature its patented Class E PA modules, multiple PA modules and multiple PA power supplies. This extensive redundancy makes these rigs ultra reliable. BE touts the broadest output power range of any transmitters on the market. Other features include quality audio performance, AM stereo generator, compact size and ease of installation.

Armstrong Transmitter Corp. introduced its X-series of AM transmitters at last year's spring convention. The X-series is touted as feature-rich, IBOC-compatible, solid-state transmitters at budget prices.

Features include hot-pluggable modules; three power level presets; VSWR, lightning and surge protection; and construction with conservatively-rated, commonly-available parts. Packaged in compact rackable chassis measuring 12-1/2 inches high by 20 inches deep, the X-series is available in 500-watt and 1-kW power levels.

In the news late last year was the acquisition of transmitter manufacturer Omnitronix by LPB Communications Inc. LPB will continue to manufacture the Omnitronix AM and SW line of transmitters. In addition to LPB's line of Part 15 (unlicensed) low-power AM transmitters, the company will be showing the Omni family, a solid-state line of AM/SW transmitters in 1 kW, 5 kW and 10 kW power levels. LPB says it has worked with iBiquity to ensure that the Omni line is IBOC-DAB ready.

New management

CCA is active again under new management. It offers a line of AM transmitters in power levels from 1 kW to 15 kW. These rugged transmitters feature high-efficiency power amplifier circuit-

ry, heavy-duty power supplies, conventional high-level plate modulation, power line phase-loss protection and step-start operation.

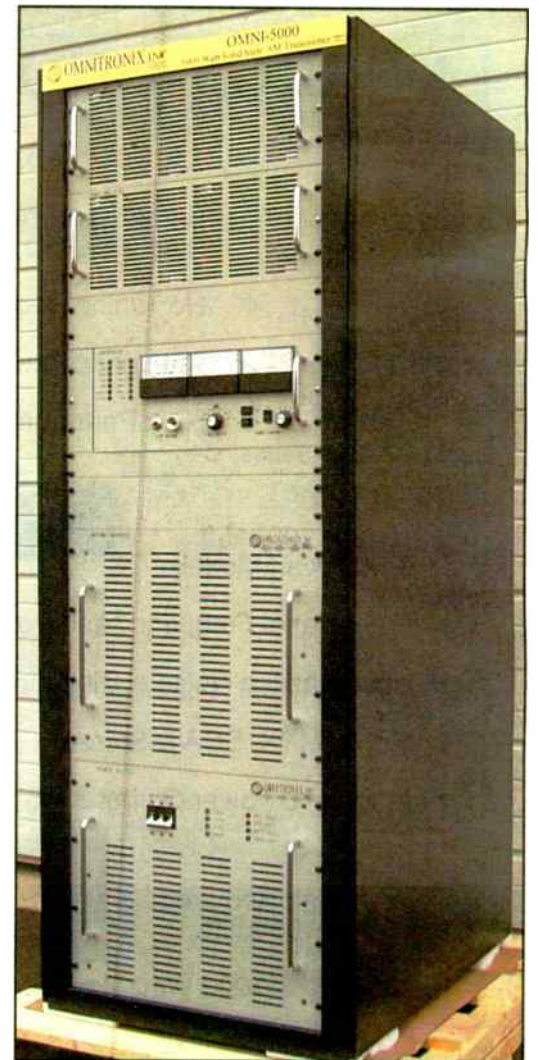
Broadcast Richardson, a familiar name in broadcast equipment, is now producing AM transmitters for the U.S. market under the name RFCast.

The company will exhibit 1 kW and 5 kW models of the RFCast line at NAB2001. The 1 kW model features more than 75 percent efficiency and has two RF modules. It can operate at full modulation at power levels from 100 watts to 1.5 kW. The 5 kW model approaches 80 percent efficiency, featuring seven hot-unpluggable and interchangeable power amplifiers.

Energy-Onix will display a new solid-state AM transmitter, an expansion of its established Pulsar line that includes 5 kW, 10 kW and 20 kW rigs. These transmitters feature a 2 kW "Slide Out Module." Three such modules are used in the 5 kW rig, six in the 10 kW and a dozen in the 20 kW.


Continental Electronics, a long-established name in AM and shortwave transmitters, will roll out its new 420C, a state-of-the-art 500 kW shortwave transmitter. This cutting-edge rig operates in standard AM, CCM or single-sideband (SSB) service on any frequency from 3.9 to 26.1 MHz. Continental also manufactures the PowerStar A-series of AM transmitters in power levels from 1 kW to 50 kW.

"We believe that solid-state transmitter technology is the future for high-power stations in the megawatt range, and many of our customers will return to



Omnitronix is now owned by LPB Communications.

Continental Electronics as they replace and upgrade their systems," said General Manager Adil Mina.

"Furthermore, our strategic alliance with Harris will allow Continental to work with more broadcasters worldwide." 

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Then, just two years ago, as Engineering Manager of three Indianapolis stations, Max had the opportunity to fulfill a lifelong dream.

"My dream," he says, "a total rebuild of the facilities...a chance to design the studios the way we always wanted, with state-of-the-art equipment."

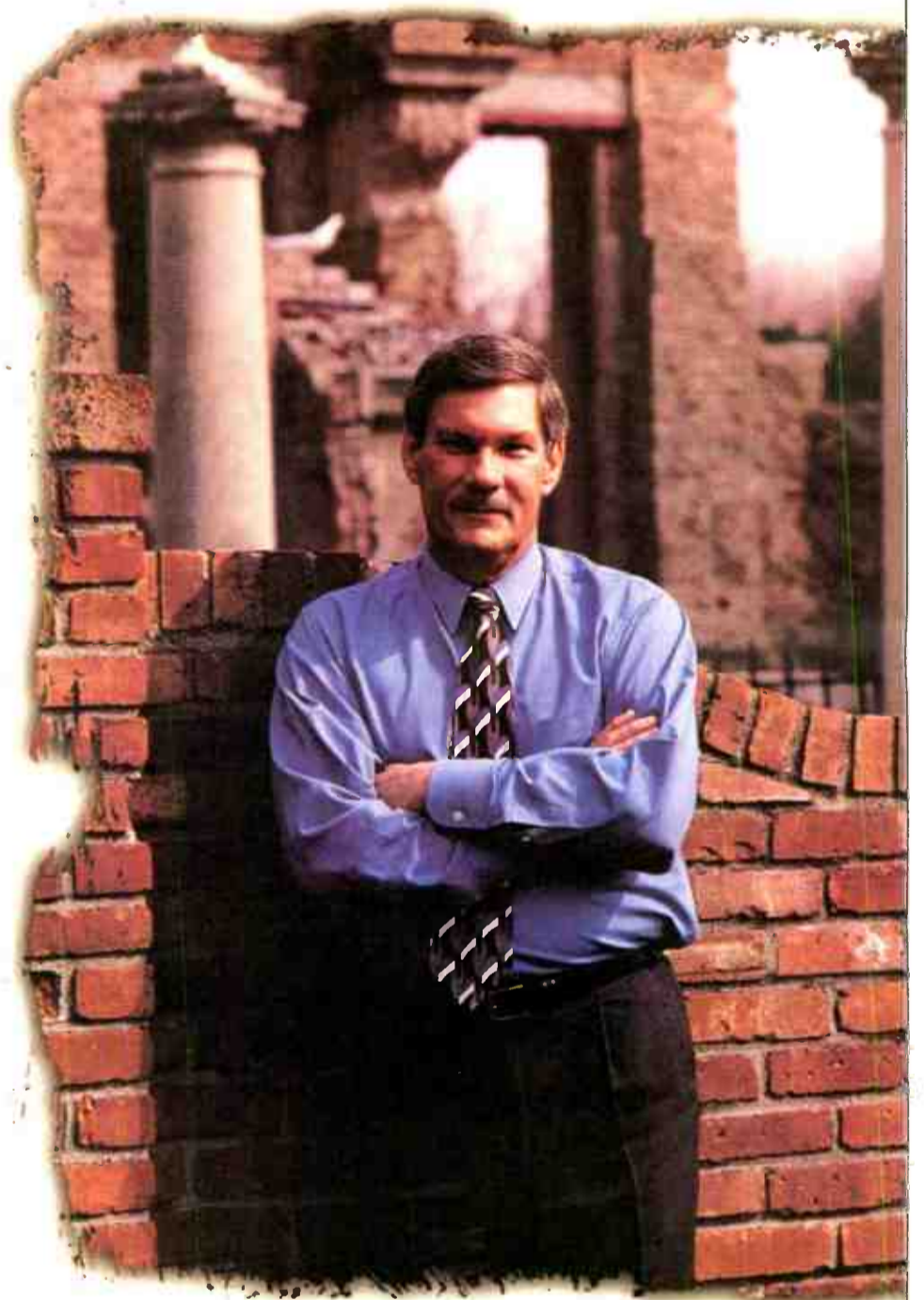
As he took the stations from records and carts to a touch-screen digital operation, Max enjoyed total support from the corporate office. In his words, "Susquehanna has the

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Web Tools to Help Radio Stations

Craig Johnston

The rapid growth of Webcasting has spawned an industry building tools and providing services to radio broadcasters looking to distribute their signals online. The volatility of the new economy also has seen late entries to, and last-minute departures from, the NAB exhibition floor, so check your on-site program listings for the location of your favorite supplier or new dot-com suitor.

RealNetworks will take the wraps off its Radio Business Application (RBA) 2.0. It integrates with a radio station's broadcast automation infrastructure to provide live ad replacement capabilities; enhanced user presentations within RealPlayer that synchronize song title, artist and album art information; and "buy now" capabilities for impulse online CD purchases.

Broadcast infrastructure

Real says the heart of its broadcast infrastructure is RealSystem iQ's NeuralCast Technology, which allows its servers to communicate dynamically with each other to route traffic in the most efficient manner, and in a way that is standardized and transparent to the user.

iBEAM Broadcasting will introduce Syndication Manager, which it calls the first fully-integrated Internet-based application that lets media companies set specific, business-based usage rules to control distribution of their streaming media assets to multiple Web sites and collect detailed usage data on their content.

Syndication Manager's technology offers content owners and syndication companies the ability to grant or deny access to content based on business agreements, track content usage for each affiliate, and access detailed reports for billing or audience analysis.

Internet features and functions will show up in the products of companies that make automation and music-on-hard-drive management systems.

Management Data Media Systems AG will bring DABS NewsCenter 3.0, which supports the workflow process within a newsroom, offering a comprehensive set of information sources within one interface. These sources include agencies such as Reuters, AP or AFP, editorial scripts, audio clips or the Internet via the integrated Web browser. Combining and pre-producing text elements with audio clips are made possible by the integration of the DigaSystem ReporterBox.

CartWorks Digital Audio Systems products will include support for the Cart Chunk file standard and automatic Web site content generation.

Computer Concepts Corp. will introduce Visual Traffic, a scalable 32-bit traffic and billing system with Internet Order Entry, very fast log processing, real-time corporate reports and 250 other reports.

Internet features and functions like ad insertion will show up in the products of companies that make automation and hard-drive audio systems.

Dalet Digital Media Systems will showcase a news management system that assists news broadcasters and content providers with most aspects of their operations, including Webcasting. It enables stories to be repurposed automatically and simultaneously onto any electronic medium including radio, TV, the Internet, wireless devices and interactive TV.

The company's Digital Automation System includes scalability, serving just one station or the needs of a Webcasting site with 100+ channels and an audio library of several terabytes.

Dalet will also unveil its Multimedia Broadcasting System, including multimedia broadcasting, promotion and e-commerce tools to allow radio stations and Webcasters to add complementary content such as album art, artist name and song titles via the Internet. E-commerce links can be incorporated, allowing listeners to purchase related merchandise with a few clicks of the mouse.

MediaTouch will premier iMediaAdCast, an ad substitution system that inserts Web-only commercials into a Webcast stream without interrupting the music or entertainment content. It uses one PC and fixed IP Internet connection.

Lightningcast will showcase technology that allows advertisers to target audio and video ads by age, gender, geography and personal music preference while allowing streaming media publishers to realize incremental revenue from their Internet streams.

mediatron Digital Radio Systems will introduce an Internet Radio Automation system with live-assist functionality, ready for e-commerce. The mediatron system works with plug-in technology. It

is Windows NT/2000 based, and Digigram- or Soundblaster-compatible.

SplitStream

RCS will introduce SplitStream, a component of RCS RadioShow. This system sends a different commercial to each Internet listener, appealing to his or her interests. SplitStream operates with

smooth segues, no delays and no re-buffering; the company says it sounds like terrestrial radio.

SplitStream works with automated and manual stations, and does not require player download. With SplitStream's Interactive Advertising feature, the user can display graphics associated with each spot and provide a click-through to the advertiser's Web site.

Also from RCS, iSelector is a customizable version of a terrestrial radio station, using the power of the Selector music scheduling system.

iSelector allows Internet users to create their own unique version of their favorite radio station, increasing or decreasing airplay on any song or artist

company's music scheduling software, Selector. Features include supervised access to the Selector database coupled with the Living Log, instant HotKey audio, "Real-feel" voicetracking in the studio and over the Internet, and the Log-Linked Web Browser.

Streaming21, in collaboration with Neon Technology Inc. and Sigma Designs, will showcase a joint solution for the delivery of broadcast-quality video and audio streaming. Streaming21 will provide carrier-class delivery and a content distribution platform enabling the future of IP television.

Neon's participation will be driven through its SurfReady Set-Top Box environment, which delivers Internet access and video by using Sigma Design's decoder chips. Sigma Designs is known for its digital video MPEG decoder silicon and broadcast-quality MPEG chips.

SpaceCom Systems, Inc. will feature rapid deployment two-way interactive satellite communication services ideal for establishing connectivity virtually anywhere at any time. Its solutions include fast connection for Webcasting of events, streaming audio or video over the Internet, establishing high-speed connectivity for remote sites.

Mindport will show the Sentriq, which protects streaming content distribution and revenue streams. Based on the company's experience in conditional access technologies, Sentriq provides real-time Video Digital Rights Management (V-DRM) to ensure a secure and scalable platform.


Also from Mindport will be BIS, which features fast Internet, file download, Webcasting, ticker/IP streaming and e-mail delivery systems for satellite-based service providers.

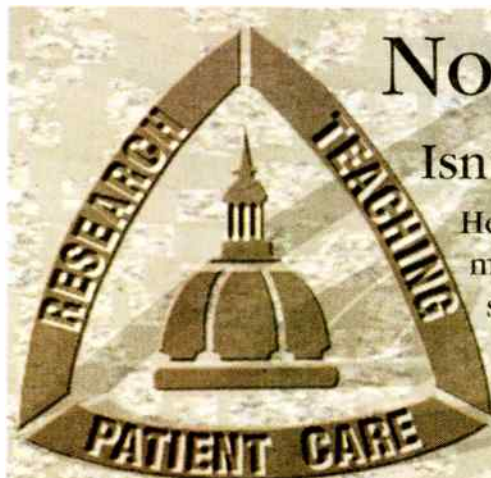
The new iSelector lets Internet users create a unique version of their favorite radio station.

while keeping the stations imaging (jingles, liners, promos) intact.

The company also will exhibit RadioShow, its branded Internet player. RadioShow is available in three levels: Level 1 displays current title/artist info on your site, synchronized to the streaming audio signal. Level 2 adds the "Buy Me" Button, enabling the purchase of music online, with additional revenue going to the station. Level 3 adds animated graphics and other synchronized visuals.

RCS's MasterControl integrates the

Prompt Software will showcase its Prompt Internet Application, which enables scheduling and planning information within a Prompt ERP application to be accessible via Internet, intranet or Extranet. In a secure environment, PIA generates current information online regarding the bookings in your facility, while providing additional information for your staff and management. Staff can report worked hours from a remote location using Prompt's secure e-mail facilities, which is updated in the Prompt ERP application. 



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Test and Monitoring at NAB2001

Harold Hallikainen

In the area of broadcast signal monitoring equipment, several products announced in advance of NAB2001 reflect incremental improvements, rather than revolutionary introductions.

The improvements are largely in software, either improved use of digital signal processing or advanced analysis of measurements from existing hardware. Further, especially in the area of RF measurement, many companies are concentrating on products for digital television, because every TV station will need a large amount of equipment in making that conversion.

Specialized monitors

Nonetheless, the new features to be introduced certainly are worth a look.

DK Audio will introduce the MSD600M Surround Sound monitor. Radio applications for surround sound are few, but some studios in combined radio/TV facilities are so equipped, and the product has interesting features. The unit is available in 2-, 4-, 6- and 8 channel versions. It combines a phase meter, surround-sound vectorscope and multi-channel peak program meter.

A color display (with VGA output for external displays) shows a "Jelly-Fish" surround sound image. A "pseudo-surround" decoder could be used to drive studio monitors. The audio inputs may be either analog or digital (AES/EBU and S/PDIF). An optional FFT spectrum analyzer may be added. When the FFT is added, you gain a white, pink, sine and burst generator with balanced outputs. This turns the "monitor" into a piece of audio test equipment. DK Audio offers several other stereo display/monitors.

Boland Communications will introduce uniVUer on-screen audio metering products, including metering in PPM, VU, AES3 and embedded formats.

Manufacturers showing existing lines of audio metering equipment include Dorrough Electronics with its award-winning Loudness Meter, Logitek with a family of LED and mechanical VU meters, and Ward-Beck Systems with the XTM4 extended-range test meter.

RF signal analysis

A couple years ago, we first saw the Audemat AM and FM signal analysis products. These were among the first to integrate signal-quality data with GPS data to provide a coverage map that shows signal quality at different locations as opposed to just showing RF field strength.

This year, Audemat is introducing Goldenear signal-quality evaluation software that works with its mobile FM_MC3.2 and FM_MC4 FM monitors. Goldenear evaluates the parameters available from the monitors (RF level, subcarrier levels, multipath characteristics, etc.) and combines them into a single quality index through an algorithm developed with "golden eared" audio experts.

The software takes into consideration how each of these impairments will sound and develops the quality index, using a number between 1 and 5. The software combines this with geographic data to produce maps showing perceived signal quality at all locations in the coverage area.

With this software, it would be possi-

ble to know that your station sounds bad in a particular location, even though there is plenty of signal. Audemat will conduct mobile demonstrations of Goldenear with the FM_MC4 monitor. To reserve space,

audio broadcasting. It also will show Goldenear, which is similar to Goldenear but intended for fixed operation at transmitter sites or specific reception points. These points may be linked



Audemat Goldenear

e-mail a request to info@audemat.com.

The FM_MC4 FM monitor is similar to the FM_MC3.2 but with new IF filters and new software for co-channel interference analysis. Audemat will also show signal analysis equipment for digital

using TCP/IP to permit reception monitoring (with alarms) from anywhere.

Aztec Radiomedia is showing its FM Navigator, which combines signal-quality data with GPS data to yield geographic maps with signal quality information.

Potomac Instruments, known for its RF measurement equipment such as field-strength meters and directional array antenna monitors, is continuing to concentrate on the active DTV area. It is working on a DTV survey system. The existing radio products will be on display.

Delta Electronics will show its extensive line of RF monitoring equipment, including impedance bridges and RF ammeters.

Bird Electronics will exhibit recently introduced power monitors. Coaxial Dynamics will show their RF power monitors, wattmeters and alarms, as well as RF loads.

Besides its existing line of RF loads, Altronic Research will be introducing the FiberOptic Leak Detector. This works in high RF environments and detects liquids

See TEST, page 36 ▶

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FM60G	Solid State	3-60 watts	87.5-108.1 MHz	N/A	60WSS	\$ 3,000.00
FM100GS	Solid State	3-100 watts	87.5-108.1 MHz	N/A	100WSS	\$ 3,500.00
FM2500G	Solid State / Tube	2500 watts	87.5-108.1 MHz	FM100GS	3CX3000A7	\$ 22,995.00
FM4000G1	Grounded Grid Tube	4 kW	87.5-108.1 MHz	3CX800A7	3CX3000A7	\$ 24,995.00
FM4000G3	Grounded Grid Tube	4 kW	87.5-108.1 MHz	3CX800A7	3CX3000A7	\$ 24,795.00
FM4000GS1	Solid State / Tube	4 kW	87.5-108.1 MHz	FM700SS	3CX3000A7	\$ 25,995.00
FM4000GS3	Solid State / Tube	4 kW	87.5-108.1 MHz	FM700SS	3CX3000A7	\$ 25,795.00
FM5000G1	Grounded Grid Tube	5 kW	87.5-108.1 MHz	3CX800A7	3CX3000A7	\$ 25,995.00
FM5000G3	Grounded Grid Tube	5 kW	87.5-108.1 MHz	3CX800A7	3CX3000A7	\$ 25,795.00
FM5000GS1	Solid State / Tube	5 kW	87.5-108.1 MHz	FM700SS	3CX3000A7	\$ 26,995.00
FM5000GS3	Solid State / Tube	5 kW	87.5-108.1 MHz	FM700SS	3CX3000A7	\$ 26,795.00
FM8000GZ1	Grounded Grid Tube	8 kW	87.5-108.1 MHz	3CX800A7	3CX6000A7	\$ 26,995.00
FM8000GZ3	Grounded Grid Tube	8 kW	87.5-108.1 MHz	3CX800A7	3CX6000A7	\$ 26,795.00
FM8000GS1	Solid State / Tube	8 kW	87.5-108.1 MHz	FM700SS	3CX6000A7	\$ 27,995.00
FM8000GS3	Solid State / Tube	8 kW	87.5-108.1 MHz	FM700SS	3CX6000A7	\$ 27,795.00
FM10000G1	Grounded Grid Tube	10-12 kW	87.5-108.1 MHz	3CX800A7	3CX10000A7	\$ 27,995.00
FM10000G3	Grounded Grid Tube	10-12 kW	87.5-108.1 MHz	3CX800A7	3CX10000A7	\$ 27,795.00
FM10000GS1	Solid State / Tube	10-12 kW	87.5-108.1 MHz	FM700SS	3CX10000A7	\$ 28,995.00
FM10000GS3	Solid State / Tube	10-12 kW	87.5-108.1 MHz	FM700SS	3CX10000A7	\$ 28,795.00
FM15000G1	Grounded Grid Tube	12-15 kW	87.5-108.1 MHz	5CX1500B	3CX10000A7	\$ 28,995.00
FM15000G3	Grounded Grid Tube	12-15 kW	87.5-108.1 MHz	5CX1500B	3CX10000A7	\$ 28,795.00
FM20000G1	Grounded Grid Tube	20 kW	87.5-108.1 MHz	5CX1500B	3CX15000A7	\$ 54,995.00
FM20000G3	Grounded Grid Tube	20 kW	87.5-108.1 MHz	5CX1500B	3CX15000A7	\$ 43,995.00
FM25000G1	Grounded Grid Tube	25 kW	87.5-108.1 MHz	5CX1500B	3CX15000A7	\$ 56,995.00
FM25000G3	Grounded Grid Tube	25 kW	87.5-108.1 MHz	5CX1500B	3CX15000A7	\$ 44,995.00
FM30000G3	Grounded Grid Tube	30 kW	87.5-108.1 MHz	5CX1500B	3CX20000A7	\$ 49,995.00
FM45000G3	Grounded Grid Tube	45kW	87.5-108.1 MHz	FM8000GZ3	YU1195	\$ 64,995.00
FM50000G3	Grounded Grid Tube	50 kW	87.5-108.1 MHz	FM15000G3	YU1195	\$ 69,995.00

Digital Audio Broadcast Compatible

Plate Modulated AM & Short Wave Transmitters

Model	Transmitter Type	Power Output	Frequency Range	IPA Type	PA Type	Modulator Type	List Price
AM10KWF	Plate Modulated AM	10 kW	500 KHz-2 MHz	4-400	4CX15000A	(2) 4CX5000A	\$ 62,995.00
AM10KWFHF	Plate Modulated Short Wave	10 kW	2-22 MHz	4-400	4CX15000A	(2) 4CX5000A	Call
AM15KW	Plate Modulated AM	15 kW	500 KHz-2 MHz	4-400	4CX15000A	(2) 4CX5000A	\$ 64,995.00
AM15KWFHF	Plate Modulated Short Wave	15 kW	2-22 MHz	4-400	4CX15000A	(2) 4CX5000A	Call
AM25KW	Plate Modulated AM	25 kW	500 KHz-2 MHz	4-400	4CX20000B	(2) 4CX15000A	\$ 119,995.00
AM25KWFHF	Plate Modulated Short Wave	25 kW	2-22 MHz	4-400	4CX20000B	(2) 4CX15000A	Call
AM50KWF	Plate Modulated AM	50 kW	500 KHz-2 MHz	4-100	4CX35000C	(2) 4CX15000A	\$ 209,995.00
AM50KWFHF	Plate Modulated Short Wave	50 kW	2-22 MHz	5CX1500B	4CX35000C	(2) 4CX15000A	Call

NEW! Digital Solid State AM & Short Wave Transmitters

Model	Transmitter Type	Power Output	Frequency Range	PA Type	Modulator Type	List Price
AM500SSi	Solid State AM	500 watts	535-1710 KHz	Solid State	Digital PDM	\$ 7,000.00
AM1000SSi	Solid State AM	1 kW	535-1710 KHz	Solid State	Digital PDM	\$ 8,800.00
AM1000SSA	Solid State AM	1 kW	535-1710 KHz	Solid State	Digital PDM	\$ 16,495.00
AM2500SSA	Solid State AM	2.5 kW	535-1710 KHz	Solid State	Digital PDM	\$ 23,495.00
AM5000SSA	Solid State AM	5 kW	535-1710 KHz	Solid State	Digital PDM	\$ 41,495.00
AM10000SSA	Solid State AM	10 kW	535-1710 KHz	Solid State	Digital PDM	\$ 62,995.00
AM25000SSA	Solid State AM	25 kW	535-1710 KHz	Solid State	Digital PDM	\$ 131,995.00
AM50000SSA	Solid State AM	50 kW	535-1710 KHz	Solid State	Digital PDM	\$ 194,995.00
AM100000SSA	Solid State AM	100 kW	535-1710 KHz	Solid State	Digital PDM	Call
SW1000SSi	Solid State Short Wave	1 kW	3-7 MHz	Solid State	Digital PDM	\$ 11,495.00
SW1000SS	Solid State Short Wave	1 kW	3-7 MHz	Solid State	Digital PDM	\$ 20,495.00
SW2500SS	Solid State Short Wave	2.5 kW	3-7 MHz	Solid State	Digital PDM	\$ 27,995.00
SW5000SS	Solid State Short Wave	5 kW	3-7 MHz	Solid State	Digital PDM	\$ 48,995.00
SW10000SS	Solid State Short Wave	10 kW	3-7 MHz	Solid State	Digital PDM	\$ 72,995.00

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Radio Mic Market Heating Up

Ty Ford

The fight for microphone market share continues in the radio broadcast market. Condenser mics, while making slow gains against long-entrenched dynamic microphones, have yet to do more than slightly tip the scales.

The two most compelling reasons for stations not to change have been the high price of condenser microphones and the tight patterns required by many radio studios to keep unwanted room reflections from smearing the audio.

But the drop in prices for condenser mics from young companies in the last two years has put pressure on the legacy condenser manufacturers, and has brought the price of condenser mics within range of the dynamic microphone market.

While some low-cost condensers lack the smoothness of the higher-priced models, and condenser self-noise sometimes is an issue, the radio market is neither blind nor deaf to these new developments.

Acoustic design

At the top end of the market, and in studios where more attention is paid to acoustic design and damping, high-priced condensers have had a much easier entry.

For those waiting for the next in digital microphony, the wait is over. At beyerdynamic, Marketing Director Bob Lowig thinks digital is the most obvious direction.

"Those who are following that transition to digital in broadcasting should look at our MCD 100 digital

microphone. The package includes the MCD 100 mic, MPD 200 power supply with word clock and EA74 suspension has been reduced to \$2,999," said Lowig.

"The MCD 100 is still the only 24-bit digital mic with an AES/EBU output in the industry. There's a DSP chip that acts as a limiter so the mic never clips. The system can also be used with 16-bit devices."

For those not ready to make the digital leap, Lowig suggests the beyerdynamic M 99 large-diaphragm studio dynamic mic with suspension mount. Retail price: \$795.

At Sennheiser/Neumann USA, Marketing Director Joe Ciaudelli pointed to the new Neumann KMS-105 mic (\$595) for studio use.

Tight pattern

"The large-diaphragm condenser mic is specially designed for vocal use where a tight pattern keeps unwanted noises out of the mix. The mic has a pad switch that drops its level to that of a standard dynamic mic for easy plug and play operation," Ciaudelli said.



AKG C4500B-BC

Sennheiser and Neumann are reducing some prices. The Neumann U 87ai is now available at a slightly discounted \$3,095, which includes mic and suspension mount for the Set Z configuration.

From Sarita M. Stewart, marketing manager at AKG Acoustics U.S., comes word of the C 4500B-BC large-capsule condenser mic (\$665).

"This product has been designed for broadcast engineers and with their needs in mind. The C 4500B-BC's key feature, other than its great acoustics, is its inherent immunity to RF fields from nearby computer monitors. The money saved from buying flat screen monitors can more than pay for the microphone itself," Stewart said.

front of the microphone, which allows the microphone to be optimally positioned in front of the talent's mouth without impeding their field of vision," said Stewart.

"Also, its wider cardioid pattern allows more flexibility and freedom of movement while maintaining consistent sound. The microphone operates with all phantom powering voltages."

Smooth low end

At Audio-Technica U.S., Marketing Manager Michael Edwards also detects

Condenser microphones have made some gradual gains in a market dominated by dynamic models.

The large-diaphragm condenser microphone comes packaged with a professional, spider-type shockmount and an external pop-wind screen.

"The main axis for sound entry is in

more interest in condensers of late.

"I don't know where the standards in dynamic mics are going, but I'm starting to see more condenser mics show up in

See RADIO MIC, page 37 ▶

Test

▶ Continued from page 33 where they should not be — waveguide, coax, filters or combiners, for instance.

Radio stations must not overmodulate. But the lack of a legal requirement that stations actually have a modulation monitor, and the excellent characteristics of existing monitors, have discouraged manufacturers from producing new designs this year.

In the past several years, the introduction of DSP analysis of the demodulated signal has produced some impressive equipment. Once the U.S. standard for terrestrial digital audio broadcasting is determined, monitor manufacturers expect to ramp up new designs.

Though they are not introducing new monitors this year, stop by the long-time monitor manufacturers such as Belar, Inovonics, QEI and TFT.

Audio signal analysis

DSP continues to invade audio signal analysis equipment.

Asaca/Shibasoku Corp. of America will introduce the AM70A audio analyzer. It analyzer can measure audio level, IMD, harmonic distortion and other parameters. It completes many tests in less than 100 ms and can be operated through a GP-IB (IEEE-488) interface.

Audio Precision has a stable hardware platform for its audio analysis equipment and is making improvements in both the DSP analysis software and the user interface software. At NAB2001, AP is introducing APWIN 2.14. This software release makes improvements including a better PCI driver and improvements in the individual harmonic analyzer for the DSP-

equipped Cascade analyzers.

Neutrik Test Instruments is introducing its "minstrument" line of miniature instruments. The Minilyzer makes audio level, distortion, spectrum and other measurements. Handheld, it's a lot smaller than the HP 330D many engineers started with.

The Minirator audio generator is another handheld instrument. It generates sine and square waves, pink and white noise, and a polarity test signal. Finally, the MiniSPL can be combined with the Minilyzer for precise acoustic measurements. So, how loud are your studio monitors?

Videoquip Research Limited is introducing the new DSG-1 portable (very small!) digital signal generator. It outputs a variety of tones in AES/EBU, S/PDIF and analog formats with several sample rates.

Timers and clocks

Along with its video products, Horita is adding the finishing touches on the new DT-100 LED display timer. It can count up or down, provides an output signal when the timer reaches zero, and can be remote controlled.

ESE is featuring the ES-185A GPS master clock. Now your station's clocks can be accurate to within 45 ns! Torpey Time is showing a GPS-based clock system.

Metering and monitoring systems continue to advance through improved DSP and other computer software. The improvements tend to be incremental. Spend some time to see how improvements in these products can improve the quality of your signal.

And for broadcasters airing DAB signals abroad, RadioScape Ltd. will promote its DAB ETI Monitor, a real-time diagnostics system for EMUX ETI streams, and DAB Test Receiver 3000, a Windows-based system for DAB monitoring and troubleshooting. ●

Complex problems...

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Radio Mic

► Continued from page 36
on-air studios," he said.

"That might have something to do with the increased acceptance of our AT 4033 (\$495) and AT 4047 (\$695) condenser mics. Those prices include shock-mounts. The AT 4047 was initially positioned as a recording studio mic, but because of the smooth low end some of the broadcast guys have picked up on it," Edwards said.



Shure KSM44

Wayne Freeman, sales and marketing director at Marshall, said the company has two booths at NAB 2001, one in the Sands and one in the LVCC. New this year will be the Marshall Model 2003 (\$399) cardioid condenser microphone.

"The Model 2003 features a 1.06-inch gold diaphragm, transformer-coupled output, built-in bass rolloff, 10 dB pad and shockmount. It's one-third to one-fourth the cost of some of the similar German microphones," said Freeman.

"Our new inexpensive V69 (\$349) is a cardioid tube condenser microphone, using a 5718 vacuum tube. It's in the V67 body, but different. The circuit is designed more for orchestral work as a spot mic with the ability to withstand SPL 148dB."

At Shure, Public Relations Manager Michelle Zenner Kohler highlighted the new KSM44 (\$1,340) condenser microphone for on-air work and voiceovers.

Great articulation

"The KSM44 features externally biased, large, dual-diaphragms in a side-address design. With great articulation, controlled low end, an integrated pop protection grille, and low self-noise of 7dB-A, the KSM44 is a high performance choice for any broadcast studio," she said.

Also watch for the new SM7B (\$596) dynamic mic. According to Shure PR Coordinator Cory Lorentz, "The SM7B has all of the same industry-leading features as the SM7A, including improved shielding against electromagnetic hum. The SM7B also adds a new windscreen for improved pop protection. Its flat, wide-range frequency response, switch-

able bass roll-off and mid-range emphasis (presence boost) and natural dynamic capsule make it one to look at."

Toby Nady, marketing director at Nady Systems Inc., said the company will show two new lines of studio condenser mics: the SCM FET condensers and TCM tube condenser microphones. There are six models in the SCM line ranging in price from \$150 to \$290.

Pressure gradient

"All models feature large, pressure-gradient condenser, gold-sputtered diaphragms and FET preamplifiers. The SCM 950/980/1000 are true condenser design with exceptionally low self noise and increased dynamic range.

"These mics are ideal for recording studio vocals, acoustic instruments,

orchestras and choral groups, ambient instrument audio, and numerous live sound applications."

Nady said the new TCM 1050 (\$499) and TCM 1100 (\$529) studio tube condenser mics "have a classic vintage look and same sound and performance of the legendary vacuum tube microphones, also at a fraction of their original cost."

The TCM 1050 features a gold-sputtered, ultra-thin mylar dual diaphragm, tube preamplifier circuitry with a 6072 (classic 12AT7) vacuum tube specially selected for low distortion, superior signal-to-noise ratio and minimum sensitivity to mechanical vibrations; a special output transformer designed for ultra transparency; almost all brass parts; and nine polar patterns remotely selectable (omnidirectional, cardioid, figure 8, and

six intermediate stages).

It includes an aluminum flight case, TMPS-2 power supply/pattern selector unit, 30-foot/seven-pin XLR cable, elastic spider shockmount and foam wind-screen.

Nady said the cardioid-only TCM 1100 offers a hand-tooled brass capsule with a 3-micron, gold-sputtered mylar 1.1-inch diaphragm with a specially designed, gold-plated center element that creates a gentle extension of the top octaves and an enhanced transient response.

"As with the 1050, we use a 6072 vacuum tube and special output transformer. The TCM 1100 is supplied with rugged, portable plastic carrying case and 16-foot/seven-pin XLR cable and TMPS-1 power supply," he said.

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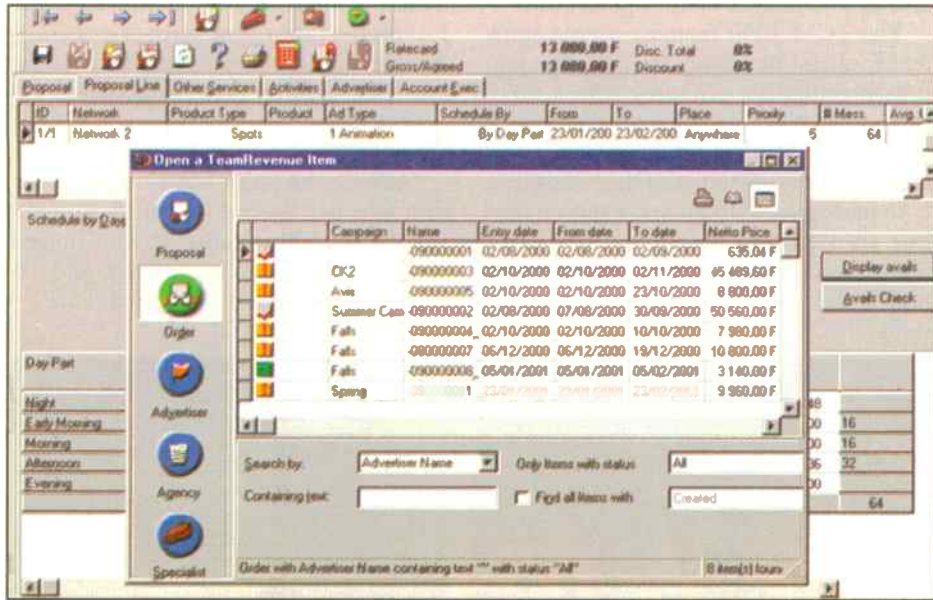
World Radio History

Traffic Looks to Net

James Careless

Three words sum up this year's offerings in radio traffic and billing software at NAB2001: Internet, control and power.

Based on the Windows NT/2000 platform, Scott is promoting Visual Traffic as the easiest traffic and billing software for managers and sales people to understand. "It provides Visual charts and graphs



Dalet TeamRevenue

"Internet order entry are this year's buzzwords," said Dave Scott, president of Computer Concepts Corp. Visual Traffic, Computer Concept's new traffic and billing software, fits these buzzwords.

"It allows sales people to enter orders from anywhere over any computer with Internet access."

showing availabilities, sold-out hours and days, tracking reports, spot rates and load factors so stations can maximize their revenues without sounding cluttered," he said.

However, it's Visual Traffic's Internet support that has Dave Scott most excited, and small wonder. Using Visual Traffic, salespeople can place orders from the field

through wireless Palm Pilots or laptops. Visual Traffic automatically faxes a hard copy confirmation to the client for signature, and for faxing back to the station.

"Immediacy is one of radio's advantages over other media," said Scott. "Visual Traffic's Internet Order Entry helps make sales even more immediately responsive."

The RCS NetCom Traffic and Billing System is scalable "from one station to hundreds or even thousands of stations with just a single operator," said Lora Colley, USA Product Manager for NetCom, "and can schedule and manage up to literally 9,999 stations, more than any other system out there."

Simple solutions

Colley said RCS is focusing on simple solutions to multi-station management problems. "Even the smallest version of RCS NetCom contains what other traffic systems sell as add-ons."

NetCom includes a new "Integrated Production Management" feature, where the status and progress of production can be individually tracked; "Electronic Invoicing" for e-mail billing if desired; and an easy-to-operate Special Events Management module for quick handling of sports events or remote broadcasts.

NetCom's Media Plan Manager can incorporate market ratings or yield management to maximize revenues. Each sales person can track all contacts using the Contacts Management part of NetCom, including inactive clients as well as prospects.

a radio group's member stations, allowing the entire sales process to be centrally managed over a network.

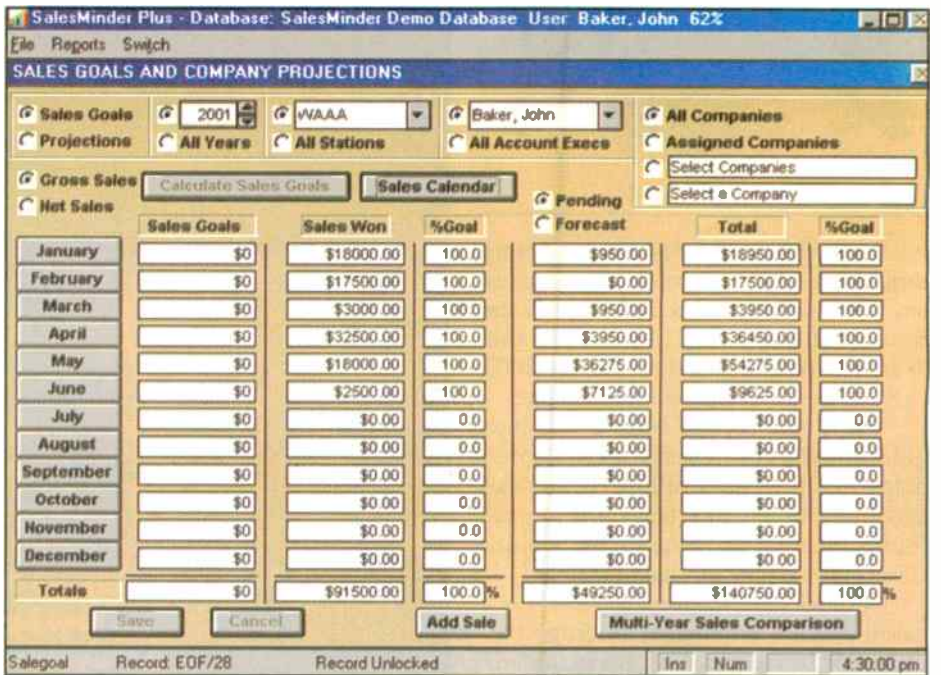
"TeamRevenue accommodates multiple networks with regional breaks and allows for cross-selling of radio," said Arnaud Lelache, product director for Dalet's Advertising and Streaming Solutions. "Through a user-friendly Web interface, the sales reps on the field can have a direct access to the real-time inventory of any radio in the network and securely place their proposals in the system. (Meanwhile), wherever your radio spots are being produced, our copy management engine will ensure their distribution to the final broadcaster together with the logs."

Although marketed as an automated show planner, D.A.V.I.D. GmbH's DigAIRrange offers features attractive to traffic and billing departments. The reason: the DigAIRrange "template," which is used for planning the show, can be viewed from any logged-in workstation.

This means that the traffic and billing department can stay abreast of what's going on air. They can even put in their two cents' worth, using a live chat area incorporated in DigAIRrange.

Register Data Systems bills its System Six sales/traffic/accounts receivable system as having "all of the power and versatility you're looking for."

System Six can support up to 999 clients and 999 orders per station, with each order holding up to 255 scheduling lines. It can also program 4,608 spots and 576 commer-



Wicks SalesMinder Sales Intelligence Program

FastChannel Network's SpotTaxi.com works over networks. The Internet is used not just to transmit sales orders, but also to download radio commercial directly from SpotTaxi.com to the client station's own server.

"SpotTaxi allows automatic ad delivery into your on-air system because of its compatibility with on-air systems and audio formats," said Jared Nieuwenhuis, marketing manager for FastChannel Network. "The SpotTaxi.com Downloader/Decoder software also gives broadcasters the ability to automate the spot download process. The application will seek out and automatically download new spots at specific user-definable times, or in increments ranging from every 15 minutes to every 12 hours."

When it comes to control, Dalet TeamRevenue deserves mention. It is an advertising management program that covers functions from proposals to order follow-up, inventory management to trafficking, and billing to post-sales analysis.

In addition, it can be distributed through

cial breaks every day for each station, and can store an unlimited number of logs.

As well, this software automatically posts billing data to the System Six accounts receivable component, where client statements can be printed for whomever A/R wishes.

Wicks Broadcast Solutions' D32 traffic and billing system promises power to burn. Included among its capabilities are no limits on booking customers and contracts. D32 also allows multiple station orders to be entered, and automatically accesses each customer's account balances and credit when orders are being placed.

Meanwhile, Wicks has also released a new sales proposal tool called RateMinder, and a customer relationship management program called SalesMinder. Together, these products help managers and their reps monitor the sales process from start to finish. Finally, Wicks Broadcast Solution's CBSI DeltaFlex traffic system has been enhanced to allow up to 98 program logs in the assembly/editing stage.

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World Radio History

Transmitter Firms Eye DAB, LPFM

Jeff Johnson

With rapid changes driven by digital technology taking place in the telecommunications industry, FM transmitter manufacturers face challenges. It is apparent that they have been watching the dual developments of digital audio broadcasting and low-power FM with interest.



Nicom NT 30 Exciter

Exhibiting at NAB 2001 will be many manufacturers responding to these changes as well as continuing their support of heritage FM technology.

Solid at 20

Kim Winking, marketing services manager of Broadcast Electronics Inc., said BE will display its new FM20S, described as the first solid-state 20 kW FM transmitter designed from the start as a complete stand-alone unit. BE said its internal combiner and single integrated controller make the FM20S a cost-effective solution for high-power solid-state FM applica-

tions.

Entering the FM broadcast transmitter market for the first time is a well-known name, Marti Electronics, which is owned by BE.

"This is a new field for Marti," said Jim Godfrey, president of Marti. An addition to its Plug-and-Play, or PNP, line of FM broadcast transmitters is a 1kW model.

According to Godfrey, it is a lower-priced 1 kW FM transmitter.

The PNP 1000 features analog or digital input and a digital exciter, and is targeted to the translator, lower-power full-service and standby transmitter markets.

Nautel Inc. will display its Q40, 40 kW Solid-State Transmitter. According to Jorgen Jensen, manager of sales and marketing, Nautel achieves 68 percent efficiency with this transmitter, rivaling tube transmitters, by means of a single-stage combiner and a tuned link between the IPA and PA.

This efficiency and the reliability of the

redundant systems of the Q40 makes it suitable for hybrid in-band, on-channel digital audio broadcast service, according to Jensen.

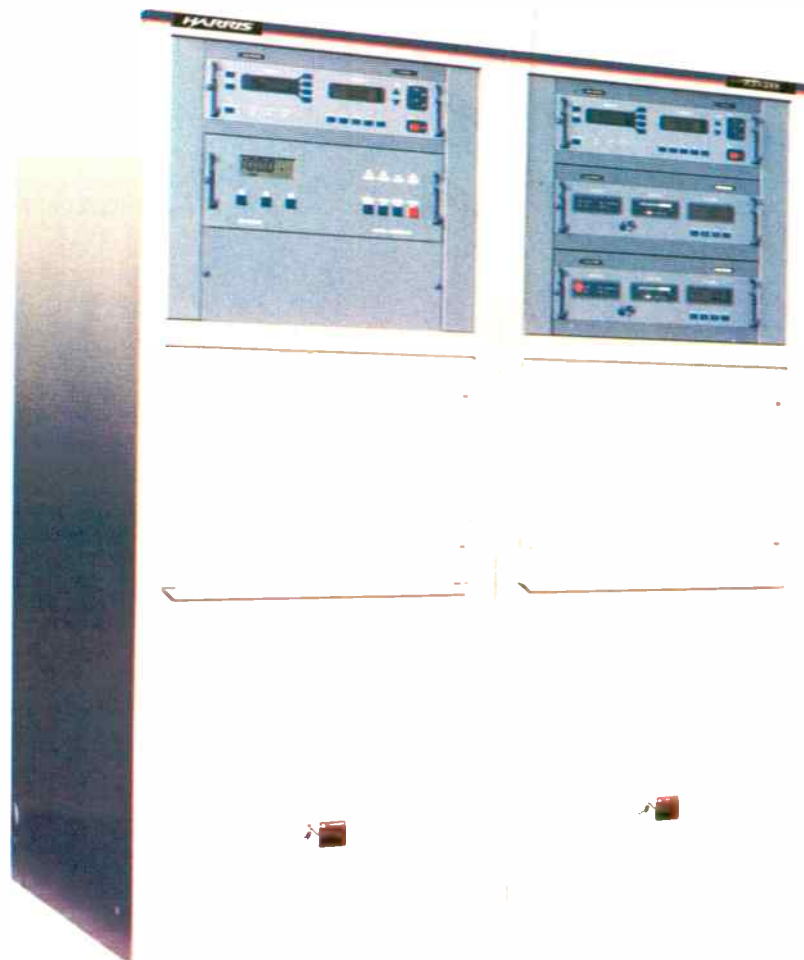
Continental Electronics will emphasize its long service to the industry. Bret Brewer, the company's new marketing director for AM and FM products, described the venerable Continental 816R as "old reliable" and said CE is returning to "what we do best," promoting its track record of reliability.

amplification/low-level combining.

Harris has several prototype Z-IBOC digital transmitters being used for over-the-air field tests by iBiquity Digital, he said.

Jorgen Jensen of Nautel said he expects the FM hybrid (analog plus digital) mode of broadcasting will survive for a long time after the launch of IBOC, and that many broadcasters will opt for separate amplification to avoid replacing their entire transmitting plants. He said Nautel's transmitter line is optimized for hybrid mode and will perform well in the separate amplification digital environment.

Jensen feels that over-the-air broadcast stations face an imperative of rapid imple-



Harris Platinum ZD20CD FM Transmitter

Energy-Onix Broadcast Equipment has expanded its line to include intermediate power levels such as 1.5, 2.5 and 4 kW.

"Thus, broadcasters will not be required to purchase 2 kW transmitters when only 1.2 kW is required," said President Bernard Wise. He said, "Energy-Onix is the only major U.S. supplier that utilizes individual switching power supplies for each 300-watt pallet in its transmitter."

The ECO product line has been repackaged, he said, to include additional features such as automatic overload recycling, remote electronics raise-lower and a more efficient combiner system combiner system for the 2 kW solid-state IPA of the high-power transmitter.

Harris Corp. will display a Platinum Z, model ZD20CD, 20 kW FM transmitter. An emphasis will be placed on Harris' involvement with IBOC DAB by means of a display which Daryl Buechting, senior radio product line manager, said "will illustrate Harris' involvement with IBOC proponents and our contributions to IBOC from its very beginnings."

As there are no standards currently in place for IBOC transmission, transmitter manufacturers are facing IBOC with different approaches and senses of urgency.

Buechting emphasized Harris' preparedness for either IBOC-only transmitters for separate amplification/high-level combining or FM/IBOC transmitters for common

mentation of DAB or risk losing ground to satellite and Internet radio.

Tim Bealor, manager of RF products for Broadcast Electronics Inc., said BE is prepared to demonstrate a "completely new compatible technology that will help BE lead all of us in the radio broadcast industry into the next phase of implementation of IBOC DAB."

Tailoring power needs to the levels required by digital broadcasting, QEI Corp.'s Quantum M series transmitters "become very affordable by allowing you to purchase the exact amount of power necessary for your application," according to Ed Etschman, vice president of operations at QEI.

He said a Quantum M 5.4 FM transmitter is on the air delivering iBiquity's IBOC signal to the San Francisco market at KLCC(FM).

Armstrong Transmitter Corp. has had transmitters in the field performing proof tests of iBiquity technology. The company has found in its tests that digital radio is a particular improvement in fringe areas, according to Ernie Belanger, sales and marketing manager. Armstrong holds the opinion that tube technology is inherently more linear than solid-state and that Armstrong's single-tube grounded grid will be the most cost-effective route to IBOC.

Belanger expects the transition to digital radio to be faster than the transition to

See TRANSMITTERS, page 41 ▶

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Transmitters

► Continued from page 40
digital TV. His reasoning is that the receiving equipment will be little more expensive than analog receivers.

"It will then be up to broadcasters to sell IBOC," he said.

Low-power

It is unclear when the first low-power FM stations might go on the air, but the FCC's plan is still in place, and transmitter makers are eyeing it. Coincident with the advent of LPFM, a number of new and established lower-power transmitters will be exhibited.

Jose Luis de la Rosa of Seratel Technology S.A.L. states that a new product will be displayed, "a small FM 1 kW amplifier with a front panel 8 inches high and 19 inches wide." He said, "We are proud to present the new 50-watt AdvancedSound Digital Exciter, the latest design and the latest technology applied to the FM digital exciter."

Crown Broadcast, according to Barry Honel, international sales and marketing, will display a prototype of a new LPFM transmitter featuring compact size and a competitive price point. In addition to its line of FM transmitters, "Crown will be unveiling an exciting new product at the show," said Honel, declining to give specifics.

QEI Corporation will exhibit the Quantum E series of rack-mountable low-power FM transmitters.

Broadcast Richardson will present its RFCast MT 1K 1 kW transmitter. David White, product manager for Broadcast Richardson, said the RFCast line was promoted in the past as Omnicast.

New this year from Nicom Llc, according to Sales Representative Michelle DeFazio, are NT LCD FM exciters in 30, 150 and 300-watt power levels.

"All come provided with bi-directional software for the remote monitoring of forward/reflected power, internal temperature, frequency change and on and off power," said DeFazio. Nicom's NTR translators feature new NT LCD exciters with the addition of a frequency-agile receiver. The transmitter and receiver can be used independently.

Superior Broadcast Products will display its FM line, including a high-performance, digitally synthesized FM exciter as well as low-power solid-state FM transmitters with stereo generation.

Also on the FM transmission front, DB Elettronica Telecomunicazioni SpA announced a new generation of solid-state FM transmitters "with zero probability of off-air interruptions" thanks to four independent RF amplifiers and four independent power supplies for each 1 kW module.

AEV Spa will be promoting its Typhoon line of FM RF power amplifiers featuring a new design with built-in driver and new original RF cavity.

Elettronika S.r.l. will exhibit several new FM products, including the MIRA series, with 30 to 250 watts; the 5.5 kW TXSM6000A, made by coupling four 1.5 kW amplifiers; and the 10 kW TXSM10000A, with eight amplifiers.

ABS, Aquila Broadcasting Sets SpA, will promote its solid-state FM transmitters with power ratings to 30 kW and single-tube FM transmitters to 60 kW.

Elenos s.r.l. will be on hand promoting its Rack Series, with transmitters for 3, 5 and 10 kW; its ETG series of FM MPX exciters with LCD display, RDS and

stereo coder; and the E2000 MOSFET Amplifier with 2 kW output.

Additional news in the controller/monitor field is Armstrong Transmitter's LCD Controller. Ernie Belanger pointed to a vexing problem solved by the controller.

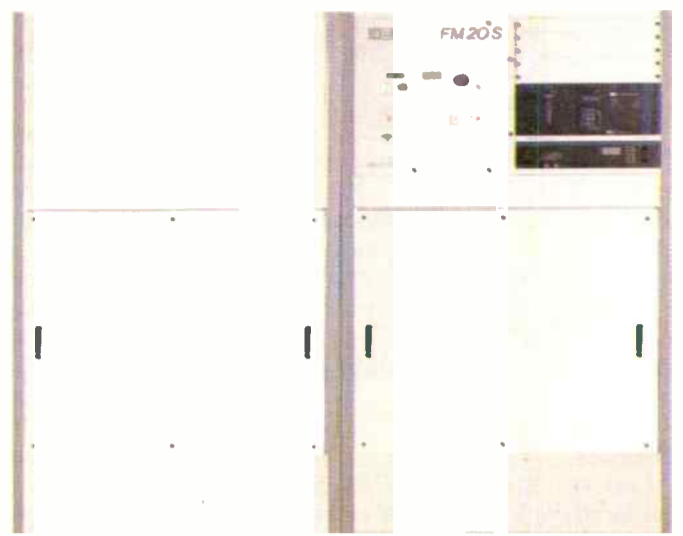
"The LCD continuously stores the last minutes of data from all transmitter parameters ... giving an accurate record of the last minute of operation just before a fault or failure occurs," he said. Remote monitoring allows the engineer to connect via modem to the monitor, backed up by battery, to determine the nature of the failure before traveling to the site.

Anders Madsen, vice president of sales and marketing for Bext Inc., promised an Internet-controllable exciter series in addition to its digital radio transmitters.

And on a related topic, Sound

Broadcast Services Ltd. will be displaying its new FRDSS silence sensor.

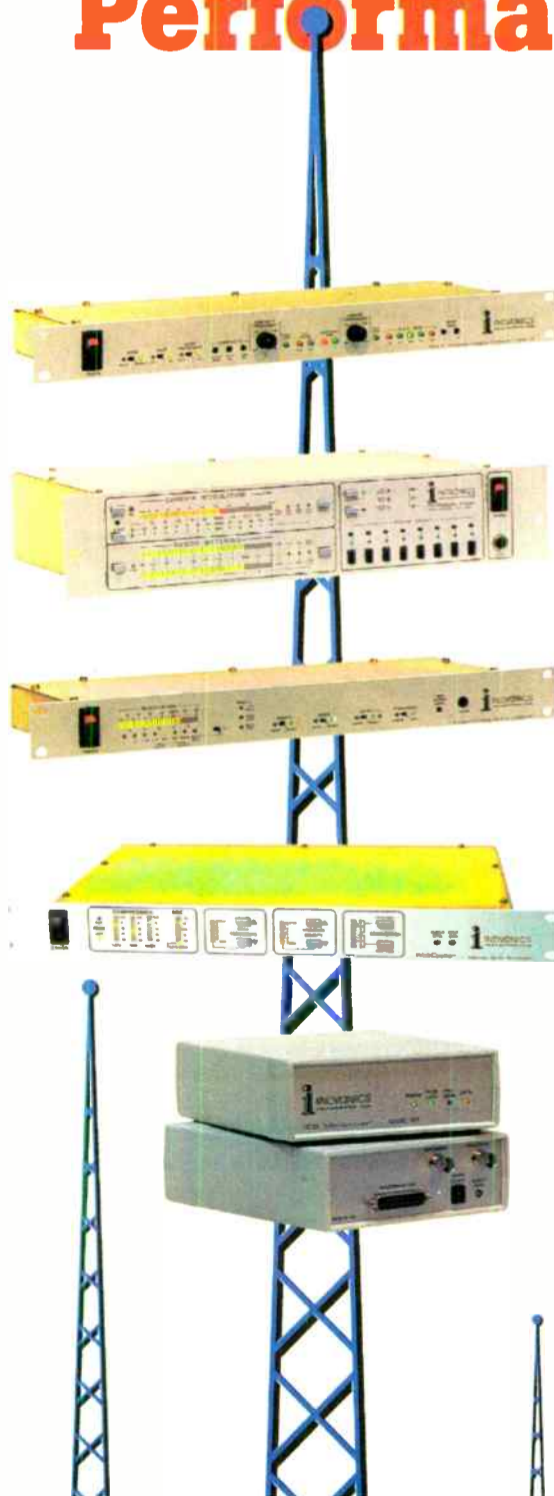
"It is part of the new Flex Rack range, offering an alternative to stacks of problem-solving boxes," said Andrew J. Bantock, group sales manager of SBS. The FRDSS is a "smart" silence sensor that differentiates between 50/60Hz hum or other noise or static and valid audio. It is capable of raising alarms and performing changeovers. ●



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Processors Pack More DSP Power

Mark Croom

If you're shopping for new audio processing gear at this year's NAB show, you'll find plenty of choices, and even a few new ideas, depending on what type of processing you need.

Whether it's on-air processing, Internet audio pre-processing or studio effects processors, there will be plenty to choose from.

Choices

Last year's merger of CRL Systems and Orban was the biggest news on the business side of audio processing for radio. It produced a company that claims it has a 70 percent share of the processing market. But on-air processing remains an arena with tremendous competition.

There seems to be no end to the controversy about which on-air processing gear works and sounds the best. There are digital offerings from several manufacturers, while some, most notably Apex Systems, tout their analog products as superior and offer digital I/O as an option.

The digital processor manufacturers are contending with the increase in latency through their units, and the consequent problems this creates for staffers who need to monitor the station while they are broadcasting.

Inovonics Inc. will show a new FM processor, its first digital unit. President Jim Wood said, "The beauty of the Omega-FM processor is that it's relatively simple, using all off-the-shelf components."

The product is multiband and features a minimum of latency, to the point where he feels that off-air monitoring is possible.

It has a front-panel interface, but control of all functions is possible using a non-dedicated PC running a configuration application. Digital and analog inputs and outputs are standard equipment.

Italian company AEV S.p.A will show the latest version of its AEV five-band fully digital on-air processor. The XTREME MkII has AES/EBU digital I/O and 18 processing presets, plus a built-in stereo generator. It has AM and FM versions available.

IDT - Impact Development will show showing digital processing again this year. The French firm says that after seeing success with its first digital FM on-air processor last year with the DVP@FM, it now has a range of digital processors, including an Internet version.

Omnia will show its Omnia-6 digital on-air processor for FM radio.

Michael Dosch, Telos Systems Managing Director, said it's the "ultimate in clarity and competitive loudness" for power users in competitive markets. The Omnia-6, which offers five bands of AGC and six bands of limiting, was introduced at the NAB Radio Show in the fall. Dosch said increased DSP power, 96kHz/24-bit processing and virtually instantaneous throughput position the Omnia-6 well ahead of its competitors.

It features a pair of LCD active-matrix displays to facilitate setup and operation, and the software can be updated by inserting a PCMCIA card, a convenience introduced in the original Omnia. The simple upgrade process allows users to keep up easily with improvements in digital processing technology.

The company's Omnia-3 is a full-featured digital processor for under \$4,000. Omnia-3 includes 48-kHz sampling, multiband processing, standard digital audio I/O, integrated composite clipper on FM models and a PCMCIA card slot for simplified software changes.

Apex Systems will exhibit the latest upgrade to its Model 2020, the FM Pro MkII, which continues the company's preferred approach of an analog design while offering digital inputs and outputs for integration into a digital airchain. The company says a new high-frequency limiter and new low-pass filter design will make the new 2020 sound better.



The Omnia-6 Digital Audio Processor

Orban will show an upgraded version of its Optimod-FM 8400 digital processor. The 8400 was introduced at last year's NAB show, and succeeded the very popular Optimod-FM 8200. Features include a peak limiting system eliminating trade-off between distortion and loudness, a sweepable bass shelving equalizer with selectable slopes, windowed dual-band AGC, two modes of stereo enhancement and three bands of parametric EQ.

Version 1.0 of the 8400 software package updates the version .94 that's been shipping since the beginning of March. Bob Orban, founder of Orban Inc. and now chief engineer of the Orban division of CRL/Orban, said the new version implements Purist 2-Band processing, clock-based automation, PC remote control software, support for Ethernet networking, and improvements in the five-band processing algorithm.

These are in addition to the .94 improvements, which included software-security passcodes, low-delay monitoring for talent headphones, full implementation of the GPI remote control, and pilot-tone reference outputs for RDS/RBDS generators.

Net processing

The major manufacturers of on-air processing products are producing models designed for the somewhat different requirements of DAB and the Internet.

While on-air processors for AM and for FM have pre-emphasis curves that have to be maintained, there are no such curves for digital and Internet audio. Many stations have fed their off-air signals into a streaming media encoder and been disappointed with the quality that came out the other end of the system. This disappointment often comes from the difficulty with which streaming media encoders handle clipping artifacts.

Most off-air signals have been through final clippers for overmodulation protection; these clippers cause distortions that

create havoc in streaming media encoders. The best digital processors designed for the Internet use predictive methods to control audio peaks while introducing as little clipping as possible.

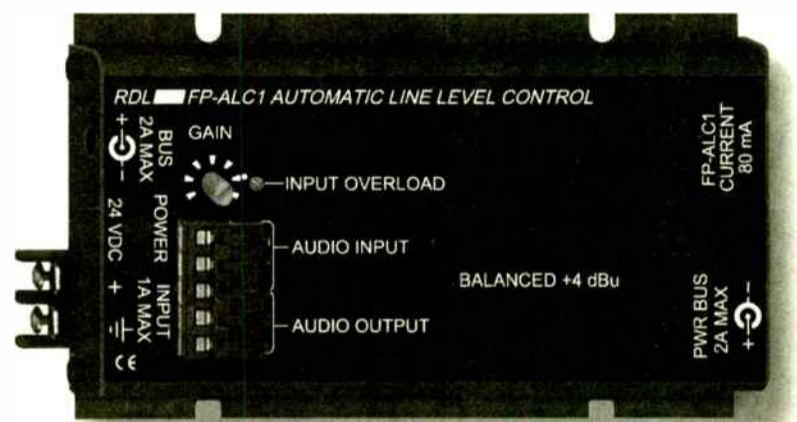
Processor on a card

Orban will show a new processing product for the Internet, and it's not a "box." The Optimod-PC is an Internet audio processor on a PCI card that goes in your personal computer. Bob Orban said it is "ideal for users with multiple streams, because you can load one computer up with as many Optimod-PC cards as you have free PCI slots, each card han-

dling one stereo program."

The Optimod-PC comes with WAV drivers that make the card look like any standard audio card to your PC. The "processor on a card" contains hundreds of MIPS of DSP computing power, allowing it to prepare the audio signal for transmission to the Internet or, by using multiple cards, to the various streams in a Eureka-147 multiplex for terrestrial DAB applications.

Orban also will show its Optimod 6200S, which can provide your standard audio card with a processed input that is friendly to the streaming media encoders used to create Internet broadcast feeds.



Radio Design Labs Flat-Pak ALC1

Apex Systems reports that an increasing number of Webcasters have selected its flagship processor, the Model 2020, to condition their audio for the Internet. Donn Werrbach, vice president of engineering, said, "Web radio has discovered the 2020."

Webcasters are using it to produce a consistent product with less "sputtering distortion" than some competing products. The company says that maintaining an analog processing path means they don't have to contend with digital aliasing distortions, so streaming encoders don't have to work as hard to produce a

good sound.

Omnia will demonstrate its processor Omnia-3net which puts the features of Omnia's RF audio processors into a package optimized for streaming media.

TC Electronic will show its newest DBMAX, version 2.60, to the show. It has new functions and presets aimed specifically aimed at Webcasters.

On the studio side, Eventide Inc. will promote a new version of its digital Ultra Harmonizer, the DSP4000B+. It retains the features of the earlier 4000B, while adding 24-bit, 96-kHz processing, digital I/O as a standard feature, and UltraShifter software. C.J. Scioscia, audio sales associate at Eventide, said the new unit has three to four times the processing power of the earlier unit.

"Owners used to the 4000 will find the B+ to be very similar and easy to use," Scioscia said.

Voice tools

Omnia's ToolVox processor is aimed to bring talent alive with "amazing voice presence." It includes a digital de-esser using advanced FFT analysis, TrueVerb from Waves, phase rotation and a suite of dynamics and EQ tools.

Symetrix will show the first of a new line of products, its AirTools family. The company has designed a new profanity delay, the 6100 Broadcast Audio Delay, which builds on the legacy of its popular 610 delay, but uses 24-bit digital processing and features an automation interface for network broadcasts.

Symetrix Marketing Director Chris Crump said the line will address the changing requirements of streaming media. "We realize that broadcasting in the 21st century is radically different in terms of technology and audience," he said. "AirTools products are designed specifically to serve Internet and satellite broadcasters, plus the traditional terrestrial radio and TV broadcasters who have used our products for the past 25 years."

Radio Design Labs has been making useful "problem solver" products for a long time, and recently introduced a

new line of products. The Flat-Pak series is larger than its popular Stick-On models, and features flexible mounting options.

Besides amplifiers and equalizers, it has introduced an Automatic Level Control module, which features two-band level control and program adaptive attack and release times. The FP-ALC1 is a single-channel unit with balanced inputs and outputs, while the stereo model is for component stereo systems to smooth out the level changes sometimes found between components in multisource installations. ●

Juggling Too Much? Harris Can Help!

Taking care of today's broadcasting needs while moving toward a digital future is a tough juggling act. You need to maintain and, perhaps, upgrade current systems. Maybe you're even contemplating complete station makeovers. Fortunately there's a company with the resources and dexterity to help you maintain your balance: Harris.

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SYSTEMS

AUTOMATION

TRANSMISSION

Let's Go to the Telephones

Michael LeClair

Codec manufacturers will show off the ability of broadcasters to use just about any type of connection for remote broadcasts.

Never before have so many options been available for the remote broadcaster, especially as new cellular technologies begin to complement standard telephone and ISDN lines.

At NAB2001, broadcasters can expect find equipment to handle any remote situation.

Move advanced

And they can expect to find that even as the technology becomes more advanced, simplicity remains an important factor; several manufacturers are offering all-in-one units to cut down on the amount of equipment needed in the field.

Codec technology is widely used to improve the quality of remote broadcasts, particularly ISDN connections. However, many products also incorporate simple telephone interfaces to ensure that reports or broadcasts can occur no matter what kind of connection is available on the remote end.

Comrex will feature the Matrix, a codec with a built-in two-channel mixer and POTS line connection standard. The Matrix creates a data connection from the remote site to the studio and uses this connection to send high-fidelity, 15 kHz audio. Optional modules provide ISDN and cell phone capabilities.

A unique feature of the Matrix is its ability to operate in a "store-and-forward" mode, which can be used to transfer audio faster than real time using telephone lines that are not clean enough for real-time operation.

"The Matrix is designed to be the one tool you need to handle any remote situation," said Kris Bobo, marketing director for Comrex.

Comrex will also have products from its established line of remote equipment, including the HotLine and Vector telephone codecs.

New from AETA Audio will be the Scoop E-Z, a multipurpose remote package. Weighing in at less than 4 pounds, including batteries, this unit packs a surprising range of capabilities.

The Scoop E-Z can connect via POTS, ISDN, GSM wireless and Inmarsat phone



Telos Series 2101 Multi-Studio Talk Show System

lines. It comes with a two-channel mixer and supports MPEG/ISO Layer II and Layer III encoding when using ISDN.

AETA Audio also will show the Scoop Reporter II, a three-channel mixer with ISDN codec.

On display at NAB will be the Sonifex Courier, a Flash-card- or hard-disk-based recorder with a "cut-and-paste" graphical editor.

It can be equipped with an optional codec that supports ISO/MPEG Layer II for sending live audio over ISDN. Transfer of audio data is possible using a modem, a GSM mobile telephone or an ISDN modem. Sonifex will display its equipment jointly with Independent Audio Inc., the U.S. distributor for Sonifex.

Swing

AEQ will introduce the Swing portable three-channel mixer, which features a variety of ways to get remote audio back home. A unique feature of the Swing is its ability to use both ISDN and analog lines simultaneously; an analog line can be established as a backup circuit during a remote broadcast. The analog line comes with frequency extension for improved sound.

Marti Electronics will mark the debut of a new model of its Cellcast unit, which supports the new digital cellular telephone technologies rapidly replacing analog cell service.

Cellcast features a four-channel mixer and will support digital CDMA and GSM cell service, in addition to POTS lines

and analog cell service. Marti will show its established line of RPU equipment for remote broadcasts.

Nagra will have its established Series C Flash RAM recorder with built-in codec and ISDN-compatible interface on display at the show.

For the studio end of the link, a number of new audio codecs will be on display to handle remote connections, as well as studio interconnections and backhauls.

Studio units are becoming more flexible, with the ability to connect to a variety of data connections, such as ISDN, T1/E1 and the Internet. The use of software codecs running on a personal computer is developing, fueled in part by the streaming audio revolution.

Musicam USA will exhibit a full-featured unit called the Superlink.

"We like to think of it as a user-configurable audio or data gateway" said Art Constantine, vice president of business development. "Our industry has pretty much gone as far as we can in designing a dedicated box. This is the next step."

The Superlink can be configured with a range of data circuit options — from

T1/E1 to Ethernet to X.21 or up to three ISDN circuits. Multiple audio encoders can be included to allow multiple simultaneous program streams via ISDN or T1.

The Superlink T1 module provides multiplex capabilities to divide up the T1 bandwidth into multiple audio and/or data channels. The Superlink will also support streaming of MP3 files via an IP streaming port.

Musicam USA will unveil its Voyager digital audio codec, which the company calls a "studio to go." This POTS codec/mixer promises 15 kHz mono audio over a standard analog phone line.

Voyager

Very low (100ms) delay and 15 kHz audio, at bit rates as low as 24 kbps, makes Voyager suitable for FM broadcasting, even a backup for ISDN music broadcasts.

A custom modem enables users to renegotiate their connection or re-equalize the line for stability within 1.5 seconds.

New from Audio Processing Technology will be the WorldNet Rio, a codec employing the apt-X algorithm. An advantage of apt-X is that it results in minimal coding delay.

The WorldNet Rio offers an enhanced apt-X implementation with either 20- or 24-bit audio, frequency response from 3.8 kHz to 22.8 kHz and operation on data circuits ranging from 64 kbps to 576 kbps.

Also new will be SOFT apt-X, a soft-



The AETA Scoop E-Z is a multipurpose remote package.

ware realization of the apt-X algorithm. Applications for this technology include radio automation systems, CD rippers and audio archiving.

MediaTouch will demonstrate a software-realized codec running on a personal computer. Possible applications include remote broadcasts via the public

See CODECS, page 45 ▶

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Codecs

► Continued from page 44

Internet to a remote access server or web stream relaying. A feature of the Media Touch software is the ability to insert audio from a hard drive to compensate for packet loss or delay problems in the remote audio stream.

The HiFi Scoop 3, new from AETA Audio, is a studio codec with the ability to handle up to three ISDN lines. By bonding all three lines, data rates up to 384 kbps are achievable.

Program circuit

Systembase will introduce a product designed specifically to monitor a program circuit independently and to switch automatically to a backup ISDN circuit. The ABU ISDN also features remote management capabilities and automatic CD or MiniDisc playback at the transmitter site in the event of a total failure of the studio-to-transmitter link.

New from AEQ will be the Eagle studio codec for use with ISDN lines. It supports a range of compression algorithms, such as ISO/MPEG Layer II and G.722.

An interesting variation on the codec will be on display at the Digigram stand.

The Hitplayer is a remote-controllable audio decoder that works with MP3 or ISO/MPEG Layer II audio files. Audio files can be locally stored on the hard drive of a personal computer or streamed from a remote location via a network or the Internet.

Despite the improved fidelity now available using digital codecs, it is still hard to imagine a radio station that does not rely on the use of telephone sound, particularly for news operations and talk formats.

The market for this type of equipment is healthy, as is evident from the variety of telephone hybrids on hand at NAB2001.

While the use of digital signal processing is acknowledged to be a superior method for the best possible telephone sound, simple and inexpensive telephone couplers are still in demand in by many stations.

Telos Systems will have its range of new telephone interface systems on display, including large, mid-range, or standalone systems.

The Series 2101 Multi-Studio Talk Show System is shipping and can handle line sharing for up to 32 studios. Unique to this system is the ability to interface directly to ISDN phone lines at the T1 level, minimizing the need to compensate for long land-lines when nulling the mix-minus audio.

For mid-range systems, Telos will be showing the TWO X 12 multiline system for sending up to 12 phone lines to either of two internal hybrids. The TWO X 12 is shipping with an optional ISDN interface modules for direct digital connection to the phone line.

Dual hybrid

Also at the Telos booth will be the Telos TWO, a dual-hybrid package, and the company is expected to make a new product announcement at the show.

In production from Radio Systems is the DI-2000, a digital hybrid with a unique remote control capability. Designed for simple and inexpensive operation, the DI-2000 can be installed so that a standard audio console with open contact switches can be used to answer a call, put it on hold, place it on-air and hang up — all through the console fader.

JK Audio will show a couple of useful new telephone tools. The Daptor One simply adapts from the RJ-11 output of a remote mixer to the 2.5-millimeter headset jack on a cell phone, allowing for simple remotes via cell.

The Voice Path is a telephone insert that connects from the handset of a standard telephone to the soundcard in a computer. An application for Voice Path would be a newsroom workstation for editing newscast actualities.

Henry Engineering will feature the Digistor II device with telephone coupler. It can store up to 16 minutes of audio with a 7 kHz bandwidth and is intended for listener information lines.

Henry Engineering also will introduce its Audio On-Line interactive telephone information system. Audio On-Line is soft-

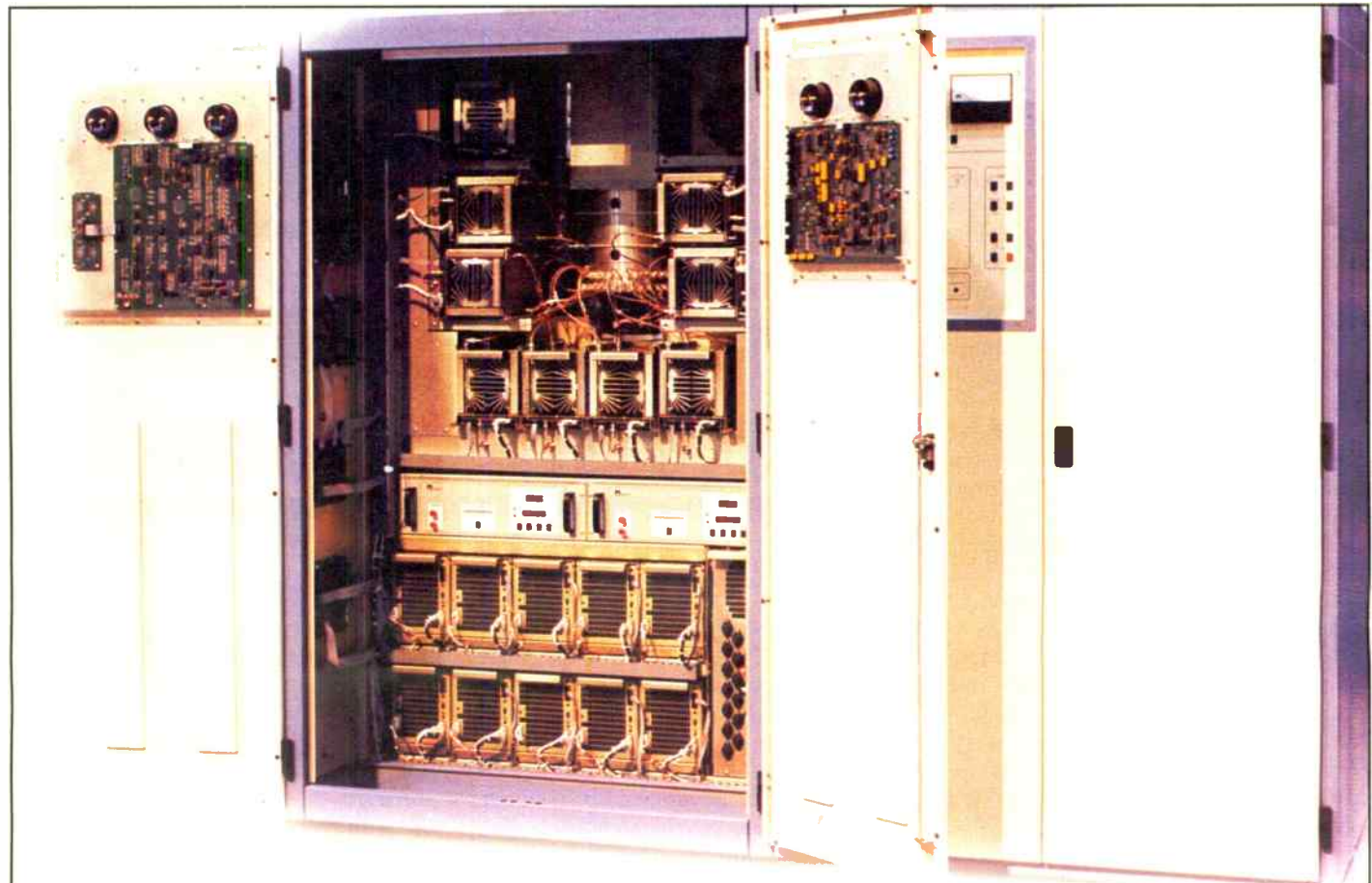
ware that uses a personal computer to handle multiple callers and multiple lines for more complex listener information services. It can also be used as a central repos-

itory for remotely filed news actualities.

Gentner, AEV and Sonifex will have established telephone hybrid products at the show. ●



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See us at NAB Booth #R2725

DAWs, Editors and Cards, Oh My!

Bernie Cox

Radio World has diligently covered developments in the world of digital production and related products. Readers have a chance to see the new gadgets and software bundles they have read about at the NAB.

Digital tools

Enco Systems Inc. will give a sneak peek of its two-track editor, the Digital Intern.

The software-only, two-track editor is designed for phone-call recording and editing within the broadcast studio.

360 Systems updates its Short/cut editor for the show. The next generation Short/cut has more recording capacity, providing 12 hours of stored audio. The unit is still self-contained, including keyboard, speakers, large waveform display, scrub wheel and tape-style transport controls.

Also, its DigiCart/II Plus combination hard-disk recorder, mini audio workstation and digital cart machine has been restructured. It now offers storage of up to 232 hours of audio and other enhancements.

Companies that make digital automation systems will promote their editing and production functions.

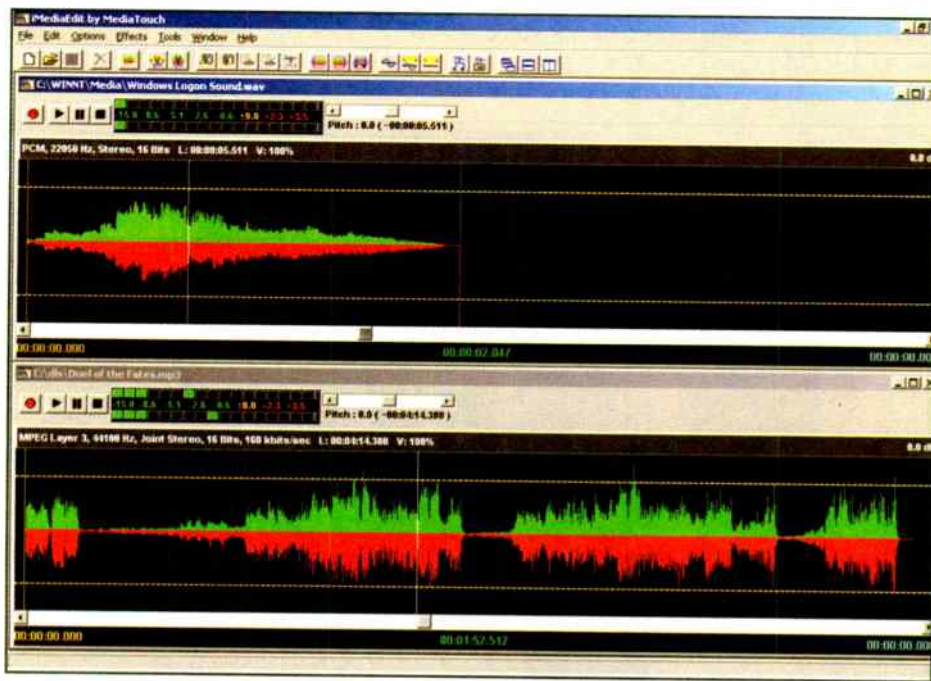
CartWorks / dbm Systems Inc. makes a line of live assist, satellite automation and music-on-hard-drive systems. Features include CD quality audio, uncompressed WAV and MPEG layer 2 and 3 compatibility, support for the Cart Chunk standard and automatic Web site content generation.

Computer Concepts Corp. will demonstrate its Maestro radio/air/studio touch screen digital audio system for satellite formats or music on hard drive. The system includes Voice tracker, CD ripper and multi-track editor, and is available in Windows 2000 or NT versions.

D.A.V.I.D. GmbH will break out its DigaSystem, a digital radio operating

system designed for fast database access. Its solutions range from single-user workstations for correspondents or small radio stations through to complete multi-server networked systems.

Dalet Digital Media Systems brings its Newsroom System to the show. The news management system assists news broadcasters and content providers with management and operations. It enables stories to be repurposed onto any electronic medium including TV, radio, the Internet, wireless devices and interactive TV.



MediaTouch iMediaEdit

Digigram will promote its PCXpocket 440 Type II PC Card for audio applications on laptops. The unit is a multi-channel sound card designed for specialized applications operating on the card's on-board digital signal processor. DSP functions include mixing, MPEG Layer 1 and II, GSM encoding and decoding, variable sampling frequency and audio processing.

Networking seems to be the hot word for '01. Gefen Inc. has developed the USB-400S/R, which allows extension of a USB signal up to 300 feet away using CAT-5 cable for the extension. The product also includes a USB HUB with four outputs at the extended side.

Additionally, the company will discuss the CAT5-4000 matrix extender/switcher. The product allows two users to share two computers.

MediaTouch sets forth into the net-

enabling three times the audio signal processing. Features include removable SCSI audio storage, expandable I/O arrangements and DSP, up to 192-kHz/24-bit, eight to 32 I/Os and a four-channel RS422 interface.

Also new to the SADiE workstation line, the RADiA is supplied as either a single PCI card or a turnkey system. The system will interface into any studio installation.

Features include four balanced analog audio I/Os, AES/EBU and S/PDIF digital I/Os, 24 replay tracks, up to 4-kHz/24-bit, PCI card or 19-inch rack mount, turnkey hardware and removable SCSI audio storage.

The SADiE operation system has been upgraded to version 4.0. The system is compatible with the RADiA, 24-96 and Artemis systems.

Make noise

MSoft gets in to the act at the big show with servers, software bundles and sound effects libraries.

The mSoft SoundQuery line of turnkey audio servers, which has a starting list price of \$9,995, includes a choice of three sound effects audio packages preloaded to hard disc with SoundQuery audio file players for Mac or PC.

The SoundQuery audio file players for Mac or PC are a standalone program alternative to mSoft's browser-based plug-in file players.

The new SoundQuery audio file players can be used with ServerSound or SoundQuery servers. The players will perform file format and sample rate conversion while transferring files to digital audio workstations. The SoundQuery audio file players are available as a free download from mSoft at www.serversound.com

Also introduced at the show will be the MusiCue software module for ServerSound.

The MusiCue's database can contain pop CDs as well as a production music library. Music can be found through a Boolean search, as well create cue sheets.

The Clack and Weddington SFX Libraries from mSoft Inc. are available pre-digitized on hard disc in AIFF or WAV formats at 44.1 or 48 kHz.

The four Clack collections feature effects created by Clack Studios in New York for MTV, Nickelodeon, VH1 and ad agencies. The Weddington Collections are from Weddington Productions from Academy Award and Golden Globe winning feature film work.

At NAB2001, Sound-Effects-Library.com brings an arsenal of sound effects online. Users can search for, listen to and purchase virtually any sound of the 60,000 online now. The company has plans to add another 4 million effects.

For NAB2001, Sonic Desktop Software gets in on the sound game with SmartSound Sonicfire Pro.

Sonicfire Pro features video importing, a redesigned user interface and support with imported non-SmartSound music.

Channels of sound

TC Electronic sees the future for radio in multichannel sound. For NAB2001, TC Electronic brings Engage for System 6000.

This package enables real-time translation of 5.1 mixes into a virtual 3D

See DIGITAL, page 48 ▶

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working world with a development in the company's codec technologies, a news production package and editing software.

The company will add codec technologies to its Card Independent line of software, making its software compatible with more digital systems using off-the-shelf equipment.

Phone editor

The iMediaEdit is a standalone phone editor capable of editing WAV, MP3, MPEG-II, ADPCM and WMA files. The system can be outfitted with an external scrub wheel, record and play buttons.

The iMediaEdit is built on the Windows platform and will work with any Windows-compatible sound card.

Some interesting production tools will be on display by mediatron Digital Radio Systems.

The mediatron NewsEdit NT is a non-destructive digital news recording and editing system for radio with an integrated content management system and mediatron Computer Aided Radio System.

NewsEdit offers clipboard functions with playback, a moving wave display and a database that collects content information, sounds and pictures.

SADiE makes links in its network of products for NAB2001.

SADiEnet is a real-time, multichannel audio network using ATM technology. The network allows audio files and projects to be shared between multiple SADiE workstations without the need to transfer audio drives physically.

Based on the SADiE 24-96 workstation, the ARTEMiS has increased the DSP power of the 24-96 workstation

In the Spotlight!

The Broadcast Richardson name may be new to you, but its ideology is not...servicing the customer. With the acquisition of turnkey distributor Broadcast Richmond in the Spring of 2000, Richardson Electronics realized the combined strengths of each organization would result in a very dynamic product and service offering.

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Digital

► continued from page 46
headphone experience through ordinary stereo headphones.

In addition, the D22 Digital Broadcast Delay II is an enhanced version of the original D22 digital delay.

The new delay offers up to double the delay time per channel — 2600ms on two channels with maximum delay of 60 frames. The system also features 24-bit A-D/D-A converters, as well as a compliment of digital I/Os including AES/EBU, S/PDIF and Wordclock BNC 75ohm.

Fairlight gets into the 5.1 mix at NAB2001, as well.

The Prodigy2 is a digital audio production system featuring the Fairlight MFX3.48 digital audio workstation integrated with an automated digital mixer.

The system features compressor/limiters on all mix busses, 16 assignable motorized faders, dynamic automation of all faders, joysticks, mutes, pans, EQ and aux sends, cue-list automation of console snapshots and 5.1 surround monitoring with Dolby decoder insertion.

The MFX3.48 is a digital audio workstation featuring Fairlight QDC Technology engine for 48-track, 24-bit recording and editing.

The system features up to 48 tracks of nondestructive recording and editing with independent digital and analog I/O. The unit can be expanded to 96 kHz.

It also features scrolling high-resolution waveforms on tracks, multi-layer clip-based editing with 64 levels of undo, integrated 9-pin machine control, file exchange with most common DAW formats and MediaLink fast audio networking.

For more on automation and live assist systems, see the story on page 28. 🌐

You Name It, They've Got It

Paul Kaminski

Here's a quick roundup of other neat products that you can see at the NAB2001 convention.

Water and electronics don't mix well. If you need to shelter the talent at your next remote, the KD Kanopy line gives the remote setup person the cover of a tent canopy without the problems involved with other cover systems.

If your problem is keeping the field kit dry and organized, ENG Gadgets will present its Gadget Bag. It's a soft-sided organizer with a protective outer bag and interior pouches for adapters and other items that go to the field with the remote engineer or reporter.

If the remote engineer is trying to make analog equipment talk to digital recorders, a visit to the Benchmark Systems booth will find a new portable 12-volt A-to-D converter. The Sonic AD2K offers multiple 16-, 20- and 24-bit outputs at the standard 44.1, 48, 88.2 and 96 kHz sampling rates.

Benchmark has a new studio D-to-A converter, the DAC-2408-96, with 8 channels of 24-bit, 96-kHz audio. The converter has the ability to operate in two-, four-, six- or eight-channel modes and comes with meters, bit scope and status display.

Reporter's kit

Radio reporters and news people can visit HHB to see the PortaDisc reporter's kit. It includes the HHB MDP-500 MiniDisc recorder, Sennheiser MD46 microphone and cable, power adapter and charger, two battery caddies, six 80-minute HHB MD and a USB cable, all in a Pelican water- and dust-proof case.

Engineers will visit HHB to check out the Quancom line of AES and clock distributors for synchronization of digital audio devices in the broadcast plant.

Some of those new digital devices include Sonifex's Net Log, a device



HHB promotes a reporter's kit with MD recorder and full accessory package.

that Managing Director Marcus Brooke says will solve a number of problems for broadcast stations. The Net Log "overcomes the inherent unreliability of PCs for long-term recording of audio by providing a dedicated hardware recording platform which uses a simple connection for

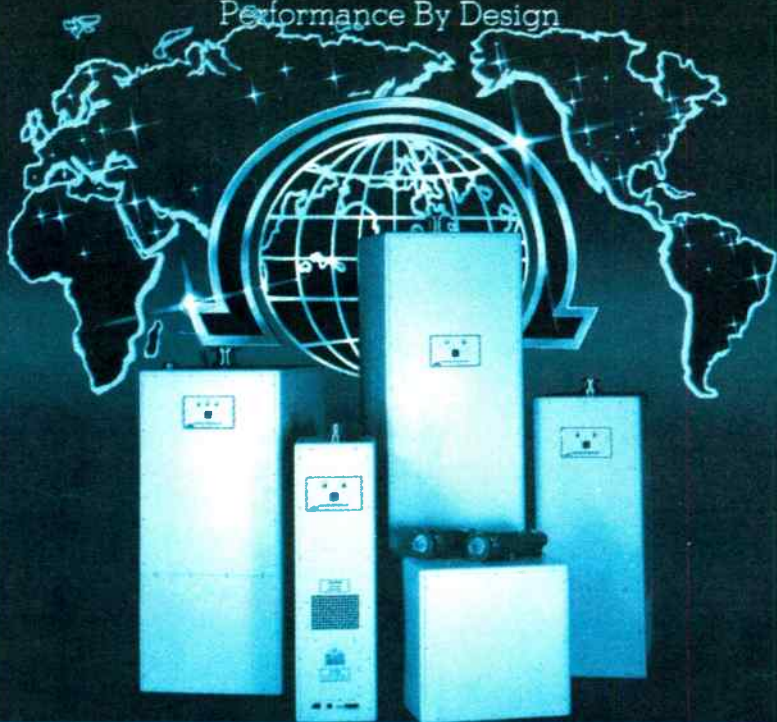
audio playback."

Brooke said the Net Log also will provide the means for management, sales and programming to capture audio that had been broadcast simply by searching Net Log's 30 GB of hard-disk storage via connected desktop computers.

See STUFF, page 49 ►

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Stuff

► Continued from page 48

Digigram will show miXart multi-channel audio processing and mixing soundcards. First in the line is the miXart8 PCI card, with eight mono (or four stereo) analog input/output pathways. It includes four mic pre-amps on the input bank. The optional AES/EBU daughter card effectively doubles the input/output capacity.

Their latest version of the HitPlayer, the HitPlayer-L, will be introduced at NAB. The device is not just an audio player; it can also be used as an audio server for Webcasting, with the ability to command and control the system using the most common protocols. The HitPlayer-L also plays MP3 and MPEG Layer II files.

Henry Engineering is noted for simple solutions to nettlesome problems in the broadcast plant. President Hank Landsberg said his company's new DigiStor II brings that same philosophy to the playback of "stand-alone" digital audio storage.

"Since the DigiStor II has no moving parts, its operating cost is virtually zero," he said. The DigiStor II will make its NAB debut.

Zeros and ones

Tying these digital devices together is critical. Gepco International brings its latest 110-ohm AES/EBU digital multipair cable (5569 GFC) to NAB.

To monitor those digital signals, ATI introduces the latest addition to its Nanoamp series, the DM200 Digital Monitor. Signals can be looped through the DM200 on 110-ohm XLR or 75-ohm BNC or RCA connectors. A 24-bit, 96-kHz D-to-A converter feeds stereo headphones, a VU meter and balanced line outputs. ATI also will show its new DXA stand-alone digital distribution amp, which can also be used as an output expander to its DDA line of distribution amps. The new DXA is a simplified, less-expensive version of the DDA, without input EQ or front-panel status indicators.

Also, ATI will exhibit its new HDA400 and HDA600 headphone amplifiers, with four and six outputs respectively.

Plug and play is not limited to computer operating systems. Wheatstone will show its version of PNP for the broadcast plant. The WireMax system allows the installer to use the standard connectors for a piece of equipment instead of fabricating an adapter. Off-the-shelf cables connect a Wheatstone console to the WireMax panels, and standard cables connect the equipment with its proper connector (XLR-XLR, RCA-RCA, etc.) This eliminates the need for punchblock connectors and their attendant documentation, and allows for quick upgrades as equipment changes.

Wheatstone will introduce its digital router, the Bridge. It will handle not just digital signals but analog inputs and outputs, as well as optical network connections. The digital routing cages in the system are capable of handling 512 audio channels at the same time. The Bridge has the ability to carry control signals and serial signals (RS-232) which should make studio to equipment room wiring in the broad-

cast plant a simpler task.

Digital equipment, whether in the studio or rack room, needs clean and safe power. Superior Electric will introduce its new line of Stabiline Transient Voltage Surge Suppressors, which are designed to keep surges out of your equipment. These suppressors are installed on service entry panels and distribution panels.

Furnishing and wiring the studios in the broadcast plant is at best a compromise between functionality and appearance. Mager Systems will introduce turnkey prewiring at NAB. This makes sense from an operational standpoint, because the people who build the furniture know exactly where the wires can go without compromis-

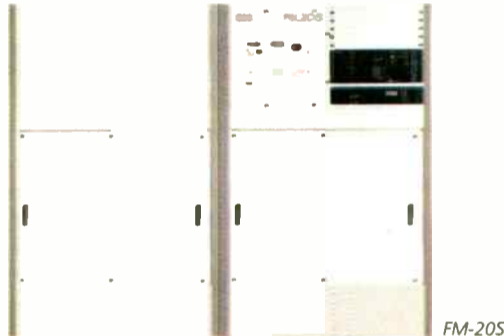
See STUFF, page 50 ►



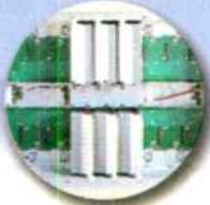


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The NAB Show, Back in the Day

Mark Durenberger

It's NAB time again, and that event triggers the usual media mega-wordage, from previews of coming attractions to floor maps to survival guides. In less than a half-century, this show has grown from a few thousand attendees to become so complex that only a Las Vegas could handle it.

And if it weren't for the limits of human endurance, it might also be possible to "do" the entire show ... if it were only scheduled over three weeks.

It wasn't always thus.

The NAB convention once fit into a couple of hotels and two exhibit halls. And in most respects, it was a different sort of congregation.

I've gathered the collective memories of a distinguished group of salesman-engineer-broadcasters: Dick Maynard, a veteran radio and TV broadcaster, sales-

man and station owner; Elmo Reed, retired director of engineering for the Post stations; Jeff Bixby, a consultant and former sales executive for Collins; Jim Wychor, broadcaster, station owner and recently retired executive director of the Minnesota Broadcasters' Association; Jack Ducart, veteran radio jock, engineer and equipment salesman; Jack Sellmeyer, consulting engineer; and Robert Van Buhler, a broadcast engineer since 1964.

Together we recall what it was like to attend some of the early NAB conferences of the 1950s and '60s.

Smaller scope

For a long time, the NAB shows were held at hotels, typically in Chicago and, each inaugural year, in Washington.

"The shows in Washington were a nightmare, you spent most of your time in taxis and busses going back and forth to the meetings and exhibits," Ducart

recalls. "The main reason we went there was so that the people at the FCC could see how important we thought our broadcast industry was."

Reed remembers having more fun.

"You knew so many people and could interact. Exhibitor suites were attended by engineers and not very crowded."

What stands out in Ducart's mind from the first shows was how small they were. That was in the days when RCA was "King of the Hill." When you first walked into the exhibits, all you saw

approachable than today's "syndies" on their well-lit stages.

Most of us remember that you'd always be running into engineering legends at those early shows and they'd spend time with you. Art Collins and A. Prose Walker and Parker Gates, RCA old-timers and the engineering consultants who helped build the industry, always had time to chat.

You could visit the Continental hospitality suite and hang with guys like Jim Weldon, listening to his stories about the 500-kW Border-Blaster stations in Mexico. You'd see George Bartlett, vice president for engineering at NAB, interested in making this a better industry and not burdened with an NAB internal agenda.

In the Conrad Hilton days, a person could sit near the elevator, and sooner or later everyone you wanted to visit with would walk by.

Stuff

► Continued from page 48

ing the function and appearance of the furniture. In any installation, saving time equates to saving money.

Harris Broadcast Communications

dard, and provides the flexibility to reconfigure equipment.

Digital studio

Harris' NAB studio will feature its PR&E PrimeLine furniture; AirWave digital console; "Matrix" routing; Intraplex digital STL Plus; and a new hard-disk system that will be announced as an addition to the Harris product line before NAB.

Econco will promote its medium- to high-power rebuilt power tubes for radio transmitters.

E-Z Up International will exhibit Instant Shelters, suitable for remotes. They are portable and set up with no assembly; your logo and artwork can be printed on the fabric.

Hey suppliers: Did your new product information not reach us in time? We still want to know for our convention wrap-up issue. Send your press releases and images via e-mail to radioworld@inaspub.com

will demonstrate an operating multi-dimensional radio studio. The studio enables stations to deliver programs on-air and online; it is compatible with the proposed IBOC DAB stan-

was RCA. There wasn't even a Harris then, only a small upstart company called Gates Radio. Reed recalls the 1950s shows as numbering a couple of thousand attendees and maybe a hundred engineers.

In Chicago, the NAB was held at the Conrad Hilton, Pick Congress and adjoining hotels. The three dozen or so exhibits were in the basement of the Hilton (nee Stevens) hotel. The bigger hospitality suites were run by RCA and GE, the two big guns at the show.

Wychor and Sellmeyer recall that in the Conrad Hilton days, a person could sit near the elevators and sooner or later everyone you wanted to visit with would walk by. The career broadcasters of that era had been in the business for 20 or 30 years; it was all they'd ever known. These were well-grounded people, goal-oriented and focused. Meeting these leaders inspired more than one youngster-attendee to make a career out of broadcasting.

Big shoes at your elbow

And if you knew where to look, you could easily find industry notables from the clear-channel heritage stations and the rock-and-roll giants. At the Conrad Hilton you could watch the jocks from the Chicago stations doing remotes from the show. Somehow they were more interesting, real and

(Personal contact aside, Sellmeyer observes: "Back then, NAB Engineering's emphasis was on keeping the handbooks updated and reviewing the status quo. There wasn't much emphasis on new technology, because that wasn't moving very fast.")

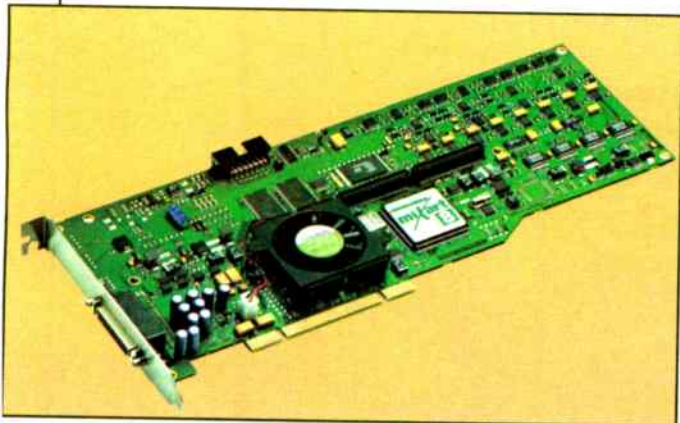
For Wychor, a highlight of those shows was the separate meetings of rump organizations, like the Daytime Broadcasters Association, the Clear Channel Broadcasters and the Regional Broadcasters.

"All of these groups would hold their informational meetings at the radio shows and try to recruit members at the same time," he said. "I remember one show where I was posting meeting notices of a Daytimers' meeting on all the bulletin boards, and a high-level NAB staffer was following me around and taking them down." If you were an exhibitor, you recall those early days with mixed feelings. Dick Maynard's major memory is sore feet.

"We'd stand in our leisure suits all day on the convention floor, demonstrating the wonders of the Schaefer 903 and their greatest invention, the Audio-file. Then at right we had to work the suites of the programmers like Drake Chenault, TM and Peters Productions," he said.

"Obviously if people were buying programming, they might need an automation system to play it, so we would have

See MEMORIES, page 52 ►



Digigram will exhibit its miXart multichannel audio processing and mixing soundcards.

will demonstrate an operating multi-dimensional radio studio. The studio enables stations to deliver programs on-air and online; it is compatible with the proposed IBOC DAB stan-

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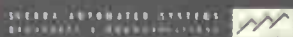
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Memories

► continued from page 52

to bird-dog the suites. I think being a station guy at the NAB was much better than being a peddler. A station guy could go to the various sessions and if they were good, learn something. If they weren't good, you could sleep. But peddlers had to stay on the floor and pretend it was fun."

Less "pitch"

I seem to recall there was a lot less vaporware at the earlier shows. The gear was usually pretty far along in the development cycle: it was set up and working and was usually ready to ship. You weren't just dealing with a proof of concept. As a result, buying decisions were easier.

The early technical sessions were delivered by equipment designers and manufacturers' engineers who talked about their gear and how it worked. Sales pitches were usually absent.

Wychor told me, "Guys like me would go to the show to pick the brains of guys like you. We were able to do it one-on-one, since those early shows never attracted more than 3,000 to 6,000 people. All were serious radio broadcasters, and most were owner-operators. The seminars were much smaller and relaxed, and you could interact in greater depth."

I think that, as the NAB shows matured, we began moving away from equipment descriptions, in the direction of radio's emerging technologies.

Van Buhler recalls, "We were beginning to understand the quirks and limitations of the FM Multiplex signal, subcarriers, multiband audio processing and processing with pre-emphasis. We were learning about circular polarization for FM, new forms of monitoring for directional arrays."

The developing "hands-on" sessions dealt with ways to interface phone lines with the broadcast plant, as the emergence of talk radio drove the demand for better-quality telephone audio.

Ducart said, "The main difference between then and now is that the industry was more intimate then — like we belonged to this exclusive family/club called Broadcasting. We all thought that we were really providing a service to the public by bringing them entertainment and news, and that was important."

"As for the NAB show, it was the big event of the year. People planned for it months in advance. Equipment purchases ceased in January, because everybody wanted to see what was new at the show."

Perk of the job

Whether in Washington or Chicago or Las Vegas, the NAB shows were, to paraphrase a great writer, the best of times and the best of times. As a young station engineer, to be sent to NAB was a great reward. It validated all your overnight work and emergency call-ins throughout the year.

And you went because it was your only chance to see all the new toys and to rub elbows with those industry giants. It was also an opportunity to spend some

quality time with your compatriots at other stations, who were not only glad to see you, but actually had a few minutes to chat, one-on-one.

(The two most famous dialogue lines at today's NAB: "Where are you staying?" followed by "Let's get together." When the NAB was of a manageable size, people actually meant it.) How has the usefulness of NAB changed on the radio side? That depends, of course, on what you're looking for.

Today it's not necessarily hardware. The communications revolution allows us to get our information online, so that we don't have to wait until April to learn about the new toys. The engineer's time is often spent one-on-one with factory support people, dealing with issues that have surfaced with the gear they bought last year.

Management uses the NAB as a convenient and cost-effective meeting place. Some try to find time for the "high-level 30-minute walk-through," so they can absorb the toy value of the show from a safe distance. (They expect their staffs to boil it all down to bottom-line reality.)

Technologists will agree that today's NAB is much more useful for gathering information on emerging technologies and trends, and the multimedia aspect is invaluable. In that respect, it's 10 times the show it was in the 1960s. And we're usually willing to pay the price, in 60-minute bus commutes and the general despersonalization of it all.

So, other than size, maybe it isn't all that different. Bixby puts it together:

"On balance, the show has gotten bigger in attendance and in exhibit hall size. But I'm not sure it has changed much otherwise. It was tiring, it still is. It was an impressive display of technology, it still is. It was a good chance to see old friends, it still is, although you have to work harder to find them. In many ways, it differs only in size and scope."

Mark Durenberger is a long-time RW contributor and former general manager of Group W Network Services, Minneapolis. He now resides in Colorado, where he operates a media services company.

RW welcomes other points of view and your own memories of conventions gone by.

Past and Present

Lyssa Graham

The NAB convention has been a regular part of broadcasters' lives for more than 75 years.

Oct. 11, 1923, saw the first NAB convention in New York City. That show at the Commodore Hotel had a total of 23 attendees who attended sessions titled "The Future of Broadcasting," "A Manufacturer's View of Broadcasting" and "Government Regulation."

By 1946 there were 3,000 members of the radio industry examining 45 exhibits. In 1986, some 660 exhibitors entertained and informed 39,000 convention attendees. Last year's show saw a record 1,510 exhibitors and 115,293 attendees.

In 1946, there were 3,000 members of the radio industry examining 45 exhibits.

But exhibitors have only been an official part of the NAB convention since 1941, when the NAB opened associate membership to equipment manufacturers. Twenty-three exhibitors took part that first year.

Fifteen years later, the number of exhibitors had more than tripled. More than 1,500 exhibitors are slated to take part in the 2001 convention.

The show goes on growing. Legions of legendary broadcasters have

appeared at the NAB convention, keynoting, moderating and appearing on panels. Celebrity guests and honorees have included the likes of Bob Keeshan (Captain Kangaroo), Rush Limbaugh, Charles Kuralt, Brian Williams (a former NAB employee), Don Imus and Tom Joyner. Cast members from "Saturday Night Live" and "All in the Family," Apple Computer co-founder Steve Jobs and broadcast network presidents past and present have all appeared at the NAB convention — as have most U.S. presidents since Kennedy, although Bill Clinton did not.

The government is always well represented. Senators, FCC commissioners, retired Army generals have all made an appearance at the NAB.

In 1999, Sen. John McCain keynoted the annual radio luncheon. Colin Powell spoke at the 2000 NAB Radio Show. Powell's son, current FCC Chairman Michael Powell, will speak at the FCC Chairman's Breakfast this year.

The NAB also reaches out to international broadcasters, highlighting their contribution to broadcasting and providing a forum for an exchange of ideas and networking. Past conventions have boasted a strong international flavor. The 1947 convention saw speeches from the general counsel of the Canadian Broadcasters Association and the Cuban vice-president of the Inter-American Broadcasters Association.

Broadcasters from 80 countries attended the 1947 convention. More than 26,000 international broadcasters and industry members attended in 2000.

It's not always smooth sailing. At times, larger forces come into play. World War II severely limited the size and scope of the NAB convention. Due to an appeal from the War Department, the 1945 convention was cancelled. Things were back on track by the 1946 event, which was widely held to be the first "full-fledged" industry convention since 1942.

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The following is the list of exhibitors at NAB2001, provided by the show organizers. Highlights are paid for by the exhibitors. Check your on-site program for changes and late-registering companies.

Booths preceded by the letter R are in the Las Vegas Convention Center Radio Audio Hall; L is the LVCC General TV/Video/Film Hall; MM is Mobile Media/Outdoor Exhibits; M is Multimedia Exhibits at the Sands Expo Center; S is Sands General TV/Video/Film; I or i is Internet/Streaming @ NAB2001; T is Satellite and Telecommunications; and E is the new E-topia at the Sands.

NAB2001 Exhibit Hours

Sunday, April 22 (E-Topia at Sands only)	2 to 6 p.m.
Monday, April 23	9 a.m. to 6 p.m.
Tuesday, April 24	9 a.m. to 6 p.m.
Wednesday, April 25	9 a.m. to 6 p.m.
Thursday, April 26	9 a.m. to 4 p.m.

ABS SpA	L777
Accom	S4806
Accurack	MM217
AccuWeather	L10768, i5949
Acoustic Systems	L7777
Acoustical Solutions	L6218
Acoustics First Corp.	R1856
Acrodyne Industries Inc.	L8645

AEQ, S.A. R1863
Intro: E@sy family includes EAGLE V35 and X21 ISDN audio codecs, RANGER broadcast audio multiplexer with E-1 or T-1 interface, IMPACT digital audio matrix with summing function and the DCS-10 digital commentary system; IMPACT digital matrix sums inputs and distributes outputs while offering 12 AES/EBU inputs and 12 AES/EBU outputs, with the ability to expand up to 5 IMPACT devices and up to 60x60 AES/EBU. The unit works with the CADDY A-D/D-A converter to access inputs and outputs; EAGLE audio codec, a 1 RU unit offering dual channels with G.711, G.722 and MPEG compression to provide 7.5 and 12 kHz bandwidths per mono channel at 64 kbps and 15 kHz joint stereo or 20 kHz mono at 128 kbps; SWING portable mixer, audio codec and digital hybrid with ISDN and analog lines that work simultaneously. The unit offers three mic inputs, plus in/out auxiliary, VU meter for reception and transmission and limiter/compressor for transmission, with 7.5 kHz and 15 kHz bandwidth; Mar4Autolist, a member of the Mar4Win automation system family, offers music scheduling functions according to radio station musical criterion, automatically downloading the programming over Mar4Win; Mar4Dac, a member of the Mar4Win automation system family, offers the Ripper function or CD quick copy and conversion into Mar4Win, with access to the CDDB database; Mar4Data, a member of the Mar4Win automation system family, extracts broadcast reports and filters and arranges reports according to radio station criteria; Mar4DAB, a member of the Mar4Win automation system family, broadcasts multimedia text and objects feature of DAB emissions.

Also: On-air consoles; digital hybrids with frequency extender; portable mixers; broadcast automation system; audio monitors; and audio codecs.

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AIST Inc.	M9877
AJA Video	L10286
Akamai Technologies	i7231
AKG Acoustics	E5606
Alcatel	L241
Alcorn McBride Inc.	M9371
AliasWavefront	S4812
All Mobile Video	MM524
Allen Avionics Inc.	L9052/53
Allen Osborne Assoc. Inc.	L9772
Allied Tower Co.	L120
Alticast Corp.	E4617
Altinex	M10418
Altronic Research Inc.	R1841
Ambient Recording	E2847
Amco Engineering Co.	L6110
Amek USA	R1629
American Capital Group	L5843
American Studio Equipment	L4947
American Tower	L5231
Ampex Data Systems	L365
AmpliX Wireless & Satcom	T1024
AMS Neve	L9945
Analog Way	M9177
Anark Corp.	E4708
Andalucia Digital Multimedia	E2842
Andrew Corp.	L9510, S2722
Angenieux SA	L9046
Anivision	E5017
Antenna Concepts Inc.	L7163
Antex Electronics	i6671
Anton/Bauer Inc.	L7030
Anvil, Calzone and Majecal Cases	L11630
Anystream	i6467
AnyTime TV	S4650
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5D Solutions	S3054
615 Music Library	S2647

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A. F. Associates Inc.	L9012, i5942, S4823
A.N.N. Automation Inc.	L5128
ABE Electronica S.p.A.	L6333, L1571

Acterna	L671
Activate	E3536
Active Light Inc.	E5307
ADC Broadcast Systems Division	L9857
Addenda Electronics	E2805
ADIC	E2923
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Advanced Designs Corp.	L12564
Advanced Rendering Technology	S4169
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Advantech	T750
Advent Communications Ltd.	MM318, T1650

Aeta Audio Corp.	R2752
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Armstrong Transmitter	R3115
Arrakis Systems	R2733
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ARS Electronics	R1853
Artbeats Software Inc.	M9057
Artel Video Systems	L971
Artesia Technologies	E5021

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Intro: VC11A portable TV standards converter converts standards between NTSC, PAL and SECAM systems described in the ITU-R Rep624-3 using motion compensation with the motion vector, adaptive line interpolation and digital encoder/decoder; AM series DVD-RAM libraries with fiber RAID controller provide increased data transfer rates to the storage area networks; AM series DVD-RAM libraries with embedded SPARC provide applications in network attached storage.

Also: TG35BX digital test signal generator; TG75AX HDTV SDI test signal generator; TS55A6 sync generator; AM250, 750, 1450 DVD-RAM libraries.

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Ascential Software Inc.	i6457
ASCII Corp.	E2555
Aspen Electronics	L329
Aston Electronic Designs LTD	L171
Astro Systems Inc.	L277
AT&T	L1055
ATCi/Antenna Technology	S2929
Athan Corp.	i6065
ATI (Audio Toys Inc.)	T1659

ATI Technologies Inc. E5903

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Intro: HDA400 headphone amplifier is a four-output stereo headphone monitoring system with balanced 1/4-inch TRS stereo line inputs with stereo/mono switching and a clipping indicator drive of four independently adjustable stereo outputs. Each output drives 32- to 600-ohm headphones to over 100 mW each; HDA600 headphone amplifier is a six-output stereo headphone monitoring system that uses XLR and TRS balanced stereo master line inputs with loop-thru capability and front mono/stereo selection. A mic/line cue input is selectable into left, right or both master distribution busses; DM200 digital monitor accepts loop-thru AES/EBU format digital audio data via 110-ohm XLR and 75-ohm BNC and RCA connectors. A 24-bit, 96-kHz D/A converter feeds stereo headphone drivers, balanced audio line outputs, and a stereo LED meter; DMM100 and DMM100-BAT Digital MatchMaker accept serial digital NRZ signals such as AES/EBU digital audio from a 110-ohm balanced XLR input, a 75-ohm BNC or RCA input, or a TOSLINK optical fiber. The

DMM100 provides reshaped outputs to simultaneously drive a 110-ohm balanced XLR line, 75-ohm BNC or RCA cables, and a TOSLINK optical fiber; DXA112-XLR and DXA124-BNC AES/EBU digital audio distribution amplifiers can be used as a standalone or as an output expander for use with a DDA full-featured companion unit.

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ATTO Technology Inc.	i6768

Audemat R 3035

Intro: Goldeneagle FM monitors signals from the transmission site or off-site with a reception antenna, which sends back alarms to alarm reception software. The unit includes TCP/IP interface and is upgradable; FM MC4, a FM precision measurement and analysis unit that includes new IF filters for measurement in high interference environments and offers co-channel analysis software adapted for frequency interference; Goldenear v2.2 evaluation software uses audio replay to visualize, in colored graphic form, the reception quality from the mobile campaign and listen to the programming on the station monitor; a new joint product venture with IDT; the DAB Tester is an autonomous mobile device for the monitoring of DAB transmitter networks by analyzing DAB quality from the FIC bit error rate, geographic position, frequency, date, time and velocity and recording it onto a PC card flash disk; Umodir, a universal modular digital broadcasting measuring system for installation, line-up and examination of DAB single frequency networks. This mobile equipment allows stationary network monitoring with delay monitoring and synchronization of single frequency networks. Field strength measurements and quality tests can be carried out during installation of transmitters and repeaters.

Also: FM MC3.2 FM field strength meter and base band analyzer; AM MC3 AM field strength meter and baseband analyzer; Datacaster, an RCS, DARC, RDS+DARC encoder; ITS4 monitoring system for FM, AM and TV; DTVA01 TV sound analyzer; RXR1 FM rebroadcasting receiver.

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Fax: +33-5-57-92-89-29
E-mail: h.miller@audemat.com
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Audio Developments LTD	R1753
Audio Intervisual Design/DTD	R2855
Audio LTD./MacArthur Group	R3053
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Audio Processing Technology	R3015
Audio Specialties Group	R2763
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Audiolab Electronics Inc.	E3434
AudioScience	R1983
Audio-Technica U.S. Inc.	R2647
Austin Co., The	S3260
auto.des.sys Inc.	i5649
Autogram Corp.	R2915
Automated Data Systems	L12154
AutoPatch	M8360
AV Communications PTY LTD	R1837
Avail Me	E1745
AVCOM OF VIRGINIA Inc.	L12515
Avica Technology Corp.	S3869
Avid Technology Inc.	M8318
Avitech International Corp.	M7854
Avitel Electronics Corp.	L11680
AVL Technologies	MM215, T1220
AVP Mfg & Supply Inc.	L4533
AWS Inc.	L1477
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Axon Digital Design BV	L1541
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B	
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B&H Photo-Video-Pro Audio	L11877, R2142
Backbone	R1756
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BAF Satellite & Technology Corp.	T2359
Baird Satellite Supporting Systems	T1144

BALCAR SA L10782

Intro: The 55W line for studio, fluorescent lights fully dimmable either by DMX, analog 0/10V signal, regular phase dimmer or non-dimmable. The line is composed of four fixtures: Duolite with two lamps, Quadlite with four lamps, Fluxlite with six lamps and Octalite with eight lamps; Zoomlite kit, three portable fluorescent fixtures fully dimmable (built-in dimmer) and focusable; Powerflux for production use as the beam. It can be used with daylight or Tungsten lamps and has a built-in dimmer that can be remotely controlled by DMX or 0-10V analog signal.

Also: Camflux; Spotflux 1/2/4; Duolite/Quadlite/Fluxlite 36W.

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Web Site: www.balcar.fr

Band Pro Film/Video Inc.	L11368
Barbizon Lighting Co.	E5840
Barco Projection Systems Inc.	M9018
BarcoNet	S5360
Baron Services	R1673
BBC Technology	i5931
BCE Nexxia	E2955
BDL Autoscript Inc.	L8286
Be Here Corp.	i6227
Beck Associates	L10368
Belar Electronics Lab Inc.	R2533
Belden Electronics Division	L8783
Benchmark Media Systems Inc.	R1752
Bernclare Multimedia	E2648
betaresearch GmbH	S2849
Bexel Corp.	L555
Bext Inc.	R1947
beyerdynamic Inc.	L4405
Bird Electronic Corp.	R1873
Bi-Tronics	L9032
Bittree Inc.	L5840
Blueline Technology Inc.	L123
Boeckeler Instruments Inc.	M7460
Boeing Co., The	T559
Bogen Photo Corp.	L10777
Boland Communications	L7886
Bomar Interconnect Products Inc.	M9671
Boris FX	i7251
Bose Corp.	E4601
BOXX Technologies	S3872
BrainMedia LLC	E5914
brightline	R2963
Brill Electronics	M9060
Broadata Communications/ Physical Optics	E4745
Broadcast Electronics Inc.	i6126, R2505
Broadcast Microwave Services Inc.	L6101

Broadcast Richardson, Div. of Richardson Electronics R2325

Intro: Syntax Media Systems non-linear multimedia editing system is based on third-party multimedia editing software and includes Wizard custom software for a step-by-step process to deliver video programs for either CD-ROM or Internet distribution; SWE DISH satellite communications products and services; FM transmitters including the RF Cast MT100 and MT1K, a 5 kW AM transmitter and the 1 kW UHF (LD71KO); fixed and mobile microwave products.

Also: Tubes, studio products and engineering support for Eimac (CPI), Sender, Linear, RFcast, SOUNDcast, SWE Dish, Broadcast Richardson PIE racks and complete integrated solutions.

Contact: John Donarski

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E-mail: broadcast@rell.com
Web Site: www.broadcast-richardson.com

Broadcast Store Inc.	L12164
Broadcast Technology Ltd.	L1555
Broadcast Video Systems	L8923
Broadcasters General Store	L5933, R1846
BroadLogic Network Technologies	E3541
BSP	T2159
BSW-Broadcast Supply Worldwide	i7239, R1915
BT Broadcast Services	T1732
BUF Technology	L122
Bulldog	i5937
Burk Technology	R1805

Burle Industries Inc.	L5030
Burst Electronics Inc.	L8974
C	
C.O.E.L. Complementi Elettronici S.r.l	L1177
Calculated Industries Inc.	L337
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Cammate Systems	L11383
Camplex Corp.	L8080
Camseat Ltd.	E3901
CANAL+ Technologies	S4871
Canare	L12573
Canon USA Inc.	L10436
Canopus Corp.	S4154
Capital Networks Ltd.	i7260
Caption Colorado	L335

CaptionMax	S3349
Carlson	L265
Carpel Video	L12132
Cartoni USA, Div. Of Ste-Man	L9034
Cartworks/dbm Systems Inc.	R2603
Case Design	E2845
Cavena Image Products AB	S3151
CBS News Archives	M9440
C-Cube Microsystems	S3313
Celco	T1325
Cellstack Systems Limited	E5601
Central Tower Inc.	L1429
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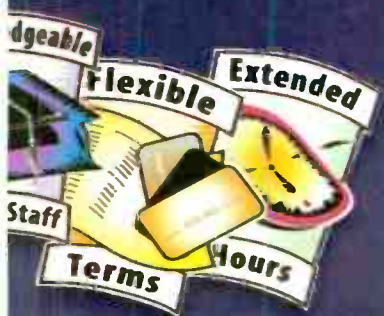
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Christy's Editorial Film & Video Supply	E3145	Coherent Communications Inc.	M9924
Chrome Imaging	E2056	Colortran, A Leviton Company	L9953
Chyron Corp.	i6631, L12300	Command Audio	R2681
Cinekinetic Pty Ltd	L9873	Communications & Power Industries	L6114, S2732
Cinemacraft Inc.	E5236	Communications Specialties Inc.	M8767
Cinemills Corp.	L4407	Compaq Computer Corp.	M9024
Cintel Inc.	L5344	Compix Media Inc.	S2847
Ciprico Inc.	M8336	Comprehensive Video Group	L9020
Cisco Systems	T1153	Comprompter	L9057
Clark Wire & Cable	L12580	Computech International	E3121
Clear-Com Intercom Systems	L10373		
CMP Media Inc.	i7255	Computer Concepts Corp. R2633	
Coastal Satellite Inc.	T1122	Intro: Maestro is a radio air studio touchscreen digital audio system for satellite formats or music on hard drive. A voice tracker, CD ripper and multitrack editor are included and it operates on Windows 2000 or NT; Visual Traffic is a scalable	
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Comrex Corp. R2525
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Continental Electronics Corp.	L12211
Continental Microwave	L12549
Control Concepts/Liebert	i5847, L6226
Convergence Corp.	L12164
Cool-Lux	R2009
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Crystal Vision Ltd.	L116
CTE International SRL	R2169
Curious Software	E2635

D	
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DB Elettronica Telecomunicazioni S.P.A.	R1641	Dielectric Communications	L9539, R2341	Digital View Inc.	E2914
DCM/Autocue	L12158	Digibid	R2175	Digital Vision	E2642
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DSP Media Inc.	R2669
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Eartec	E2545
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Econco R1928
Intro: Rebuilt UHF TV power tetrodes, including models TH347, TH393, TH382, TH582, TH327, TH527 and TH593. The company also offers full UHF RF test capability.

Contact: Joseph Emsley
Vice President of Marketing
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Edak	E2821
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Electrophysics Corp.	L4946
Electracker Products Co.	S3302
Elenos S.r.l.	R2575
Elettronika S.R.L.	R2105
EMC Corp.	i6446, L1341
EMCEE Broadcast Products	L6431
eMotion	M8363
EMR Corp.	E3200

ENCO Systems, Inc. R3041
Intro: AirPLAY, part of the DADpro32 family, is a live-assist user interface designed for large-market live-assist radio that combines random access and playlist-based operation in a seamless, easy-to-use screen; Digital Intern is a software-only, high-speed two-track editor designed for phone call recording and editing within the broadcast studio; the company's direct sales force for North America will move in house. By moving away from a dealer-based model domestically, the company expects to provide better presale, sale and post-sales support to users.

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Director of Sales and Marketing
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eP2me.com GmbH E4936
Intro: MINNA library is a new system that covers all media formats and controlling software, while offering consulting, training, installation organization and field service for storage archiving and automation tasks.

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Web Site: www.eP2me.com

ERG Ventures Co. Ltd.	E3248
Ergo 2000	L414
ERI-Electronics Research	R2625

ESE L5730
On Display: The ES-185A, an enhanced GPS-based master clock/time code generator; self-setting analog clocks; digital clocks; timers and slave displays; audio and video distribution amplifiers; black burst generators; audio level indicators and interfaces.

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E-mail: bway@ese-web.com
Web Site: www.ese-web.com

Esser Test Charts	L11062
e-StudioLive	L11645
ETM-Electromatic Inc.	L11984, T1756, MM216
Euphonix	R3005
Eutelsat	T546
Eventide Inc.	R1817
Evertz	L12146
EVS Broadcast Equipment	L1131
Exatel Visual Systems	i5646
Excalibur Technologies	M10263
Exeltech	T1420
Express Video Supply Inc.	L10686
Extreme Music	S3315
Extron Electronics	M7936
eyeon Software Inc.	S3157
E-Z UP International Inc.	R3125

F
FACTUM Electronics AB L713
Intro: FACTUM IPX-DAB transforms any DAB network from digital audio radio to a powerful IP multicast platform. Already the evolution of the Internet has created a new set of solutions to build streamed services and e-commerce applications based on IP. IP over DAB would provide several advantages, such as high bandwidth, high penetration, high-performance encoding and low cost due to point to multipoint, thereby combining the best of DAB and internet radio; EMX100 and EPC100, Ensemble Provider Multiplexer System for digital radio applications (DAB). The system supports upstream service providers as well as local insertion of data and audio services. Our PC-based solution makes the system scalable to suit both small and large applications. Redundancy solutions are available.

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Fairlight USA	R1616
Fantastic Corp., The	M10060
Faraday Technology Ltd.	L331
Faroudja Laboratories	L12240
Fast Forward Video	L8083
Fast Multimedia AG	S4817
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Fiber Options	S4166
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Film & Video Equipment LTD.	S3569
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PMD690 stereo recorder

PMD680 mono recorder

Also Available:



PMD650 MiniDisc

The new portable Marantz PMD690 records high-quality stereo digital audio files that can be immediately transferred to a computer for archiving, editing, or uploading to the Internet. (PMD680 is a lower priced monoaural version). Simply insert a recorded PC Card or flash memory card into your computer's PC Card slot. It's that easy. The unit's Type III PC Card slot is compatible with both compact flash (using an adaptor) and ATA-size PC Cards. There are no moving parts and flash memory is impervious to temperature extremes and shock, which might damage recordings.

Compressed MP2 digital audio files recorded on the PMD690 can be stored as MP2 (.mp2) or in the Broadcast Wave standard (.bwf). The PMD690 also allows uncompressed recording (PCM) in the true wave (.wav) file format. For example, a 440 MB card provides you with up to 27 hours of MP2 audio or 1 1/2 hours wav. file uncompressed audio.

Designed especially for the broadcast market, Marantz Professional's line-up of digital recorders leverage decades of experience in providing reliable, high fidelity portable recorders for field recording professionals.



FirstCom Music Inc. L4954, R2921

Intro: Velocity library brings the authentic vibe of today's music to productions with speed, confidence and power; Galerie, a new library with a French heritage, features 40 CDs containing some of the finest film and television scores by the music producer René Taquet, and will add 10 CDs a year of the latest continental-flavored professional music; Delivered on CDROMs with AIF music files for either Mac or Windows applications, QuickTrax was created to save time and simplify productions by dragging user files to the hard disc for slicing and dicing with your video, creating a full mix or a custom brew by combining eight or more stereo pair multitracks.

Also: FirstCom Music; Chappell-recorded music library; MusicHouse; OneMusic library; HollywoodMusic; Gotham; Access Music; Headspace; The Production Edge; TotalAccess-The Music Library; Sound Designer II; Sound Designer Production and Scoring Library; Maximum Impact; Vivid.

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Flash Technology	R2347
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Floral Systems Inc.	L1317
FM Systems	L4650
FMTV.com Inc	E2536
Folsom Research Inc.	M9168
FoNet Inc.	M9638
FOR.A-Video Gainesville	L8612
Force Inc.	S3563

Forecast Consoles Inc.	M7929
Formatt Filters	L4710
Fortel DTV	L1261
Frauhofer-Institute IIS	E5847
Fred Nudd Corp.	L11954
Fresh Music Library	L11852
Frezzi Energy Systems	L4626
Frontline Communications Corp.	L12558
FSR Inc.	M10429
Fujinon Inc.	L8739
Furman Sound Inc.	E2650
Future TV	E3845
FutureTel Inc.	E3821
Fuze 3 Technologies	E2834

G

GAM Products Inc.	L6126
Garner Industries	L6223
GE American Communications	T2330
Gefen Systems	M9339
Gene Michael Productions	L4652
Genelec Oy	M9571, R1969
Gennum Corp.	S203
GeoVideo Networks	L1055
Gepco International Inc.	L5856
Gerling and Associates	MM420
German Pavilion	E2333
Getris Images S.A.	S4643
Glidecam Industries Inc.	E5806
Global Communications Solutions	T1050
Global Media Corp.	E2352

Global Media Resource Inc.	S4402
Global Microwave Systems Inc.	L5742
Globalstor	E3538
Globecast	T2338
Globecomm Systems Inc.	T538
Glyph Technologies Inc.	E4214
GMPCS Personal Communications Inc.	T1022
Gorgy Timing	L1213
Gorman-Redlich Mfg.Co.	R2200
Graham-Patten Systems	L955
Grande Vitesse Systems	M10377
Grass Valley Group	L10409
Groove Addicts/ Who Did That Music?	R3131
Ground Zero Software Inc.	E3245
Gyration Inc.	E2852

H

Hafler	L771
Hannay Reels	E5321
Hanson Engineers Inc.	L12086
Hardata S.A.	E5337
Hardigg Cases, A division of Hardigg Ind	M9738
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Hitachi Denshi America Ltd	L6414
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HORITA Co. Inc.	L9773
Hosa Technology	L4427
Hotronic Inc.	L9868
Hughes Global Services	E2042
Hughes Network System	E4350

I

Ianiro Aldo SRL	L140
iBEAM Broadcasting	i7263
Iberica de Componentes, SA	R2483
iBiquity Digital Corp.	R1975
IBM Corp.	L1117
I-Bus/Phoenix	E2800
ici Media Inc.	i6655
IDB Systems	T1753
IdN Magazine	E5623
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Ikegami Electronics	L10420
iKnowledge	E5003
IM3 Networks	R2075
Image Icons.com	E2833
Image Video	L4621
iMagicTV	E6211
Imagine Products Inc.	i6755
IMAS Publishing	L4610, R3153
IMMAD ECVS	L1277
Incite Multimedia Corp	S3572
Independent Audio Inc.	R3102
Industrial Acoustics	R2047



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Industrial Logic Corp.	T1951
Industry Flip Book, The	M10450
iNEWS	L11377
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InfoLibria Inc.	E3601
Informa Media Group	T1120
Inline Inc.	M9745
Inmotion Systems	M9674
InnovaCom	M10134
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Innovision Optics	L11568
INOIZ. Com Inc.	E2345

Inovonics Inc. R1953

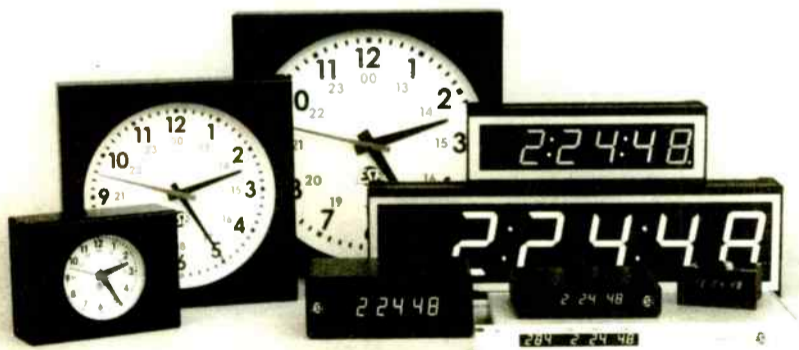
Intro: OMEGA FM is a digital broadcast processor and stereo generator featuring a short signal path with minimal latency, multiband AGC, leveling, compression and distortion-canceling limiting. The processor offers front-panel buttons, analog and digital inputs and outputs, and boasts full control over all processing parameters with menu-guided PC-programmability; Model 711 is a full-featured RDS/RBDS encoder that has been added to the company's line of FM RadioData products and is fully compliant with NRSC and CENELEC standards. The 711 interfaces with existing radio automation to display song titles, telephone numbers, contest results and promotion or advertising messages.

Also: DAVID-II FM audio processor/stereo-generator; WebCaster Internet streaming audio processor; Model 222 NRSC AM broadcast processor; Model 235 triband AM broadcast processor; Models 255 and 260 FM broadcast processors; Model 510 RDS/RBDS decoder-reader; Model 520 AM mod-monitor with preselector and active antenna; Model 530 off-air FM mod-monitor; Model 630 FM rebroadcast receiver; Model 701 RDS/RBDS encoder; PBX telephone line eliminator.

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Inscriber Technology Corp.	S4832
in-sync	S5322
Integrated Lighting Systems LLC.	L6546
Integrated Tracking Systems	L4413
Intel Corp.	i6519
Intelligent Media Inc.	M10447
Intelsat	T1738
Intelvideo Inc.	L8207
Interactive Effects	S2926
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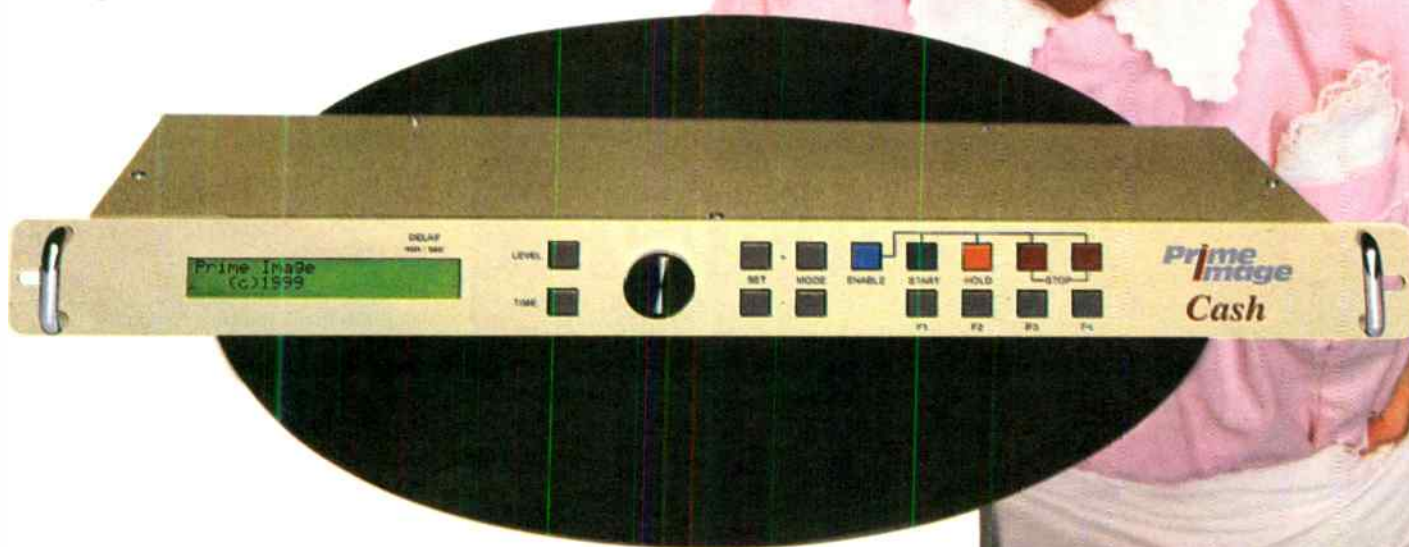


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Istream TV	E4440	K & H Products Porta Brace	L9083	Kingston MediaStream	E5642		
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		Kasenna	E3914	Klotz Digital America	R3169		
J		Kathrein Inc., Scala Division	L9574	Knox Video Technologies	L9054		
J.L. Fisher	L10886	Kavouras, A DTN Co.	L729	Ko Yong Photo Co. Ltd.	E1742		
J-Lab Co., The	L6130	Kay Industries Inc.	R2134	Kobold Division of Bron Elektronik AG	E4645		
Jampro Antennas/RF Systems Inc.	L5728	Kaydara Inc.	S3263	Kohler Power Systems	MM336		
Janson Design Group LLC	i6275	K-Best Technology	E2921	Konan Technology Inc.	M10470		
JBL Professional	M9353	KD Kanopy Inc.	R3154	KPM Music Ltd.	E2906		
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Marconi Communications	E5006
Markertek Video Supply	L9577
Marshall Electronics Inc.	L144, S3460
MartinSound Inc.	R3224
Masterclock Inc.	L159
MATCO	L12521
Mathematical Technologies Inc.	S4137
Matrox Electronic Systems Ltd.	S4113
Matthews Studio Equipment	L4604, S4502
Maxell Corp. Of America	L12629
Maxtor Corp.	S3537
MaxVision Corp.	E3801
Measurand Inc.	M10472
Media 100 Inc.	i6511
Media CareerLINK Inc.	E2917
Media Computing Inc.	L9073
Media Concepts	L6338

Media Excel E6439
Media1st.com E5614

MediaLinks CO., LTD L12128

Intro: MR-MTX16 high-performance digital multi bit-rate routing switcher, 16x16, in 1 RU; MR-MTX32 high-performance digital multi bit-rate routing switcher 32x32, in 2 RU; the MD4000 upconverter transforms D-1 signals (SMPTE259M) into 1080i/59.94 Hz, 720P HD signals; a unit to transform 1080i/59.94 Hz, 720P HD SDI signals to D-1 signals (SMPTE259M); a unit to transform optical input to SDI (D2-HDTV) output and SDI (D2-HDTV) input to optical output; HD-SP6/HD-PS6, an HDTV SDI 1.5 Gbps interface module that supports all formats of SMPTE292M

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Medialogixx E2050
MediaSite Inc. M10145

MediaTouch R2953

Intro: iMediaTouch Radio Suite combines an on-air system with CD ripping, Web streaming, online ad insertion compatibility and PCM/ADPCM/MP3/MP2 ability. It is suitable for live or voice-tracked operation and is scalable to fit anything from a single radio station to a large market cluster; New codec technologies are being added to MediaTouch's Card Independent line of software, to make its software compatible with more digital systems using off-the-shelf equipment; iMediaAdCast is an ad substitution system that inserts Web-only commercials into a Webcast stream without interrupting the music or entertainment content, using a single PC and fixed IP Internet connection; iMediaEdit is a stand-alone phone editor capable of editing WAV, MP3, MPEG-II, ADPCM and WMA files and may be outfitted with an external scrub wheel, record and play buttons and will work with any Windows-compatible sound card.

Also: iMediaLogger, enhanced this year to record the same source in up to four different formats at the same time and will now accept up to eight different sources simultaneously. Timed recording has been enhanced to enable time-shifting satellite programming, and it supports PCM, ADPCM, MP3, MPEG-2 and WMA using standard Windows audio cards, while maintaining compatibility with many different automation systems.

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MedioStream Inc. E5845
Megatrax Production Music Inc. M9926, R3130
Merging Technologies E6227
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Metropolitan Area Networks E6214	MSE Media Solutions L5038
MGE UPS Systems i5954	MSHOW.com E5139
Micro Communications Inc. L8768	mSoft Inc. E5817
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Microdolly Hollywood L11057	Multimedia Accessories Ltd. L5740
Micron Audio Products Ltd L9068	Multipoint Communications L12549
MicroNet Technology M9768	Musashi Co. Ltd. L4656
Microspace Communications Corp. T734	Musicam USA R2935
MicroVideo Ltd. L4754	Myat Inc. L4618
Microwave Radio Communications L6420	
Microwave Service Corp. L12283	
Middle Atlantic Products i6472	
MidStream Technologies Inc. S5354	
Milestek Inc. S4163	
Miller & Kreisel Sound Corp. S2546	
Miller Camera Support LLC L10773	
Mindport E2546	
Minerva Networks Inc. i6452	
Miranda Technologies Inc. L8632	
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Miteq/MCL Inc. MM500, T1423	
Mitsubishi Electric Corp. L255, M9363	
Mitsutech USA Corp. E3111	
Mixed Signals Technologies M8338	
Mobilized Systems Inc. MM324	
Modulation Sciences L4416	
Mohawk/CDT L12177	
Mole Richardson L6450	
Monal Systems MM532	
Monivision M9573	
Moore Digital Services E2822	
Moseley Associates Inc. R2553	
Motion Analysis M8343	
Motorola, Broadband Communications Sectr L716	
N Systems Inc. (NSI) L12604	
Nada-Chair E2924	
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NATPE S3461	
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Nemal Electronics Int. Inc. L5031	
Neotec Graphic International Inc. E5811	
NERA Telecommunications E5939	
Net Insight E1942	
Netcom L8209	
Netia R2973	
Network Appliance Inc. E3530	
Network Connection (TNCi) E2339	
Network Electronics AS L229	
Neutrik Montreal R2130	
Neutrik USA Inc. L11636	
New England Satellite Systems Inc. T843	
New Haven Moving Equipment E5322	
New Media Technology E2939	
New Pro Video E3247	
New Skies Satellite N.V. E5314	
Newpoint Technologies Inc. T440	
Newtec America Inc. T550	
NewTek S4837	
Next Level Digital Academy E4340	
nGame Ltd. E2627	
NHK Engineering Services Inc. S3451	
Nicom LLC R2655	
Nigel B Furniture L11973	
NKK Switches E5521	
Non-Stop Music L6222, S3020	
Norpak Corp. i6760	
Norsat S2939	
Northern German Pavilion S5366	
Northern Technologies Inc. L4752	
Nothing Real S4854	
Novotronik T756	
NPR Satellite Services R1956	
NPTV E2535	
NS Microwave L129	
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nStor Technologies Inc. i5763	
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Network Music i7236, L6444

Intro: Short Trax Library holds more than 6,000 tracks on CD including all of the broadcast-length edits from both the Network Production Music Library and the Network Classical Library and includes the Trakfinder CD-ROM Catalogue; Network Sound Effects Library contains more than 8,000 effects on CD, including the Trackfinder SFX, a CD-ROM search and audition tool and frequent updates to its sound effects library; AfterShock provides 380-plus earthshaking cuts on 4 CDs; Spike2Glide comedy pack provides more than 340 humorous cuts on 4 CDs; Brainstorm is a collection of more than 500 production elements on seven CDs.

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Tradeshaw Coordinator
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Oxberry	M10427
Oxtel Limited	L147

P

Pacific Radio	L11873
Packard-Hughes Interconnect	L247
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Panasonic Broadcast	L7020
Pandora International Limited	L4944
Paradise Datacom LLC	E5801
ParkerVision	E2355
Path 1 Network Technology	E4103
Pathfire (formerly Video Networks Inc.)	L655

PCS Innovations	E2929
Peace Corps	M9438
Peerless Industries	S3049
Penny & Giles Controls Inc.	R1829
Penta Laboratories	R3114
PEP Inc.	L8929
Perceptual Robotics	E5611
PESA Switching Systems Inc.	L8757
Phasetek Inc.	R1847
Philips Digital Networks	L5010
Phillips Business Information	T1043
Phoenix Tools SRL	E5027
Photoflex	E3105
Photron USA	S3449
Pilat Media Limited	L1141
Pineapple Technology Inc.	R1952
Pinnacle Systems Inc.	L11327
Pioneer Magnetics Inc.	L1414

Pioneer New Media Technologies, Inc. S4865

Intro: A self-contained 50-inch XGA plasma panels unit that delivers high resolution and 160-degree viewing angles. The panels can display content from sources including HD, DVD, PC and Macintosh.

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Potomac Instruments	R2140
Power Technology	MM343
Power-tek International.com	L477
Predwave	E4107
Presentations Magazine	M7761
PricewaterhouseCoopers	i7268

Prime Image Inc. L10382

Intro: The Cash radio time machine is a fully digital, easy-to-operate device that utilizes a patented random "micro-edit" process — undetectable to listeners — to reduce the length of any audio production up to one minute in every 10 for additional commercial insertions without reducing program content. Cash works automatically, in one pass, with no additional processing in real time live. Programs containing voices, sound effects or music, alone or in com-

ination, are shortened with no warbling time compression or sped-up chipmunk audio.

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Fax: 408-926-7294
E-mail: primeimagein@earthlink.net
WWW: www.primeimageinc.com/

Princeton Video Image	L1161
Prism Media Products	R3000
Pro Consultant Informatique	M10229
Pro Cyc	L7783
Production Garden Music	L6228
Professional Label Inc.	L8206
Professional Sound Corp.	R3055
Professional Sound Services	T2150
Progressive Marketing/Delta Designs	S4160
ProMax Systems Inc.	M9359
Promusic Inc.	L1435
Propagation Systems Inc.	L6156

Prophet Systems Innovations R2115

Intro: Expanded Auto Phone Call provides up-to-the-minute weather, commuter and traffic reports without station intervention. Multiple predefined spot numbers are available for any type of outside call the station would like to play back or rerecord; Platform Support automatically sends e-mail to support running overnight routines, an audio server failure, and/or a file server failure. Elect to send all unopened messages in the NexGen Digital support-user mailbox to technicians, available 24 hours a day. Receive support for WindowsNT, Windows 2000, Novell and Linux-based systems; SS62 Dedicated Hot Spare allows an audio server to be standing by, and, upon failure, the system will switch to the standby and pick up where the failed audio server left off.

Also: NexGen Digital Broadcast, CD/Extractor Pro, Audio Format Converter.

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E-mail: JackieL@prophetsys.com
Web site: www.prophetsys.com

ProSource/BMI	L9286
Proximity Corp.	E5311
PSSI	T543

Q

QEI Corp.	R2035
QTV	L12158
Quantel	L11520

Quartz Electronics L977

Intro: QMC master control switcher supports automated and manual operation and contains a range of modular control panels and an internal DVE; Q16/Q32 serial video routers are redesigned to include an upgrade path from analog to digital and can be used as a standalone or integrated into larger systems. The Q32 offers 32x32 using 2RU with optional supplies; HD routing products to fully integrate with existing routers and share the same control systems and control panels.

Contact: Pete Challinger
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Fax: 530-839-2207
E-mail: petec@pmttech.com
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Quest Research & Development Corp.	L12254
Quickset International Inc.	L12152
Quintech Electronics&Communications(QEC)	T850
QuVIS Inc.	M10249

R

Radamec Inc.	L1441
Radiacion Y Microondas, S.A. (Rymsa)	R3025
Radio Express Inc.	R2941
Radio Systems	R1935
RadioScape Ltd.	E4140

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John Patti - Director of Audio/Video Services
Casey Fuller - Assistant Audio Engineer
Westwind Media.com - Denver, CO



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 Phone: 703-998-7600
 Fax: 703-998-2966
 E-mail: radioworld@imaspub.com
 Web Site: www.rwonline.com

Radyne ComStream Corp.	T1722
Ram Broadcast Systems	R2600
Rapidtext Inc.	E2935
RCI Custom Products	M9824

RCS R1925, I5946
 Intro: SplitStream ad insertion technology sends a different commercial to each Internet listener, appealing to individual interests, and offers no delays, smooth segues and no re-buffering. The unit also displays graphics associated with each spot and provides a click-through to the advertiser's Web site; RadioShow, a branded Internet player, is available in: Level 1, which displays current title/artist info on the user's Website synchronized to the streaming audio signal, Level 2, which adds the "Buy Me" Button for the purchase of music online, with additional revenue going to your station, and Level 3, which adds animated graphics and other synchronized visuals to the user's site; MasterControl digital automation system integrates the music scheduling software Selector with access to the entire Selector database, and is coupled with the Living Log, instant HotKey audio, "Real-feel" voicetracking in the studio and over the Internet, and the Log-Linked Web Browser.



Mandalay Bay

Also: Selector music scheduling system; Linker Promo Management; TalkBack talk show call screening.

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RDL Radio Design Labs	L4955, R3141
Real Networks Inc.	i6726
Realviz	M8945
Red Hawk Vision	M10422
Rees Associates Inc.	L8952

Register Data Systems	R2005
RevCom Inc.	T822
RF Parts	R2146
RF Technology	L12549
RFS Broadcast	L9528
RGB Spectrum	M8350
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Richland Towers	L1146
Riz-Transmitters Co.	R2582
Rohde & Schwarz GmbH & Co KG	L5750
Rohn Industries Inc.	R2547
Rorke Data	i6442
Rosco/Entertainment Technology	L9061
Ross Video Limited	L11639
RTI-Research Technology International	L7045
Rules Service Co.	L5230
Russ Bassett, Media Storage Solutions	S4172
Rycote Microphone Windshields Ltd.	R1653

S

S.W.R. Inc.	L8773
S4M - Solutions for Media	E4735
Sachtler Corp. of America	L9545
Saco SmartVision Inc.	S2736
SADiE Inc.	R3175
Sanyo Fisher (USA) Corp.	M8354
Satellite Engineering Group	T753
Satellite Export & Engineering (Patriot)	MM410, T434
Satellite Networks	T553
Sato Kensetsu Kogyo. Ltd.	L371
Satvision Technology Int'l Inc.	E2531
SAV Systems	L436
Audiofrequency Videonique	L436
Savannah College of Art & Design	S3053
SBC Communications	T2224
SBS Technologies Inc.	M10462
ScheduAll by VizuAll Inc.	i6746
Schoeps	R3124
Scientific-Atlanta	S4142
SCM Micro Systems	i5757

Scott Studios Corp. R2905
 Intro: SS32 is a radio air studio touchscreen digital audio system for music on hard drive or satellite formats with a studio phone recorder and voice tracker, 30 sets of 30 hot keys, live copy on screen, instant requests, and automatic fail-proof redundancy, uncompressed or MPEG or APT; AXS3 is an affordable digital system for satellite formats or music on hard drive with Voice Tracker available and CD ripper included; Scott Do-It-Yourself Software, low-cost digital systems for satellite formats or music on hard drive; Wire copy and audio feed auto-capture and editors, versions for small, medium or large news operations with seamless interfacing with all Scott and Computer Concepts systems.

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Screen Subtitling Systems Ltd.	L455
SeaChange International	L917
Seamount Technology	E2907
See It First	E2552
Sencore Inc.	L417
Sender S.A.	R2852
Sennheiser Electronic Corp.	R2253
Seratel Technology	R2952
SF Video	E3840
SGI	S4132
Sharp Electronics Corp.	E6101
Shiron Satellite Communications	E2802
Shively Labs	L6116, R2705
Shook Electronic USA Inc.	MM306
Shotoku USA	L12186
Shure Inc.	L4614
Sichel Embroidered Crew Apparel Inc.	L1413
Sierra Automated Systems & Eng. Corp.	R3105
Sierra Video Systems	L3750
SierraCom	T2251
Sigma Designs Inc.	M9629
Sigma Electronics Inc.	L12639
Sigma System Engineering Co. Ltd.	R3145
SignaSys Inc.	E2900
Silicon Valley Power Amplifiers	R3163
SintecMedia	E4147
SkyStream Networks	i6875
Smart Storage	E6239
SMART Technologies Inc.	M9968

Smarts Broadcast Systems R3024
 Intro: Smartcaster dual processor units feature two computer systems sharing a passive backplane motherboard in a single box using the Windows operating system as the user interface, while allowing audio to play from its own operating system running on the companion processor. Dual processor units will also be on display; Voicetracking Smartcaster system features the ability to voice track entire shows easily and with minimal announcer time required; Internet Web Spider automates broadcast quality audio over the Internet; an easy-to-use Windows interface in mouse driven or touchscreen models that works with existing Smartcaster systems.

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 Fax: 800-398-8149
 E-mail: info@smartsbroadcast.com
 Web Site: www.smartsbroadcast.com

SMI Promotional Apparel	E5815
SMPTE	i6128, L8832
Snell & Wilcox	L10428
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SoftNI Corp.	T626
Solid State Logic	R2515
Solutions Custom Furnishings	i5654
Sonic Desktop Software	L1113
Sonic Solutions	S4826
Sonifex Ltd.	R3001
Sony Electronics Inc.	L11600
Sorenson Media	E6235
SOS Global Express	L6217

Sound Devices, LLC R2900
 Intro: 442 portable field mixer offers four inputs, including transformer-balanced mic/line/tape level selection, phantom or T powering, input trim, variable high-pass filter, pan, input limiter, solo monitoring and direct output. Outputs are transformer-balanced on XLR, Hirose and other connectors; USBPre portable hardware interface for PC-based digital audio recording and streaming, featuring two microphone preamplifiers with 48 V phantom power, 24-bit A/D converters, 106 dB dynamic range, USB



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interface for Macintosh OS 9 (and X) and Windows computers, selectable line or tape inputs and headphone monitoring powered solely from the computer's USB port; MixPre, a two-channel, portable stereo microphone mixer featuring transformer-balanced mic inputs with phantom power, dual-stage input limiters, two position high-pass filters, pan switches, built-in slate microphone, 1 kHz tone oscillator, headphone output with tape return, sunlight viewable LED metering and an extruded aluminum chassis; MP-2, a studio-quality two-channel microphone preamplifier featuring transformer-balanced mic inputs with phantom power, dual-stage input limiters, two position high-pass filters, M/S stereo matrix for output or headphones, headphone output with tape return, sunlight viewable LED metering and an extruded aluminum chassis; MP-1, a portable, battery-powered microphone preamplifier with phantom power featuring transformer-balanced input and output, two-position high pass filter, dual-stage unclippable limiter, 116 dB dynamic range and gain adjustment via calibrated switch.

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 Marketing e-mail: jon_tatoes@sounddevices.com
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Sound-Effects-Library.com E2946

Intro: Sound Effects Library, a sound effects and music samples resource in which users can search, listen and purchase virtually any sound, with 60,000 online now and an additional 4 million to come.

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 Phone: 44-207-439-3325
 Fax: 44-207-734-0631
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Sound Ideas	L5330, R2025, S3463
Soundscape Digital Technology	E2818
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Spectralogic	E4408
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Speedera Networks Inc.	E2342
Spider Support Systems	L9880
Spottaxi.com	E5035
SpotVault	E2817
Sprocket Digital	L5047
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SSE Telecom	T1651

Staco Energy Products Company L12252/53

Intro: The Encore Series interactive UPS with versatile rack, tower or wall-mount, power conditioning features, and unlimited, scalable run-times through external battery packs; Trolgard power conditioner, a single phase 1, 2 or 3 kVA rackmount power conditioner offering a wide input range, low harmonic distortion, regulated voltage to +/- 2 percent, and full time sag, surge, lightning, and brownout protection; SVR Stepper voltage regulator providing +/-0.25 percent to 1 percent output voltage regulation with full range correction in less than one second. The unit is available in ratings from 2.5 - 15 kVA and in a 19-inch rack-mounted unit, or as an enclosed unit; AVR series regulators, offering single phase, modular construction with 100 percent front accessibility and +/- 1 percent or better output voltage regulation over the full input range without any wave form distortion or harmonics added to the electrical system; MVR series regulators, three-phase regulators with an input range of +10 percent to -20 percent with +/- 1 percent or better output regulation over the full input range, without any wave form distortion or harmonics added to the electrical system; Staco power conditioners, single or three phase power conditioners with input range of +10 percent to -20 percent and output regulation of +/-1 percent or better.

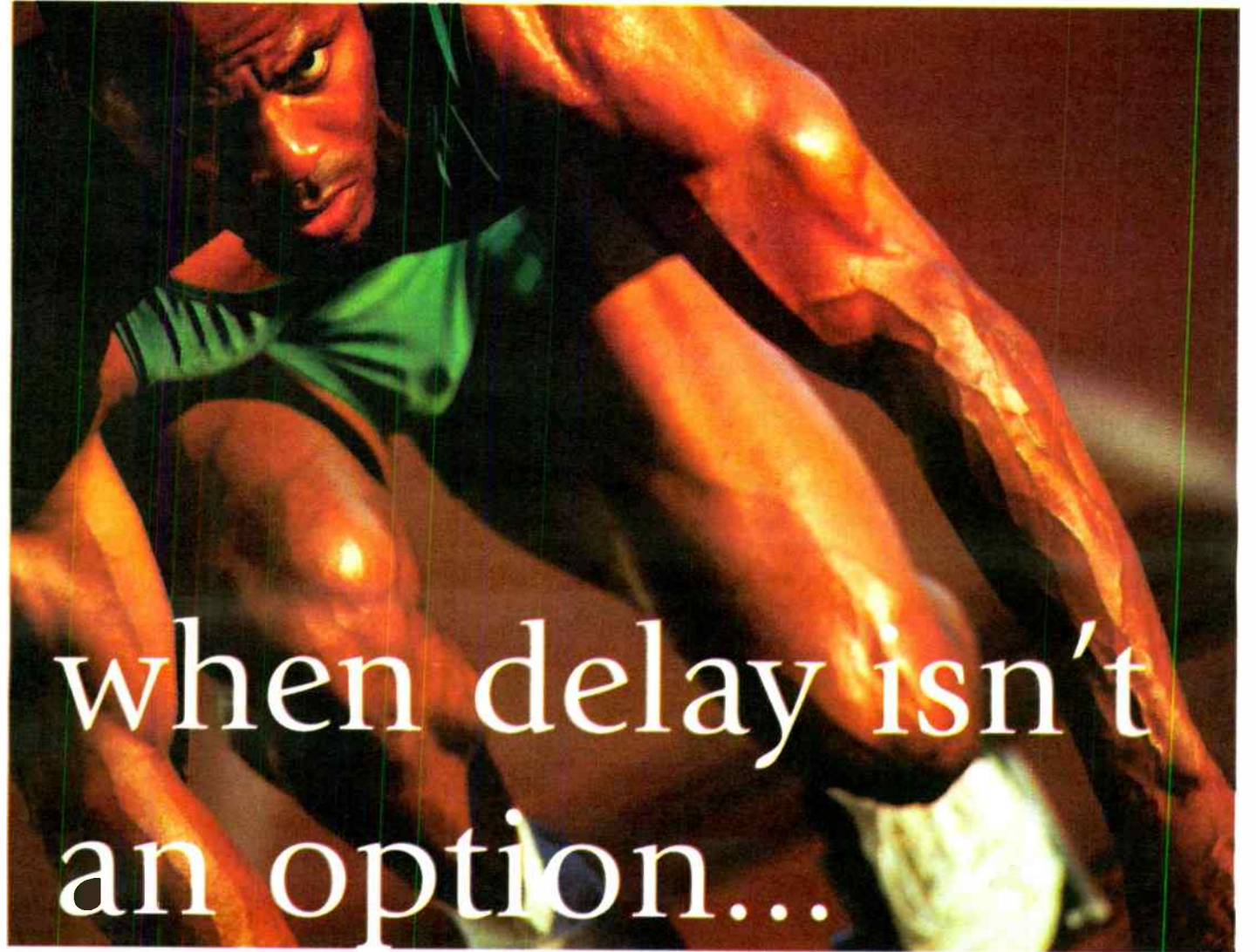
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StageTec GmbH	R2181
Standard Communications Corp.	T1134
Stanton Video Services Inc.	L8383

Starbak Communications	E3855
Starmaze	T2353
Steinberg North America	E3517
STE-MAN Inc.	L9034
Storage Computer Corp.	E5927
Storage Concepts Inc.	S3051
StorageTek	E4901
Storeel Corp.	L6106
Stradis Inc.	M10445
Strand Lighting Inc.	L9016
Stratos Lightwave	E4747
Streaming21	E3239
Streampipe.com	E2347
Studer	R2125
Studio Network Solutions	i6227
Studio Technologies Inc.	R1852
Sun Microsystems	i7215

Sundance Digital Inc.	L1355
SuperColor Digital	E5209
Superior Broadcast Products	L1535
Superior Electric	L4738, R2029
Sure Shot Transmissions Inc.	T2250
Svetlana Electron Devices	R3014
SVS Inc.	M7859
SWE DISH Wahlberg & Selin AB	MM300
Switchcraft, Inc.	L4403
Symah Vision	i6656
Symetrix Inc.	M9338, R2153
Synelec USA Inc.	M9349
SyntheSys Research Inc.	i5952
Syntrillium Software Corp.	E2539
SysMedia Limited	E2918
Systembase Ltd.	R2045

T		
Taber Mfg & Engr Co.		L7786
Tadiran Scopus		S5372
TAI Audio		S3860
Talk America Radio Network		R2702
Tally Display Corp. (TDC)		L8780
Tandberg Television		S4859
Tannoy/TGI North America Inc.		R3126
Tascam		R2141
TBC Consoles		i7272
TC Electronic Inc.		M9639, R2101
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Thanks for all your help and your great products.

Sincerely,



Kent D. Smith
President
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PRODUCT EVALUATION

The 8400: Orban's 'Best-Ever'

A Major-Market Engineer Finds That the New Optimod Overcomes His Analog Prejudices

Phil Simon

Two main reasons audio processing is employed on FM radio stations are, of course, to prevent over-modulation and maintain a relatively consistent audio level for changing program content. The Optimod-FM 8000 did that job very satisfactorily.

But as the state of the art of processing audio has improved, the loudness bar has been raised across the dial in every market. You keep pace, or you get left behind by 2 or 3 dB. Maybe even more.

As long as PDs and engineers have continued to believe that being loud and clean is important, Bob Orban has continued to perfect the Optimod. With each version of this venerable box, stations gained more control in achieving their on-air sound objectives.

But getting loud and staying clean, especially in the all-digital world we now inhabit, has been an evolving and continuous challenge.

Convincing performance

Digital processors have the ability to "look ahead" at peak waveforms and precisely control them by crunching numbers in ways analog processors could never even attempt. But harnessing a digital engine to enhance sound for the analog process of human hearing has proven to be a rather complicated endeavor requiring a ton of R&D with trial-and-error listening.

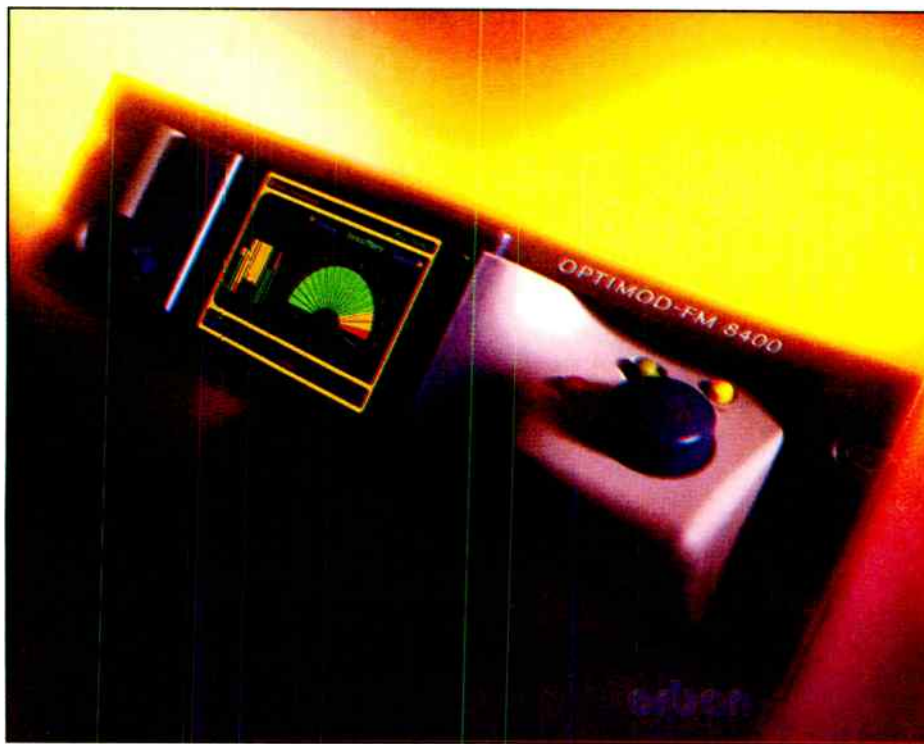
There are still many audio processing aficionados who believe that a carefully tweaked analog system consisting of an Optimod-FM 8100 and various other before-and-after boxes produces a more consistent, friendly, yet competitively loud sound signature than any digital processor out there.

And there are many who believe that the Optimod-FM 8200 offers more than enough processing to stay competitive and that there isn't enough margin for improvement left to justify buying the next level.

If you are either of those, as I used to be, the 8400 very likely will change your thinking. Especially if your competitor

puts one on the air before you do.

Before describing the ability of the Optimod-FM 8400 to get out of the blocks and perform on the radio dial, the physical appearance and dashboard user interface deserve attention. The first impression conveys a kind of "Fisher-Price" look, with a two-tone gray case and royal blue control panel dotted with red, green and yellow buttons.



Optimod-FM 8400

But this box is hardly just a high-tech toy. The 8400's control interface sports a bright, multicolored LCD screen, with selected parameters highlighted and chosen by cursor and enter buttons. Navigation is smooth and effortless. A large blue shuttle-wheel knob is pushed to bring up and change menu selections and jogged left or right to change parameter magnitudes for less/more control.

The 10-year-old Optimod-FM 8200 emerged during the era of the 386 PC. Even the GM can tell you that computer processing power has improved dramatically since then. With the state-of-the-art Motorola DSP56362 processor, the latest

Optimod now has 5.5 times more processing horsepower to crunch numbers with ultra-precise resolution.

Perhaps one of the secrets of the Optimod family's historical success has been its ability to be consistent with all kinds of source material with any format, not letting the user get into trouble creating something awful, even with maxed-out adjustments.

Levels of control

Most of the truly dangerous parameters that might be adjusted beyond listen-

functions of multi-band compression, limiting and clipping with a simple "less/more" control:

- "Intermediate Modify," which offers additional control of the dynamics functions, similar to what was available with the 8200; and
- "Advanced Modify," which offers control of several critical parameters never offered previously in any Optimod, including attack timing and thresholds, plus automatic clipping distortion controls. Orban strongly suggests this section is best left to experienced users familiar with on-air sound signature design.

The collection of format presets offers 20 distinct flavors which cover most significant format types and typical processing signatures found in any crowded FM market.

They include several variations for each of the major format categories, including classical, rock, oldies, country, urban and a "loud" family that all users should evaluate, considering they were conceived and perfected through a joint effort of Bob Orban and Greg Ogonowski.

Orban suggests starting with a preset that matches your format and then perhaps doing some additional custom tweaking, first in the Basic Modify and then in the Intermediate Modify section as necessary to achieve the desired final sound signature.

That's good advice for most users. But we were interested in discovering if the 8400 could produce something truly unique and impressive beyond what its predecessor or any standard presets could deliver.

We installed the 8400 on our mainstream top-40 station. It replaced an 8200 and version 3.0 firmware that was pedal-to-the-metal with a few flavoring boxes ahead of it.

For those of us still caught in loudness wars, the prevailing consensus concerning the 8200 has been that it had to be adjusted perhaps too aggressively to compete fully or "dominate." It just tended to run out of gas on the steep slopes.

But to be fair, the main competitors were barely any better and have had consistency problems of their own.

After spending only a short time with the 8400 on the bench, with raw studio audio driving a QEI 691 mod monitor hooked to a decent amp and speaker set,

See OPTIMOD, page 76 ►

ability were kept out of the user's reach. The 8400 retains a natural two-band phase linear "purist" processing structure, as well as the more powerful five-band structure, with an architecture similar to that found in the 8200.

Competitive pressure from other processors that feature more control and alleged loudness potential has perhaps persuaded Orban to incorporate more access and adjustability. The 8400 offers three levels of parameter control:

- "Basic Modify," which allows the user to control the newly added stereo enhancer, the equalizer and the dynamics

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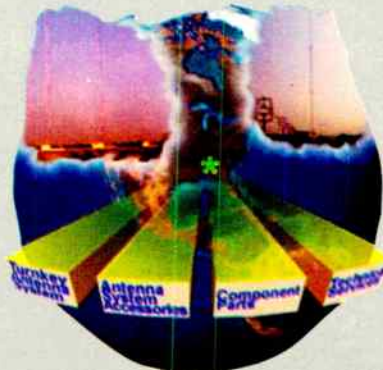
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World Radio History

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Workbench

Radio World, March 30, 2001

Little Things That Mean a Lot

John Bisset

It's the little things that mean a lot!

Consider those solid-oak studio doors that you specified for that added sound-proofing touch to the studio project. They're great, except they lack a window.

If there's no studio window in the wall next to the door, one might walk in on talent in the middle of a recording session. The on-air light stays constantly illuminated, because most talent will leave the microphone on, potting it up and down as needed.



Fig. 1: Security Peephole

So the dilemma remains: how do you know when to enter the studio? You peek!

Many years ago the engineers at Curtis Media in Raleigh, N.C., were faced with this same problem. To make matters worse, the studio door opened into a very busy newsroom. A door security peephole was installed at a modest cost, and the problem was eliminated.

Figure 1 shows the peep hole mounted to the lower right of the production sign. It's hardly noticed, and the wide-angle lens brings the whole studio into view.

Thanks to the Curtis engineering staff for sharing their idea.

★★★

If you've ever spent time crawling under a console, or even duct-taping cables at a remote, you'll appreciate the find shared by Bonneville Washington engineers.

Home Depot offers a variety of inex-

★★★

Cable trays, conduit and other wire management systems can be costly. If you're running cables on a budget, and they will be "up and out of the way," consider the PVC solution shown in Figure 3, used by Ron Fribush at WEVA(AM) in Emporia, Va.

Needing to run several mult cables within the transmitter room, aesthetically pleasing wiring trays could have been selected. Ron used cut PVC couplings instead, saving money for needed studio upgrades. Proper spacing of the PVC couplings prevents cable droop, and the cut in the top of the coupling simplifies the process of adding cables later.

★★★

A *Workbench* reader has a customer looking for a bit to drive ground rods using a jackhammer.

John Stortz, drove multiple 10-foot (or longer) ground rods around his tower



Fig. 2: Easy on the Knees

site, using a stepladder and sledge hammer. The rods were steadied by a couple of trusting hands as John drove them into the ground.

I've never heard of a bit that would fit a jackhammer, but thought I'd query the readers of this column.

I suggested that he check with the local power company or cellular companies; both use ground rods extensively. Any other ideas? E-mail them to me at jbisset@harris.com

See WORKBENCH, page 76 ▶



Fig. 3: PVC Cable Channel

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World Radio History

Optimod

► Continued from page 73

it was apparent this box was in a new class by itself.

Rather than follow the step-by-step directions provided in the preliminary manual, we've always preferred to play with these kinds of devices intuitively at first, testing limits of the major parameter controls. Then when we needed answers to specific concerns or questions, the manual was indeed quite helpful.

We tried the "loud" preset options first, but concluded they were too busy, too fatiguing or just too over-processed for our tastes. So to achieve a cleaner, more open flavor, yet with sufficient punch and loudness demanded by the PD, we started with the instrumental preset and modified up from that.

In general, low-end clipping is held soft to keep the bass honest, and release times are kept on the slow side to preserve dynamic feel and definition. Loudness is augmented with multi-band drive and carefully chosen clipping settings in Advanced Modify. Each highlighted parameter being modified also displays a helpful descriptive tag nearby to guide the user during adjustments.

It took the better part of a week of small step changes from a base-line starting point and then daily evaluation to arrive at an adjustment set that engineers, jocks and the PD all agree is an impressive and significant improvement over what we had with the 8200.

Clarity

The most striking difference is in the perceived cleanliness of both the lows and highs, while maintaining dominant loudness. The one word the PD likes to use describing the result is improved "clarity."

Certainly the look-ahead limiting capabilities and increased processing horsepower have much to do with that. Digital grunge is truly once and for all a thing of the past with this processor. And consistency from song to song holds up well, even from older, relatively unprocessed recordings to the current crop of many over-processed CDs that music companies are bound and determined to deliver to radio stations.

Although the manual suggests using an Optimod Studio Chassis ahead of the STL if the 8400 is placed at the transmitter, we found that no additional AGC

controller was necessary with the unit at the studio ahead of the STL. Orban finally got the AGC nailed in this version of the Optimod, so don't worry about adding a Compellor, Studio Chassis or some other leveler ahead of it.

Internet access

The 8400 will be remote-controllable via a Windows-based PC with serial or PCMCIA NIC interface with password protection. The next version of operating software, V 0.95, soon to be released, will include TCP/IP control. With a private IP address, you will be able to use the Internet to access and control it. New software updates will be downloadable directly from the Orban Web site.

Because of the look-ahead limiting, overall delay through the 8400 is about 50 milliseconds. That compares with only 2.7 msec on the 8200, which was inaudible for jocks monitoring in real-time headphones.

That old habit will not work at all with

50 msec, so a sidechain for headphone monitoring is definitely necessary, as cautioned in the manual. This also presents a problem for live remotes and traffic reports, so be prepared to set up real-time IFB and mix-minus circuits.

Orban says the version 0.95 software will add the ability to switch the analog outputs to provide a low-delay, albeit-non peak-limited, monitor output.

The retail price of the processor is \$10,700.

After living with this best-ever Optimod for three weeks on-air, the PD and staff have fallen in love with their new air-sound and will not give up the 8400. That's the best endorsement we can articulate to management to justify approving capital funds for its purchase. We only hope the corporate bean counters will approve.

Phil Simon is a pseudonym for a well-known major-market CE. He asked to conceal his identity "to protect a newly discovered competitive advantage."

Workbench

► Continued from page 75

★ ★ ★

If it takes more than a few seconds to locate a tool in your tool box, you might want to adopt the "bin" method, as Tim Parker of WWZZ(FM) in Washington, put into practice.

As shown in Figure 4, each drawer of the tool chest uses the cardboard "parts" bins to separate like tools. The cardboard prevents marring of the chest drawer, and speeds selection of a specific tool.

★ ★ ★

Bob Seaberg is a CPBE from Illinois. He remarked about the "overloaded" tower shown in the Nov. 22, 2000, *Workbench*.

To save you the time looking through your archived pile of RW, this was the tower with so many coax cables that the red and white paint was obscured, and the base of the tower looked like an octopus with at least 18 coaxial cables snaking up the tower.

Bob asked if the coax runs just "grew" over the years. Actually, the runs were planned, but no thought was given to the lines obliterating the tower paint.

Bob brought up a good point that

everyone who manages towers should consider: icing. There is a reason structural studies are needed before loading up a tower. Ice on antennas is one thing, but when ice coats 18 transmission lines, that's another story.

In our subject tower's case, the proper structural studies were performed, and though the tower cannot handle any more load, it's not overloaded.

to the cost of a guyed 500-foot tower.

Once the tower is in place, a structural study alone could cost this much, before any cost of strengthening the tower is considered. In the context of a tower project, adequate rental space is a minor expense, and can provide a healthy payback over time.

John Bisset has worked as a chief engineer and contract engineer for more

Product Capsule:

Orban Optimod-FM 8400 Digital Audio Processor

Thumbs Up

- ✓ Easy user interface for a very complicated device
- ✓ Bright multicolored LCD screen
- ✓ Comprehensive remote control including IP options
- ✓ Excellent on-board AGC
- ✓ Excellent "preliminary" manual
- ✓ The cleanest and loudest Optimod ever

Thumbs Down

- ✓ None of the format presets delivered a truly dial-dominating but dynamic result
- ✓ Hard to convince management to purchase now since my 8200 is only a few years old
- ✓ Overall delay of 50 ms makes sidechain monitoring necessary

For information contact Orban in California at (510) 351-3500 or visit www.orban.com

Workbench

► Continued from page 75

★ ★ ★

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John Bisset has worked as a chief engineer and contract engineer for more



Fig. 4: Toolbox Organizer

Keep overloading in mind if you need to spec a new tower. It's a good idea to consider the potential for rental use, and purchase the tower with that in mind. Tim Ryan at Central Tower tells us that beefing up a tower to handle one level of PCS antennas adds a raw cost of about \$2,500

than 30 years. He is a district sales manager for Harris Corp. Reach him at (703) 323-8011.

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



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World Radio History

PHOTO GALLERY

Susquehanna's Big Production

Radio World recently visited the Susquehanna group facility in Indianapolis, which houses studios for three stations: country WFMS(FM) at 95.5 MHz; oldies WGLD(FM) "Gold 104.5," and hot country WGRL(FM) "The Bear" at 93.9.

WFMS is the long-time tenant here; the space was rebuilt extensively two years ago to accommodate the others, with room for a fourth station. Altogether it has five production and three air studios.

Gold 104.5 is a national leader in the oldies format, and 95.5 WFMS won "CMA Station of the Year/Large Market" for the second time in 2000.

All three stations use the Enco DAD_{PRO}NT audio management system for commercials, jingles, music and promos. WFMS and WGRL use Electro-Voice RE-20 and RE27 N/D microphones; WGLD uses Shure SM5s. Exclusive on-air processing has been designed by the Susquehanna engineering staff.

The Susquehanna team has received numerous awards for its commercial and imaging work, and the facility is production-heavy. Those rooms are outfitted with a combination of Pro Tools 888 24MIX and Spectral digital editing systems, Yamaha digital mixers and Pacific BMX analog boards. All production studios use Genelec near-field speakers. Production is backed up on CD-R and mastered on DAT.

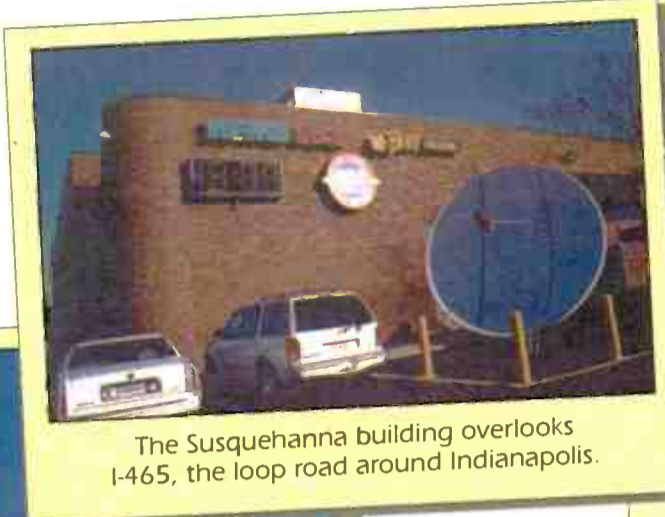
Imaging Director Johnny George said imaging voices are received weekly via ISDN. Several clients use the MP3 mode of Internet delivery of spots. Material also is sent and received via DGS, CD-R and reel.

The transmitters are off-site: WGRL in Noblesville, north of Indianapolis; WFMS on a multi-station tower on the city's east side and WGLD on the Butler University Campus.

Charlie Morgan is GM/VP of WFMS and WGRL, with overall responsibility for all three stations. Jenny Skjodt is GM/VP of WGLD; Bob Richards is PD of WFMS, David Wood is PD of WGRL and WGLD. Max Turner is senior chief engineer, and Jeff Goode is the chief engineer for all three stations.

RW seeks station photos and information for future Photo Galleries, particularly stations with new facilities or historical interest. Contact Paul McLane via e-mail to radioworld@imaspub.com

Photos by Scott Fybush



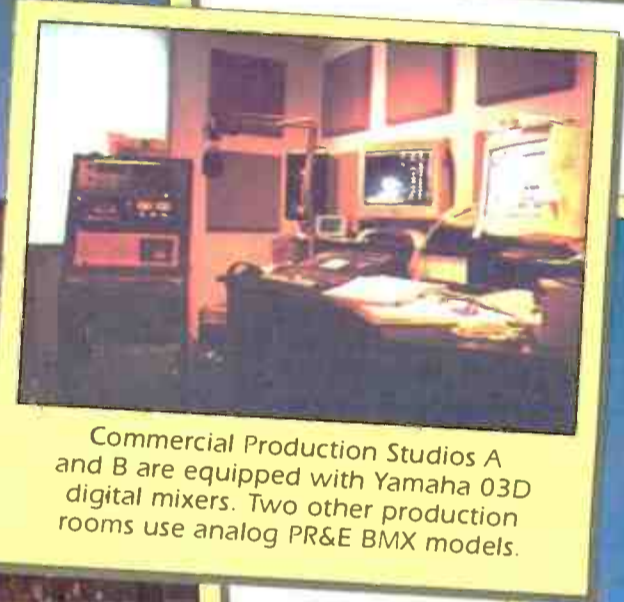
The Susquehanna building overlooks I-465, the loop road around Indianapolis.



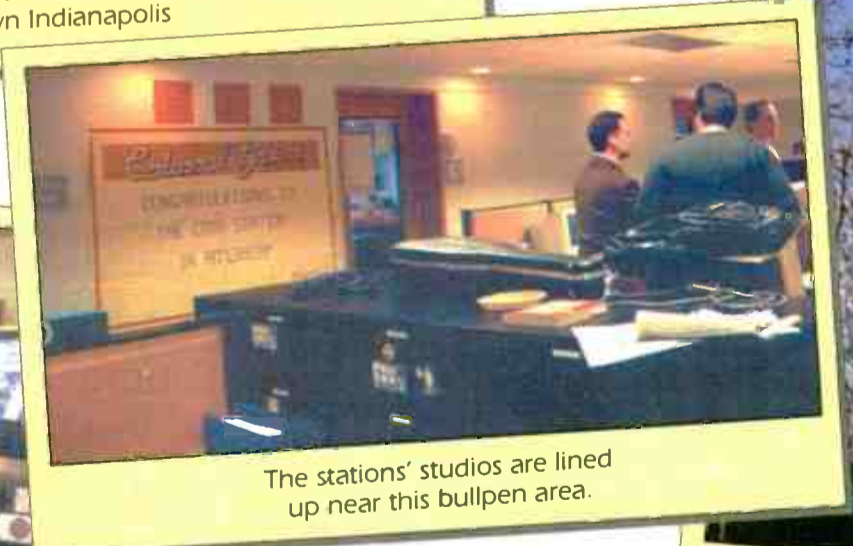
In the production studio is Johnny George, imaging director for all three stations.



Scenic Downtown Shot of Monument Circle at the Heart of Downtown Indianapolis



Commercial Production Studios A and B are equipped with Yamaha 03D digital mixers. Two other production rooms use analog PR&E BMX models.



The stations' studios are lined up near this bullpen area.



Midday talent Steve Rich works the mic at WGLD. All air studios are equipped with Pacific Integrity digital boards.



The WGLD transmitter site is on the campus of Butler University, which owns the stick. It once served noncommercial WAJC before that station was sold to Susquehanna. The group first put WGRL on the 104.5 frequency before moving WGLD there and moving WGRL to WGLD's original 93.9.

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brightline
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Broadcast Richardson, DIV of Richardson
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R2741
R1856
R1863
R2752
R2063
R1841
R1629
R2034
R3115
R2733
R1853
R3035
R1753
R2855
R3053
R3015
R2763
R1983
R2647
L4414
R2915
R1837
R2481
R3047
R2142
R1756
R2533
R1752
R1947
R1873
R2963
R2505
R2325
R1846
R1915
R1805
R2569
R2603
R1757
R3157
R2681
R2633
R2525
R2009
R2947
R2929
R2663

Company

CTE International SRL
D&C Electronics
Dalet Digital Media Systems USA, Inc.
Dan Dugan Sound Design
DASTO
Dataworld
DB Elettronica Telecomunicazioni S.P.A.
DELTA MECCANICA s.r.l
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ERI-Electronics Research
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R3027
R1941
R3021
R3143
R2563
R1641
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R2175
R2773
R1840
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R2715
R2669
R1928
R3137
R2575
R2105
R3041
R1855
R2625
R3005
R1817
R3125
R1616
R2921
R2347
R1881
R1969
R2200
R3131
R2641
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MUSICAM USA
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Nautek Maine, Inc.
Netia
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Nicom LLC
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NSN Network Services
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OMB
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On Air Digital USA
Orban
Orga Aviation Lighting
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Penta Laboratories
Phasetek Inc.
Pineapple Technology, Inc.
PM/JOEMEEK
Potomac Instruments
Prism Media Products
Professional Sound Corporation
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QEI Corporation
Radiacion Y Microondas, S.A. (Ryma)
Radio Express, Inc.
Radio Systems
Ram Broadcast Systems
RCS
RDL Radio Design Labs
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R2147
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R1934
R3224
R2081, R2953
R3149
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R2553
R2935
L5238
R2782
R2725
R2973
R2130
R2655
F1956
R3029
R2755
F1758
F1963
F1932
R2148
i6226, R2015
R2901
R1829
R3114
R1847
R1952
R1930
R2140
R3000
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R2005
R2146
R2582
R2547

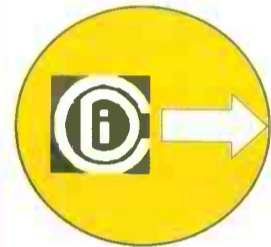
Company

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Wheatstone Corporation
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Booth/Stand Number

R1653
R3175
R3124
R2905
R2163
R2852
R2253
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R2515
R3001
R2900
R2025
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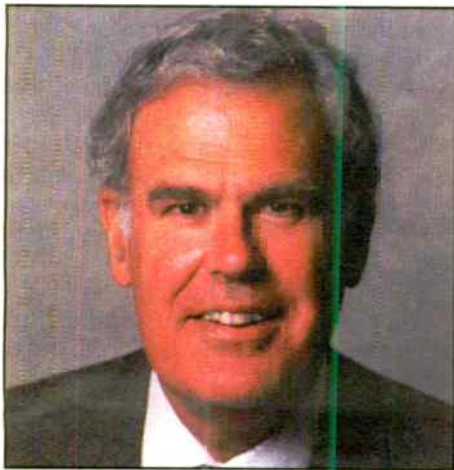
*MSRP (USA) for Omnia-3. Prices may be slightly higher outside the U.S. due to duties, freight and other costs.



Dot-Coms Fail, Radio Sales Slow

Scott Fybush

Just a year ago, it seemed like the good times could never end for radio. While radio enjoyed modest increases beginning in 1992, once the effects of consolidation settled in, radio stations and networks found themselves posting record sales gains.



John Davison

Then the dot-com advertisers began to add tremendous dollars into radio's revenue stream. Last year, stations had inventories sold out wall-to-wall and would-be advertisers offering extra money just to get a spot on the air.

As consumer-focused sites sprouted, offering everything from plane tickets to pet supplies to home delivery of videos and food, radio was ready to provide a platform for Web entrepreneurs to let

See DOT-COM, page 82 ▶

The PD Chronicler Speaks to RW

There are a lot of radio writers, but few really write about the business as it is, warts and all.

Perhaps "Jack James" (*not* his real name) is radio's equivalent to a whistleblower. He began "The PD Chronicles," a collection of anecdotes taken from his real-life experiences as a major-market program director for the RadioDigest.com, but these days the column appears at AllAccess.com.

His identity is one of radio's most closely guarded secrets, for obvious reasons (we had to swear to secrecy in order to secure an e-mail interview with him recently).

Among those in the know is AllAccess.com President and Editor Joel Denver, who speaks with James regularly (and knows where to send his paycheck).

Denver said "The PD Chronicles" is one of his Web site's most-popular features, logging 8,000 hits during one recent week.

Denver added James' column to the AllAccess.com roster after RadioDigest.com ceased publication.

"It's fun content that *most* in radio can relate to," Denver said. "It was the one reason I went to RadioDigest.com on a regular basis."

Rear guard

Although James regularly criticizes the new order of radio, the "bean counter" mentality, consolidation and cookie-cutter formats, Denver said he's had absolutely no complaints.

"Just a *ton* of great reaction and 'thank you' letters. 'PD Chronicles' is something that anyone from radio or even the record business can relate to. The situations are extreme but funny and I know when I read it I think 'Been there, done that, too!' I can't wait for the next week's installment to arrive."

The mystery PD, "Jack James," has

published a collection of his past columns in book form. Of course, the book is called "The PD Chronicles: Blatant Confessions of a Radio Guy."



Jack James uses his head to write 'The PD Chronicles,' but we can't show you what he looks like.

Recently, Jack James and frequent RW contributor Peter King had a cyber-chat about his book and his take on the business we all know and love.

RW: How'd you get started on "The PD Chronicles" column and how long ago did it begin?

James: Over the years, I'd share radio war stories with friends and colleagues. Invariably, the response would be, "Save that one for your book."

Then along came a Web site called RadioDigest.com. On a whim, I proposed writing a monthly column about life inside a radio station. I wanted to write the unvarnished truth, so I took a pen name

(Jack James). That was two years ago.

The column took off. They asked me to do it weekly. Writing has always been my first love, so it wasn't like this was a chore.

Getting paid was icing on the cake. Writing the column has proved to be cathartic. I honestly believe it's helped me get through some really stressful times at the stations where I've worked.

Fortunately, when RadioDigest.com went belly up, the folks at AllAccess.com were kind enough to take on the column.

**Sometimes
I feel like the
Salman Rushdie
of the Internet.**

— Jack James

RW: It's almost impossible to stay anonymous in our business — how many people actually know your true identity and what precautions have you taken to keep from being discovered?

James: A handful of close friends who can keep a secret, that's it. I rarely use real names or calls, unless the stories involve nationally known radio personalities. Sometimes I feel like the Salman Rushdie of the Internet.

AllAccess.com forwards mail and e-mail to me. Only two people there know my identity and home address.

See MYSTERY PD, page 88 ▶

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Dot-Com

► Continued from page 81

the world know they were open for business.

"We saw some months when radio growth, on a year-to-year basis, was 20 percent," said Linda Bannister, senior media analyst with Banc of America Capital Management.

The Radio Advertising Bureau reported 99 consecutive months of industry revenue increases through November 2000. Last year closed out with a 12 percent combined local and national revenue increase over the record-breaking previous year, a nearly \$20 billion take. This sum is almost double the industry's revenue in 1994,

according to the RAB.

We know what happened, of course: When investors suddenly stopped throwing money at the dot-com stocks, radio sales tanked as hundreds of dot-coms folded.

James Marsh is a broadcast and outdoor analyst at Prudential Securities. He said what was once a seller's market one year ago is now clearly a buyer's market.

Shakeout

"Starting in the spring 2000, shakeout saw dot-coms pulling out of the market, softening rates and spiking cancellations as ad buyers opted to sit back and watch rates slide rather than lock in early at higher rates," Marsh said.

He believes that national ad comparisons look much more fearsome in the first half of 2001, following the limited

gains and even the first negative reports — local and national revenue down 3 percent, according to the RAB, in the last month of 2000.

Subsequently, the RAB said overall sales were also down 3 percent in January, dragged down by a 15 percent drop in national sales. Thus radio posted back-to-back months of sales declines.

With deceleration in the economy that would affect radio even without the dot-com ad comparisons, Marsh recently revised his radio revenue 2001 forecast from 8 percent to 6.5 percent.

Radio stations at the core of the Internet world perhaps suffered the most.

"The market has definitely had a correction and it was bound to happen," said John Davison, director of sales for ABC Radio Networks' KGO(AM) and sister stations KSFO(AM) and KMKY(AM) in

San Francisco.

KGO(AM) is the highest-billing radio station in a market at the epicenter of the dot-com craze, according to Duncan's American Radio Market Guide 2000.

In the long term, analysts expect radio to recover most of the lost ground from the dot-com bust, especially later in 2001 when year-to-year monthly comparisons reflect the weaker sales of late last year, not the boom months of early 2000.

In early 2001, Bannister is optimistic about radio's performance.

"We think the first half of the year, on a same station basis, we're likely to see flat to minus 2 percent revenue growth," she said.

Marsh has recently revised his first quarter forecast for radio revenue to 2 percent, from 3 percent, but he believes radio is still a good buy.

"Despite our gloomier near-term forecast, we think radio stocks could perform well over the next 12 months," Marsh said.

Banc of America's Bannister said the effects of the dot-com boom and the subsequent bust were felt most strongly in the largest markets, since small and mid-sized markets never had the volume of dot-com advertising that flowed to stations in markets such as Los Angeles, San Francisco and Boston.

In the wake of the dot-com downturn, things have changed for radio. William Shatner is no longer extolling the virtues of Priceline.com every other stopset. And the company he was shilling for is one of the lucky ones — they're still in business. Many of the advertisers who lined up for spot time a year ago don't even exist anymore.

And Davison is still smiling as he sits just a few blocks north of the buildings where many of the failed dot-coms were headquartered.

"The category is still robust," he said. "I wouldn't say it's gone back to where it was before it all began, but it's back to levels advertisers will find comfortable."

In other words, it's not just the dot-com stocks on the National Association of Securities Dealers Automated Quotations (NASDAQ) that are more affordable this year than last; radio time, too is available at a lower cost. That, in turn, means that the dot-coms that survived are still buying plenty of spots.

But as a category, dot-com ads are a small percentage of inventory at stations these days.

"The total dot-com ad market is still a very healthy market," said Mary Beth Garber, president of the Southern California Broadcasters Association.

Garber said broadcasters in her market benefited from the dot-com boost last year, when first-quarter ad revenues were 30 percent ahead of the same quarter in 1999.

"It was probably such an anomaly and so unlike the normal first quarter pattern one gets in radio," she said, "that stations were nervous about what the first quarter of 2001 might look like without the dot-com dollars."

In early 2000, Garber said, the Los Angeles market posted at least one month with as much as \$8 million in dot-com

See DOT-COM, page 84 ►

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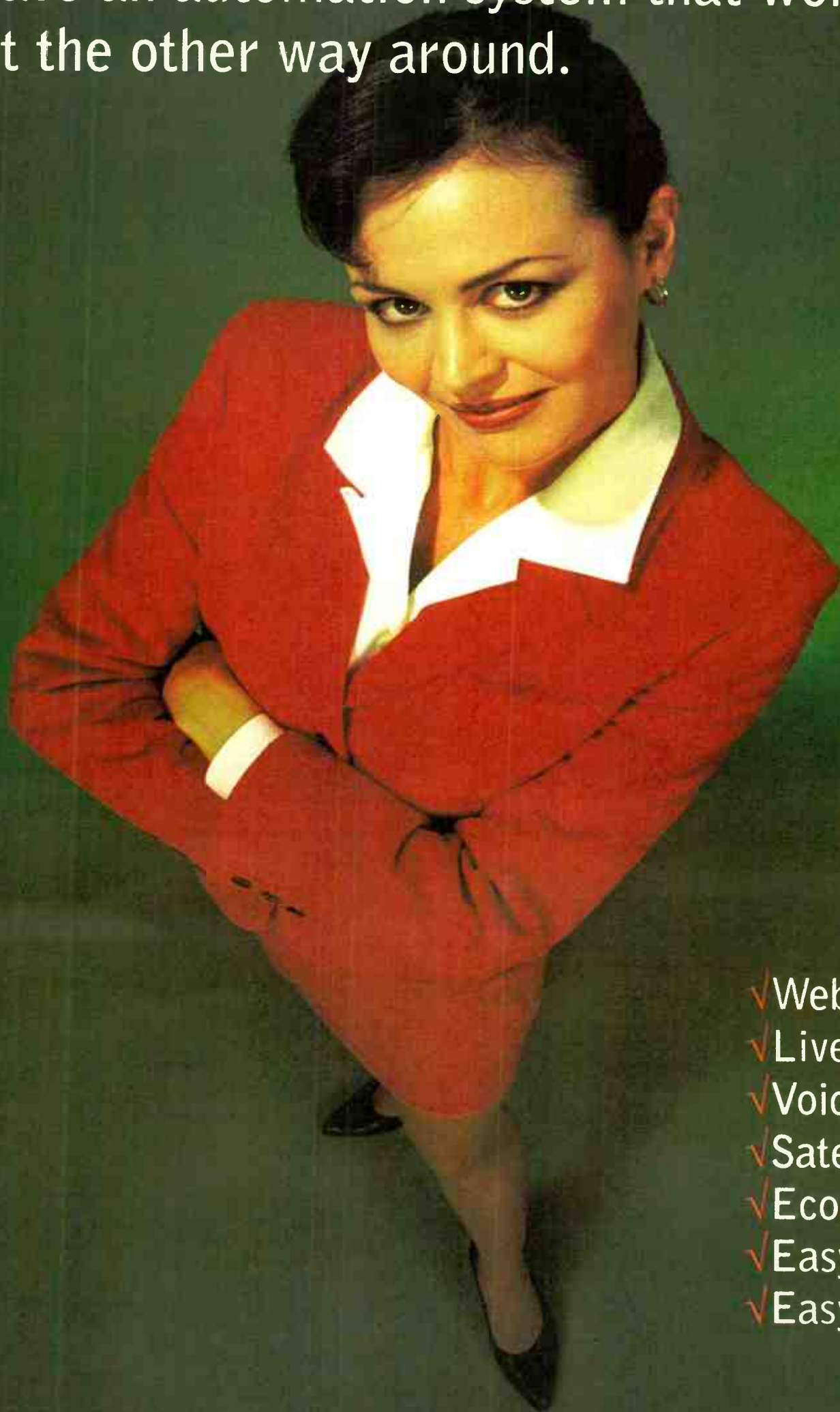
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Correction

In the Feb. 14 RW article "ABC's Tim O'Donnell Remembered," the New York Institute of Technology was incorrectly identified as defunct.

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Dot-Com

► Continued from page 82
revenue, up from the usual \$3 million to 6 million spent on all radio in this market per month.

With regard to dot-com ad pacing this year, Garber said she believes radio is still doing just fine.

Most radio stations avoided one peril of the downturn: lost revenues from dot-com advertisers that bought on credit that they couldn't pay back.

"I think there were people who got burned out front because there were agencies that got burned out front."

advertiser, we do ask for cash in advance," he said.

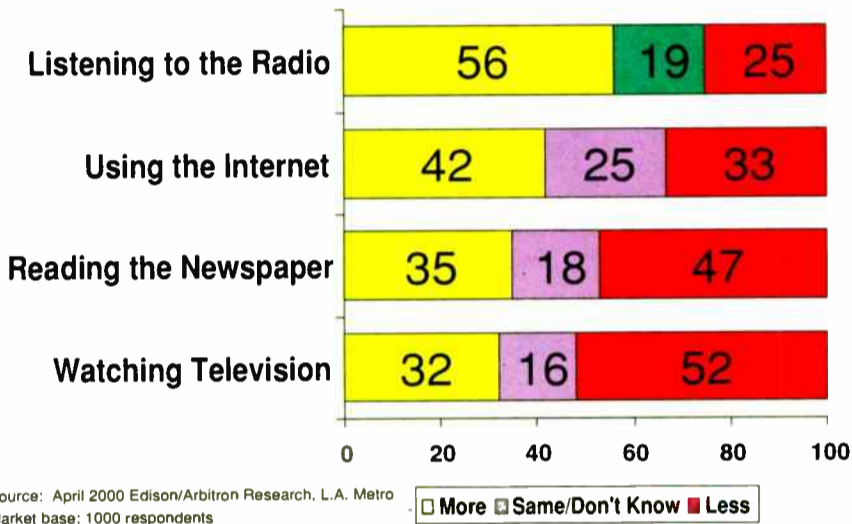
So what has radio learned from its flirtation with the dot-com boom? Garber believes the sudden rise in revenues helped give the industry a confidence boost.

"The dot-coms enabled radio to break a traditional cycle of how much we'd think revenue increases were possible," she said.

Now that dot-coms aren't bidding up the cost of ad time, stations are able to offer advertisers rates that make radio look more attractive than ever.

Radio's big advantage, Garber said, is its ability to catch Internet users right where advertisers most want them.

"Overall, are you spending more or less time...?"



Radio beat the Net, newspapers and TV in an L.A. market survey last spring.

Most stations in her market realized the danger.

"I think they look for cash in advance from any new client and they always have," she said.

Davison said KGO and its ABC-owned sister stations never departed from their regular policy.

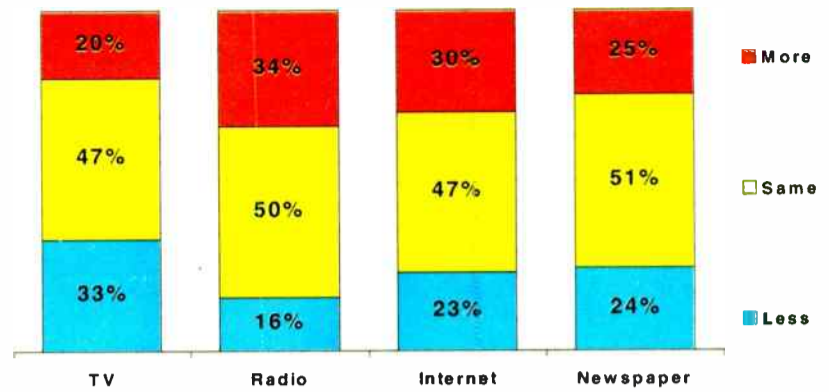
"If we have no credit history with an

"The people who are very heavy radio users tend to be heavy Internet users," she said, "and the people who are heavy Net users tend to use radio while they're surfing the Net."

An April 2000 survey of Los Angeles residents conducted by Arbitron/Edison Research for the SCBA found that 56 percent of

Consumers Expect to Spend More Time with Radio and Internet

"Over next 12 months, do you think you will spend more or less time with...?"



edison media research

Base: Total population

ARBITRON

Nationally, radio led all media in anticipated use in the latest Arbitron/Edison Internet study.

respondents said they're spending more time listening to the radio than they used to, compared to only 32 percent who reported spending more time watching television.

Arbitron and Edison Media Research also report in their "Internet Study VI - Streaming at a Crossroads" that nationally, consumers expect to spend more time with radio and the Internet, vs. TV and

newspapers (see chart).

Garber said radio's advantages over TV go even deeper for dot-com advertisers. Because the heaviest surfing time coincides with TV's evening prime time, she said, radio is catching those surfers in the car just before they get home and hit the Net, giving advertisers a perfect platform to get their dot-com messages across.

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BROADCAST LAW REVIEW

Take Stock of Your FCC Compliance

It's Time to Take Account of Your Radio Stations' Compliance With Commission Regulations

Barry D. Umansky

As the days become warmer and the trees again begin to interfere with FM reception, a young (or older) radio broadcaster's fancy turns to reviewing the station's compliance with the law.

Or, perhaps not.

But now is truly the time to see whether your station is doing things right. It's an opportune moment to clean out some bad behavior and ensure a lawfully run station.

Starting now

Here's a short checkup list of just some of the areas where radio broadcasters should make sure they are doing things correctly.

If you find that you've been missing the mark on any of the matters found on this checklist, you should take corrective action promptly.

Station Identification — Each station only has one set of official Federal Communication Commission call letters. Be sure those are the ones you use in your official ID at the top of the hour. (You aren't "K-102" for FCC purposes.)

You must follow the mention of the call letters with the name of the community to which your station is licensed. If that community is a small town near a larger city that you serve, you can add the larger city, but only after the mention of the community of license.

And all that can go between the call letters and the mention of the community of license is your frequency. No promotional language can be part of a formal ID.

Sponsor Identification — Whenever you are paid to deliver a message to your audience, you must disclose the identification of the party trying to persuade them — whether it's to buy a product or to subscribe to a point of view.

Can the listener easily figure out from your air copy who is paying for the spot? If not, you should alter the sponsor ID portion of the message. For political spots, you must use the "magic" words of "paid for" or "sponsored by" in identifying the political advertiser.

Can the listener easily figure out from your air copy who is paying for the spot?

Main Studio Location — Several years ago the commission made it easier to change the location of your main studio. It can be located anywhere within the principal community contour (also called the "city grade" contour) of any station (radio or TV) licensed to your community of license, or within a 25-mile radius of the central "reference point" of your community of license, whichever is larger.

To locate your main studio beyond the farther of these perimeters requires

the grant of an FCC waiver of the rule.

Also, make sure your main studio is a fully functional studio, capable of program origination. You can have a "remote studio" with more bells and whistles than the main studio. But, the main studio must be more than a closet with a microphone. It must look and operate like a studio.

The main studio also must have "meaningful staff and management presence." For stations with five or more full-time employees, at least one "management-level" employee must be assigned to the main studio and that person must spend a "substantial amount of time" there each business day. A full-time staff person also must

be assigned to the main studio, but the staff person could be "shared."

For stations with only one studio and four or fewer full-time employees, the management-level person only need "report" to the main studio each day. He or she need not spend a substantial amount of time at the facility.

EAS — All stations must have Emergency Alert System decoding equipment, must participate in weekly and monthly tests of the system (and also monitor for state and local EAS activations), regardless of whether the station has chosen to "participate" in the EAS plan.

Make sure your station logs contain entries showing all EAS tests. The FCC enforces EAS rules heavily.

Tower Lights/Painting — Regularly check your tower for compliance with the lighting/marketing requirements. Make sure the paint has not faded and that your light bulbs/strobes are in working order and comply with the relevant Federal Aviation Administration tower lighting circular.

Public File — Make sure your public file is complete and up to date. Check Section 73.3526 of the FCC's rules for a list of what must be in commercial stations' public files. Section 73.3527 provides the noncommercial station list of requirements for the public file.

Issues/Programs Lists — Among the key components in the public file are the station's quarterly issues/programs lists. These should include information on the programs that gave "significant treatment" to particular issues of concern to the station's community of license and service area during the preceding three months.

You have 10 calendar days following the conclusion of a calendar quarter to include the latest list in the public file. The lists should include the date, time, duration, title and short description of each program.

Obscenity/Indecency — FCC rules and the federal statutes prohibit the airing of obscene language. Indecent language is "constitutionally protected" speech, but according to FCC rules (as affirmed by the courts), indecent speech may be aired between 10 p.m. and 6 a.m. only.

This isn't just a big-city or network-radio issue. Stations in all-sized markets have been on the receiving end of FCC fines and other enforcement actions for airing indecent speech.

LMAs/Unauthorized or Premature Transfers of Control — Make sure that your relationship with your LMA partner doesn't actually amount to an unauthorized or premature transfer of control. Each station only has one licensee. And it is that licensee who is responsible for licensee decisions — particularly those involving programming, finances and personnel.

Tobacco Ads — It is absolutely unlawful to air spots for cigarettes, little cigars, snuff or chewing tobacco. Other tobacco products (e.g., cigars and pipe tobacco) may be advertised. But, watch out for ads for "tobacco shops," where the copy might be generic enough to amount to your advertising of cigarettes or other prohibited products.

Music in Commercials — Remember, your American Society of Composers, Authors and Publishers, Broadcast Music, Inc. and SESAC licenses don't cover your use of music in station-produced commercials. Separate "synchronization" rights must be obtained before you can use someone's music in a commercial.

Broadcasting Telephone Conversations — With only limited exceptions, a station may not air a telephone conversation (live or recorded) unless, prior to airing the conversation live or rolling the tape, the person(s) on the other end of the line are informed about the station's intention to record/broadcast the conversation.

Make sure your drive-time team isn't airing phone conversations where the required notification hasn't been made. You cannot obtain permission after the tape has been made or the live or taped conversation has been aired.

While by no means comprehensive, this list of "cleanup items" can help ensure at least a spring and summer free of FCC fines or other legal and regulatory jeopardy. Also, I've only given you general guidance on how to comply in these areas.

To make absolutely sure that you comply with the relevant law, it's essential that your own communications counsel, who may establish a lawyer/client relationship on these sometimes-tricky issues, guide you.

Barry D. Umansky, the former deputy general counsel of the National Association of Broadcasters, is with the communications practice group of Vorys, Sater, Seymour and Pease LLP in Washington.

Contact him at (202) 467-8822 or via e-mail to bdumansky@vssp.com

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Mystery PD

► Continued from page 81

RW: You've pretty much written the book I fantasized about writing for years. In a business full of egos, it must be hard not to be able to publicly claim credit for the column and the book ... or is it?

James: Jeez. I'm glad I beat you to the punch. I can't begin to tell you how exciting it was the day my book arrived in the mail. It took almost a year to get the damn thing published. I must say I had second thoughts when I saw the pseudonym on the cover. But I think I did the right thing using a pen name.

It perpetuates the mystique. The only drag is when close friends ask for autographed copies. I'm not used to signing Jack James.

It's also a bummer that I won't be able to be a guest on Letterman or Leno. I had a brown paper bag that I wanted to wear over my head.

Secret identity

RW: Has anyone come close to putting two and two together and discovering your secret identity?

James: I wear gloves when I write the column and I always wipe the keyboard clean so there are no prints.

Seriously, I've had a few co-workers wonder out loud if I might be the author of "The PD Chronicles," which I always laugh off. The closest call was when my GM came into my office one day and started talking about a story in the column that had been brought to his attention.

It was specific to our radio station. He was like, "We have a mole inside this station. Someone must be e-mailing the guy at 'The PD Chronicles.'" Whew.

RW: Does your GM have any clue you're doing this?

James: The answer is he's clueless. He's

not a big fan of the Internet. Unless someone prints out the column for him, I don't think he sees it.

RW: Who is your target audience? Is it management? Jocks? Everyone?

James: "The PD Chronicles" is must-reading for anyone who has ever listened to the radio, works in radio or is thinking about getting into radio. I believe it should be a required textbook in college for all journalism and radio-TV-film majors. I don't candy-coat things. I tell it like it is.

I have a story in the book about the time I spoke to a radio class at a major private university. I told them flat out that they'd be lucky to make \$18,000 a year starting out. The instructor nearly had a coronary. The students almost lynched me.

My point was, radio isn't for everybody. You have to be willing to put in long hours, make lousy money at first and have a thick skin. It's a wonderful business. It can also kill you, as it did a friend of mine whose story is detailed in my book.

Also, this book is a gift to parents of those of us in radio. My mom, who has constantly nagged me about getting a real job, read the book and finally is off my back. Now she gets it.

RW: There are so many stories here, do you have a particular favorite?

James: It's a tie between two stories. One is the owner who removed the chairs from my office, complaining that the talent was spending too much time with me. They wound up sitting on the floor! The other is the story about the remote we did at a local bank, which was visited by a woman who suffered from Tourette's Syndrome.

Wrong and right

RW: You're extremely critical of many facets of the business, yet you stick with it. What's wrong with radio — and what's

right with it?

James: I think I'm justified in my criticisms of "Consolidation-Era Radio." For instance, some publicly traded broadcasting entities — and I've worked for several of them — are under such intense pressure from Wall Street to perform, they've compromised programming standards (too many spots, infomercials, NTR events).

You have giant companies owning four, six or even eight stations in a single market. The competitive spirit has been blunted. The cash cow or cows in the group get all the best programming and resources. The "other" stations in the cluster — the redheaded bastard stepchildren — serve to protect the cash cows from being attacked by another company's upstart wolf.

The listeners lose. We're doing a lousy job attracting and developing new talent.

I wear gloves when I write the column and I always wipe the keyboard clean so there are no prints.

— Jack James

(Voice tracking has eliminated many opportunities in smaller markets.)

But there's also plenty right with radio. It's different every day. When it's good, there's nothing like it. It really is like getting paid for having fun. It can get you girls, free t-shirts, concert tickets and CDs. You also have more freedom on radio than you do in many other mediums, most notably print and TV.

And there's the immediacy. Whether you're a jock, newsperson or talk host, there's nothing like the rush you get from a huge, breaking story.

Why do I stick with it? Radio is in my blood. Besides, there's nothing else I'm qualified to do.

RW: If you could design your own general manager, what qualities would he or she have?

James: You mean Robo-General Manager?

This won't surprise you. My ideal GM would be a former programmer who learned the sales side and worked his way up the corporate ladder. Someone with wit, wisdom and plenty of patience, who has a thick skin, appreciates great talent, promotions and marketing and won't press the panic button if he gets a complaint call from a listener or client.

RW: Is this a good time for people wanting to get into the business? What's your

advice for young people seeking careers in radio? Where should they set their sights?

James: This is probably a good time for people wanting to get into radio, because, frankly, I don't see people beating down our doors like they did in the past.

Radio has lost its show-biz luster. It's difficult to find new help. Six-dollar-an-hour board op jobs don't appeal to college grads with liberal arts degrees who can earn \$30 to \$40 thousand a year with full benefits in other industries right out of school.

My advice to anyone thinking about a career in radio? Try it first. Intern. Work part-time in the promotions department. Live it, breathe it, feel it. Talk to people at the station. Determine if this insecure business, inhabited by misfits, malcontents, wackos, egomaniacs and creative geniuses, is really for you before you major in radio-television-film or drop out to be a DJ.

RW: Do you think many people, from jocks to GMs, see themselves in your stories? Or will they be oblivious?

James: The thread that runs through my e-mails from radio people is that everyone has lived the same stories — only the call letters change. I rarely hear from GMs. They either don't read the column, or they're in denial.

RW: What do you see yourself doing in 10 years?

James: Spending my inheritance. That's another downside to radio. No pension.

To order "The PD Chronicles," visit www.xlibris.com/thepdchronicles.html or www.Amazon.com

Peter King is an Orlando, Fla.-based reporter/anchor for CBS News Radio and a confirmed PD Chronicles addict. He knows how to reach Jack James, but has no idea who he is or where he works.

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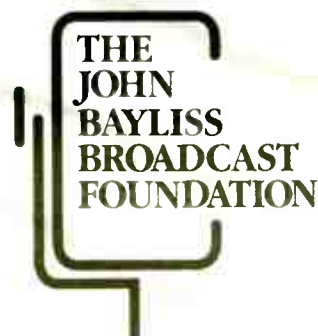
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Deadline: April 30, 2001.

A Slice From 'The PD Chronicles'

Here is an excerpt from Chapter 6 of "The PD Chronicles," by Jack James, available from Xlibris at www.xlibris.com/thepdchronicles.html or visit www.Amazon.com

Down the Cinco

Excuses, excuses. The phone rings a little after 6 a.m. It's the morning guy, informing me he has no news. That's because our news guy is AWOL. Not surprising, inasmuch as it's the Seis de Mayo.

I figure he's either hung over or still passed out from massive quantities of

tequila. It's two-and-a-half hours into morning drive before "Mr. News" checks in. Says he can't make it in because, well, his grandmother died.

But late that afternoon, apparently suffering from a guilty conscious, he calls me with a startling confession.

"I just got out of jail." As "Mr. News" tells it, he was the designated driver for a bunch of friends who went Cinco-de-Mayo'ing. On the drive home, a cop pulled him over.

"I swear, I didn't have anything to drink, but I panicked. I got out of my car

and started running as fast as I could."

In a scene right out of "Cops," he sprinted about five blocks before three of the city's finest tackled him, cuffed him and brought him back to a black-and-white for transportation to the police station.

Stunned, I tell him he should come in tomorrow morning, do the news and then we'll talk.

"I'm so sorry," a whimpering voice says on the other end of the phone. "Please don't tell anyone what happened. I'll make it up to you. I don't want to lose my job."

Next morning around 5, my phone rings — another rude awakening. "Mr. News" is a no show. It's well into the 8 o'clock hour before he finally calls the jock, blaming a faulty alarm clock for his tardiness. I call him at home with some news of my own.

"You're fired."

The boss

We should play the theme from "The Godfather" over the intercom when our curmudgeonly owner shows up.

There's an air about him that makes you wonder whether there's a body or two in the trunk of his rental car. He's a tiny man, maybe 5'1," with white hair and a smile that turns out to be, on closer inspection, a perpetual smirk.

Guido, I'll call him, isn't in the building more than a minute before he begins terrorizing my staff. He doesn't so much walk as shuffle into each of the control rooms in our building, startling the air talent, then lecturing them on how — he thinks — they can get higher ratings.

"Every break should include time and temperature," he bellows. "When people get up in the morning, they wanna know how they should dress."

He does an inspection of offices and cubicles, ripping down from walls and throwing into the trash any personal items — pictures, cartoons and newspaper clippings — he feels are in bad taste.

Invasion of privacy?
"I own this sumbitch," he reminds everyone.

He's been casing my office all morning, eyeing the activity from the front lobby. Finally, he comes in to confront me.

"You're spending much too much time with your air talent," he tells me.

"Well, sir, that's my job," I reply. Astonishingly, he orders me to remove

all the chairs in my office except the one at my desk.

"If they have to stand when they come into your office, they'll leave sooner."

Later on in the day, our gazzillionaire owner tells me he thinks I'm too nice to be a PD.

"Never compliment the talent," he says in a hushed tone. "If you give them praise, all they'll do is ask for more money."

I knew I should've called in sick today.

Letters

Dear PD:

Stuff keeps getting stolen at our station. I'm talking about everything from CDs and personal belongings, to someone's brownies that were in the fridge. What gives?

— Ripped Off

AC station in Fairbanks, Alaska

Dear Ripped Off:

Theft at radio stations is nothing new. If you have anything valuable, keep it locked up at the station, or leave it at home.

As for the brownies, tell the victim to bake another batch — with laxatives. The thief won't be hard to spot.

Dear PD:

A woman with a really sexy voice keeps calling me during my night show. We've talked off and on for about three weeks. She told me she's a "10." Do I dare meet her outside the station?

— In Love

CHR Station
San Diego, Calif.

Dear In Love:

Remember this simple radio formula — the sexier they sound on the request line, the more likely they are to outweigh even Rosie.

Dear PD:

My cousin gets released from prison next month after doing three years for perjury, theft, assault and battery and forgery. He'll need a job, but is afraid no one will hire him with his record.

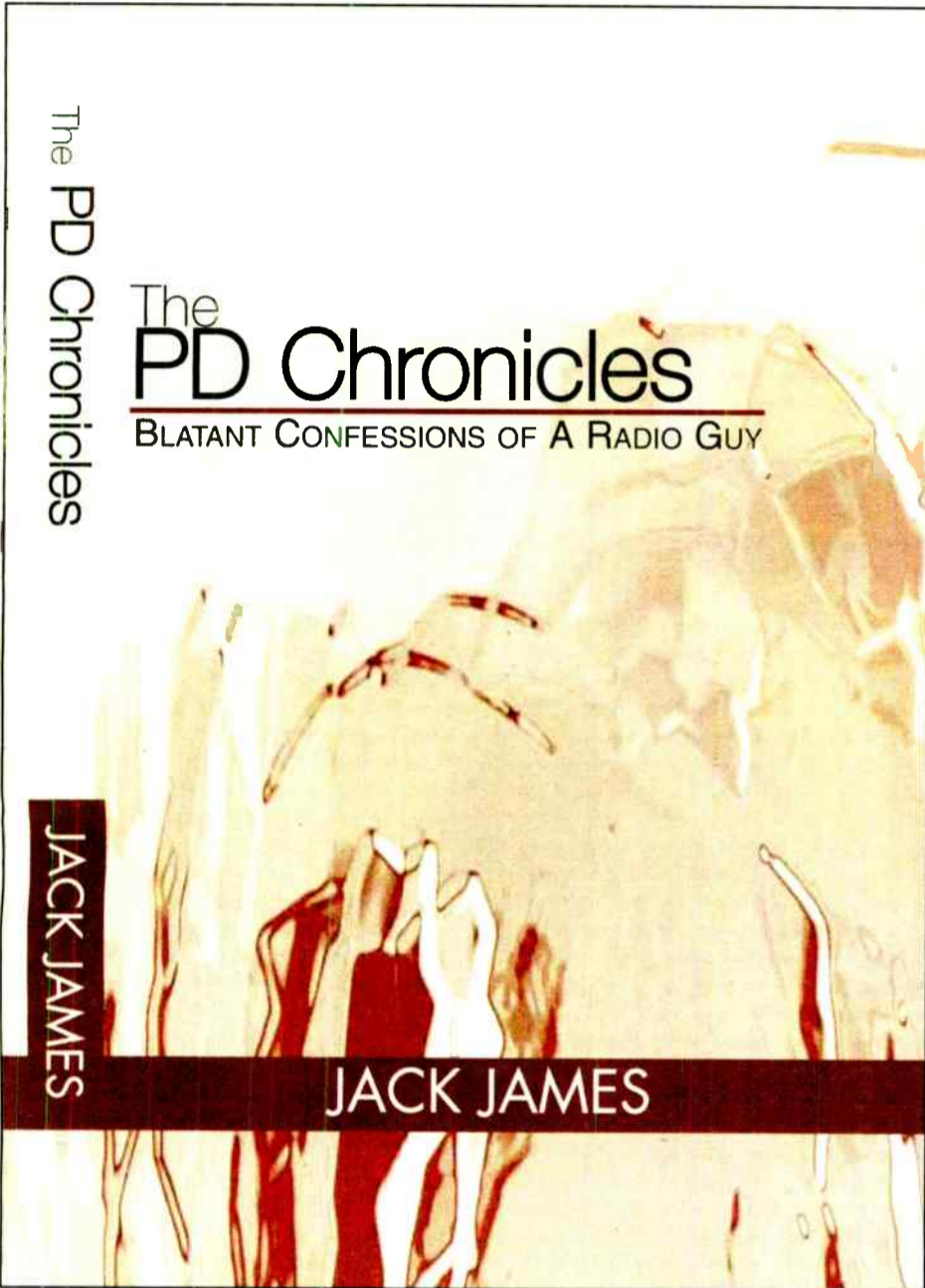
Any suggestions?

— Puzzled in Palo Alto, Calif.

Dear Puzzled:

What am I, Dear Abby?

Sounds like he's perfectly qualified to work as a jock or sales person at any radio station in the country! 📻



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Internet Radio

Web
Wins
Page
94



Radio World

How to Succeed in the Dot-Com World

March 30, 2001

WSJM.com: Radio News You Can See

Steve Sullivan

Mike Frazier proudly relates what he hears from his contacts on the Benton Harbor, Mich., police force.

"A couple of 30-something cops say one of the first things they do every morning is log onto our Web site. They say everyone else in the precinct does, too."

That's great news on two fronts for Frazier, the news director and content manager for Mid-West Family Broadcast Group's WSJM(AM) in Benton Harbor.

news; in most cases you can hear audio clips and *see visuals*. Many of the stories are accompanied by still photos or short video clips, gathered by Frazier's news team.

"The camera was the component we felt we needed to add to get people back to the site and keep them interested," said Frazier. "We're in a unique situation in this market in that there is no real television presence. We're technically part of the South Bend, Ind., television market, but you rarely see a story about south-

The site has garnered national attention for its efforts. Shortly after its launch, it was featured in the Radio and Television News Directors Association publication, "Communicator." Mark Thalheimer is director for the RTNDA Foundation's "News in the Future Project." He said this is an outstanding example of localizing the power of the Internet.

Local-level innovation

"In talking to people around the country who are trying to figure out what the relationship is between broadcast and online, so little is innovative at the local level. This is incredibly innovative, and it gets back to the whole idea that a journal-

ist is a journalist and can inform people in a number of ways."

Frazier first pitched the idea for adding visuals to a radio news Web site while he was working for news leader KFAB(AM) in Omaha, Neb., about a year ago, at the then-AM/FM station.

But the proposal never got far through the management hierarchy, and was derailed when Clear Channel bought the radio station last year and the news department was hit by staffing cuts.

Last June Frazier came on board at WSJM. Madison, Wis.-based Mid-West Family Broadcast Group owns fewer than 20 stations nationwide. One of the first things Frazier did was dangle the Web site idea in front of Olson.

"There's something to be said for a small chain of command," said Frazier.

See WSJM, page 95 ►



A Few of the WSJM(AM) Staff, From Left: Dave Wolf, Webmaster; Mike Frazier, News Director and Content Manager; Joe Barron, Web Developer for TRS New Media, the Web Division of WSJM Inc.; and Gayle Olson, President and General Manager

First, it means people — in this case no less than the police department — are using the station's Web site as a first source for information.

Younger demo

Second, he stresses the point that these are "30-something" officers, a sign that the Web site is helping attract a younger demographic to the news/talk station.

The folks at WSJM will be the first to admit that this is a relatively new phenomenon.

"Until the middle of last summer, this was your typical radio site," said Gayle Olson, president and general manager for WSJM Inc., the licensee for WSJM and Mid-West's six other stations operating in southwest Michigan.

"There really wasn't any reason to come back to it. It had bios of the personalities and a program schedule. Once you'd seen it, you'd seen it."

But that changed on July 3, 2000, when the station relaunched its site, creating one of the most innovative radio news sites on the Internet.

When you log onto www.wsjm.com, local news literally is featured front and center. But not only can you read the

western Michigan in a (TV) newscast, even though we've got over 200,000 people living in and around this area."

Another opportunity was presented by the local newspaper, part of a disappearing breed of papers that publish in the afternoon. This means there is no news waiting on the doorstep when area residents wake up each morning.

"Our goal was two-fold," explained Frazier. "First, we felt we could quench a visual thirst, and second we felt we could satisfy a thirst for morning news."

"If we could do our best to mirror what a morning newspaper looks like, and add the interactivity of the sound files and visuals, we felt we could achieve our goal."

Based on traffic figures, the station has tapped into something for which there is a demand. Between Dec. 20 and Jan. 18, WSJM.com attracted more than 3,500 unique visitors, with many repeated visitors to the site.

During this period, the site averaged nearly 7,000 hits per day, serving a daily average of more than 1,000 page views. Making this all the more impressive is Olson's reference that "the entire cume for the radio station is around 10,000."

WEB WATCH

From the Ruins, Net Radio Streams

Carl Lindemann

Web Watch is a roundup of all things radio and the Web. Send your news and tips to Internet radio editor Laura Dely via e-mail to ld@imaspub.com

Millennial madness — that's what future historians, sociologists and psychologists will call the "great Internet bubble" that's now gone bust.

A thousand years ago, "millennial madness" manifested in a whirl of cathedral construction.

Now, at the start of the next millennium, we see another whirl of commerce and concerted human effort, but it is built of much more ethereal stuff — cyberspace.

Instead of sculptors chiseling scenes in marble to create totems of the power of the day, we have 20-year olds attacking billion-dollar modern day industrial "gods" with Internet efforts like Napster's.

Unlike the terra firma that the Chartres Cathedral is built upon, our cyberspace is all too vulnerable to the whims of consumer confidence and other "perceptual" markers that are the foundation of the "new economy."

Fees to come

Napster, for example, may be remembered as one of the high-water marks of the craze. Appropriately, the **Recording Industry Association of America** has always treated it in apocalyptic terms more appropriate to certain religious sects.

Now that Judge Patel of the U.S. District Court in San Jose, Calif., threw down the gauntlet and required that the file-sharing service block access to copyrighted material on its site, many observers said that this may mean the end of the service.

No matter what Napster threw as peace offerings to the recording industry as Judge Patel's revised decision loomed — from the \$1 billion offer to settle with the major labels to the promise that the company will convert to a subscription-based service to the promise to deploy just such a screening system as the court finally mandated — all were rejected.

As RW went to press, the RIAA was busy scrambling with the major record labels to slam Napster with the biggest wish list of all time — the list of every copyrighted song the industry owns. For every song on that list, Napster will have

See WEB WATCH, page 92 ►



Web Watch

► Continued from page 91

to figure out how to block it on its site.

Industry observers noted that about 90 percent of the files shared on the Napster site are of copyrighted material that will have to be blocked.

Napster had started to block some of the most popular songs traded on its site just before the court's decision came down, but mischievous users were "misspelling" or otherwise coding the names of the blocked content to evade new the Napster filter.

This is just part of the difficulty that the RIAA's Secure Digital Music Initiative, which is the RIAA's version of Napster technology, without Napster, has in trying to build its own subscription-based downloadable system.

But the SDMI, which intends to develop technology to protect audio files from unauthorized downloads, is stuck in limbo. Critics wonder if the delays in achieving SDMI's goal of putting "digital barbwire" around online audio files are due to the near impossibility of the task.

This year's first SDMI meeting opened with the announcement of **Executive Director Leonardo Chiariglione's** resignation. Chiariglione will step aside in several months, perhaps to coincide with the release of what's called "Phase II Screening Technology" in June.

The hope is that SDMI's work will facilitate proper licensing of online music. At the very least, SDMI's success will remove a major excuse for the RIAA's obstructionist attitudes towards digital downloads.

When that RIAA-sanctioned "Napster" arrives, the only difference between it and its probably vanquished predecessor is that consumers are likely to overpay in a system that underpays artists. In other words, this is how the "new economy" is transformed into business as usual.

Hearings to come?

Earlier in March, the **Consumer Electronics Association's Digital Downloads Conference** featured **Rep. Rick Boucher** as the keynote. Boucher, co-chair of the **House Internet Caucus** and member of the **Intellectual Property Subcommittee**, has been an outspoken advocate to codify new business models that will facilitate the so-called "jukebox-in-the-sky."

In a conversation with Boucher a few months back, he mentioned some other interesting developments in the same 9th Circuit Court that favored the RIAA in January.

"If you use copyright to push a competitor out of business, that's illegal," Boucher said. In other words, if the RIAA puts Napster out of business just to make room for the aforementioned similar businesses under the recording industries' aegis, this could come back to haunt them.

According to Boucher, to make this case is "something short of an antitrust violation. You don't have to demonstrate that it (the business strategy) is anticompetitive," he said.

Battle of the Titans

Meanwhile, the **RIAA/National Association of Broadcasters' conflict** continues to unfold with the **NAB's suit against the U.S. Copyright Office** for its rulings on performance rights that threaten to cripple the nascent streaming radio business. This battle is likely to drag on into Congress.

Meanwhile, some Webcasters have opted to pay the new fees inflicted by the Copyright Office's ruling for their broadcasting clients.

StreamAudio is one who has decided to pay their broadcaster clients' tabs. As to whether that is really viable in the long run remains to be seen. This may go the way of the now-vanished **BroadcastAmerica's "something for nothing" business plan.**

Of course, the something turned to nothing ... causing something of a headache for station managers scrambling to get their signals streaming again.

Speaking of BA, **SurferNetwork** did finally buy BA's broadcast assets out of bankruptcy court in February.

This wasn't exactly according to the game plan the companies agreed to last Thanksgiving. SN was to share the helm navigating BA through Chapter 11 with an intact, integrated BA/SN coming though in the end.

Instead, BA decided to maintain control and look for additional investors. When investors proved scarce, it was the end of the line for BA, which left its stations high and dry after service was shut off in January.

This was a lose-lose situation. BA lost everything and SN's interest in the station contracts took a hit, too. How badly those were devalued is up for debate. Certainly, a number of those once under the BA banner fled elsewhere when the BA service ceased.

Can these stations that sought to continue their Webcasts through alternate streaming services be brought back into the fold through force to honor BA contracts bought by SN?

Winner

No matter how SN settles the BA contracts issue, SN also recently bought **GlobalMedia's** radio contracts, a move that is likely to give the New Jersey-based aggregator some stature.

In closing the books on BA, SN's chief executive officer, **Gordon Bridges**, must wonder why BA's now missing-in-action **John Brier** didn't stick to the original deal struck last Thanksgiving.

(Brier apparently has just fallen off the face of this planet — he ducks all attempts to reach him — whether by phone, fax, e-mail, even an in-person visit to his home. I just happen to live down the road from him.)

With that, BA was supposed to have remained intact with SN taking over controlling interest. Brier and other key BA management would have had a place on the board of the newly combined companies. Certainly the planned outcome would have been far better than the total demise of the company that silenced hundreds of Webcasts.

Perhaps it is kindest to understand Brier's disastrous dealings as yet another manifestation of "Millennial mania." There are other rash decisions that seem to fit this description. Take, for instance, **Disney's decision to scrap the Go.com Web portal.**

Some 400 employees were sent packing with investors swallowing hundreds of millions of dollars in write-offs. Rather than scale-back or restructure the operation ... *poof!*

Of course, the Disney Empire is not out of the Internet altogether. The various sites once under the Go.com umbrella have now splintered into the individual Web sites including **ABC.com, ABCNews.com** and **Disney.com.**

The constant

Fortunately, not everyone's bailing out of the Internet arena. Among those that continue to build amidst the smoking dot-com ruins include **Jones Radio Network** and **RadioResearch.com.** They have launched a joint venture dubbed the **Jones Research Network.**

The new JRN offerings differ from **RadioResearch.com's** other music testing products in that they lower costs by participating in a syndicated research network. Stations may also buy it through barter.

"Even though Internet-based research for radio stations costs considerably less than traditional phone or auditorium methodologies, there are still many stations who don't have a sufficient cash budget to be able to afford it," said **Bill Troy, president of RadioResearch.com.**

At **Arbitron**, **Judy Carlough** has taken the newly created position of **vice president, advertiser services for the Webcast ratings division.** Carlough's task is to inform major advertisers about how they need, want and can afford Webcast advertising — a fact that was somehow overlooked amidst the financial free-fall that has engulfed the entire streaming industry.

Given her nine years at the **Radio Advertising Bureau**, she's likely to make the case that should have

been a top priority from the get-go. Or, shall I rephrase that now that Go is, in fact, gone?

Taking care of the ad business is, of course, the first order of business now that venture capital seems to have fled the country like a pre-pardon Marc Rich. **Jones MediaAmerica** has entered into an agreement to represent **Coolink Broadcast Network.**

Holy macaroni

CLBN projects that \$20 million in ad placements will come from their ad insertion technology.

Michelle Jennings, chief operating officer of **Jones MediaAmerica**, said CLBN's technology will define the emerging industry.

"The standards they're setting will be the benchmark by which all others will be measured. For an advertiser, the ability to track targeted streaming media impressions and associated click-throughs in real-time makes this an extremely compelling advertising platform," said Jennings.

With the New Economy's newfound faith in traditional economic realities, some have become skeptical of revenue claims made by various New Media ventures. A recent, glowing **Wall Street Journal** feature on **Clear Channel's Web-only "World Class Rock" station, WDST(FM),** drew dubious glances from certain radio industry news outlets.

Whatever **WDST's** current cash flow, it's bound to improve now that the streamer has signed up for **Hiwire's** ad insertion services. Hiwire has just begun its live stream ad insertion rollout, starting with **GWR Group's "Classic FM,"** a UK-based station. Stateside stations will soon follow.

Kevin Mayer, chairman and chief executive officer of Clear Channel Internet Group, sees this as the breakthrough step to achieve "considerable revenue potential."

CCIG is also adding other techno treats beyond ad insertion. Its acquisition of **Enigma Digital** brings the company's proprietary integrated media platform in-house. The deal also adds Web-only stations **KNAC.com, Grooveradio.com, Acaza.com** and **LuxuriaMusic.com** to CCIG's roster.

Many phoenix

Despite the dour atmosphere, even smaller operations continue to forge ahead. **Cleveland-based Radio.Beonair.Com** launched a fourth Internet-only radio station, **Rock.Beonair.Com.** The classic rock format is billed as a "B-Side Rock 'n Roll station." In other words, they feature something that they claim goes beyond a "10-song classic rock playlist."

That raises an intriguing question for those of us that fit within the 25-to-54 target audience. If you had to pick a 10-song classic rock playlist, what would it include? Send your entries to *Web Watch*. Winning entries will receive free career counseling in the burgeoning field of radio programming.

As millennial madness and its aftermath fades, rest assured that there will be a robust streaming radio business. Once again, step back into the mindset of all those crazed cathedral builders preparing for the "end times" as Y1K approached.

Many of these projects were barely begun when it was clear that things weren't turning out exactly as planned. Those that followed through attained achievements nothing less than monumental. Those giving up on the Internet this early in the game will achieve monumental stupidity.

Carl Lindemann can be reached via e-mail at carl@cyberscene.com



Michelle Jennings



Rep. Rick Boucher

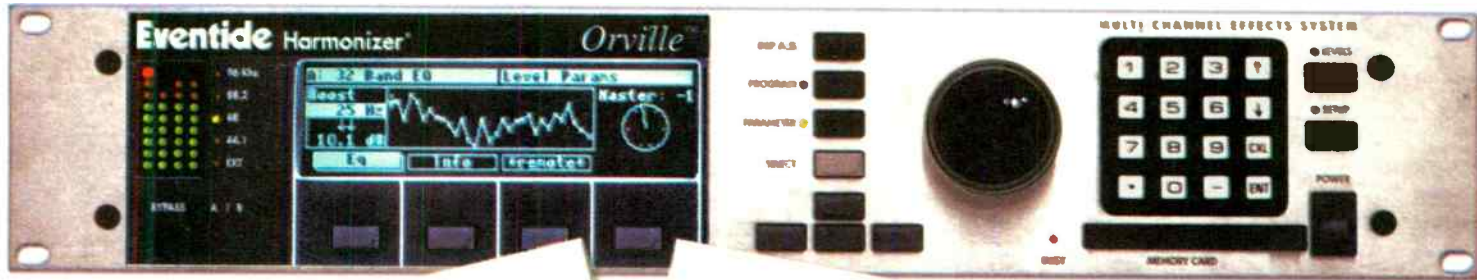


Kevin Mayer



Judy Carlough

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Face it. If there's an Eve/Net remote sitting conveniently on your console, or if perhaps you've installed multiple Orville processors in a central machine room, you may never use the Orville's own front panel controls. So why pay for them? Eventide's new "no faceplate controls" Orville/R model has all the capabilities of the standard Orville, but is designed for use exclusively with Eve/Net. You can mix and match standard Orville and Orville/R processors. You could pay many \$1000s more for a competitor's multi-channel processor system and still not equal the versatility, quality and ease-of-use of Eventide's Orville system.

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WEB WINS

Baby Your Web Site and See It Grow

Dave Casper & Mike Mahone

Web Wins is a new column that runs in alternate months of RW's Internet Radio section. Written by the Radio Advertising Bureau's Internet sales and strategy experts, Dave Casper and Mike Mahone, Web Wins brings RW readers tips and ideas to build your radio station's Web site into a new revenue river.

When we were asked to write an article about *long-range strategic planning* for the Internet, two thoughts came to mind. First, when it comes to the Net, current long-range planning probably doesn't extend much beyond lunchtime tomorrow!

Secondly, we wondered what you, the reader, would expect to get from such an article. If your goal is to get some kind of

specific, point-by-point plan for the development of content and revenue for your site, this might be a good time to move on to another article.

While it's a very good question, it's sort of like asking Orville and Wilbur about long-range strategic plans for the airplane. Our guess is their answer would have been something like, "To keep it in the air!"

As we suggested last time, the Internet is still a baby and it's just too early for anyone to see where all of this will finally go. If you have kids, you know that they grow up in stages — stages in which they continually change and develop.

State of change

So it is with the Internet. Can there be any doubt that the Internet of tomorrow will not be the Internet we know today? Lightning-fast technological advances combined with comparatively slower but ever-constant consumer adoption will undoubtedly keep the Web in a state of constant change for many years to come.

And while we don't know exactly where it's going, here's what we do know: The Internet is not going to go away. Forget the tough times that have befallen many Internet and some technology companies over the past year.

Established, experienced players with prudent online business models are replacing those defunct dot-com companies with weak business plans and exaggerated short-term expectations. Internet usage continues to grow. By latest estimates, 41 percent of U.S. consumers now have Internet access.

The week of Dec. 10, 2000, consumers made 58 million online shopping trips.

Using the Net to research, shop for and purchase goods and services is one of the fastest-growing trends, with business-to-business and business-to-consumer sales continuing to increase dramatically.

Right now (and for a very limited time) radio has a tremendous advantage over anyone trying to build and maintain an Internet business. There's no secret why the dot-coms spent millions of dollars on radio over the past two years. They did so because we have large and loyal audiences and the unique ability to persuade our listeners to do things — things like visit a Web site.

Act now

Use it or lose it. Use your power. Non-broadcast Internet players would kill to have the power and influence you have over your audience. Don't wait. Start today to condition your terrestrial audience to think of your station's Web site as *the place* to begin each and every one of their Internet experiences.

Finally, think back to the very early days of radio when receivers the size of a small refrigerator populated living rooms across America. Could anyone have predicted then that radio would grow to become a "portable" medium, finding a place in nearly every corner of American life?

Now, ask yourself, "What's the future of the Internet?" The answer is undoubtedly bright and filled with new opportunities, but only if we, as radio broadcasters, stay focused and keep working to keep it "in the air."

Dave Casper is senior VP of Internet services and Mike Mahone is executive VP of services at the RAB. For two years, they have toured the country, helping stations discover new revenue opportunities by combining Internet and radio. Contact them at (972) 753-6743 or via e-mail to dcasper@rab.com or mmahone@rab.com or visit the Web site at www.rab.com



Dave Casper and Mike Mahone

Web Wins Check List

So, if there is such a thing as long-range strategic planning where the Internet is concerned, here are a few thoughts to consider:

Keep the faith — The Internet will continue to grow and if you stay with it, your stations will ultimately profit from your Internet initiatives.

Explore — Now's the time to think like Orville and Wilbur. Don't be afraid to strap on a second pair of wings and experiment with your Internet programs.

Find good partners — Finding the right partners who can provide you with online programs like e-com, classifieds, coupons, streaming, etc. can be a great way to get your started little or no out-of-pocket investment.

Be flexible — The baby is going to grow. Be ready to make whatever changes are necessary to stay up with technology and stay in tune with the wants and needs of your Internet audience.

Be patient — While you must be ready to change plans and make any necessary changes, don't be too quick to drop something from your site because it isn't immediately profitable.

Ask and ye shall receive — The beauty of the Internet is that it provides for immediate feedback. Be sure to ask your Internet audience what they want and check your server stats to see what they like and don't like about your site.

Build — Build the best Web site you can afford and work to keep making it better. Having "a" Web site is better than having "no" Web site. Start small, find partners to help with content and be sure to budget for continuous program growth and site improvement.

Set goals — No team could ever win a football game without having some idea of the location of the end zone. Set annual, quarterly and monthly goals for content, traffic and revenue. Make sure everyone knows where the goal line is.

Think defensively as well as offensively — Over the past few months, a number of Internet-only "radio" sites have gone belly-up. They didn't make it for a number of reasons, not the least of which is that most people find listening to audio over the Net a less than satisfactory experience.

This is going to change! Ask yourself this: What would I do if tomorrow my listeners could listen to a direct format competitor broadcasting high-quality sound via the Internet to everyone's car radio? That technology is already in place. Be prepared!

— Dave Casper and Mike Mahone

NET RADIO SERVICES

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Using the PlaceLinks "Local Commerce Directory System," radio stations can increase advertising revenue opportunities by promoting local businesses through their Web sites.

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PlaceLinks is a revolutionary new way to promote your local business and services through your Web site. It's a Web-based application that automates and delivers local business brand, product and service data and targeted promotional content.

Using the PlaceLinks "Local Commerce Directory System," radio stations can increase advertising revenue opportunities by promoting local businesses through their Web sites.

PlaceLinks features include:

- Increase your advertising revenue by promoting local businesses and services through your Web site.
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- Promote your local business and services through your Web site.

For more information contact Holly Intravia at (781) 235-1313 or visit the Web site at www.placelinks.com or send e-mail to hintravia@placelinks.com

Advertisers can promote their products and services by name and use tracking software to measure impressions and interest. PlaceLinks customizes its "Local Commerce Directory System" according to the look and feel of a radio station's Web site. PlaceLinks hosts and maintains the directory system or licenses it to run on a customer's own servers.

For more information contact Holly Intravia at (781) 235-1313 or visit the Web site at www.placelinks.com or send e-mail to hintravia@placelinks.com

WSJM

Continued from page 91

"When I came here, it took about a week to get this done."

"Two days later Dave came back and had it done. We spent about another week tweaking it and then it was ready to go."

But to really make the concept work required the buy-in of WSJM's seven-person news staff. Frazier had to sell the radio reporters on the practice of carrying

the same page that convergence is what's happening and that they were going to be much more marketable professionally if they understood and embraced the technology. They were so excited about the idea that they actually fought over who got to use the cameras."

Another important key to acceptance was making the additional responsibility easy on the news staff.

"My goal was to get the reporters to where they would spend no more than 15 to 20 minutes of additional time in their workday to add the content," said Frazier.

The routine is efficient and fairly simple. On certain assignments, reporters take with them Sony Mavica digital cameras. The cameras have the capacity to capture on a disc 30 to 50 still pictures or up to 60 seconds of sound and video.

The reporters file their radio story at

half his time to serve as official Webmaster.

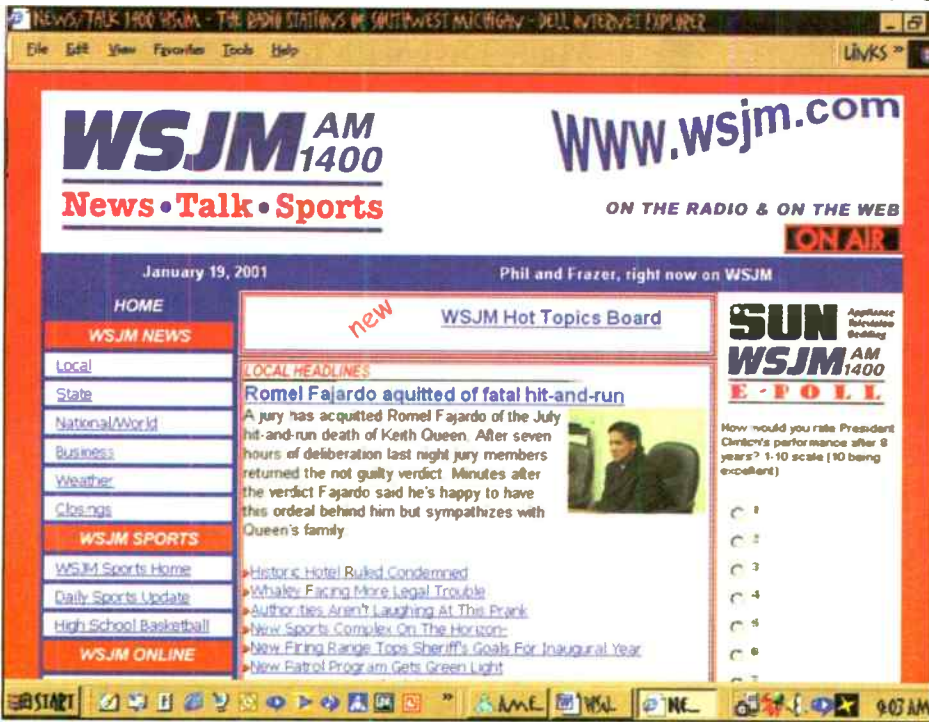
The site has yet to make any money, but that's because the station only recently started to market advertising opportunities aggressively.

"We're finding here and at some of our other company markets that it's very hard for our radio sales staffs to sell the Internet," said Joe Barron, Web developer for TRS New Media, the Internet division of WSJM Inc.

Skill set

"It's a different skill set. The size of orders is so different and it takes a different sales approach. We really had to wait until we could dedicate somebody to sell it and we just hired someone to do that."

According to Barron, finding advertisers won't be hard. "The advertisers have



WSJM's Web Site, Jan. 19

With Olson's approval, Frazier sat down with Dave Wolf, an overnight operations assistant who at the time also served as the station's unofficial Webmaster. Frazier diagramed on paper what he wanted the site to look like.

Seven Biggest Station Web Goofs

Peggy Miles is president of InterVox Communications, a Webcast consulting company based in Washington, D.C. and is co-author of the second edition of the just released "Internet Age Broadcaster," published by the NAB.



Peggy Miles

She advises clients as diverse as CBS Radio Networks Online to single radio stations about Webcasting and how to build great, profitable sites.

Here she offers the seven most common mistakes she sees on Web sites that you can learn to avoid just by reading this!

- 1.) Too many slow-loading graphics
- 2.) Using animation and other techniques many surfers can't experience
- 3.) Not using audio
- 4.) Not updating content frequently enough
- 5.) Not putting up easy to find, searchable advertising directories
- 6.) Failing to create personality
- 7.) Not putting together a coherent marketing and business plan and making someone responsible for the number of surfers and dollars realized

See you on the Net!

Peggy

cameras with them on their assignments.

"The focus was to equip them with the tools they needed to provide more compelling content. They're at meetings doing the interviews anyway. Snapping a picture is something they can do while they're listening and recording what's going on. It's really no added time, it's just making better use of the time."

The news director said his staff was supportive and excited about the idea.

"The nice thing about being in small-market radio is that you've got kids who grew up with computers and they're hungry and willing to do a variety of things in order to learn the business.

"One of the first things I did was sit down and explain our management vision on where journalism is going. We got on

WSJM using AP NewsDesk and then paste it directly into the station's Web site, along with the selected stills, sound clips and/or video.

In addition to work efficiencies, the site is also cost-efficient. Each of the Sony Mavicas (the station has three) list for around \$700. The software package used for archiving stories, audio and video — Xcent's XcNewsPlus — costs less than \$100.

WSJM pays a monthly hosting fee to Quantum Connections, but has worked out a trade agreement with Quantum to reduce the fee. Olson made one staff addition, a new overnight operations assistant. This allowed Wolf to bring his talents to dayside, where he now devotes

noticed this and they're actually approaching us to be part of it. They're finding it exciting that the same thing they listen to in the morning, now they can get online and get all that content."

"There's no doubt that there's interest and awareness of the WSJM Web site among news-oriented advertisers," said Olson. "I'm pretty confident that six months to a year from now we'll have some significant income to show on the ledger."

Steve Sullivan is co-founder of the Advanced Interactive Media Group LLC, an interactive media consulting group and is a frequent contributor to RW. Contact him at (512) 260-3313 or send e-mail to sullicom@aol.com

The advertisers have noticed our Web site and they're actually approaching us to be part of it.

— Joe Barron

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See Page 102



Radio World

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PRODUCER PROFILE

KQRC(FM): At'sa One Spicy Pizza!

A.J. Ingle Puts the Sizzle on Production at Entercom Radio Station in Kansas City

Ken R.

A.J. Ingle is the chef who cooks up the production at Entercom's top-rated rocker KQRC(FM) in Kansas City, Kan.

"This station is just like the pizza place you keep hearing your friends talk about," said Ingle, the station's production director. "Until people try our pizza they don't know how great it tastes — and our job is to keep getting more people to take a bite."

Food metaphors aside for the moment, Ingle is a 16-year veteran of

the radio wars. He began his career at KAYE(FM), a college radio station in Tonkawa, Okla., in 1984.

"I knew I wanted to work in radio and when the program director got kicked out for drinking, I got to move into his slot," he said. "It was great getting some hands-on experience while I was earning my degree in radio broadcasting."

Ingle continued his college radio experience at Oklahoma State College's KSPI-AM-FM in Stillwater, Okla., before landing an internship at KATT(FM), a commercial station in

Oklahoma City. After learning the joys of the typical 16-hour radio day, Ingle got a taste of professional, big-time broadcasting.

"I got bit by the production bug," said Ingle. "I learned how to deal with salespeople and on-air guys, I learned my craft."

At KATT, Ingle met programmer Doug Sorensen, who later lured Ingle to Kansas City in 1992 to help sign on KQRC.

"We had to build this thing from the ground up," he said. "I was on the air from 7 p.m. to midnight, plus I did production. I began to eat, sleep and breathe radio and I've been here nine years now."

"Sorensen gave me a shot when I didn't even believe in myself," he said. "He

saw something in me, gave me support and guidance and pushed me. Everything he told me was on the money."

Sorensen has since passed away. Ingle continues to praise his late program director's influence.

"I have him to thank for everything."

Of Entercom's eight stations in the market, KQRC is the only one in the



A.J. Ingle is happiest in the studio.

PRODUCT EVALUATION

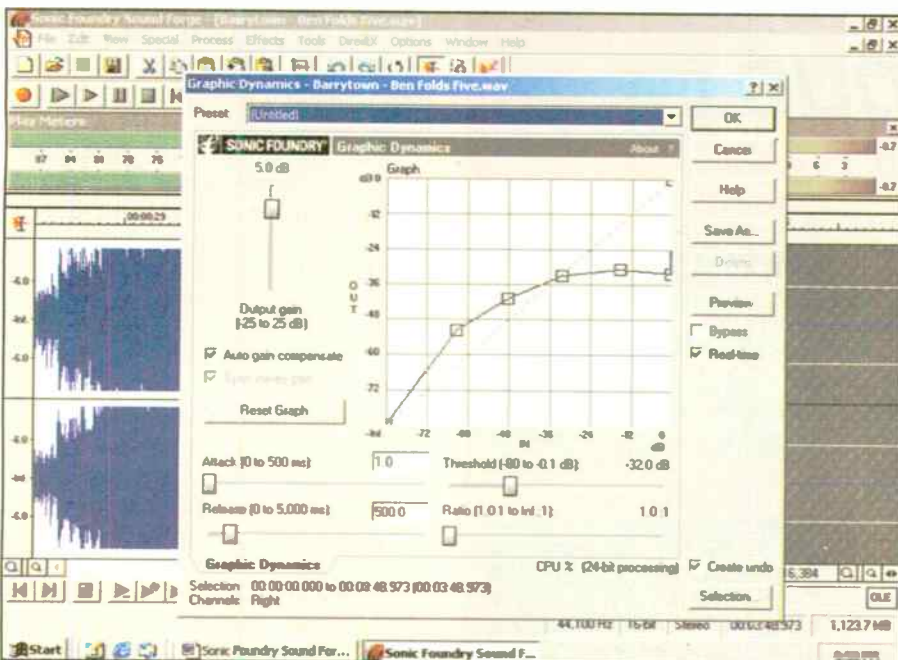
Sound Forge 5.0 Continues Code Line

Carl Lindemann

Sonic Foundry has revamped its product line since the last major revision of Sound Forge. When 4.5 came out, Sound Forge was far and away the

Version 5.0 refashions this venerable audio editor to bring it up to speed.

Aside from the infrastructure upgrade, what users will notice is a wider support of sampling and bit rates for audio files and a few amenities like



Sonic Foundry Graphic Dynamics Display

company's lead product.

In the meantime, other offerings like ACID and the Vegas series of audio and video production products have stolen some of the spotlight.

On the programming level, these new 32-bit programs are significant advances over the legacy 16-bit DOS-based code at the core of Sound Forge.

track-at-once CD burning. Also, the package comes loaded with nearly the complete library of Sonic Foundry Direct-X plug-ins. There is even a "lite" version of Vegas Audio tossed in to give multitracker capabilities.

Sound Forge 5.0 is not a radical departure from the audio editor that so

See SOUND FORGE, page 100 ▶

building that is live 24 hours a day.

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See KQRC RADIO, page 101 ▶

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Sound Forge

► Continued from page 99
many of us use and love.

It's more like a gold plated, fully loaded special edition offered at a great package price.

At first glance, 5.0 looks exactly like 4.x. The only apparent difference is the color scheme of the buttons and meters. But unlike 4.x, the user interface is customizable.

The meters and control buttons can be situated as needed. A few elements like the "playbar" transport controls under the waveform display are fixed. But other toolbars can be placed on top to cut the need to go into drop and drag menus for tools and effects.

Though the "standard" layout is just

about hardwired into the brains of veteran Sound Forge users, the ability to adjust the controls to individual needs

just supporting 8- and 16-bit, this goes all the way to 32-bit. Additionally, sampling rates go to a whopping 192 kHz.

The increased range of sampling rates and bit-depth support are found as options on the familiar menus.

can save quite a few keystrokes.

The increased range of sampling rates and bit-depth support are found as options on the familiar menus. Instead of

Even though storage is cheap in these days of 80 gig hard drives, the maximum settings consume a frightening amount of space — two hours of

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- ✓ Terrific value



Thumbs Down

- ✓ Limited CD mastering capabilities
- ✓ Radio stations may have all that is needed with 4.5 and XFX plug-ins

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uncompressed 16/44.1 stereo recording time collapses to just a fraction of that at 32/192.

The high end is more theoretical than practical here. The CardDeluxe audio card in my system cannot support anything beyond 24/96 anyway. Besides, the utility of these ultra high-fidelity capabilities is dubious for most any radio use.

Audio formats

The same can't be said about the complement of built-in codecs, including MP3, Real 8 and Windows Media. There is precious little out there that 5.0 cannot open and manipulate.

Like the earlier version 4.5, video and AVI support is part of the Sound Forge multimedia pallet. Producers delivering content to multiple platforms on-air and online have everything needed to deliver the goods.

The addition of the complete XFX library of 18 effects — plus the Acoustic Mirror space simulation and microphone modeling as well as the Wave Hammer compressor/volume maximizer — makes this a full-function production and mastering studio.

The 4.x version included many of the same mastering functions and effects. The biggest difference between these and the XFX Direct-X plug-ins is that these enhanced tools preview the output in real-time.

When you can listen to the end result on the fly, obtaining the right sound is much faster and easier. Otherwise, you get bogged down in having to test out various settings on a trial-and-error basis with significant processing time between attempts.

Off to Vegas

The other major add-on here is a newly designed version of Vegas Audio — Vegas Audio LE. This 8-track multitracker is really all that's needed for the quick-and-dirty, day-in day-out of radio work.

If somehow, there were a tighter integration between Sound Forge and Vegas Audio LE it would be a nicer setup.

The best solution would be to have the ability to add additional tracks within the Sound Forge workspace. But that does not seem to be in the cards. Instead, you have to run the multitracker in the background and toggle between these programs as needed.

Oh, there is also one unnecessary annoyance with Vegas Audio LE. You cannot deselect the promo to "upgrade" to the full version that pops up when the

See SOUND FORGE, page 101 ►

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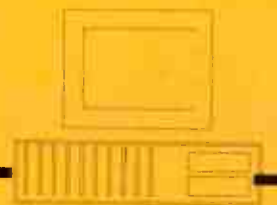


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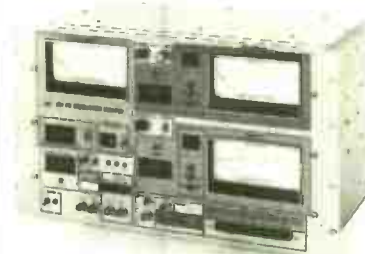
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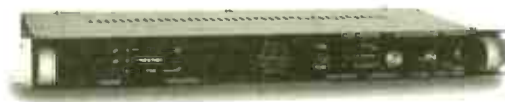
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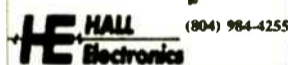
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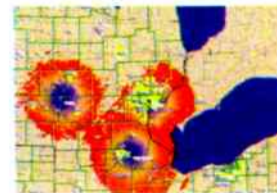
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Want to Buy

AM or FM station located in RI, MA, CT or FL area. Non commercial or commercial. No station to small, will consider partnership. Michael Cardillo, 151 Morgan St, Cranston RI 02920. 401-942-8341.

TAPES/CARTS/ REELS/CD's

Want to Sell

Cartridge tape equipment. Clay Freinwald, Entercom, 1820 Eastlake Ave East, Seattle WA 98102. 206-726-7071 or email: cfreinwald@entercom.com.

Want to Buy

Drake Chenault 10.5" reels, Contempo 300, late 70's or early 80's, basic library reels. Chuck Raab, Rd #1, Kingsley PA 18826. 570-434-2609.

TEST EQUIPMENT

Want to Sell

Ampex 300E vacuum tube voltmeter, \$35; B&W Nidek 400 distortion meter, \$20; Beta Scope non destructive thickness gauge, Twin City Testing Co, Lionel electronic, \$30; Eico 250 AC VTVM & amp, \$20; Electronic Designs 100 electronic voltmeter/ohmmeter, \$25; General Radio Co Type 1564-A sound & vibration analyzer, \$45; HP 330B & 330C distortion analyzer, \$25 ea; (4) HP 400D vacuum tube voltmeter, \$45/all 4. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952.

Oscilloscope FM radar, AN/USM Dept of the Navy, bureau of Aeronautics; Model engineering & MFG Co OS-4A/AP in nice metal box with carry handles, \$20. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952.

Ampex 300E vacuum tube voltmeter, \$35; B&W Nidek 400 distortion meter, \$20; Beta Scope non destructive thickness gauge/Twin City Testing Co, Lionel Electronic, \$30; Eico 250 AC VTVM & amp, \$20; Electronic Designs 100 electronic voltmeter/ohmmeter, \$25; General Radio Type 1564-A sound & vibration analyzer, \$45/BO; HP 330B & 330C distortion analyzer, \$25 ea; HP 400D (4) vacuum tube voltmeter, \$45/all 4. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952.

Fluke Model 41 AC power line quality/harmonic test set with amp clamp, like new in box. Brad Hildebrand, KSLQ, 511 West Fifth St, Washington MO 63090. 314-486-4601. email: brad@kslq.com.

Oscilloscope FM radar, AN/USM Dept of the Navy, bureau of Aeronautics; Model engineering & MFG Co OS-4A/AP in nice metal box with carry handles, \$20. Will Dougherty, WLD, Music Valley, Rt 1, Box 1548, Mill Spring MO 63952.

TRANSMITTERS

Want to Sell

Various FM transmitters, to many to list. Clay Freinwald, Entercom, 1820 Eastlake Ave East, Seattle WA 98102. 206-726-7071 or email: cfreinwald@entercom.com.

Singer SCF 1/35, 2.5 kW transmitter, spare tube, spare drivers, other spare parts, 3 phase, no exciter, \$2500/BO. Joe Schloss, KICD/KLLT, 2600 N Hwy Blvd, Spencer IA 51301. 712-262-1240.

Harris MW-5-B five KW pulse modulated AM xmitr. Continental Communications. 314-664-4497. Email: contcomm@fiastl.net.

RCA BTF-20-E1 20KW FM xmitr. Continental Communications. 314-664-4497. Email: contcomm@fiastl.net.

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Reiser reading

Great article on John Reiser ("Reiser: Interference Concerns," RW, Jan. 3).

Joe Monie

Regional Director, Northeast Region
Federal Communications Commission
Chicago



John Reiser

AM stereo

Barry Mishkind's article "RW: Help Screen for a Generation" (RW, Jan. 17) rang the AM stereo bell again. Good show!

The ability of the marketplace to resolve technical issues and system considerations is just as bad as the ability of competing proponents to define a common operating system for the benefit of all.

Bob Streeter
President
AM Stereo Inc.
Fort Wayne, Ind.

AM receivers

Regarding the Reader's Forum about AM radio in the Jan. 3 RW ("AM Receivers Trash AM Signals"):

Of course Chris Cuff is correct about programming entirely. Of course we would all like to have 15 kHz noise-free reception like FM but actually AM radio has something that FM or digital will never have ... that's "warmth."

I really can't explain it technically but AM sounds far friendlier and warmer than FM ever does, especially with the insane amounts of processing used by our FM brothers today.

In addition, AM's ability to reach

over hills and valleys has profound advantages from a EAS perspective. I have spent more than 25 years in the local emergency management community and I assure you analog AM radio is hands down the best way to communicate to a lot of folks on simple equipment in a hurry. Civil Defense/Emergency Management literature does not say, "Tune to your complex FM or digital algorithm radio for emergency information."

I can be back on the air with an ATU and a long wire ... how about you?

Stop losing sleep over audio quality and pay attention to your programming.

Lloyd B. Roach
Owner/Operator
WCOJ(AM)
Coatesville, Pa.

Sidelobes revisited

The Jan. 17 RW rebuttals of Ali Mahnad and Leroy Granlund to my Oct. 25, 2000, article on sidelobe-free FM antennas were interesting reading, and I thank them for stating their views.

The point of my article is still valid: Sidelobe-free FM antennas can produce higher levels of power density around the antenna site than either half-wave spaced or full-wave spaced "standard" antennas.

Whether or not a sidelobe-free antenna will give an acceptable reduction of radiated energy below the horizontal plane when compared to "standard" antennas of the same number of bays is a legitimate concern in site design.

Comparing six-bay antennas this way is not an improbable situation. A sidelobe-free design may not be the best choice for control of nearby signal levels for every site. The entire elevation pattern envelope of the antenna (including the main beam) needs to be considered, and not just its performance in the region of the sidelobes — which is the conventional practice I was addressing in my Oct. 25 article.

Specifying a sidelobe-free antenna with sufficient aperture (length) will reduce the width of its main beam and so reduce the nearby, high signal levels seen for it in Fig. 1 of my Oct. 25 article.

As Mr. Mahnad points out in his Jan. 17 article, producing main beam widths roughly equivalent to a full-wave spaced antenna requires about twice the number of antenna bays for "standard" half-

Certify Engineers — and Pay Them Better

Radio is struggling to retain good engineers in every aspect of the industry: from the station level to networks to regulators. We support efforts to increase the education and expertise of those engineers we have.

Now it's up to owners and managers to step

up to the plate with better compensation and staff support.

The FCC has already reached that conclusion for itself. Several civil-servant career engineers have recently retired from the agency. The former chairman, Bill Kennard, and his successor Michael Powell both acknowledged the struggle to retain top technical talent when engineers can command higher salaries in the private sector.

Powell says the commission is exploring ways to attract and retain engineers, such as more generous benefits or increased compensation. Meanwhile, the industry pays the price when its regulatory body struggles to find competent staffing.

On the station side, the SBE has a new certification level, the Certified Broadcast Networking Technologist, which emphasizes hardware and installation issues common to network platforms typically used in a station. The SBE believes this type of certification will help bridge the gap between traditional broadcast engineering and the increasingly important area of IT and network hardware support. We concur.

SBE Certification Committee Chair Terry Baun developed a four-hour presentation on this topic, covering network topologies and layouts; common network protocols; wiring and connector types; system standards and installation; maintenance, troubleshooting and connectivity; challenges unique to media-based network platforms; and digital compression technologies and storage issues. The tutorial is followed by the actual CBNT exam.

A second, new tutorial clarifies regulations concerning duties and responsibilities of Designated Chief Operators. The rules are aligned with the "FCC Self-Inspection Checklist." The material includes the most commonly violated agency rules noted by actual inspection reports. The intent: to help you pass an FCC inspection.

The tutorials have been presented at several state broadcast association meetings in recent months, and the networking tutorial will be presented during the NAB2001 show.

We encourage you to bring a tutorial to your area. The cost to the sponsor is only in the hundreds of dollars. We challenge radio managers in all markets to consider creative ways to sponsor this event for engineers in their area. All benefit from an educated technical talent pool. For information, send e-mail to lgodby@sbe.org

It's imperative that radio expends the same effort on continuing education of its technical staff that it expends on other staff, such as sales. As the responsibilities of our engineers increase, so too must the compensation and support.

— RW

wave spaced antennas, and more than twice as many for sidelobe-free designs. Of course, this greatly increases the cost of the antenna itself, and adds antenna weight and windload that can affect the design and cost of the antenna supporting structure.

These added costs may be justifiable for the situation, but by relying only on current advertising claims for sidelobe-free antennas, and without doing a detailed power density comparison study, the best antenna configuration for the site might not be known.

Mr. Mahnad claims in his Jan. 17 article that sidelobe-free antennas give "extraordinary improvement in signal quality and coverage." Such claims could be viewed as a normal bit of advertising zeal, still one reasonably might expect that data exists somewhere that proves these claims to be true. But according to Mr. Mahnad in this same article, such data collection and analysis

has yet to be undertaken.

Certainly the claims for the "drastic improvement" in the performance of sidelobe-free antennas will be more believable if and when they are the conclusion of a well-designed, objective, and real-world field study.

Richard J. Fry
Quincy, Ill.

Write to Us

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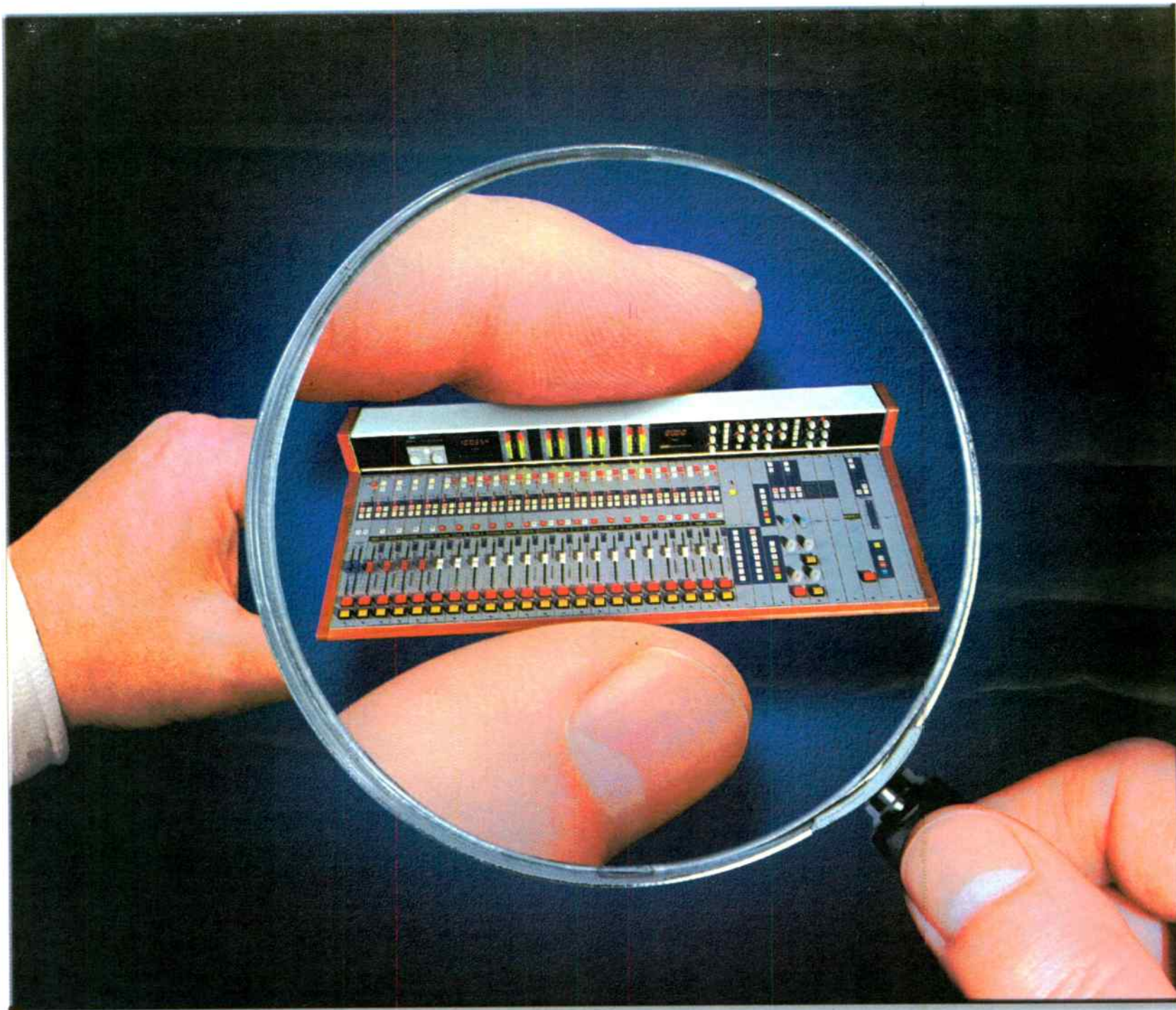
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