

Skip Pizzi Is Back

The new year marks the return of a familiar name to the pages of Radio World.

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San Diego Style

Clear Channel nears completion on an 11-station build-out.

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Radio World

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The Newspaper for Radio Managers and Engineers

January 2, 2002



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NEWS MAKER

New Sirius CEO Shapes Launch

NEW YORK Sirius Satellite Radio hopes to jump-start its launch and begin offering its satellite-delivered digital radio subscription service this year.

With a new chief executive officer in place, company officials are focused on a product rollout planned on Feb. 14 in three initial markets: Houston, Denver and Phoenix.

Moving beyond delays

Sirius and rival XM Satellite Radio are starting their services later than originally planned. Sirius had hoped to be operational by the end of 2000 and XM in the second quarter of 2001.

Sirius' delayed start until this year meant XM has been the only company providing satellite-delivered subscription digital radio for several months.

In 2001, Sirius had satellites in orbit and completed studios. But it encountered chipset delivery delays that affected the availability of receivers on store shelves. Company co-founder and Chief Executive Officer David Margolese

See CLAYTON, page 6 ▶

SPECIAL REPORT

Broadcasters Ready Coverage Plans

Radio Looks Ahead to 2002 Winter Olympic Games

by Randy J. Stine

SALT LAKE CITY The possibility of a terrorist attack, however remote, is forcing some news organizations to reevaluate their coverage plans and allocate more resources to covering the 2002 Winter Olympic Games in Salt Lake City.

Programmers say the Winter Olympics, set to begin Feb. 8, have become as much a news story as a sporting event in the aftermath of the Sept. 11 tragedy. They See OLYMPICS, page 8 ▶



Salt Lake City Skyline

Photo by David Quinney

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◆ NEWSWATCH ◆

Expect Heavier Security at CES

The Consumer Electronics Manufacturers Association plans security changes to its Consumer Electronics Show Jan. 8-11 in Las Vegas in light of the terrorist attacks.

Attendees, exhibitors and speakers will need personal and business identification to obtain show badges. Public and private security will have an increased presence on site and bags will be searched. Attendees are encouraged to leave their bags in their hotels.

Microsoft Corp. Chairman Bill Gates

kicks off events Monday Jan. 7 with a pre-show keynote at 6:30 p.m.

In the weeks leading up to the show, domestic and international pre-registration was on par with the last two conventions, CEA said. Both of those shows had more than 110,000 attendees.

Many U.S. buyers who cancelled trips to Asia this fall are relying more heavily on CES to make 2002 buying decisions, the association believes.

With the expansion of the South Hall in the Las Vegas Convention Center, the 2002 CES will house nearly 1.2 million square feet of exhibit space. CES will be the first show to use the new hall.

To register, go to www.CESweb.org.

\$16,000 Due for EAS, Tower Violations

WASHINGTON Barnstable Broadcasting owed the U.S. Treasury \$16,000 by Jan. 4 for EAS and tower violations.

Barnstable did not dispute the fine, levied by the FCC for Des Moines, Iowa, FM stations KGGO and KJJY.

The commission stated in the Forfeiture Order that the company failed to determine why the stations were not receiving EAS tests and did not keep a log of the missed tests, maintain tower

lighting or notify the FAA when the tower lights were out.

Barnstable has since sold the stations to Wilks Broadcasting and disputes the commission's view that Barnstable prematurely transferred control of the station to Wilks under a time-brokerage agreement. Barnstable successfully argued that its station manager had a "meaningful managerial presence" and so the FCC struck that notation from the record.

FCC Again Dismisses Primosphere

WASHINGTON Now that XM Satellite Radio has launched and Sirius Satellite Radio is poised to start its service, one of their original competitors for S-band spectrum seems finally to have lost its long quest to overturn the decision granting XM and Sirius the licenses.

Primosphere Limited Partnership was one of the four companies bidding. When the spectrum was awarded to CD Radio (now Sirius) and American Mobile Satellite Radio Corp. (now XM), Primosphere protested and asked the FCC to review the decision.

See NEWSWATCH, page 5 ▶

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Olympic Tech Preps Nearly Complete

by Ted Nahil

Westwood One Inc., holder of the U.S. radio rights, is preparing to provide more than 550 hours of Olympic programming to its affiliates and other radio broadcasters in the United States.

"Westwood One has had the Olympics for some time," said Conrad Trautmann, vice president of engineering for Westwood One Radio Network.

The organization will go with a proven plan when it's time to report the events of the 2002 Olympic Winter Games from Salt Lake City beginning Feb. 8.

No analog

"We're recreating the same facility that's been used for years, which has worked well," Trautmann said. "The only big difference this year is that we'll have virtually no analog equipment."

In the past, Westwood One has used reel, cassette and even cartridge tape systems to gather and distribute audio for the Olympic game events. This year, the only analog gear will be some "just-in-case" cassette decks, according to Trautmann.

The distribution of programming for the Olympics, radio or television, can be confusing to the first-time observer.

In the past, host broadcast operations have been a function of the host country's Olympic Organizing Committee, and usually have been performed by the domestic rights-holder for an Olympic event. The host broadcaster would then distribute, for a fee, programming to each country's rights-holding broadcaster.

Each country has one radio and one TV rights-holding broadcaster. The United States' rights-holding broadcasters are NBC for TV and Westwood One for radio. Had past precedent been applied, NBC would be this

ming to the United States.

Westwood One technicians, including Mitch Glider, will spend January in Salt Lake City, constructing and testing Westwood One's facilities. During the games, Westwood One will have a



The Salt Palace will become the main media center during the games.

staff of seasoned engineers and technicians on site including Christopher Tobin, director of engineering, Wally Tienken and Ted Schneider.

For radio broadcasting, each venue at the games is connected to the International Broadcast Center via a four-wire circuit. Audio from the venue is brought back to an editing station or studio, and cue and IFB audio is sent to the venue for the talent located there.

Field reporters and talent will use Marantz MD recorders for interviews and wrap-around audio. Each venue has an area, called the "mixed zone," where media can interview athletes after an event.

Live audio events like ice hockey, ice skating, speed skating, luge and some skiing events, which Westwood One plans to air in real time, will be sent back to the IBC. There, using one of the three studios constructed, that audio will be produced and sent back to New York for distribution. All live programming will originate from Salt Lake City, with New York functioning as a backup for commercial insertion.

Westwood One will use Intraplex T1 equipment with MPEG cards, and an ISDN backup, to move this program-

ming between Salt Lake City and New York. There will be a total of three program audio paths to New York and two return paths to Salt Lake City. A high-speed Internet connection will be available at the Westwood One studio

complex for use by the technical and on-air staff.

Non-live audio brought back to Westwood One's studios at the International Broadcast Center will be edited on Metrosource workstations using Cool Edit software. Westwood is using Logitek ROC-10 digital consoles and an SAS 32000 router at the IBC location. Most of the microphones in the field will be EV 635s with SM-7s at the studio and control room locations for interviews conducted there. The Metrosource workstations also run the wire service software.

Rights vs. non-rights-holders

"The Olympics is the largest sporting event we do and NBC(TV) has been a pleasure to work with," said Trautmann. "We have a fantastic crew, all of whom have years of experience doing the Olympics. We're excited to be involved again this year at Salt Lake City."

Other broadcasters will be present in Salt Lake City. Although the International Broadcast Center is reserved for rights-holding broadcasters, non-rights holders will be able to use the Utah Media Center as a place from which to work.

ABC Radio has made plans for space there with ISDN links back to New York. Scott Iverson, head of the

See TECHNICAL, page 7 ▶

ISB is constructing the International Broadcast Center in Salt Lake City, from which radio and TV programming will be distributed to the world.

year's host broadcaster.

The Salt Lake Olympic Organizing Committee (SLOC) deviated from past procedure and selected an independent company, ISB(TV), Salt Lake City, as the host broadcaster. ISB is constructing the International Broadcast Center at the Salt Palace Convention Center in Salt Lake City. From this central point, radio and TV programming will be distributed to the world as the 2002 Olympic games.

NBC's main broadcast facilities are located at the International Broadcast Center. Within the NBC floor space, Westwood One is constructing three studios and five editing workstation areas, occupying 1,500 square feet. From this central location, Westwood One will distribute the radio program-



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Skip Pizzi Returns to Radio World

With the advent of the new year, I'm absolutely delighted to welcome Skip Pizzi back to the pages of your newspaper. Starting next issue, Skip's column will appear in alternating issues of Radio World. He also will write product reviews, news analysis and other stories from his unique perspective as an expert on the radio, television and new media industries.



Skip Pizzi

Skip's name is known throughout the radio engineering and technical community. He has written for broadcast, media-production and computer industry trade publications since the early 1980s, and he spent 13 years at National Public Radio, in various technical production and management positions, where he contributed to numerous award-winning radio programs.

Skip authored the book "Digital Radio Basics" in 1992 and serves on the Distribution/Interconnection (D/I) committee of the NPR board of directors. He is the former technical editor of Broadcast Engineering magazine and former editor-in-chief and contributing editor for BE Radio.

These days, his full-time job is manager of television standards and regulatory affairs for Microsoft Corp., a position in which he represents Microsoft in digital TV standards organizations around the world. He is secretary to the Applications Subcommittee of the Advanced Television Systems Committee, the standards organi-

zation for U.S. digital TV, and he chairs the Working Group on Content Rights Management and Protection of the TV Anytime Forum, a standards body for the personal video recorder environment.

Skip is a member of the board of the Advanced Authoring Format Association, which is creating a multimedia authoring and file-exchange standard. He's also something of a Renaissance man, having studied electrical engineering, international economics and fine arts at Georgetown University. He is a member of the AES, SMPTE and the SBE and a former chair of the D.C. Chapter of the AES. He received the Public Radio Regional Organizations' PRRO Award and the AES Board of Governors Award.

I consider it my job to build the best publication possible at Radio World. Skip Pizzi is a visionary, one of the finest columnists in our industry. To have his byline in our pages once again, along with such outstanding engineering contributors as John Bisset, Tom McGinley, Cris Alexander, Al Peterson and many others, is part of that effort.

Welcome, Skip.

★ ★ ★

New this year is Radio World's "Readers' Choice" Awards, in which you, the reader, can vote for industry products that work best for you. The results will be announced in April.

This is a complement to our popular "Cool Stuff" Awards, in which industry judges pick their favorite product introductions. The "Readers' Choice" program lets you vote for your own favorite new products.

To submit your ballot, simply visit www.rwonline.com and click on the logo.

Your name also will be entered automatically into our Readers' Choice Sweepstakes contest. We will select 26 winners in 26 random drawings for great prizes, announced in every issue of RW this year.

This is a fresh sweepstakes, not a continuation of last year's; so I encourage you to head over to our Web site and put your name in now.

★ ★ ★

The executive director of the SBE tells me that the society's relief fund for the families of six broadcast technicians killed in the terrorism attacks has "gone beyond what any of us imagined."

Including a large matching gift, the fund totals more than \$165,000, according to John Poray. He said contributions were still arriving months after the attacks.

To make a contribution to the SBE Relief Fund for families of broadcast technicians and engineers lost at the World Trade Center disaster, make a check payable to Ennes Trust and mail it to: SBE, 9247 N. Meridian Street, Suite 305, Indianapolis, IN 46260. Attn: Broadcast Engineer Relief Fund.

Thanks to all who have already contributed.

★ ★ ★

If you are headed to the big Consumer Electronics Show this week in Las Vegas, be sure to include the session "It's All Digital: Riding the Waves of a New Radio

From the Editor



Paul J. McLane

Landscape" on your dance card.

Radio World News Editor and Washington Bureau Chief Leslie Stimson will moderate the one-hour session on Tuesday, Jan. 8, at 10:30 a.m.

Digital radio, including satellite and IBOC, represents the biggest change to radio since FM. The panel will include representatives of XM Satellite, Sirius Satellite, Ibiqity Digital, Visteon — which supplies receivers and components to automakers — and General Motors' OnStar. 🌐



Over the past 12 months, Radio World has given away \$48,000 in radio and audio prizes in our Silver Sweepstakes. Thank you for helping us to celebrate the 25th anniversary of IMAS Publishing and RW's own 25th birthday next summer.

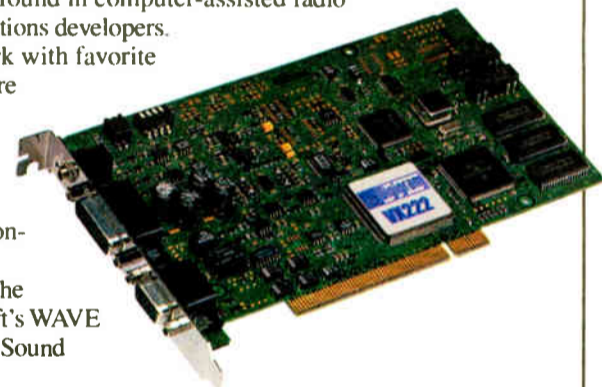
Michael L. Hays, owner of TwangCast Internet Radio in Orange, Va., is the winner of a Digigram VX222 sound card.

Digigram cards are found in computer-assisted radio products from respected applications developers. The VX222 is designed to work with favorite PC and Mac applications. There is also a laptop version, the VXpocket v2.

This high-quality sound card includes balanced analog inputs and outputs with 24-bit converters, as well as digital I/O in AES/EBU or S/PDIF formats. The VX222 operates under Microsoft's WAVE protocol, ASIO2 or the Mac OS Sound Manager. Retail value: \$549.

Thanks to all the companies that contributed prizes for our sweepstakes.

For a list of the winners, visit www.rwonline.com/sweeps/index.html.



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Digital Delay

This is one in a series in which Ibiqity Digital Corp. answers questions about how to implement in-band, on-channel digital audio broadcasting. Broadcast Technology Manager Jeff Detweiler answers here.

Q: How much delay is added by an IBOC system? One of my stations is running in delay, the other is not. What will be the impact on both if I transition them to digital broadcasting?

A: There is no noticeable impact to stations already operating in delay. However, for stations not currently operating in delay, you will likely need to make monitoring changes because a delay of about 7 seconds is added when transmitting an IBOC digital signal.



Buffering and processing delays exist in any digital transmission system. Once the delay reaches the 15- to 20-millisecond range, depending on the person, certain on-air talent could have problems with monitoring off the air. Longer delays make off-air cueing difficult for remote broadcasts, including aircraft-based traffic reports.

Increasing the number of digitally processed stages in the audio path adds to the signal latency. Digital studio-to-transmitter link and audio processors have brought many stations to the 15- to 20-millisecond range of delay already.

Knowing that delay in digital systems is unavoidable but easily remedied, Ibiqity selected a buffer of 4.5 seconds to optimize system performance and provide coverage comparable to analog. The present version of in-band, on-channel digital audio broadcasting technology also introduces 2.5 seconds of processing delay for a total of 7 seconds of delay.

Delay is not a phenomenon new to broadcasters; live call-in talk shows with profanity delay have worked around the issues for years. For most monitoring applications, a "pre-delay" feed (direct from the broadcast console) will satisfactorily meet the station's needs. Adding a side-chain audio processor will satisfy on-air talent's specific monitoring needs.

Remote broadcast and traffic reports in the IBOC world will also require a similar pre-delay feed. Pre-delay feeds can be provided in a number of ways including:

- Cellular or wired telephone service into an auto answer coupler, which is fed with pre-delay audio for on-air cues,
- ISDN phone lines used to send pre-delay program cues back down the ISDN line to the remote site, or
- Analog SCA channels used to send real-time program cues. Installing SCA receivers in the traffic aircraft or mobile studios creates a real-time IFB link for cueing remote broadcast talent. This method proved very effective during IBOC field tests.

With planning and attention to the unique needs of the air talent, broadcasters can adapt easily to the changing monitoring requirements of the industry's transition to IBOC digital broadcasting.

Send your IBOC questions to radioworld@imaspub.com. RW welcomes other points of view.

► Continued from page 2

The agency dismissed Primosphere's application in 1997 because the company was an unsuccessful bidder in the auction and there were no remaining SDARS licenses available. Primosphere said that dismissal was premature.

The commission has reaffirmed its 1997 order granting SDARS licenses to CD Radio and AMRC, making Primosphere's application moot.

XM Funded Through Q4, 2002

WASHINGTON XM Satellite Radio says it is well-financed to operate into the fourth quarter of this new year.

XM has placed 10 million shares of its common stock in a public offering underwritten by Morgan Stanley. Gross proceeds of \$112.5 million were to go to XM. The satellite radio company has granted the underwriter an option to purchase an additional 1.5 million shares of common stock. The offering was expected to close in mid-December 2001.

Also, XM has closed a \$66 million funding package with Boeing that was made public in October. The financing package included \$35 million in new debt financing with Boeing Capital Services Corp. and \$31 million in restructured obligations with Boeing Satellite Systems International Inc.

XM President and CEO Hugh Panero said, "With these financings representing \$147.5 million in new funding, XM is well-positioned to operate its business into the fourth quarter of 2002."

NAB to FCC: Ban Cross-Ownership Ban

WASHINGTON NAB believes the restriction that prohibits joint ownership of newspapers and broadcast stations in one market needs to be eliminated.

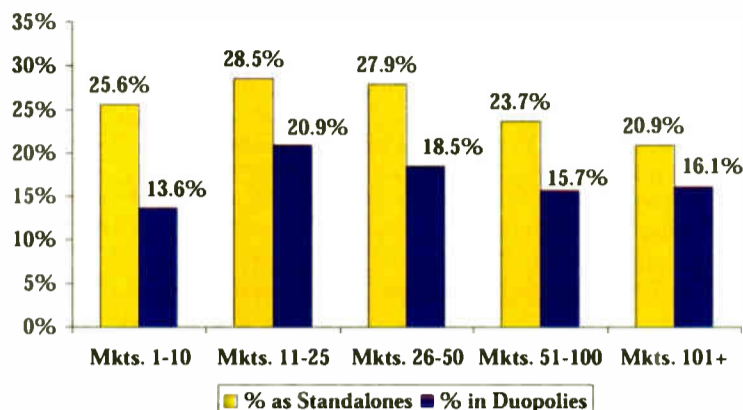
In a more than 60-page filing submitted to the commission, NAB stated, "Since the early 1940s, the commission has tried to identify specific abuses or concrete problems presented by newspaper ownership of broadcast outlets.

"Despite this effort spanning decades," continued NAB, the FCC has "consistently failed to establish the existence of any competitive or other harms caused arising from newspaper/broadcast cross-ownership."

NAB provided the FCC with ownership information on all 286 radio markets measured by Arbitron using a database from Broadcast Investment Analysts. NAB calculated how many owners are in each radio metro. In the Arbitron New York Metro, for example, 14 stations are singly owned, four group owners own two stations each, three groups own three stations each and so forth.

Nationally, 1,510 stations are the sole facility owned by an owner in a market. That's 23.6 percent of the 6,403 commercial stations operating in the 286 Arbitron

% of Local Commercial Stations that are Standalones or in Local Duopolies by Market Size Grouping



Source: Analysis of BIA Media Access Pro™ Database, Research and Planning Dept., National Association of Broadcasters

NAB said the figures show that more than 40 percent of the nation's commercial stations are either stand-alones or duopolies.

markets. An additional 1,064 stations, or 16.6 percent, are part of a two-station group within the market, called a duopoly.

NAB said the figures show that more than 40 percent of the nation's commercial stations are either stand-alones or duopolies. In 1999, that figure was 50 percent, said NAB. Yet, "It remains the case that a large number of stations in

Arbitron markets are 'independent voices,' in that they represent the only radio outlet, or one of two radio outlets, controlled by the same owner in the local market they service," stated NAB.

Reply comments on cross ownership and the related waiver policy, MM Dockets 01-235 and 96-197 respectively, are due Jan. 7.

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Clayton

► Continued from page 1

stepped down in October and is now a non-executive chairman.

Sirius has picked consumer electronics veteran Joseph Clayton, 52, as its new chief executive officer. He has been involved with product launches for Thomson Multimedia's RCA, ProScan and GE brands of consumer electronics. Clayton helped develop and launch consumer equipment for satellite-to-home television service DirecTV. He's also a former chairman of the Consumer Electronics Association.

Clayton spoke with Radio World News Editor/Washington Bureau Chief Leslie Stimson about the challenges of the Sirius rollout.

RW: You were involved with the launch of DirecTV as executive vice president of marketing and sales for the Americas and Asia for Thomson Multimedia. Are there similarities between that launch and this one?

Clayton: In 1994 we launched the hardware, the RCA brand built by Thompson Electronics. Hughes did the content and the satellite launch. So it was a combination of the three, along with USSB (U.S. Satellite Broadcasting), which also had content. I expect a lot of the same characteristics to apply. ...

For example, we went with a regional rollout for satellite TV. That is exactly what Sirius will do. We will go in three phases. The first phase, we've identified those markets: Denver, Phoenix and Houston.

At the Consumer Electronics Show we'll identify phases two and three. ... In those test markets, we will vary different types of consumer offers. We will look at price sensitivity, both on a monthly basis and on a full-year basis, or even multiple years. We will also look at different types of media, whether it's newspaper, broadcast, regional magazines or even billboards. ...

We'll also look at different creative approaches to our advertising message. That's what you do when you do regional rollouts or test markets. We will fine-tune our message to the buying public as we launch the balance of the markets in mid-year. ...

RW: What's your first order of business?

Clayton: The first thing you always have to do is understand the strengths and

capabilities of your people, of your human resources and what gaps you might have from a technical or a commercial standpoint. I'm in the process of doing that.

RW: What changes might we see in the executive roster?

Clayton: You can assume I will probably be bringing in some people who were involved in the satellite launch, only because there won't be much of a learning curve because they've done this before just as I have. I'm not talking about wholesale changes. Where we have gaps we will fill.

RW: What kinds of assurances have you made to Sirius investors?

Clayton: I am going to drive the shareholder value up, because that's what I'm paid to do as CEO of the corporation, to make the maximum use of available resources. ...

You build shareholder value by building your asset base and your cash flow. If you do that, that will drive your share price; and additional investors, or even

chips, they all mean the same thing, to bring the cost down.

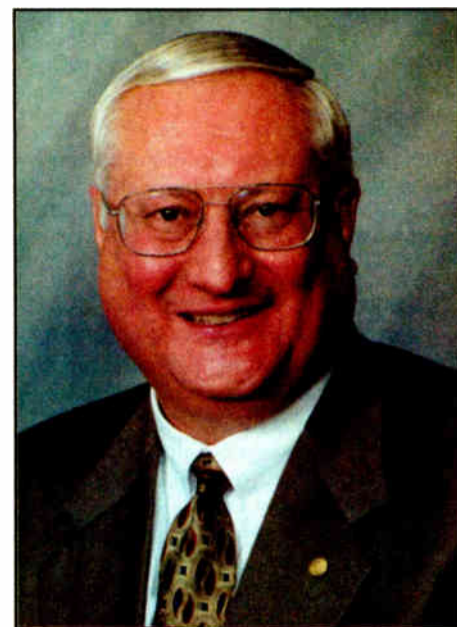
We will have a plan to cost reduce both the receiver and the chipset over the next several years. We're working on getting generation one out now, generation two out yet this year from a sample standpoint, and then generation three the following year, 2003.

RW: Is it possible Sirius might bring its chipset development in-house given that it has taken Lucent so long to get it done?

Clayton: I won't be specific, but we're going to do it differently. I'm probably going to bring in some experts that I've used in the consumer electronics business for many years. That doesn't mean that might not be R&D houses, consultants or full-time employees. It will probably be a combination of (all three.)

RW: So, a different kind of team overlooking chip manufacturing...

Clayton: In retrospect, this was a great satellite team, but I'm not going to say we had the proper resources allocated to the consumer electronics portion of it.



Joseph P. Clayton

Clayton: That will be a challenge. We have some lined up and will detail more at CES. Are we going to make all of the product lines in 2003? No, nor is anybody else. (Editor's note: BMW will offer Sirius radios as an option on some models in 2002 and Porsche plans to offer both Sirius and XM radios as options in 2003.)

RW: When David Margolese stepped down as CEO, there were rumors of Sirius possibly being sold to GM, CBS/Infinity, XM, etc. Is it possible Sirius would be on the block?

Clayton: As a CEO, our job is to enhance shareholder value and if there was to be something that would significantly increase or enhance or maximize the value of the company, we have a fiduciary responsibility to consider that. But I don't believe that's a very likely scenario at this particular point in time.

RW: In relation to your launch in February in those three markets, is network radio still a possibility as part of your advertising? Some radio groups are rejecting those ads.

Clayton: I can tell you I've already lived through that. You know, when I launched satellite TV, CBS wouldn't run my spots and we were the sponsors of the NCAA college basketball player of the year. They wouldn't run my spots. ... It didn't last very long, and this won't last long either.

RW: What's your favorite channel?

Clayton: I love the bluegrass station. I'm from the great commonwealth of Kentucky. 🎸

'Maybe we underestimated the job that needed to be done in getting the boxes out.'

existing investors, will want to contribute more money as we ramp up the volume of this out into 2003, 2004 and beyond.

Our ramp-up will be second-half driven as we roll out in logical phases in the first half. The ramp up that (XM) will have in a tough economic environment, as will we, makes it much more difficult than say, two years ago.

RW: Last year at CES, Sirius said it had eight chipsets in its receivers, being produced by Agere Systems, formerly the microelectronics group of Lucent Technologies. Have you managed to get that number reduced?

Clayton: Chipset normal connotes multiples. There are eight integrated circuits in the initial product and four memory chips too. In any consumer electronic product, you want to minimize the number of integrated circuits or semi-conductors or

RW: Sirius had the studios done and the satellites up, but on getting the receiver product at the other end, that's where the difficulty came.

Clayton: I maintain they got the hard part right, getting satellites up and functioning. Maybe we underestimated the job that needed to be done in getting the boxes out. There's a team in place now that knows how to do that.

RW: You're going to start your rollout in February, so you'll have receivers out in the marketplace, in volume, this summer?

Clayton: We will be at critical mass in the summer to fill in the other markets that we've missed ... We're going to hit most of the major metropolitan markets in the rollout.

RW: Does that give you enough time to get any receivers in '03 model-year cars?

Public Service Announcement

The BlueBox is a new POTS codec from Comrex. This codec delivers the audio quality of our Matrix and Vector codecs (15 kHz on a standard dial-up line) at the entry-level price of our HotLine, just \$2800. It also adds features such as wireless operation, field upgradability, and a cellular hands-free interface, and remains completely compatible with all our POTS codecs.

Since the HotLine is so popular, we decided to provide a "heads up" in advance of replacing it. To this end:

- 1) The BlueBox will begin shipping in February 2002, and the HotLine will be taken out of production.
- 2) We'll continue to support the HotLine for many years to come.
- 3) If you can't wait for the BlueBox, you can buy our remaining HotLines at the new price of \$1995 (while supplies last!)

We at Comrex hope this helps. If you want to talk about the options or try a demo of any of the Comrex codecs, give us a call at 800-237-1776.

If you want a small 15 kHz POTS codec that can also work on wireless circuits but only want to pay \$2800, you can wait and buy the BlueBox in February.



Choice A
The BlueBox: \$2800

Choice B
The HotLine:
\$1995



If you need a POTS codec today, if 7 kHz is more than enough, or if you just want to save money, you can purchase the HotLine for \$1995. But don't delay, there is limited stock available.

Technical

► Continued from page 3

Media Center, anticipates he'll have a lot of broadcasters looking for space to set up shop.

"We don't have a 'radio bay' as such," Iverson said. "But we're finalizing plans for high-speed Internet access, ISDN and telephone service from the Media Center for broadcasters who may need space."

Who goes?

Many stations around the country are still deciding whether to send staff, but the events of Sept. 11, the 1972 attacks on Israeli athletes at the Munich Olympics and the bomb blast at the 1996 Atlanta Games are causing news directors to rethink their plans.

For such non-rights-holding stations that may want reporters or staff to attend, the Utah Media Center is the place from which they will operate.

Mario Hieb, radio frequency coordinator for the games, said no RF devices will be permitted in the area unless they have been registered and certified. All accredited users, rights-holding broadcasters and National Olympic Committees must certify their RF equipment at the Main Media Center or the Olympic Village. All non-rights-holding broadcasters, non-accredited users and sponsors must certify their RF equipment at 2451 South 600 West, Salt Lake City. Certification begins on Jan. 25.

Visiting broadcasters who need frequency coordination should apply on the Web at www.slocfrequency.com.

No uncertified RF devices will be allowed within 100 km (62 miles) of any Olympic venue once the games start. The FCC plans to enforce violations strictly throughout the Olympics. ●



Photo by David Quinney

The Utah Olympic Oval in Kearns, Utah

The only big difference this year is that we'll have virtually no analog equipment.

— Conrad Trautmann

KSL(AM), a Westwood One affiliate, and KSL(TV), an NBC affiliate, both in Salt Lake City, will benefit from their affiliations and their proximity to the Salt Palace Convention Center. They are located directly across the street from the main broadcasting facilities.

KSL field reporters can access the venues, use Sony MD recorders for audio, edit on ENCO DADpro workstations and provide Salt Lake City listeners with reports on the games.

"As an affiliate, and the local radio rights-holder, we have passes for the entire venue," said Randy Finch, assistant chief engineer for KSL.

Please note

The *Matrix* with its modular design is available if you want the ultimate in flexibility and future-proof ability.

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Olympics

► Continued from page 1

say the global stage offered by the Olympics makes it a terrorist target.

News organizations such as ABC Radio, CBS Radio, National Public Radio, Associated Press Radio and major-market radio stations that can afford to send reporters have spent months preparing.

"Because of the very real possibility of a major news story breaking out, we will not only have correspondents on hand to cover the scheduled sporting events, but also in place to cover the unexpected," said Chris Berry, ABC Radio VP of news.

Berry said ABC News Radio will send correspondents Tim Scheld and Steffan Tubbs to Salt Lake City to anchor news reports and update hourly newscasts. ABC

Radio has built its primary broadcast position at the media center at the Salt Lake City Expo Center.

ABC Sports Radio also will be providing its affiliates with hourly Olympic updates, Berry said.

CNNRadio will focus its coverage on both news and sports. The radio network will send its own people to Salt Lake City, but it can pull reporters from the cable operation if needed, said Robert Garcia, vice president of CNNRadio.

Not just sports

"It's paramount we have the people in position to carry out coverage in the event anything extraordinary happens. I hope it's a boring Olympics from a news point of view and just the games take center stage," Garcia said.

Garcia noted that 2002 is the 30th anniversary of the Munich Olympic Games

when Arab commandos stormed the Olympic Village and killed 11 members of the Israeli Olympic team.

The 1996 Atlanta Summer Games were also a terrorist target. A bomb blast in Centennial Olympic Park killed one and injured more than 100 people.

"People can recall the coverage of the Munich tragedy very vividly. As a news organization it's vital that we make preparations not to be caught short," Garcia said.

National Public Radio will cover Olympic sporting events and human-interest stories. NPR will send reporters Howard Berkes and Elizabeth Arnold along with sports correspondent Tom

Goldman to Salt Lake. The trio will provide updates for NPR's top-of-the-hour news reports and also produce longer stories to air during regular programming.

"The goal of our coverage will be to tell interesting stories about the athletes and their countries," said Uri Berliner, sports editor for National Public Radio.

The events of Sept. 11 certainly brought a new awareness to safety issues and security concerns at the games, Berliner said.

Having the games "domestic" in 2002 should make them easier to cover, said Wally Hinds, assistant managing editor for Associated Press Radio. In Sydney, broadcasters faced the challenge of a 15-hour time difference at the 2000 Summer Olympic Games.

"I think that gave added value to radio coverage in Sydney because we could provide real-time updates when television was tape-delaying everything," Hinds said.

Hinds said AP Radio will provide its affiliates with 60-second "Going for the Gold" updates twice an hour. Mike Gracia and Jack Briggs will host the programs.

"We did not adjust our plans for Olympic coverage after Sept. 11. We have always thought that the games transcended sports. We go about our coverage as if it were any big news event," he said.

News-talk stations fine-tuned their Salt Lake City coverage plans in the final weeks of December.

Program managers at KIRO(AM) in Seattle, WBAP(AM) in Dallas and WINS(AM) in New York said they were still considering sending reporters. Other stations contacted cited the slowing U.S. economy and drop in advertising dollars as reasons for not sending news staff to the games. Most said they would rely on their respective network's coverage instead.

Peter Casey, director of news and programming for Infinity's WBZ(AM) in Boston, said the news-talk station will draw upon the resources of CBS Radio's Olympic coverage and possibly hire several free-lance reporters to file audio from Salt Lake City.

"I think there is a renewed sense of patriotism in this country that will generate a lot of interest in the games. I'm sure the security angle will be covered in great detail, but I think once things start, the sporting events will become the main story," Casey said.

Calling itself the "official" radio station of the 2002 Winter Olympics, KSL(AM) in Salt Lake City has the advantage of having its broadcast facility right in the heart of the games.



2002 Olympics Paraphernalia



Salt Lake City Mayor Deedee Corradini waves the Olympic flag after it was presented to her by Juan Antonio Samaranch during the XVIII Winter Olympics in 1998 in Nagano, Japan. The flag will fly over Salt Lake City until the end of the 2002 Winter Olympics.

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Listening In on Uncle Sam

With the Right Equipment, You Can Hear America's Defenders in the Skies Above

by Gary Palamara

"Bright-Star, Bright-Star, Right Foot on Yellow twenty?"

"Bright-Star go ahead."

"Yes sir, request base plus two?"

"Affirm, Toaster will meet you on Victor. Track two-four-seven west at Wrestling. How soon, Bingo?"

"Plus one-point-five."

"Click, click."

After years of listening to conversations just like this on my multiband radio scanner, I'm still drawn to the excitement and intrigue of monitoring military aircraft transmissions.

Puzzle in the sky

What does it all mean? Who is saying what to whom? Where are these folks flying, is this a practice exercise or is something really going on? Are we safe? It's a giant jigsaw puzzle in the sky.

You can listen in as your U.S. air forces endure the long hours of constant training above the skies of America. Usually they are practicing clandestine missions for unseen emergencies and homeland defense, all the while knowing

that someday the emergency may arrive.

Meteorologists who report on the weather for our nation often compile a list of top 10 weather days for the year. Bright sun, low humidity and calm winds with moderate temperatures figure into the mix for making the "best days" pick.

Tuesday Sept. 11 was such a day in the north-eastern part of the United States. Who among us could have imagined that a day dawning with such promise would become the darkest moment in American history? Only a handful of self-proclaimed religious zealots knew what was about to unfold as the day began. Soon the entire civilized world would be rocked by the actions of a few.

Most of us will remember where we were when we heard about the attack on America. For the men and women of our military this wasn't a drill. War had

come to our shores not from without, but from within. This time it was the real thing.

As westbound jetliners began diverting from their filed flight plans, F-15 Eagles from Otis Air Force base just north of Falmouth, Mass., and F-16 Falcons out of Langley Air Force base Hampton Roads, Va., headed north and south to intercept the stray aircraft.

Despite closing at near-supersonic speeds, the Otis F-15s were still 70 miles



AWACs at work: The Air Force E-3 Airborne Warning and Control flying command post is distinguished by its rotating radome, which contains aerial surveillance radar. This one is at McGuire Air Force Base.

north of Manhattan when the second jetliner hit the World Trade Center.

Although the F-16s from Langley also arrived too late to prevent the carnage at the Pentagon, once on station, both groups would patrol the skies indefinitely. President George W. Bush issued the unprecedented order to shoot down any aircraft that further threatened America. Less than 90 minutes later all commercial air traffic was on the ground nationwide.

Commercial airliners across the country were replaced with armed jet fighters, KC-10 and KC-135 tanker aircraft for refueling, as well as E-3 AWACs flying command posts. The entire military establishment was at highest alert status.

In the New York area, news helicopters covering the morning traffic were not permitted to return to the air. A no-fly zone extended around lower Manhattan and the nation's capital.

Along the East and West Coasts of the United States, military surveillance extended miles out to sea as pilots scrutinized everything afloat along our boarders. A boat that came perilously close to an ocean liner several miles off Atlantic City, N.J., was buzzed repeatedly by F-15s. Upon investigation, the second vessel was identified as a Coast Guard ship.

In the uncertain moments after the attack on America, everything was suspect. For those with the capability to monitor aircraft transmissions, the chatter was non-stop as the nation and indeed the world struggled to comprehend the magnitude of the crime.

Altitude matters

Monitoring the military in peacetime can be a fun and interesting pastime. Listening to radio chatter during warlike conditions takes on a new perspective. For those in the news business, monitoring military activity can give us insight into what is really going on around us.

Commercial aircraft generally operate within the VHF spectrum, at frequencies between 108 to 137 MHz. Most typical police and fire scanners will also cover this commercial band.

Military aircraft are capable of operat-

ing within both the VHF and UHF bands. Because the military are many times within the same airspace as commercial jetliners, its planes have the ability to simulcast on both the civilian and exclusively military frequencies. Transmissions almost always use AM as the mode of operation.

Signals within the VHF and UHF spectrum travel in a line-of-sight manner and generally are limited to the curvature of the earth, a distance of approximately 20 to 30 miles.

In a newsroom while monitoring local police and fire frequencies, the occasional adjacent city transmission might be heard when conditions permit.

Newcomers to aircraft monitoring often are surprised as to the long-distance reception range afforded by airborne transmissions.

Aircraft are heard over extremely great distances because of their altitude. As high as 35,000 to 40,000 feet, aircraft transmitters cover vast distances.

From my listening post in central New Jersey it's not unusual to hear aircraft in flight from Boston to Washington and as far west as Pittsburgh.

Like any activity, aircraft and military communication has a language all its own. The more you listen, the more intuitive you will become as to what is really happening in the skies above you.

Some conversations are routine and straightforward, but there are times when security matters. Because aircraft radio waves cover such vast distances, and with transmissions plainly within earshot of millions of ground-based listeners, the military has two options for clandestine radio communications.

For total security, the obvious answer is to encrypt all two-way radio transmissions and make them unavailable to anyone without a need to know. While the use of encrypted transmissions by routine military aircraft has never been officially confirmed, it's reasonable to assume that if radio encryption capability doesn't already exist, it will someday.

Foxtrot Tuna Flipper

Totally encrypting all radio transmissions, however, poses a problem when the need arises to interface with civilian ground controllers and other commercial aircraft.

The second security operation involves the legendary use of tactical call signs and codes to evade and confuse those of us who mean no harm, as well as those who do.

Coded messages offer the most interest for the casual radio listener.

"Poker Three Two. Tuna?"

"Go Head, Tuna."

"Heads up, Flipper 88, one-twenty tracking north east, estimated two zero."

"Roger."

"Click, click."

Although it sounds like standard American English, it's difficult to comprehend what is being said and by whom. Even if you think you know what's going on, chances are you'll never know for sure. And that's the idea. Even if you figure out who Tuna is today, chances are they won't be Tuna tomorrow.

Training and now homeland security flights are not the only military scanner action within earshot of anyone on the ground.

The flagship of the Air Force inventory is the Boeing 747 commonly known as Air Force One. Actually there are two 747s. They are called Air Force One only

See LISTENING, page 18 ►

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At Ease... with Radio Systems Millenium Consoles

by
**Grady Moates, owner
 Loud and Clean**

Boston, MA: I'd have to answer the question, "Why have you installed so many Radio Systems consoles?" with the simple phrase, "I'm lazy!" My goal, as a contract engineer, is to specify and install equipment that addresses all the needs of an on-air or basic production studio efficiently and inexpensively, while minimizing my time spent, both during and after installation. The centerpiece of most of my studio designs is a Radio Systems console.

The Radio Systems RS-12 has been the "easiest to install" console I've ever worked with, and the new Millenium series builds on that reputation with unparalleled control surface reliability.

Planning is a breeze, because you can put any combination of input levels anywhere on the console, and you never have to build an attenuation pad. Never. Microphone level inputs, line level inputs, consumer level inputs and even those pesky "lower than consumer but higher than mic level" inputs can all be intermixed on any fader in the console using only gain jumpers and plug-in headers to set levels. Remote control is equally simple because all basic remote control functions are built into every fader, with sophisticated programming choices just a jumper plug away.

Building renovation is easy to accommodate as well. I've moved complete studios centered around Radio Systems consoles, breaking them down and rebuilding them in another room with all functions restored, in 6 hours. As a matter of fact, I've done it twice in the last 3 months.

Service is another area where I save time with Radio Systems consoles. I've got full access to everything in the console with a swift lift of the hood. The new Millenium series uses

soft-urethane buttons that press conductive pads directly onto gold-plated contacts on the circuit board, with well-designed seals to prevent moisture and dust from contaminating the contact area. Lamps have been replaced with LEDs, which may need to be replaced someday, but I've never had to replace one. Faders, potentiometers and headphone jacks are just about the only interface components that operators can still kill, and they can be replaced in 5 minutes, with the power on, using only an Allen driver and a nut driver. There are Millenium consoles that were installed 3 years ago that I've not had to touch since installation. Install'em and forget'em, that's what I say.

Millenium consoles offer excellent audio quality. From Classical to Rock to Folk to Blues to Oldies to Talk to Foreign Language, the Millenium console does the job clearly, quietly, consistently, and inexpensively.

There's one other reason for specifying Radio Systems consoles, and that's customer satisfaction after installation. It's reassuring to see customers with one Radio Systems console purchasing a second one. Then a third one. Then a fourth one. In a conversation I had just the other day, Rob Landry, the Chief Engineer for WCRB/World Classical Network, who uses four RS-12's and an RS-18 said to me, "I'm ready to build new studios at one of our other stations, and I can't think of a single reason to buy anything other than Radio Systems."

I guess he's lazy too.

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PRODUCT EVALUATION

FreePlay Wind-Up Radio Improves

by Charles S. Fitch, P.E.

The extraordinary FreePlay radio, which has been reviewed in these pages before, now is available in a range of flavors, including the newest model the FreePlay Plus.

The radio is the brainchild of inventor Sir Trevor Baylis. Watching a documentary on the HIV plague in Africa, he realized radio could help in the task of getting AIDS information to the indigenous population and reinforcing its application for prevention.

He realized that a radio using a windup generator would work anywhere that people could turn the crank.

The essence of cost-effectiveness, the original FreePlay had only the windup generator as a power source and a no-frills receiver. Its target was a citizen of an emerging nation with very limited funds.



The FreePlay Plus is shown with its antenna up and its light nesting inside it on the picnic table.

Since then, new models have been introduced satisfying different needs and a more upscale clientele such as the trekker, outdoorsman and survivalist.

The FreePlay Plus has useful enhancements. Most notable is the inclusion of a solar cell as one of three power sources.

The FP+ also has NiCad batteries to reservoir the input power regardless of source. These can be charged by the solar cells, the windup generator or an external supply such as a plug-in wall-wart or car charger.

In the light

An LED "flashlight" powered by the FP+ is another notable improvement. The flashlight has a six-foot cord with a magnet on the back to provide mounting flexibility.

The light is held by the magnet in a side nest near its separate on/off switch. The user can hold the radio's handle, turn on the light and aim it like a regular flashlight.

The light head plugs into a DC outlet in the nest, which makes for easy connection of extender cords in case you would want to extend the light or use the unit as a 6-volt power tap for other gear.

The six-foot cord for the light is niftily inside the light head in a scheme reminiscent of winding up one of those little travelers' shortwave antennas.

The radio receives AM, FM and the most popular section of the SW band, 3 to 18 MHz. Although the headset jack is wired conveniently as a mini stereo to allow the use of stereo headsets, the audio is mono.

FreePlay radios are made in South Africa and, at last report, GE owns a portion of the firm that makes them. Ours was purchased on the Web from C. Crane at www.ccrane.com. We were lucky enough to discover a sale in progress and paid only \$99.99 including shipping.

The manufacturer claims a little over 5 pounds in weight. Most of that is the sturdy crank spring generator and the NiCads. My unit had an integral fixed carrying handle, needed to stabilize the radio when you crank the windup generator, and was finished in flat black plastic. The warranty is for one year.

About a year ago, we published a series on lighting for your radio station as part of our usual NEC column. We predicted that LEDs soon would make their way into the

general lighting arena as a power-efficient substitute for task-level incandescent.

Here in the FP+ we see one of the first applications of LEDs in this manner. Although the instructions state that output of the three long-life, rugged LEDs in the "spotlight" is only the equivalent of a single candlepower, it will help you locate big objects and keep you from injuring yourself caused by bumping into these big objects.

The radio is the heart of the unit, and in keeping with the FreePlay keep-it-simple philosophy, tuning is by knob with a mechanically driven pointer on a horizontal analog dial.

The wide range of the two shortwave bands means that the main knob station tuning is critical. The FP+ gets around this by having a SW-only fine-tuning, "band-spread" knob that seems to be about 50 kHz wide.

The dial is not lighted or fluorescent. You turn on the light, pull out the head and shine it on the dial if you need to operate in the dark.

Reception

The AM section has an internal ferrite bar antenna (rotate receiver for strongest signal) and a whip antenna for FM and shortwave (rotate antenna for strongest signal). External antennas for FM and SW are just clipped onto the end of the whip.

Sensitivity is good to excellent on all bands, but selectivity and rejection leaves much to be desired. When we tried it, TV stations and 50 kW Class B FMs on nearby Avon Mountain popped up in multiple places, as did co-located WTIC(AM) on the AM dial.

By clipping our test HP generator's output signal directly onto the whip, we were able to measure approximate sensitivity which at midband on SW 1 (5.22 MHz) was 56.2 μ V (-72 dBm) and similarly on SW 2 (11.94 MHz) was 22.4 μ V (-80 dBm) for full quieting. On FM at 99.3 MHz, full quieting was achieved in mono at 70.8 μ V (-70 dBm).

Because no external antenna input is available for the AM section, the best testing alternative I could devise was to tune in a distant station and then compare this to the field intensity level for that station. Here in Avon, Conn., Rochester station WLGZ at 990 kHz was easy to listen to with an FIM reading QSBing (varying in strength) between 0.4 and 1 mV/m as was WTOP from Washington at 1500.

Sound quality from the 4-inch speaker and on my Koss headset seems remarkably good, especially on SW where, for instance, Deutsche Welle during the day around 15 MHz sounded like a local, with warm, pleasing and intelligible tone and response.

The solar cells do a great job of charging the NiCads, which played at least 4 hours through a pleasant evening for me listening to Radio Bulgaria, Radio Rumania and other sources. The cells are mounted permanently on top at a slight angle conducive for window charging. You should however crank it the full 60 winds if you want to relax for any length of time when the batteries are dead.

The best ideas are the simple ones. The windup generator in these FreePlays is a beautiful and near-perfect example of that concept. Trevor Bayles deserved to be knighted just for that.

The one in this unit required about 30 seconds of modest, steady torque to



The wind-up crank provides power.

wind tightly; the generator ran back smooth and noiseless.

You can listen and charge at the same time on the 6-volt AC power supply. Make sure whatever supply you select is well-filtered or you'll hear hum in the background.

Suggestions for the next version: add an external antenna input for at least SW and improve the overload capability.

I would love to make the light cord do double duty as a long-wire SW antenna, because it has that wind-up feature. Most Chinese-made radios use an audio chip that provides FM stereo to the headset and I think this would be a small cost improvement.

This is a useful and fun radio for outdoors, isolated locations and emergency use or as a discussion/conversation item. For emergencies, one can keep it charged and ready to go by just leaving it where the sun shines on the photocells for a few hours a day.

Buc Fitch writes frequently in Radio World about the National Electrical Code. 

Christina in Ghana

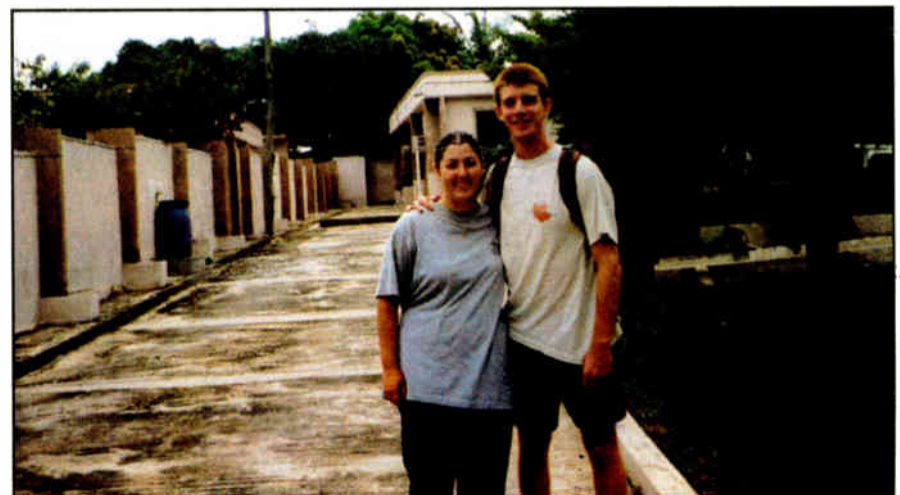
My daughter Christina is in the medical school at Yale studying for her masters in public health. When the opportunity came to go to Ghana to research the modern role of the traditional birth attendant, the African version of a midwife, she jumped.

She took our Grundig Yachtboy 400 to listen to the BBC and VOA to stay abreast of the world situation. Thanks to a good supply of batteries, shortwave turned out to be her "window to the world." Even some locations with power infrastructure were without power for days at a time.

Fellow Notre Dame graduate Chris Kusak accepted an assignment with the Peace Corps to help with an economics project in the great outback of Ghana. Chris tells us that although folks in his village have the poles and wires for power, they haven't had juice for months.

Christina and I decided that Chris needed a FreePlay Plus. We obtained one for him and tested it for this review before sending it to Africa.

Chris has promised to send us a picture of it in use and give us a field report. When he leaves Africa, the radio will stay in Ghana; he intends to give it to a nearby birth clinic.



'Domers' Christina, KB1CRW, and Chris Kusak in Ghana, West Africa

Encore!

The Telos Zephyr is one tough act to follow. It revolutionized point-to-point audio by combining ISDN with MPEG coding, and quickly became the #1 selling codec worldwide — perhaps the most successful digital broadcast product ever. So what will we do for an encore?

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And of course Zephyr Xstream includes everything else you'd expect from a Zephyr, like Layer-II and Layer-III coding, ISDN connectivity, a simple, friendly user interface, and bulletproof reliability.

Zephyr Xstream. Sometimes the sequel is even better than the original.

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Better FM Coverage, Within Reach

Consultants Culver, Markley and Dawson Share Ideas on Antenna Pattern Studies and Parasitics

by Richard J. Fry

How can you get the most out of your FM antenna system? To provide some insight into this subject, three prominent broadcast consulting firms were asked to respond to 15 topics about FM antenna performance. The first responses were printed in the Nov. 21 and Dec. 5 issues. The next are shown below, and the rest will follow in future issues.

The participants are Ben Dawson of

Hatfield & Dawson; Bob Culver of Lohnes & Culver; and Don Markley of D.L. Markley & Associates. Note that any consultant would need specific site and application information to provide an accurate recommendation for a given situation.

Topic: Value of pattern studies at antenna OEM test range:

Culver: Pattern measurements ("studies" is too vague a term, it could mean

anything) can *only* be done on a test range as part of the manufacturing process.

It could be done after the antenna is built, in full size, but that is difficult. It is easier, less costly and used as a pattern development tool to make scale model measurements at about 450 percent of intended frequency.

Pattern measurements *cannot* be accurately made at any acceptable cost by any present method once the antenna is installed on the tower.

That is not to say that it will always be impossible, but no one has yet to disclose that they are using a method that isolates the antenna and its support

from nearby structures and the terrain. It can be done, we know how to do it, but the tools and procedure have not been integrated yet!

If you want to know what pattern your antenna will develop, you must make the pattern measurements on a good antenna range. Most manufacturers have them.

Markley: We recommend that the proposed antenna and tower combination be checked on a range, either full scale or modeled. This is the only way to be able to accurately predict a station's service area.

Topic: Desirability of using parasitics with a non-D FM antenna:

Dawson: An FM antenna with parasitics is not a non-D antenna.

Culver: Now we get to the real issue. An omnidirectional (non-directional) antenna is one that is inherently designed to be so. Its native pattern is a circle, or nearly so, to the point that it is considered a uniform circle for convenience.

Pattern

measurements cannot be accurately made at any acceptable cost by any present method once the antenna is installed on the tower.

— Bob Culver

This includes vertical arrays of inherently omni elements, ignoring their mounting, and panel arrays of proper size, mounting and with a feed of proper phase and magnitude to develop a circular or near circular pattern.

How lumpy can the circle be? Good question! The FCC has never adopted a definition of max/min pattern variations for omni antennas.

If you add a parasitic element to the antenna, it is not an omni. That is just my working definition and I know others disagree. You can do all the pattern work you want, try all the mounting configurations such as vertical position, spacing, angle, tower dimensions, etc. to see what the effects are and pick the one that creates the *most circular* pattern. That is "optimizing the omni pattern" to have the least harm (nulls in unwanted areas).

There is a middle ground that does the same thing, pattern tests as above, but never getting a pattern without some significant nulls. In that case the resulting nulls are oriented to have the least impact. That is the engineering of FM antenna omni pattern optimization.

Optimization as understood by the general manager, however, is different. It appears that the goal there is to get

See COVERAGE, page 18 ►

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Workbench

Radio World, Jan. 2, 2002

Past columns are archived at www.rwonline.com/reference-room

Tones to Troubleshoot AM Xmitters

by John Bisset

Engineers are perhaps the most resourceful members at a radio station — quick to save the station money, slow on getting kudos from management. It's like it's expected.

Take telephones. You may consider refurbishing your existing telephone system, especially if it's the on-air key system, rather than seek replacement. If you're planning a telco project, you'll want to use Lamar Owen's recommendation: Mike Sandman at www.sandman.com.

If it has to do with repair or refurbishing telephone systems, Mike has it. Sandman.com sells a cleaning kit that is just incredible, Lamar writes. There's also a cabling installation video that will make you bald or balder as you

keep slapping your head telling yourself, "So that's how it's done."

If it deals with phones, this is the site. Thanks to Lamar Owen of WGCR(AM) in Brevard, N.C., for sharing the information.

★ ★ ★

Speaking of "how it's done," I had to chuckle when I visited with Lewis Moore at WJNV(FM), Jonesville, Va.

Lewis works for the phone company, so you can expect the wiring will be done properly. Take a look at the lace job in Figure 1. I didn't even know you could still buy that waxed lacing twine!

Jonesville isn't the biggest town, which has its advantages. Consider the phone book. Because it doesn't weigh a

lot, Lewis was able to mount it on a cord by the telephone. Handy when you need it for reference.

The phone also is near the door, making it easy to step outside if the transmitter blower is competing with your voice on a phone call. See Figure 2.

Once, while checking over a site where I had taken over as chief, I noticed a full complement of telephone directories in an old wooden desk drawer. I was impressed at the thoroughness of my predecessor.

However, when I pulled the books out to use them, I saw that they had become mouse-nesting material. The mice had crawled into the top of the closed drawer and chewed through a good portion of the books. Fortunately, the tech manuals were in a metal file cabinet.

Lewis Moore had another piece of equipment that will make many readers of this column smile. Figure 3 shows a 3M Wollensak reel-to-reel. It still works!

I remember these from seventh-grade Spanish class: "Hola Isabel, como estas?" But I also ran across them at many radio stations. Weren't they the original ENG recorder for news reporters? Seems I remember a backpack option.

★ ★ ★

The *radio-tech* page of Broadcast.net recently had an interesting discussion on troubleshooting older plate-modulated transmitters.

An engineer was having trouble getting decent modulation and suspected the audio processor. Not so fast, the brain trust warned; the processor may



Fig. 2: With the phone mounted near a door, you can step outside and talk in a quieter environment.

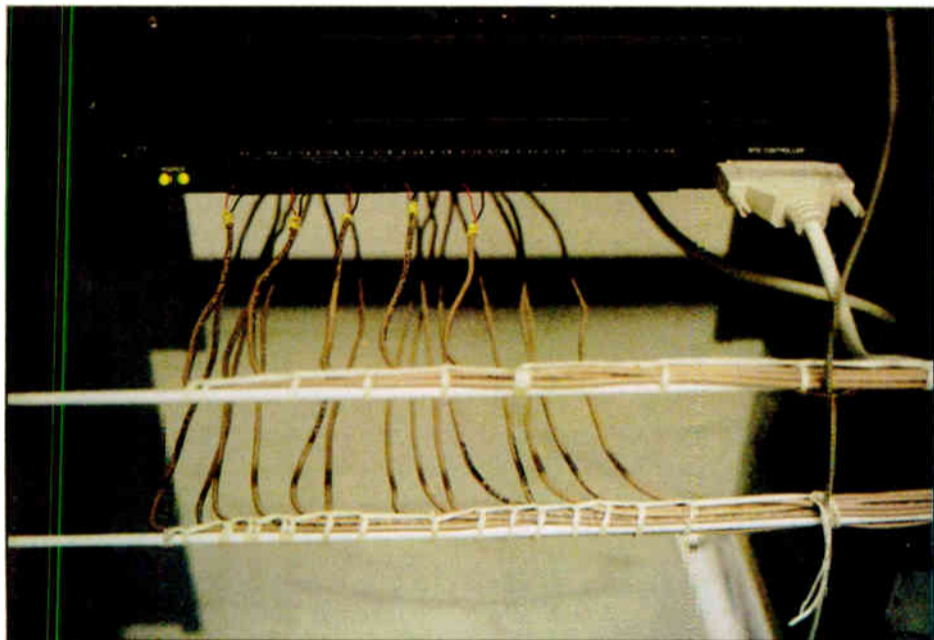


Fig. 1: Wiring at WJNV is worthy of the phone company.

be fine.

To isolate the processor, Tom Osenkowsky, an engineering consultant and RW contributor, suggested feeding a sine-wave tone into the transmitter directly, and looking at the modulation envelope with a scope.

Speaking of resourceful, Tom suggests using the test tone from an Otari MX5050 reel-to-reel if you lack a tone oscillator. Be careful about tones from other sources; they may not be pure sine waves.

Looking at the modulated waveform will yield useful troubleshooting information. For example, is the distortion on both the positive and negative peaks? Is the RF drive level normal? Are tube grid voltages normal?

See WORKBENCH, page 18 ▶

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11 Stations, One San Diego Address

by Paul McLane

Work is continuing on a facility project that is bringing 11 Clear Channel radio stations in San Diego under one roof. The project is a consolidation of four studio locations into a single, new 70,000-square-foot space, located on Serra Mesa north of downtown.

The first stations moved into the empty building shell in February 2001. The facility now houses six FM and four AM stations with 38 studios and control rooms. Another FM has yet to make the move.

SAS and Prophet

Managing the project is Kevin Douglass, director of engineering for Clear Channel in San Diego, who is advised by Al Kenyon, the company's vice president of engineering/technology, and Steve Davis, VP of engineering/capital.

Yet to be completed are a control room, four production rooms, five news booths and a performance studio with control room.

"We're at least a year away from being completely finished," Douglass said.

Douglass said the facility is home to AM stations news/talker KOGO; sports-formatted XETRA; talker KSDO and talk/standards station KPOP, as well as FM stations alternative XETRA; CHR station KHTS; oldies KJQY/KJOY; '80s format KMSX; classic rocker KGB; and rock station KIOZ.

Yet to come is "old school" station XHRM(FM).

Audio mass storage needs are being handled by a big-capacity Prophet Systems NexGen management system.

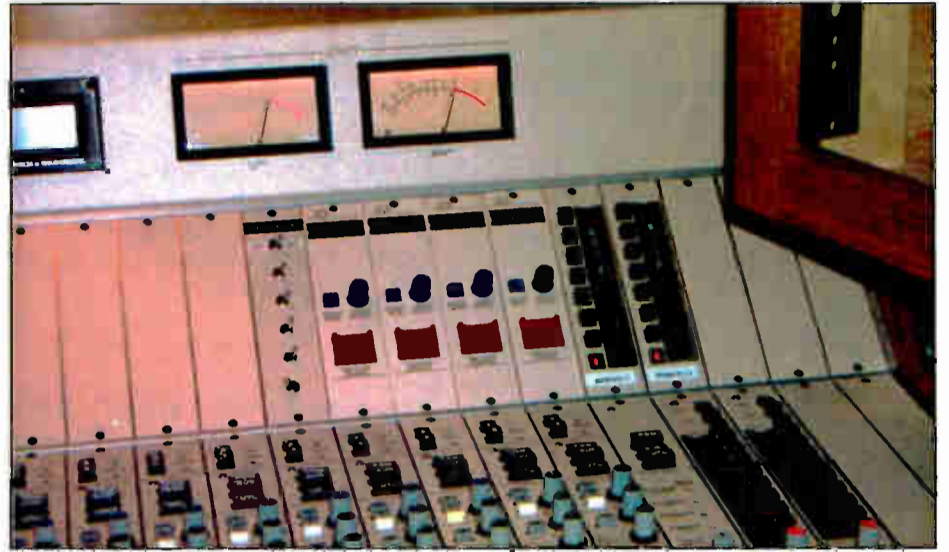
"Ours is the largest one devoted to

over-the-air radio in the U.S., and the third-largest in the world," Douglass said; the system offers more than 1 Terabyte of storage using a compression ratio of 5.5 to 1. Prophet is a division of Clear Channel Communications.

For routing, Clear Channel went with a Sierra Automated Systems SAS 64000 Audio Routing Switcher.

nationally broadcast network talk shows. These efforts have been distributed over the air locally, and throughout the nation via satellite, ISDN, POTS codec, and probably dial-up telco coupler."

Even though the plant is currently analog, the studio-to-master control and studio-to-Prophet cabling is Gepco 24-pair digital. "Analog was chosen for two rea-



Shown is a PR&E AMX console with four SAS CPI-80 panels installed.

"The configuration selected by Clear Channel has an exceptionally high packaging density: 256x192 mixed mono and stereo channels in only two frames," according to a description from SAS. "It supports analog and digital I/O and can be reconfigured to a full stereo system if the need arises. The control software allows adjacent inputs or outputs to be linked as stereo pairs and treated as one source or destination."

son," Douglass said. "First, no one could give me a rational, supportable, dollars-and-cents reason to go digital. There was no discernable return on investment for our situation here.

"Second, we can maintain and repair analog. Digital is a board swap, with the attendant cost of maintaining a sufficient stock of spare boards."

Most consoles in the San Diego facility are new or refurbished Pacific models, including BMX-II, BMX-III, AMX-34, AMX-14, ABX-26 and Integrity mixers. A Mackie 8/32 is used in the performance control room.

Prewiring

Transmitters were not part of this project. The FMs use Continental 816s. For the AM stations, KOGO has two Gates 5s as the main/alternate main plus an RCA BTA-5F backup that Douglass calls "a marvelous old beast."

XETRA has a DX-100 and a MW-100C as a backup. KSDO has a pair of Continental 316Fs. KPOP has a Harris Gates 5 with an RCA BTA-5T backup.

Moseley STLs are used, mostly analog PCL-606 and 606C models, relocated from their previous locations. There is one pair of digital SL9003Q Starlinks.

Rancho Santa Fe Technologies, a local company, is the wiring contractor. Its staff pulled and terminated cable throughout the building, including audio, control, video, data and RF.

New studio furniture was by Harris Pacific. "Scott Russell has done an outstanding job keeping the job flowing," Douglass said.

Twenty-one rooms of new furniture were pre-wired at the factory.

"It's still not 'plug and play,' by any means, but it does speed things up," Douglass said. "The remaining rooms are using existing cabinetry we sent out to be refurbished to match the new cabinets. You can't tell the difference, except when the bills come in. The savings is staggering."

What has been the toughest part of the job?

"Remaining sane," he said. ●



Kevin Douglass works near the main audio cable terminal wall.

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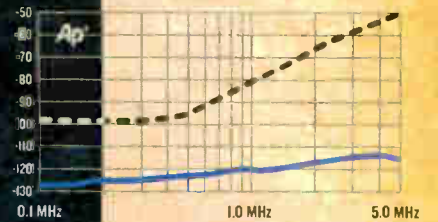
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Workbench

► Continued from page 15

What about clipping on the modulator tube grids?

If the modulator tubes have gone soft, before replacing them consider the drivers. It may be prudent to replace the tubes in the entire audio section, not just the modulators.

Coverage

► Continued from page 14

250 percent of allowed ERP toward all of the populous areas, especially that fringe city nearby.

This is where the problem arises. If you file at the FCC for an omni antenna, you just specify the vertical pattern gain, which is easily estimated based on the number and type of elements and the vertical spacing. It is approximately 0.5+ per element for circular polarization (*editor's note: for one wavelength vertical spacing of the elements*).

If you add any parasitic elements you have purposefully distorted the omni pattern and created a DA. True, you can purposefully distort the pattern with a selected mounting of the antenna, but adding parasitics makes that work obvious to the eye.

Now, if there are no parasitics used and the CP and license say omni, regardless of the resulting pattern the original antenna was omni and it can still be considered so. The FCC FM separation rules are based on an effort to avoid interference but they depend only on distance separation. If the resulting distortion creates a lot more or less ERP in some directions, the station can cause or receive more than anticipated interference.

Adding parasitic elements makes this potential very obvious, you can see the parasitic elements attached to the antenna! True, the intent may have been to "circularize" the pattern, but if the station is licensed as omni, there is no requirement to prove it is omni, there is no limitation on the "lumpiness" of the omni pattern and this presumption of circularity and minimum separation distances, but with actual excessive (or low) ERP can create cause (or incur) interference.

Markley: There is no reason to use parasitic elements on a non-directional antenna other than to correct for significant distortion caused by the mounting structure.

This can only be done on a range and must be carefully documented with before and after patterns to clearly demonstrate that the omnidirectional characteristics have been improved.

Otherwise, the FCC will consider the antenna to be directional and all calculations regarding ERP change from using the RMS gain of the antenna to the peak gain.

Richard Fry is a retired FM applications engineer with almost 35 years of service with major U.S. broadcast transmitter and antenna manufacturers. Reach him via e-mail to rfry@adams.net.

Once you've verified that the transmitter is OK, you can investigate the audio processor. Use the 'scope to verify excessive clipping or flat-topping on the output of the processor.

★ ★ ★

Another engineer complained about the loss of low end on an AM Optimod that was installed after sitting idle for a long time.

Tom McGinley, RW technical advisor and DOE for the Infinity Seattle market, writes to say he suspects the electrolytic capacitors, especially those used as coupling capacitors in the audio path, which take out the low end when they go bad.

When electrolytics sit for a long time without power, they dry up and don't form the proper capacitance when charged up again. The result is these capacitors behave like caps with a fraction of their original value.

The solution? You could buy a \$49 capacitor tester, but if one cap has failed, others are probably waiting. Tom suggests you save your time and "shotgun" the box, replacing all the electrolytics, power supply included. PC mount coupling capacitors can be found at inexpensive prices from Digikey or Mouser Electronics.

Rob Meuser adds a caution. When

you "shotgun replace" electrolytics, keep your replacements only to the electrolytic capacitors. Processors use precision polypropylene capacitors that are critical to proper filter function. Aggressive replacement of all capacitors (including the precision caps) will leave you with a non-functioning processor.

That said, if you don't have a complete manual to identify the electrolytics, download one from the Orban site

before you start.

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

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

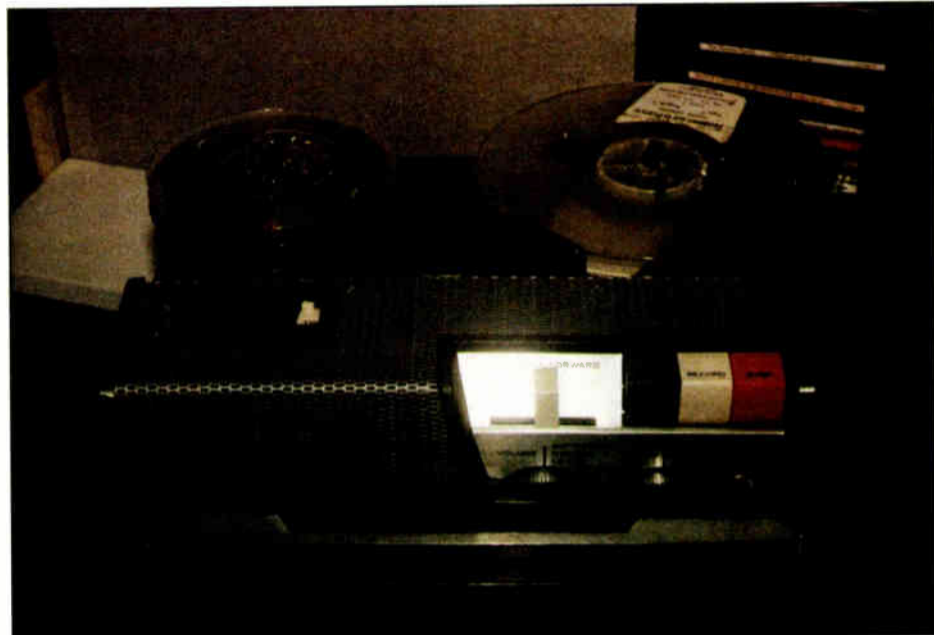


Fig. 3: This 3M Wollensak reel-to-reel is still in operation.

Listening

► Continued from page 10

when the president is aboard. You can in fact monitor Air Force One transmissions over the air.

Let me preface this by saying, in all my years of listening to the radio, never once have I heard the voice of the president of the United States on an "open" radio channel. Aboard Air Force One, the use of encrypted radio transmissions definitely exists.

An Air Force technician calling "Crown" (the White House) and using the phrase "Go secure" causes Air Force One transmissions to disappear into a rush of digital white noise, the content of which can only be imagined.

Although you may be blocked from listening to presidential conversations, there can still be items of interest and even amusement coming from Air Force One.

Flying White House

Visits to New York City by the president and other members of the former Clinton administration were routine throughout most of the 1990s. On one such visit, a half-hour discussion

ensued about the First Lady's hairdresser appointments. Another time the presidential dinner menu was discussed at great length.

While not being of any real importance, these conversations do give the listener a sense of being clued in to what's happening aboard the "Flying White House."

Whether such openness will continue in these times of heightened security is anyone's guess.

Most newsrooms have scanner capabilities to listen to police, fire and EMS. Generally only top-of-the-line units also have the ability to monitor the VHF and UHF frequencies used by the military. A list of scanner requirements for monitoring the military is listed in the sidebar.

While a complete list of military frequencies is not possible, the frequencies listed in the box at left are a good starting point.

In these times of concern, keeping your feet on the ground while you have one ear to the skies can make you better informed.

Back in the Cold War days, the old Strategic Air Command was charged with the task of defending our country against sudden nuclear attack. For more than 30 years, B-52 bombers were aloft, defending our air space 24 hours a day, seven days a week.

When the Cold War was over, SAC was dismantled and the constant aerial surveillance ended. The possibility of an airborne attack was thought to be minimal.

Our sense of invulnerability was shattered on Sept. 11. The heavy bombers of the past have been replaced by more-agile fighter gun ships, refueling tankers and flying command centers.

When a deranged man recently stormed the cockpit of an eastbound American Airlines jetliner headed for Chicago, Air Force F-16s were called on to provide a fighter escort. Presumably the fighters were in direct communications with the jumbo jet as well as ground control and an AWACS command post. The American Airlines plane landed safely at O'Hare.

As far back as the Cuban missile crisis of 1962, the Strategic Air Command had a motto that still holds true today: "Sleep tight America, your Air Force is awake." It's comforting to know they're up there — and to hear them on the radio.

Gary Palamara, AFIUS, is a radio amateur and a freelance audio engineer. He began his career with Armed Forces Radio and has spent three decades in audio and video, working as a studio and field engineer on events including the Olympics, U.S. Open Tennis, the NCAA and NBA Finals, and the Miss America Pageant. He owns a professional sound services company. Reach him via e-mail to morningstar@monmouth.com.

Scanner Requirements:

Modes: AM, FM, NFM (narrow FM)

Frequencies: 108 to 136.9750; 137 to 143.9950; 162 to 215.9500; and 216 to 449.9875 MHz.

Notes: The number of programmable channels and speed of scanning are of less importance than the reception modes and the bands of operation. If you live near a military facility you will undoubtedly find more frequencies. Specific frequencies are available publicly on the Internet, in scanner books and in FCC and FAA databases.

Two good Internet sources for scanner frequencies are:

http://maxpages.com/frequencies/National_Scanner_freqs

<http://www2.acorn.net/lists-ht/scannerlink.html>

Other sites may be found on the World Wide Web.

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As a team leader, I've learned to be happy when my team is happy. When our on-air product was suffering under a sub-standard automation system, we knew a change to something reliable was absolutely critical. We entered the process of locating such a package with a little bit of fear and trepidation because you can never be sure of what you're getting into, until you're into it. We settled on BSI's digital automation system and have not once regretted that decision. The consistency BSI has brought to our on-air sound is a 200% improvement. Being unmanned for many hours on weekdays and completely automated on weekends, we now have the confidence to walk away from the studios knowing that everything will proceed as scheduled, including satellite records and live feeds.

I've been particularly impressed with the tech support personnel. One night we had to reformat the hard drive and reload Windows. BSI's tech rep was right there with us till 2:30 am, talking as softly as she could so as not to wake up her sleeping little boy. BSI's products, despite their potential complexity, are very easy to learn and work within. And coming from the old radio tradition of manually pushing every button, that's saying something. But perhaps the greatest benefit is the affordable price. Small to medium market stations like ours need something we can reasonably get into. So now my announcers are happy, and my CFO is happy, which makes me really happy.

Loren Olson
Director of Broadcast Operations
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93KHJ: No Boss Jocks, Just Beaches

by Ken R.

What do you think of when you hear "93KHJ"?

Do you flash back to legendary talents like the Real Don Steele and Robert W. Morgan? Or Bill Drake's booming voice announcing "Ladies and gentlemen, the beat ... goes on."

That was 1965, when "Boss Radio" ruled Los Angeles airwaves. Thirty-five years later, the "bosses" have gone to the beaches.

"93KHJ" is the on-air tag of KKHJ(FM) at 93.1 on the FM dial. However, it is quite a distance from Los Angeles, both geographically and culturally.



The late Mark Gerek, KKHJ's general manager and morning man, pictured before his death with Monica Miller, KKHJ's news director.

This adult contemporary station broadcasts to about 65,000 souls on the Tutuila Island in American Samoa. About 95 percent of the population of this territory lives there.

Huh?

How did we get from "Boss" Angeles to the middle of the ocean?

"Well, you just fly to Honolulu and turn left," said Larry Fuss, president of South Seas Broadcasting Inc., the parent company of 93KHJ. "Pago Pago is about 2,500 miles southwest of the Hawaiian Islands."

About six years ago Fuss was looking out his window at a big ice storm in Mississippi, where he owns seven radio stations, and thought, "Wouldn't it be nice to have a radio station on an island in the South Pacific?"

Fuss started to keep an eye open for available frequencies and found one in his dream location: a tropical island in the South Pacific. The FCC 301 application for an FM license was filed in 1995 and granted in 1998.

Call-letter bingo

Fuss wanted to name his station after the original KHJ(AM), Los Angeles. He had secured 93.1 MHz on the FM dial, so he could use that part of the original "93KHJ" tag line, but his quest for similar call letters proved complicated.

His first choice was KKHJ(FM), but because the original station was then assigned KKHJ(AM), Fuss was denied.

In early 2000, the commission allowed KKHJ(AM)'s current owners, Liberman Broadcasting Inc., to take back the station's original KHJ(AM) call letters. Then the commission granted Fuss his cherished KKHJ(FM).



Shown is the view just outside the 93KHJ studios.

Fuss traveled to his island paradise to do a little research just before the construction permit was issued. He found the island underdeveloped. In fact there was so little commerce that Fuss said he had second thoughts about starting a radio station there.

"It was all 'mom-and-pop' businesses and they didn't even have a McDonalds," Fuss said. "But by the time the CP was granted, I had already told my friends

See SAMOA, page 22 ▶

COLE'S LAW

The Non-Com Auction Conundrum

by Harry F. Cole

Accumulated monthly activity reports from the Cole's Law Unit for Monitoring Auctions — code name: "The Thurmans" — showed almost no work for about two years, so we decided to investigate.

After all, Congress authorized broadcast auctions back in 1997. The FCC supposedly got the broadcast auction ball rolling a year or so later, at which point boatloads of FM channels were already allotted and ready to be gavelled-off to the highest bidder.

Why, then, should the Thurmans be sitting around playing computer solitaire all day, with no broadcast auctions to monitor?

Yes, the commission did adopt broadcast auction rules in 1998 and it did hold at least one broadcast auction a year later. But that auction was "closed" — the only bidders eligible were applicants who had filed for channels years before and whose applications had been caught in the 1994 "freeze" on comparative hearings.

Capitol Hill

What about all the channels that have become available since the "freeze" was announced?

The answer appears to lie in one and possibly two court decisions from last summer. If you look at those decisions, you will find that the answer lies with Congress.

In enacting legislation authorizing broadcast auctions, Congress took pains to carve out an exemption for noncommercial applicants. Congress specifically provided that the competitive bidding process shall not apply to licenses or permits issued to noncommercial applicants.

Insofar as channels (FM or television) reserved for noncommercial use are concerned, that exemption caused no problems. The exemption merely meant that channels reserved for noncommercial use would not be auctioned.

(The exemption did create a special problem for such channels, as it required the commission to

See COLE'S LAW, page 27 ▶

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Samoa

► Continued from page 21 about this project and I was in too deep to turn back.”

There were some advantages to such an underdeveloped market that Fuss soon recognized.

“There was only one station on the air down there, and they played a hodgepodge block format, which is still what they do,” said Fuss. “We put on a professional adult contemporary format which worked out well.”

A Samoan named Smitty Lutu asked Fuss if he needed a local contact to help get the station running. Lutu had some radio experience and Fuss hired him to help launch the station. Although he no longer is involved in the day-to-day operation of KKHJ(FM), Lutu is vice president of South Seas Broadcasting.

93KHJ began operation on May 1, 2000. Fuss kept expenses down, bracing for a hard economic start, but was surprised to find more opportunity than he had imagined.

Island sound

Only being able to afford three station employees, Fuss realized that hiring a full-time air staff was out of the question. So he turned to a service provided by ABC Radio Networks in Dallas called LocalMax.

Texas talent voice-tracks the shows while the music resides on a hard drive in Samoa. The announcers cross the

Pacific Ocean via the Internet because Samoa is not within satellite range.

Fuss allowed one exception to voice-tracked talent: the late morning man and general manager, Mark Gerek.

“We had a live local morning show which was a huge hit here, but our 45-year-old morning star met with a scuba diving accident and died last August,” Fuss said. “We plan on having a new local morning host very soon.”



Smitty Lutu helped launch KHJ.

Until he finds a new morning man, Fuss will continue to use the ABC voice tracks for all dayparts at KKHJ.

Fuss travels to his island station from his home in Cleveland, Miss., several times a year, spending a week each time. He still enjoys the local culture that he describes as having a slower pace of life.

“There is no commercial television and no billboards to siphon off advertising dollars,” Fuss said. “They just have one little newspaper.”

Islanders speak Samoan among themselves and English as a second language in their business dealings. Almost everything on the air tends to be in English. “93KHJ” has a small but efficient studio where everyone pitches in and does a little bit of everything.

Double duty

“Our manager doubles as a morning man, our office girl sells and we have a news-woman who sells,” Fuss said. “About 90 percent of the commercials are recorded by the vocal talent in Dallas with faxed or Internet-delivered scripts. The recorded commercials are transferred directly into the AudioVault hands-free from 8,000 miles away in Dallas.” AudioVault is an audio management system made by Broadcast Electronics.

“We e-mail our voice talent a lot of local informational talking points so they sound very local,” Fuss said.

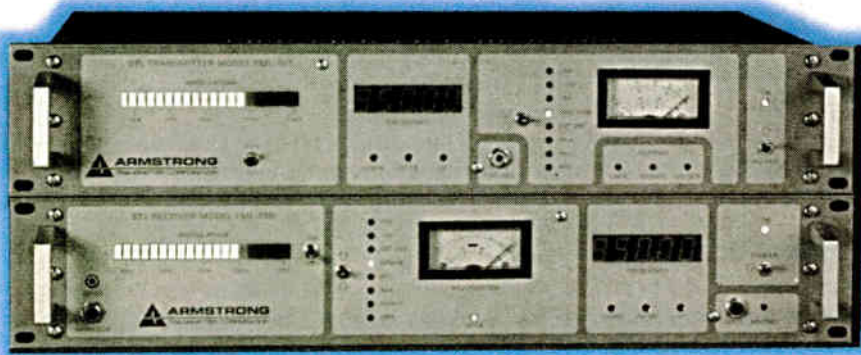
Unless you plan on taking a Samoan vacation, you’ll have to settle for visiting the station’s Web site at www.khjr.com. (It doesn’t stream.) It’s not the old-time top-40 that buffs will remember, but “93KHJ” is alive and well. And the beat ... goes on.



The KKHJ(FM) antenna is atop Mount Alava, 1,620 feet above sea level. Larry Fuss said, ‘It takes all day to get up there and back.’

Ken R. is a former broadcaster who always wanted to be a boss jock. He had to settle for being a jock, with a boss.

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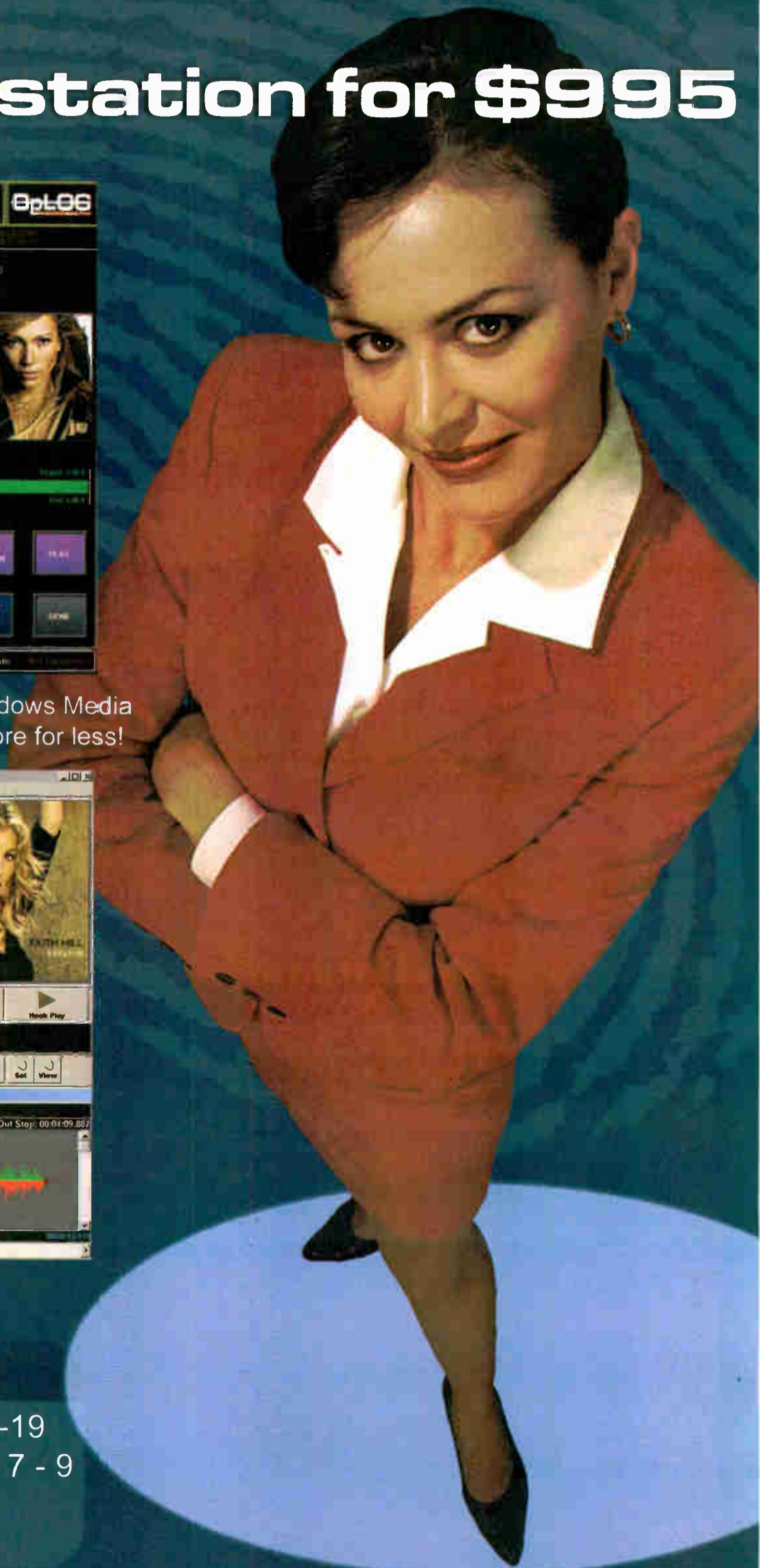
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World Radio History

Jerry Lee Takes On The Bad Guys

Jerry Lee, who owns the most successful independent station in the United States, WBEB(FM), is turning his talents to fighting crime.

In October, former Attorney General Janet Reno and crime-prevention experts convened in Philadelphia to dedicate the Jerry Lee Center of Criminology at the University of Pennsylvania.

The mission of the center is to discover the causes and prevention of crime and terrorism. It will fund and conduct research and forums on the prevention of crime and terrorism.

In addition to its research program,

the Jerry Lee Center offers a multi-disciplinary Ph.D. in criminology and an undergraduate course in the University of Pennsylvania's Department of Sociology.

Its largest current project is a \$3.5 million contract with Great Britain to introduce and test "restorative justice" for serious adult offenders there.

It also has a \$2 million contract from the Department of Justice to study the decline in violent juvenile behavior in the United States.

In March, the Jerry Lee Center of Criminology will bring together the police departments from Israel, France,



From left: Former Attorney General Janet Reno, Jerry Lee and Lawrence W. Sherman, director of the Jerry Lee Criminology Center at the center's dedication ceremony, Oct. 15, 2001. Reno was awarded the Jerry Lee Prize for Research-Based Federal Crime Prevention.

Enter to win one of 26 great prizes in Radio World's reader appreciation contest giveaway!



Dear *Radio World* Reader: Last year, many of the greatest names in our industry teamed up with *Radio World* for a year-long sweepstakes extravaganza that resulted in almost \$50,000 in prizes given away. Due to the overwhelming response from you, we've decided to do it all again in 2002 as a way of showing our appreciation to our loyal readers.

Throughout 2002, *Radio World* will conduct 26 random drawings. Prizes and winners will be announced in every issue of *Radio World*. **That's 26 chances to win!**

To enter the contest you need to complete these three easy steps:

1. Go to our Web site: www.rwonline.com
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This is your chance to participate in our Readers' Choice program and win great prizes from these fine *Radio World* supporters:



Contest Rules: To enter the drawing, simply register online at www.rwonline.com/sweeps. 26 drawings will be held throughout the year. Contest registration expires Dec. 4, 2002. Final contest prize announcement on Jan. 1, 2003. One prize per winner. All contestants MUST reside in the United States and have a valid mailing address. Winners should receive prizes within 30 days of notification; however, actual delivery time may vary and is not guaranteed by IMAS Publishing. Federal, state and local tax laws may apply to prizes and are the sole responsibility of the winner. Employees and affiliates of IMAS Publishing are not eligible.



Germany, Great Britain and Japan for a conference to learn how they use their police departments in the front line in the fight against terrorism.

Lee invites broadcasters to work with him in publicizing what works and what doesn't in preventing crime and terrorism.

Visit the Center's Web site at www.sas.upenn.edu/jerrylee/.

— Laura Dely

STATION SERVICES

105.3 The Fish Jumps In

Salem Communications has launched another "Fish" format station, this one in Milwaukee. The format features contemporary Christian rock. Salem has had success with its other Fish stations, including those in Dallas, Atlanta, Los Angeles, Chicago and Cleveland.

In Milwaukee, the 105.3 FM Fish station broadcasts around the clock. To introduce the station, Salem ran 40 days and 40 nights of continuous, commercial-free Christmas music, which began when the station launched on Thanksgiving day.

The Christmas music marathon was set to stop Dec. 26, with regular programming to ensue featuring artists such as Michael W. Smith, Amy Grant, Plus One, Jars of Clay and Steven Curtis Chapman. Commercials were to be added the first of the year.

In announcing the launch, General Manager Bob Emery said, "Milwaukee has a tremendous number of people who will enjoy the upbeat Christian sounds that have become so popular in other major markets across the country."

Veteran radio broadcaster and music programmer Danny Clayton is program director for the station. Clayton served in program management and as an on-air personality at hot adult AC WKTJ(FM) in Milwaukee for 18 years.

Salem Communications also owns WYLO(AM) in Milwaukee, which carries a combination of conservative Christian talk radio and Christian ministry programming. WYLO and WKTJ are located in the same building.

Cole's Law

► Continued from page 21

devise some non-auction mechanism for resolving mutually exclusive non-commercial applications — but that's another story.)

The problem lies in non-reserved "commercial" channels and, more specifically, in the fact that noncommercial entities can apply to use "commercial" channels. As a result, it is possible, if not likely, that the universe of applicants for any particular non-reserved channel will include one or more noncommercial applicants.

But if Congress has specified that noncommercial applicants won't have to pay for channels they propose to use, how can such situations be resolved? Auctioning doesn't work because of the prohibition, but auctioning is the only mechanism left.

Interpretation

The commission first tried to deal with this by interpreting the statutory prohibition to bar auctions for reserved noncommercial channels.

In other words, no auctions would be held for purely noncommercial channels, but if a noncommercial applicant decided to file for a "commercial" channel, the noncommercial applicant would have to compete in an auction with the commercial applicants.

Last July, however, the U.S. Court of Appeals for the District of Columbia Circuit ruled that this interpretation wouldn't fly. According to the court, when a noncommercial applicant elects to file for a "commercial" channel, that applicant must be exempt from the auctions.

For the commission, this meant back to the drawing board to come up with some way that non-reserved "commercial" channels can be made available for application so that competing applications for those channels can be resolved quickly, whether or not any noncommercial applicants file for them.

The court's decision also meant an immediate halt to the then-pending open FM auction. That auction had originally been announced in the fall of 2000, with a scheduled start date in May 2001.

But last March, the start date was postponed to December, possibly in recognition of the then-pending appeal. In September it was postponed indefinitely.

As of this writing it is unclear when those auctions may actually happen.

To the extent that folks have given any thought to the reasons for the delays in the auction, the problem of commercial vs. noncommercial applicants seems to be given the blame.

While that's not off the mark, yet another recent court decision may mean even more trouble in the long run for the commission's auction processes.

Last June the same U.S. Court of Appeals held, in a non-broadcast matter, that applicants who acquire licens-

installment payments, its licenses had been automatically canceled and the frequencies would be re-auctioned.

The re-auction was held, with a total bid amount of more than three times the price that NextWave had bid.

NextWave challenged that re-auction (and the underlying determination that its licenses were automatically canceled). In NextWave's view, its relationship to the FCC was that of a debtor to a creditor — and the bankruptcy laws govern such debtor/creditor relationships.

While you are waiting around for the next FM auction, don't blame the FCC for the delay — the real problems lie on the doorstep of Congress, not the commission.

es from the government in an auction process may be entitled to significantly greater protection against loss of those licenses than would be the case in a non-auction context.

The case was the infamous NextWave case. NextWave Personal Communications Inc. bid some \$5 billion, to be paid in installments, for a large bloc of wireless frequencies in 1996. NextWave made the down-payment, to the tune of several hundred million dollars.

But when the next payment came due, NextWave claimed that the frequencies had been overpriced and that it should not be compelled to pay the full amount of its bid.

The commission rejected that argument, so in 1998 NextWave declared bankruptcy. The government filed as a creditor in the bankruptcy action.

In 2000, after a couple of years of litigation in the bankruptcy court, the FCC announced that, because NextWave had failed to make its

As you may know, when a debtor declares bankruptcy, creditors are for the most part prevented from taking any action against the debtor. More particularly, the government is prevented from acting against the debtor because of the debtor's failure to pay any debt dischargeable through the bankruptcy processes.

Accordingly, NextWave argued, the FCC could not yank NextWave's ticket for failure to pay, because NextWave was in bankruptcy and its obligation to pay the amount bid at auction was a debt dischargeable in bankruptcy.

The court bought the argument. It stated that the commission might have been able to cancel NextWave's licenses for some regulatory reason, but the FCC chose not to do so.

Instead, the only reason the commission cited for the cancellation was the failure to pay and that, according to the court, was exactly the kind of governmental conduct that the bankruptcy laws prohibit.

Essentially, the court agreed with the-artist-formerly-known-as-the-artist-formerly-known-as-Prince, who observed through Cyndi Lauper that "money changes everything."

Of course, NextWave involved non-broadcast frequencies purchased on an installment basis. But the basic theory of the NextWave decision appears to reach broadcast auctions as well: If, by auctioning frequencies, the commission becomes a seller in addition to a regulator, then the other parties to the auction (i.e., the successful bidders) become buyers in an ordinary commercial sense and as such those buyers are entitled to the routine statutory protection of the bankruptcy laws.

And, as NextWave demonstrates, those laws put the debtor/buyer in the driver's seat to a significant degree, even if the creditor is the government.

So if the commission ever does crank its broadcast auction machine back up to speed, it will have to be mindful of the possibilities the NextWave decision creates.

Boys on the Hill

If either the commercial/noncommercial or the NextWave/bankruptcy complications with FCC auctions are to be eliminated, that relief will have to come from Congress.

It was Congress that enacted the noncommercial exemption and it was Congress that created the bankruptcy system, which affords protection to debtors. If those provisions really are unworkable, it will be up to Congress to clear them up.

Whether or not a majority of Congress sees the need to take such action, however, is not at all clear at this time.

So while you (and the Thurmans) are waiting around for the next FM auction, don't blame the FCC for the delay — the real problems lie on the doorstep of Congress, not the commission.

Harry Cole specializes in broadcast matters at the communications law firm of Fletcher, Heald & Hildreth P.L.C. Contact him in Virginia (703) 812-0483 or via e-mail to cole@fhllaw.com.

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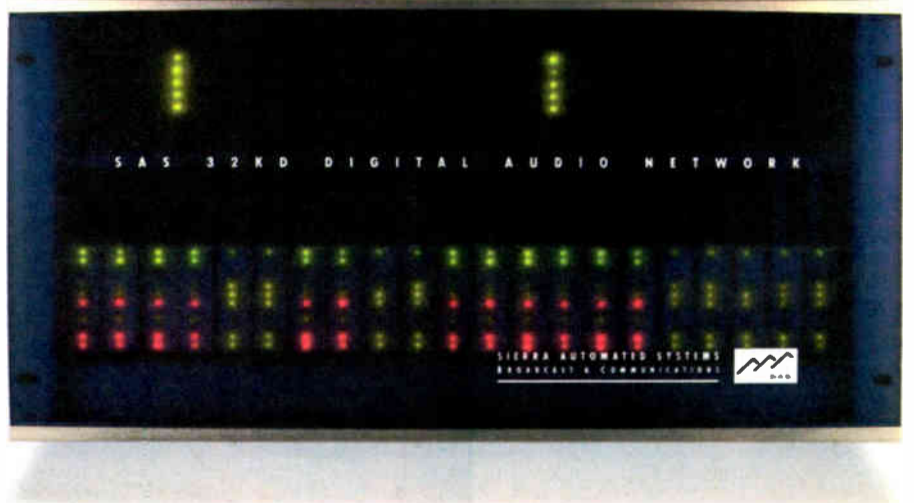
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Radio World

How to Succeed in the Dot-Com World

January 2, 2002

Activate: Ready for All Demands

by Craig Johnston

When a ship is built, it goes on a "shakedown" cruise to discover if anything is going to shake loose while at sea. A new facility may get the same kind of testing before deployment, but of course,

Paper. "Not a paper out of place."

Its building has survived several previous Seattle shakedowns. Built in 1914 to house clothing maker The Black Manufacturing Company, it has survived long enough to gain status on the National Historic Register.



Shown is Activate's 'Grand Central.' Like the New York train station, the control room has lots of comings and goings.

not in the literal sense.

And then there's the Seattle streaming media provider Activate Corp.

"We did our official launch in February of last year," said the company's senior product marketing manager Anne Paper. "We had a huge party. (with) 300 people and then the next day was the earthquake!"

Activate's new \$20 million facility survived Seattle's 6.8 shakedown last year with nary a problem.

"The thing that was amazing was that it was an incredible testimonial," said

Besides its apparently earthquake-resistant building, Activate faced a number of challenges in the design of its facility. Primary among them was the ability to receive a large number of signals and serve a large number of streams.

"It's not unusual for us, on any particular day, to have a peak stream output of about 10,000 simultaneous users, which from a streaming perspective is a large number," said Jon Brown, vice president of engineering at Activate.

Until recently, Activate was a majority-owned operating company of CMGI Inc.

In September the company announced that it had sold Activate to Loudeye Technologies, a streaming-media infrastructure company.

"We will be consolidating operations, the major result of that would be the addition of a large-scale media archiving system," said Brown. "We will also absorb their current video work. Loudeye's investments in radio, music and ad insertion technologies complement Activate's experience in those areas and that's a positive for customers in those segments."

Loudeye announced it would move its operations into Activate's quake-tested, award-winning, state-of-the-art facility.

"Activate has a fabulous facility," said Joel McConaughy, Loudeye's chief technology officer. "By combining their live-broadcast capacity with our ability to warehouse massive amounts of data we'll have a complete, end-to-end live, on-demand, Real, Windows — you name it,

we can run with any digital media situation," said McConaughy.

In November, Activate's facility won Network World's 2001 "Best of Test" Award for multimedia. The award from the information technology magazine honors IT products that have succeeded through 12 months of hands-on testing.

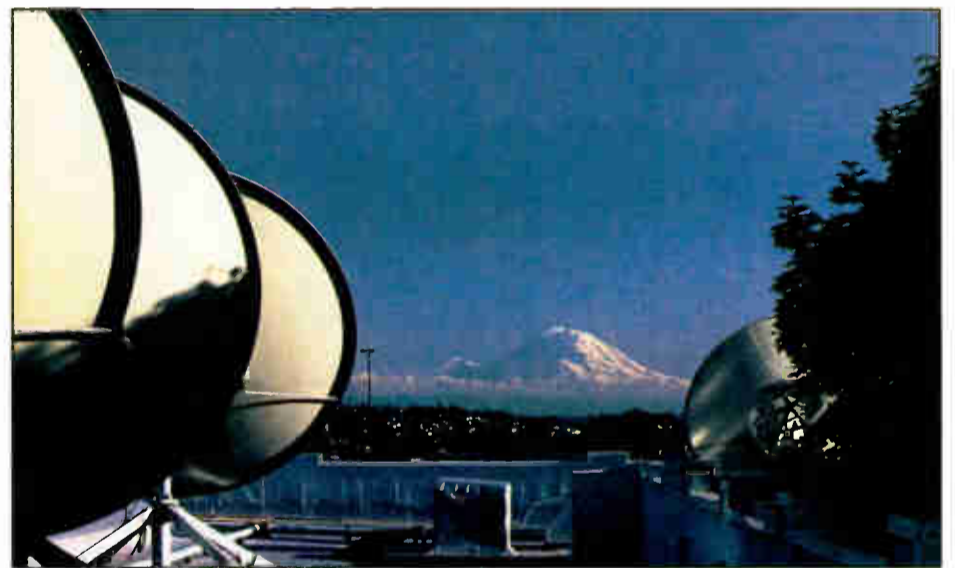
Scalable

Activate managers knew from the beginning that it would require a robust infrastructure to handle many sources going to many destinations. The answer was a pair of routing switchers: it installed a 256-by-512 nVision/ADC wideband router and a companion 64-by-64 PESA Switching Systems router dedicated only to audio.

September's terrorist attacks tested Activate's flexibility.

"The primary, immediate impact was adding additional streams for news-based stations," said Brown. "Traffic increased 30-40 percent on our radio overall."

The company plans to serve more radio stations in the future. The majority
See ACTIVATE, page 30 ▶



Rooftop satellite dishes frame Mount Rainier. The building is in the National Historic Register, which prevents the company from installing dishes permanently.

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Activate

► Continued from page 29

of its streaming serves businesses that conduct meetings virtually via the Internet. Thus the drop in corporate travel since Sept. 11 is proving to be a long-term positive for the company.

Industry observers have said this trend should continue to grow. Jupiter Media Metrix projects that the enterprise streaming market will double from \$290 million this year to \$580 million in 2002 and will grow to \$2.8 billion in 2005.

"We've also seen an increase in our live-event Webcasting for enterprise customers," said Brown. "The impact of that increase is felt more by our production staff than in terms of bandwidth or number of streams. The 'Grand Central' facility certainly has adequate capacity to handle that increase."

Activate named its control room Grand Central, after the busy New York train station.

Right-sized

Activate's ability to handle spikes in its business apparently validates decisions it made during the design process. Originally the company had looked at a 1,024-by-1,024 router, but after examining its needs the company scaled back on that and some other equipment.

"We had to get it more appropriately aligned with our budget and sized right



Activate's building originally was the home of The Black Manufacturing Co., a sewing factory.

for the amount of business that we have," said Brown.

But he said the foundation it built is capable of growing quickly with demand.

"The important things that we did are still going forward in terms of building all the base infrastructure for the whole thing, just in case."

Part of that scalability is the EMC Corp.'s Celerra File Server, which provides storage for material that is not streamed live. As clients feed them pre-produced material for later streaming, the

facility won't run out of space to cache it.

A pair of large-screen displays that monitor incoming and outgoing signals visually dominates Grand Central. But the heart of the operation is composed of the individual workstations.

A major challenge was to design workstations so that the fewest operators could do the most work and so that operators wouldn't have to move around the facility to complete a task. That meant packing a lot of capability into each workstation.

It called for a great deal of design work from systems integrator Doyle Technologies. Each workstation is dense with equipment.

"It's packed: front, back, side, bottom, top, underneath, everywhere, shoehorned every which-way," said Barry Ballanger, director of engineering at Doyle. "Very elegantly put in there, but it's full."

Brown made sure the equipment and operators were in separate rooms.

"It's a much cleaner operation, not allowing anyone to touch the equipment. That way they can't monkey with it."

While Activate's facility is designed to handle video as well as audio, it planned to provide Internet radio service when the facility was designed. Internet radio business has ebbed and flowed.

Dot-gones

"A lot of the integrators of the day have gone out of business," said Brown. This caused Activate to cultivate the corporate market in order to level out its revenue stream. Today, a big chunk of its business lies in streaming earnings forecasts and shareholders' meetings.

Still, Activate is bringing station streams back online by working directly with the stations or groups.

At present, it provides streaming services for NPR affiliates KLON(FM), KPLU(FM) and KWMU(FM) and commercial stations WBIX(AM), KTIS(AM-FM) and WUFL(AM).

Getting into the stations helped Activate come up with a strategy for the design of its Internet radio ad-insertion technology.

Brown said, "We developed it with RCS because what we wanted to do is to get a station-side plug-in to the encoder that's already there, that could read their log and also create the ad breaks appropriately."

The object was to create something that was simple and didn't require the station personnel to do a lot of work on

it. The system looks to the station automation system to tell it when a break is coming.

Then it sends the ad for the break to the player on the user's PC, where it is stored until the break itself. When the automation signals the break itself, the encoder creates a window in the stream and the player inserts the ad at the PC.

Will Activate's ad-insertion technology handle targeted ads?

"Absolutely," said Brown. "The need hasn't arisen yet, but the original design was for targeting."

So that the server knows what spot to send an individual user, the user's player sends information back upstream, including the genre the listener is tuned to, the listener's age and location.

Station side

Audio encoding for Internet radio stations is done at the station facilities, then delivered to Activate via frame relay. Why frame relay rather than phone lines?

"That gives us a clean signal from them to us and we don't have to worry about any problems that happen in distribution that will affect the entire audience," said Brown.

He said phone-line delivery can get expensive.

"We can do a frame relay through Qwest for only about \$200 a month. To lease a local phone line for 24 hours a day, it starts to add up, unless you're local."

Streaming audio that comes in via phone line at Activate typically is from events.

Brown's advice to radio stations is simple.

"You have to really be paying attention to what type of encoder equipment you have and the codec you're using." Brown said a high bitrate stream sent by a station can be down-converted to a lower bitrate for modem listeners, but trying to up-convert a low bitrate stream won't work as well.

It's also worth noting that if a station is going to stream in both Real and Windows Media formats, Brown said, it has to encode and send a stream of each.

How much high-bandwidth listening is going on?

Activate's research finds a 40-60 split, with 40 percent of the listening being done at high bandwidth. It found that the high point of streaming listening comes on weekdays at 2 p.m., demonstrating the oft-cited maxim that much Internet listening is done at work.

A terrestrial broadcaster's mindset is "the more listeners, the better." But because Internet radio streamers pay for the bandwidth incrementally as more users listen to their streams, the ability to cap the number of listeners is of keen interest to many broadcasters.

"That allows the station to know, precisely, 'I will not exceed a certain amount on a monthly basis,'" Brown said. "Popular stations get weird, organic growth that occurs every month and they just keep getting slightly bigger and bigger and bigger every month."

For mega events, where the potential audience is unlimited, Activate's distribution network is almost infinitely scalable.

"We not only have our own network but we work with several distribution partners," said Brown. "Depending on the size of an event, we can add as many chains as we would probably ever need."

Craig Johnston is an Internet and multimedia producer in Seattle.



Compaq Proliant encoding stations line a wall in 'Grand Central.'

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WEB WATCH

Radio Has Chance to Own Net Audio

by Craig Johnston

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.

Terrestrial radio, which wants to be treated the same whether it broadcasts or streams its signals, may have put a chink in its own armor by signing a new interim Internet streaming deal with Broadcast Music Inc.

Under the agreement, stations will pay BMI 1.605 percent of their "streaming Internet revenue" — minimum \$259 in 2001 and increasing with the Consumer Price

Index annually — until a final rate is set.

When that will come is an open question, as the **Radio Music License Committee** is before **U.S. District Court for the Southern District of New York** seeking final license fees and terms for streaming their broadcast signals on the Web.

If the "1.605 percent" figure seems familiar, that's because it's the same rate broadcasters pay for their terrestrial transmissions.

According to numerous studies, broadband access to the home is one of the acknowledged keys to a satisfied streaming media listener or viewer, which makes it critically important to Internet radio. On this subject, the Web Watcher has some good

news and some bad news.

First, the good news: "Three-quarters of U.S. households will have high-speed Internet access available to them by year-end 2001," according a **Yankee Group** study, "up from the 60 percent a year earlier."

But making broadband available is only half the battle.

"Success will increasingly be driven by the network operators' ability to lower the cost of hooking up individual households for broadband service," stated Michael Goodman, a senior analyst with the Yankee Group's Media and Entertainment Strategies research and consulting practice.

Which leads us to the bad news part of



the equation: actual broadband adoption in the home, which grew 100 percent this year, will grow more slowly in the years to come.

"The early adopters have been saturated," said **Imran Khan**, a Yankee Group research analyst. He predicts the growth rate could drop to 50 or even 35 percent, requiring innovative marketing and better pricing to get the less-than-hard-core Internet users to part with \$50 a month for broadband instead of a quarter of that for ordinary dial-up access.

Tech-savvy — not

The Web Watcher reveals his age in this admission: He remembers how the Walkman portable cassette player (and its offspring the portable CD player) cut into portable radio listening.

Now the portable MP3 player, capable of playing music downloaded off the Internet, similarly threatens radio listening.

The high prices of portable MP3 players as a barrier has fallen by the wayside as near-hundred dollar units such as the **Bantam Explor BA250** hit the market. At a suggested retail price of \$129, the card-deck sized BA250 offers 48MB of expandable memory and includes a detachable belt clip, car cassette adapter, ear buds and headphones.

But Yankee Group analyst **Ryan Jones** warns that lack of user technical savvy, not price, may be the true barrier to MP3 use.

"More of an issue is knowing where to get the songs, knowing how to configure your PC to upload the music onto the MP3 player, that type of thing," he said.

While Yankee Group studies show 48 percent of Internet households download music, only 14 percent of those use MP3 players. Jones says that equals just 8 percent of U.S. households overall and that MP3 use is most heavily concentrated in college students.

The **RealOne Radio Network** premiered early in December 2001 as a part of **RealOne Music**, the \$9.95 a month subscription service from **RealNetworks Inc.**

It's the first service to license content from **MusicNet**, the joint venture between **RealNetworks** and record label owners **AOL Time Warner Inc.**, **Bertelsmann Entertainment** and **EMI Group**.

The Internet radio portion offers 48 channels of commercial-free Internet stations that run the gamut of music genres, programmed by streaming platform and content provider **Radio Active Media Partners Inc.**

The subscription also permits users to download 100 songs per month from the 75,000+ in the MusicNet catalog. The downloaded songs stop working after 30 days unless they are renewed, which counts as one of the next month's downloads.

Downloaded music cannot be played on another computer or player device.

RealOne Music requires the user install the newly released **RealOne Player** on the PC. The new player combines a media player and Web browser into a single three-pane window.

The Web Watcher recommends radio station owners take a close look at the

See WEB WATCH, page 33 ▶

TWIN STREAMS OF SPARKLING DIGITAL AUDIO BOTTLED AT THE SOURCE DELIVERED CRYSTAL CLEAR



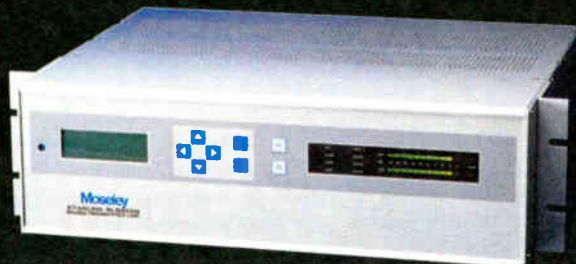
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Web Watch

► Continued from page 32

RealOne Player, as it has a related information pane that allows text and graphics to be synchronized with the audio stream.

Internet stations that take advantage of this capability may find they gain a competitive advantage through a better user experience.

RealNetworks incorporated its **GoldPass** subscription content service into the \$9.95 a month RealOne Membership service. GoldPass access to Major League Baseball, the National Basketball Association and other premium channels will continue to headline the service.

For \$19.95, both the music and premium content services are bundled into **RealOne Gold**, which includes extra music downloads.

Citadel Broadcasting Co. has inked a deal to have Yahoo Inc. stream 140 of its 204 radio stations. By using Yahoo's in-house ad-insertion technology, Citadel will skirt the dispute with **American Federation of Television and Radio Artists** over additional talent fees for spots played over the Internet.

The broadcaster, like just about every other terrestrial broadcaster, removed its stations' streams from the Web when the AFTRA royalty dispute that reared its ugly head last April. With the addition of Citadel, Yahoo Radio now streams about 450 terrestrial stations.

Clear Channel has tapped **FullAudio Corp.** as its on-demand music subscription provider in Chicago, Houston, L.A., Phoenix and Salt Lake City. About 30 co-branded, subscription music services will launch in this month of January. All of the formats that Clear Channel presents will be offered.

The deal gets Clear Channel around the need to negotiate with copyright holders for this service. FullAudio holds content licenses from **Universal Music, EMI Recorded Music, EMI Music Publishing, Universal Music Publishing and BMG Music Publishing.** The company continues negotiations with other major record labels, publishers and independents.

"We are thrilled to offer to our listeners the capability to download and listen to their favorite music, on demand," said **Jerry Kersting**, chief financial officer of Clear Channel's Radio division.

Clear Channel estimates that the monthly fees for the service will be \$5 to \$15.

Web Watcher has learned not to blink: witness RadioAMP's short-lived personalized news, weather and sports online audio service. The RadioAMP service premiered in November on search engine provider **AltaVista Radio.**

Less than a month later, AltaVista decided to shut down its Internet radio service to concentrate on its core search engine business. With its launch customer gone, RadioAMP folded the service.

"It may be something we bring back," said **Charlie Moore**, RadioAMP's vice president of business development. "We've got the back-end already built."

But he said a certain critical mass of users is necessary to justify the cost of content, which was provided by Source Media, a supplier of continuously updated news, weather and sports information.

In addition to AltaVista Radio, other Webcasters who use RadioAMP content on its sites include Clear Channel, **Barnes & Noble** and **CDNOW Inc.**

RadioAMP also has announced a financial restructuring with Internet investment firm **NetVentures LLC**, which has purchased a majority ownership of RadioAMP.

NetVentures had been the lead investor in RadioAMP's last round of funding.

Hiwire Inc., a supplier of ad-insertion technology to streaming terrestrial radio stations, is another winner in the current bleak investment climate: it won a \$9.5 million infusion from strategic partners **Clear Channel** and **Grey Ventures Inc.**, as well as venture capitalists **National Enterprise Associates** and **Zone Ventures.**

"Their technology will enable advertisers to target specific audiences using Internet audio streaming," stated Kersting. "It will dramatically enhance our viability and growth in streaming media."

HiWire also said that it has struck a technology partnership with **Blue Falcon Networks**, a streaming service provider.

Blue Falcon's software will be integrated into Hiwire's Net radio tuner.

The Blue Falcon Streamer enables Webcasters to scale their audio and video streams to larger audiences by reducing bandwidth requirements and infrastructure requirements. The result, the company stated, is reduced costs.

Salem Communications Corp.'s station group **KKLA Communications** will be the charter customer for this service, which is scheduled to launch this month on several of

"2001 Best of Test" Award in the multimedia category. The award goes to products that have succeeded through rigorous hands-on testing over the past twelve months. Network World Magazine is a weekly trade publication that covers the information technology industry.

"Winning this award is a pivotal endorsement of Activate's Webcasting services and clear validation of our leadership position in enterprise streaming," said **Dennis Shepard**, Activate's president and GM.

David Kantor, alumnus of AMFM Radio Networks, has been appointed chairman of **XACT Radio LLC**'s board of directors. The company provides custom Internet radio to broadcast radio stations.

Kantor, an XACT investor, was no stranger to the company.

Radio World being a family-friendly magazine, Web Watcher is hiding this item near the end of his watch. **Adam & Eve**, an online and mail order provider of naughty videos, sex toys and such, has launched the "Sounds of Love" audio service that streams via **Live365.com.**

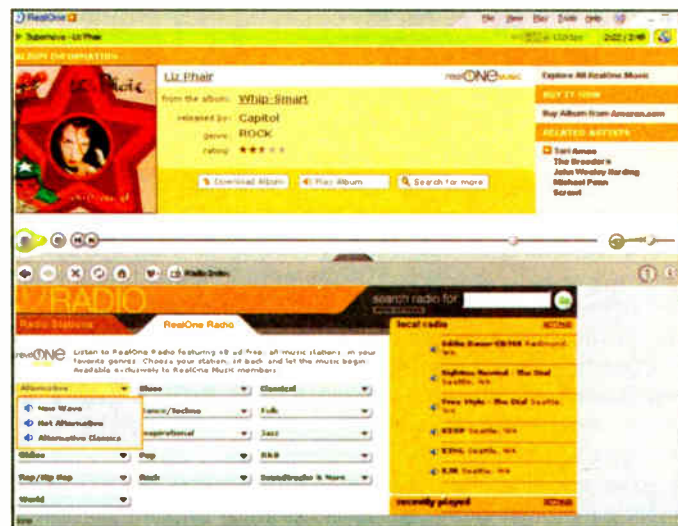
Journalist that he is, Web Watcher put on a trench coat and dark glasses, then tuned in to "Sounds of Love," where he discovered that the service plays audio of climactic portions of pornographic videos.

Since the service requires a broadband connection and Web Watcher listened via a dial-up modem, there was a lot of interruptus involved.

A link to **www.adameve.com** allows the listener to purchase the actual videos and other products.

The "Sounds of Love" detailed above is not to be confused with **Cangoose Internet Radio Group's** "Sounds of Love" channel. The service, which is based in Red Deer, Alberta, plays romantic music.

No dark glasses or trench coat required ...



Shown is the RealOne Radio subscription-based site as seen in the RealOne Player. The upper left screen is the playback window, the upper center to right screen is the related information window and the large lower screen is the media browser. The player is required to utilize the RealOne service.



Shown is the Bell South Net radio player that RadioAMP created.

its affiliate stations. **Christian Pirate Radio**, consistently high in Internet radio ratings, is a KKLA station, will be one of the stations to roll out in the debut of the service.

Several months ago the Web Watcher told you that **SiteShell Corp.**, which licenses customizable Web sites to radio stations, updating the content of those sites around the clock, was looking for a "strategic transaction," college term-paper terminology for somebody with money.

Just before Thanksgiving, SiteShell's business, along with all of its assets, were transferred to a SiteShell stockholder's company that includes some of its top management, **Cavalry Finance Corp.**

A day later, Cavalry changed SiteShell's business model. The new idea was to license its Web site technology, rather than provide services.

"It became clear over the last several months that the larger companies will want to retain a high degree of in-house control over their online media outlets," stated **Joel Hartstone**, chairman of Cavalry and an original founder of SiteShell.

A new company, created by former SiteShell design employees, will provide Web site graphic design and maintenance services formerly supplied by SiteShell. That company's name is **GreenEyes Inc.**

Loudeye Technologies Inc.'s Activate subsidiary captured **Network World's**

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The 711 is quickly programmed with the usual format identifiers, translator frequencies and other static data. Its RS-232 serial interface connects with any PC, and with most automation systems for dynamic messaging. Giving access to all the most-used RadioData groups and features, this versatile encoder complies with both NRSC and CENELEC RadioData standards.

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NET RADIO SERVICES

Audition Big Music Catalog Online

Promusic Inc. is a production music company with a catalog that contains more than 2,000 CDs from more than 25 libraries. The company recently launched a Web site that provides a search function, 30-second Windows Media audio samples, sound effect demos and descriptions, online licensing forms and links to member libraries.

The company updates the site daily with news and information of upcoming releases and additions to its catalog. Users can find and audition tracks to suit their production needs.

Music is delivered on CDs via the United Parcel Systems, with an express delivery option available. Promusic provides three license options: annual, unlimited use; "needledrop," that allows separate use of individual titles; and production blanket, which offers a reduced rate for multiple needledrops



within a single production.

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

Weekly Radio Show Ranks Net Music

"The Net Music Countdown with David Lawrence" tracks the music streamed, downloaded and sold online. Lawrence counts down the top 20 most popular online artists weekly and ranks music available via download in his "NMC eCharts."

The two-hour weekly radio show for terrestrial broadcasters is produced in three formats: alternative rock, contemporary hit radio/pop and hot adult contemporary.

Six "NMC eCharts" are released every Friday evening when the show is broadcast, at 6 p.m. EST, and are available for affiliates at <http://online-today.com>.



David Lawrence

NMC radio affiliates may also use the program's recently launched online-music news service. The NMC news is format-specific and features artist news, bios and interviews and links to CD and DVD sales. The company stated that future plans include movie ticket sales.

The NMC news content is automatically placed on a participant affiliate's Web site as the news occurs, with no intervention needed from the station. NMC customizes its content to match a station's Web site style.

United Stations Radio Networks syndicates "The Net Music Countdown" on a market-exclusive, barter basis to radio stations. There is no charge for the NMC news service.

"The Net Music Countdown with David Lawrence" is a production of Online Today Inc., a producer of pop culture/high technology radio shows. Based in Washington, Online Today produces "Online Tonight with David Lawrence," a nationally syndicated radio talk show about pop culture and high technology; "The Net Music Countdown with David Lawrence" and provides audio-enhanced e-mail online music news via VoxEmail.com.

For more information, call Online Today at (800) 396-6546 or visit <http://online-today.com>.

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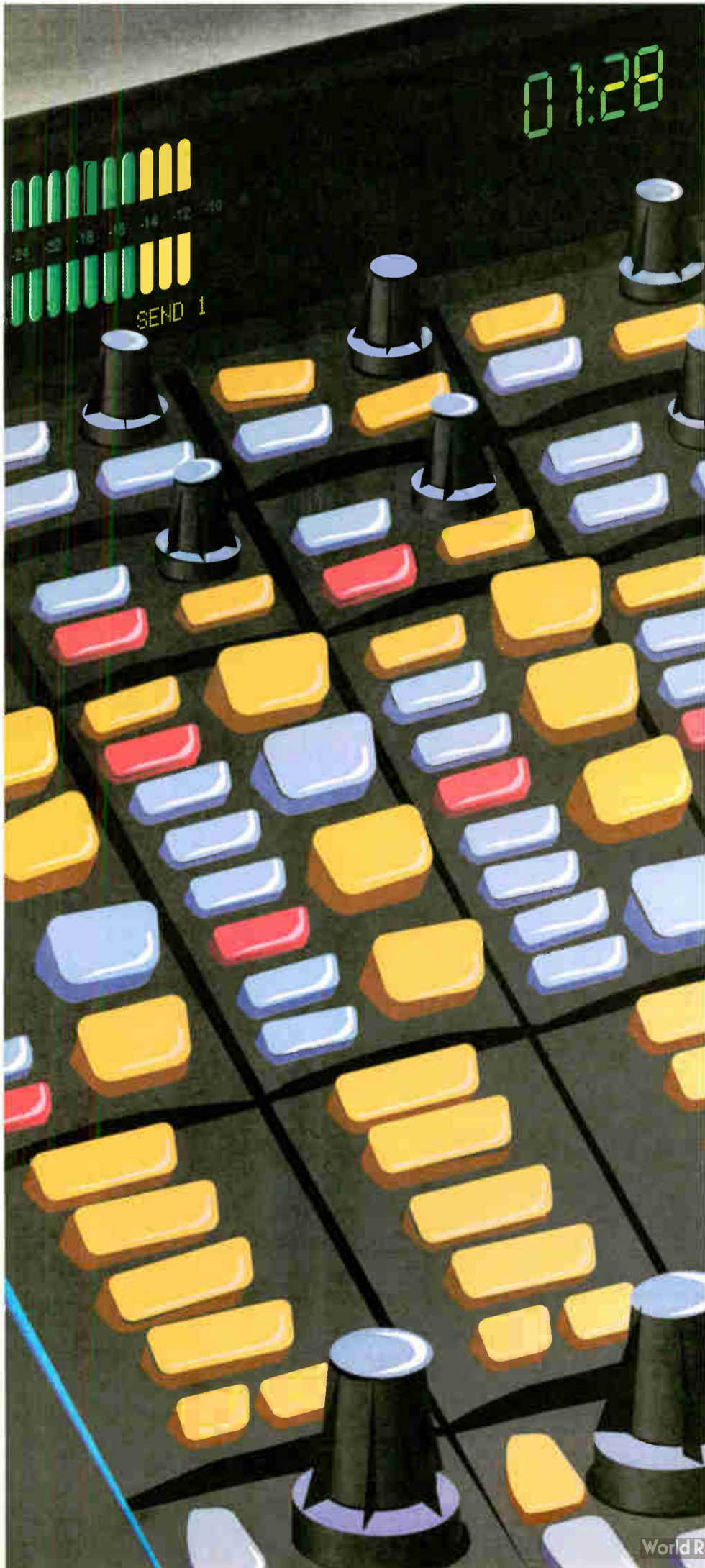
AM Edition Published Monday, Tuesday and Wednesday, with distribution at NAB-designated hotel rooms, all AM editions will be distributed by hand and in the racks at the Las Vegas Convention Center and the Sands Expo Center. Every AM edition includes an exhibit map, the latest news, product coverage, exhibitor listings, session schedules and more.

PM Edition Published Monday, Tuesday and Wednesday afternoons, the PM edition is the source for up-to-the-minute news, making it a must-read "hot sheet" for the show. The afternoon edition will be distributed at both the Las Vegas Convention Center and the Sands Expo Center.

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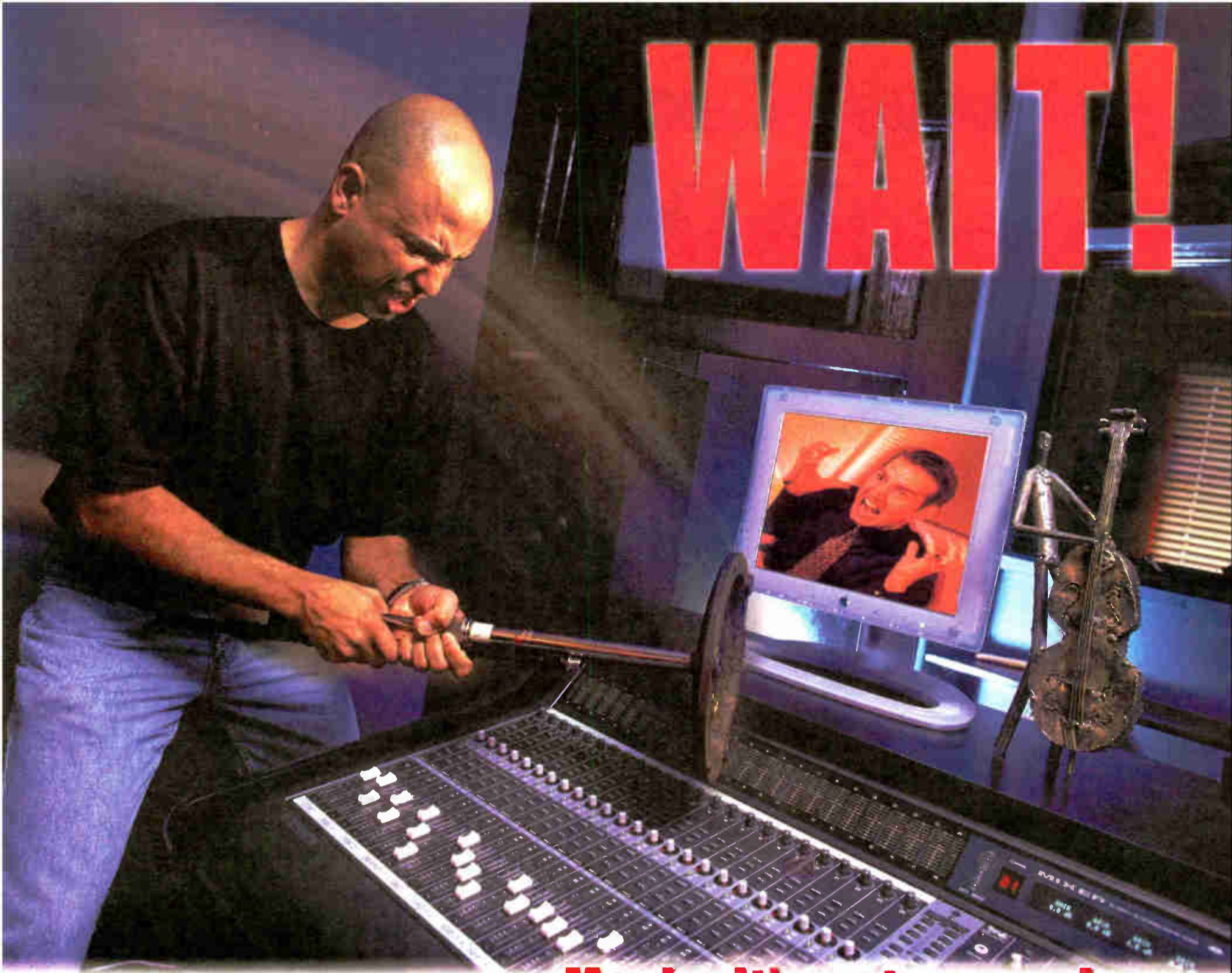
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Studio Sessions

O.C. White
Goes
Squeak-
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See Page 41



Radio World

Resource for Radio On-Air, Production and Recording

January 2, 2002

FACILITY PROFILE

PRN: Lean, Mean and Innovative

by Paul Kaminski

The Performance Racing Network broadcasts all of the NASCAR Winston Cup races held at the tracks owned by its parent, Speedway Motorsports Inc.

So when the series is at Las Vegas; Bristol, Tenn.; Texas; Atlanta; Sears Point, Calif. or Lowe's Motor Speedway at Concord, N.C. (formerly the Charlotte Motor Speedway), PRN's VP and General Manager Doug Rice and his staff produce the broadcast.

Lucky catch

PRN's offices are located at the Lowe's Motor Speedway, next to the entrance for the Speedway Club. Upon entering, one sees the studio used for the Monday night NASCAR talk show, "Fast Talk with Benny Parsons." Parsons, the 1973 Winston Cup champion, is the race analyst for NBC television.

"PRN was fortunate to get Benny for our talk show when it premiered in 1993 and we think it adds credibility to our programming," Rice said.



Producer Alicia Lingerfeldt and Production Director Kent Bernhardt catch a breather in the studio where 'FastTalk with Benny Parsons' and 'The Pit Reporters' are produced.

The next studio is where PRN's daily NASCAR News show "Garage Pass" takes place. Producer Steve Richards

edits submissions taken in by MP3 files, Comrex Matrix, DAT and MiniDisc for the program.

Rice said "Garage Pass," hosted by racing veteran Mark Garrow, has been a plus for PRN since its premiere this season. Either Richards or Garrow will be in the field covering events at venues where PRN is not the rights-holder for the live radio broadcast.

Rice said putting "Garage Pass" on

Performance Racing Network Equipment

The equipment PRN uses to produce in-studio and remote broadcasts includes:

- 360 Systems Digi/Cart audio playback backed up to Zip disk
- 360 Systems Short/cut audio editors
- Comrex Vector and Matrix for back-up
- POTS codec feeds
- Digigram VX sound cards for laptops
- Electro-Voice RE-27 studio mics
- Lectrosonics UHF UDR 200 wireless mic chains
- Mackie SR-32 audio consoles
- Sennheiser MKE-416 shotgun mics for DAT and MD
- Shure SM-58 (with switches) for remote venue origination
- Sony and Sharp field MiniDisc recorders
- Sony portable DAT recorder
- Symetrix 528E mic processors
- Sytrillium Cool Edit Pro sound editing program
- Telos Zephyr for ISDN backhaul

the air was a no-brainer.

"The program meshed seamlessly with our existing programs and we now have some 375 affiliates, including half

See PRN, page 38 ▶

PRODUCT EVALUATION

Kima System Makes Rebroadcasting Fun

by Paul Cogan

When products like the Kima were first promoted, the dot-com boom was at its height. Times have changed. But the idea of a device that allows you to monitor Web audio, independent of your PC, is still appealing.

When I opened the box containing the Kima wireless audio system from Akoo.com, I was surprised. The two units were much smaller than I expected. I thought each unit was going to be about the size of a laptop computer.

At its widest point, each one is only about five inches by four inches — about the size of a portable CD player — and about as tall as a Sony Memory Stick. Each unit weighs less than a pound.

Send and receive

The Kima system comes with a base unit for sending audio from a source such as a computer and a receiver unit to transmit that audio to a home stereo or portable radio. The specifications on the box claim the signal, which puts a signal up between 902 and 928 MHz, can reach up to 1,000 feet.

I wondered how it accepted audio directly from a computer, how far it could actually transmit and how clear the signal would be. I had read complaints that it would interfere with regular broadcast signals as the receiving unit retransmits the audio over an FM

See KIMA, page 41 ▶



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PRN

► Continued from page 37
of the top-10 markets, clearing the program," said Rice.

Richards and Garrow gather audio in the field with Sony MiniDisc recorders and transmit edited submissions via MP3 file back to PRN's studio on laptops equipped with Digigram VX sound cards. Their backup is a Comrex Matrix.

Garrow was the host of "Winston Cup Today," which ceased production in 2000 after NASCAR and Capitol Broadcasting Co. of Raleigh, N.C., tangled over a reported \$400,000 rights fee. He and Rice co-anchor the PRN race broadcasts.

Lean and mean

One gets the impression that PRN's operation is lean and mean, equipped with just what is necessary to do the job — not unlike the race cars they speak about.

'We try to let the listener know what's really happening. We try to be unbiased and absolutely truthful.'

Harill Hamrick is the network engineer. "We use Mackie SR-32 consoles in our studios and use almost every output to route our signals. They work well and are reasonably priced. Our announce mics are Electro-Voice RE-27s connected to Symetrix 528E microphone processors."

Hamrick's family owns nearby



Show Producer Steve Richards works on a submission for PRN's 'Garage Pass' program.

WHIP(AM) in Mooresville, N.C. He has been a contract engineer for Charlotte Hornets and Carolina Panthers game broadcasts.

"In the field we use a 360 Systems Short/cut audio editor for actuality and interviews. For commercials we use DigiCards and are backed up on Zip disk. We'll use Sony and Sharp MD recorders. Our pit reporters use Lectrosonics UHF UDR 200 transmitters and feed them with Shure SM-58 microphones with switches.

In June at Sears Point, a California road course, they used seven Lectrosonics systems to get audio back and forth.

Rice's network became the first to broadcast Spanish-language lap-by-lap coverage of a Winston Cup race last April from Texas Motor Speedway.

"We weren't sure what we were getting into," said Rice. "We wouldn't have done this had Julio Fernandez (general manager of the Indy Racing Radio Network) not been available to direct

the broadcast."

"He worked well with Felix Sabates and Jorge Kaechlin. In hindsight, we'd probably want to enlist one of the stand-alone Spanish-language radio networks to help us on any future broadcasts."

PRN does its racing broadcasts a bit differently than one would expect. It was the first network to use in-car radio transmissions from drivers to the booth during caution periods.

To put that in an NFL perspective, it would be similar to interviewing the quarterback just as the team breaks the huddle before the next play. Rice said football played a part with another feature of PRN broadcasts.

"We were the first to put a sports break in our race broadcasts." Rice said this helps to keep sports fans tuned in without distracting from the race broadcast and helps them build time spent listening.

Race listeners who want to give their own analysis can participate in a one-hour call-in program that PRN broadcasts after each of its Winston Cup races.

SMI's president is the legendary

H.A. "Humpy" Wheeler, noted for his business acumen, vision and flair for promotions.

Rice said, "When you present a new idea to Humpy, he won't just pick at it or shoot it down out of hand, but will take the time to listen and ask you why you think your idea will work. That's his way of finding out whether you've done your homework before presenting the idea. He sees further down the road than any other boss I've worked for."

Taking on controversy

PRN produces the daily "Garage Pass" program, "FastTalk" and another weekly talk show called "The Pit Reporters" hosted by WBT Radio (Charlotte) Sports Director Brett McMillan. "The Pit Reporters" brings its audience perspective and commentary on the events of NASCAR Winston Cup racing through the eyes of different racing reporters. "The Pit Reporters" does not sugarcoat controversies.

Although PRN is a wholly owned subsidiary of Speedway Motorsports, its editorial positions are not dictated by its management.

"In 1997, there were problems with the track surface at Texas (an SMI facility). It was the big story of the weekend and put SMI in a bad light. When I talked about this with Humpy, he said to tell the truth and don't hide from it. In our daily news, weekly talk and race programming, we try to let the listener know what's really happening. We try to be unbiased and absolutely truthful.

"Sometimes the stands we take aren't popular, but (the racing community and our listeners) know we are trying to be fair," said Rice.

Wheeler says Rice and his staff have helped PRN to grow into one of Speedway Motorsports' major assets.

"With the various programming under the PRN umbrella, PRN continues to be a natural complement to our business here at SMI. It offers wonderful opportunities to promote NASCAR, Motorsports and our various facilities and events."

Paul Kaminski is the news director for the Motor Sports Radio Network.

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PRODUCT GUIDE

ENCO Systems Distributing NewsBoss

The Desktop Technologies radio newsroom management software system, NewsBoss, is now available through ENCO Systems Inc. USA and ENCO Systems Ltd. U.K.

The NewsBoss system is used in 230 radio station sites in 33 countries. According to the company, the general increase in the number of radio stations and networks, combined with an international interest in convergent radio and Web-based technologies, is driving new applications for automated newsroom systems.

With distribution by ENCO, NewsBoss is able to reach a significant base of existing ENCO users in North America, the U.K. and Europe.

For more information contact ENCO Systems in Michigan at (248) 827-4440 or e-mail sales@enco.com.

Slug	Dur	Hlt	Cume	Back	Moved	Writer/Sub	Carls
Passenger Landing	00:26	8:00:10 AM	00:36	03:24	24/08/2001 7:17 AM	Anne Jones, The Boss	Pilot Death
State House Elections	00:29	8:00:36 AM	01:05	02:55	24/08/2001 7:14 AM	Anne Jones, The Boss	
Wayne Prosecutor	00:38	8:01:05 AM	01:41	02:19	24/08/2001 7:18 AM	Anne Jones, Peter Milt...	Conspiracy
Hunley Recovery	00:29	8:01:41 AM	02:10	01:50	24/08/2001 7:17 AM	Anne Jones, Peter Milt...	
Sports News	00:45	8:02:10 AM	02:55	01:05			
Tigers Loss	00:25	8:02:55 AM	03:20	00:40	24/08/2001 7:09 AM	The Boss, Peter Mitchell	
Strawberry Cancer Op	00:21	8:03:20 AM	03:41	00:19	24/08/2001 7:09 AM	Anne Jones, The Boss	
Weather Update	00:15	8:03:41 AM	03:56	00:04			
8am Weather	00:03	8:03:56 AM	03:59	00:01	24/08/2001 7:33 AM	Anne Jones	

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MC-16 Telephone Hybrid/Coupler

Full featured telephone line coupler/hybrid provides 32 programs; 32 ASCII strings (DTMF to ASCII); 64 macros; 16 relays; auto answer; 4-digit access codes and much more.



BOS, ROS & PBB-24 Switch Panels

The BOS offers 12 N.O. dry contact switches with status LEDs in a desktop panel. The ROS is similar, but in a single-space rack unit. The PBB-24 provides 24 momentary buttons that can be programmed to output ASCII character strings.



SRC-8 Serial Remote Control

The SRC-8 provides a means of adding 8 channels of remote control to RF, wireline and fiber type STL systems and may also be used with dedicated modems (full & half duplex models).



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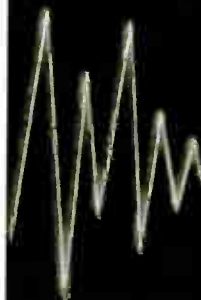
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Kima

► Continued from page 37

frequency, so I wanted to check that out.

The sending unit has a 1/8-inch female plug for accepting audio. It does not use a USB or SCSI port to accept digital audio directly from a computer. It relies instead on a sound card for conversion to analog. Another 1/8-inch female jack is added for audio throughput. To insert the Kima between the sound card and the external speakers found on home computer systems is simple.

When I checked the parts list, I saw a DC power supply was to be included. I could not find it at first, but the power wall-warts and 1/8-inch male-to-male stereo cable turned up underneath the Styrofoam packaging. The unit can also be run on four AAA batteries.

I hooked the base unit to the output of the sound card on my computer and hooked the receive end to my amplifier using the RCA outs. It worked fine for the 15 feet between those two points. MP3-encoded music on my system sounded better than the speakers on my computer.

The base unit has a five-segment LED and an attenuator that does not affect the signal going through the unit to the external computer speakers, along with a power button, power LED and low-battery LED. A switch on the back labeled A through D changes the frequencies. Information about which frequencies went with each letter was not available anywhere.

The receive unit also has a five-segment LED, a power button (without an LED to indicate power), low-battery LED, along with a button marked Scan and a stereo LED. It was obvious when the receive unit was scanning the right set of frequencies, as the stereo signal LED would light up after a few seconds.

As I could hook the transmitter up to anything with a 1/8-inch out, I tried a portable CD player. It is easier to move a portable 1,000 feet than a desktop computer and linear digital audio sounds better than compressed MP3 audio.

The specs on the box claim a 50 Hz to 15 kHz frequency response with a 55 dB signal-to-noise ratio, less than 2 percent audio distortion and at least 25 dB separation. To my ears, the performance sounded as good as an analog FM signal.

I noticed when I switched my Onkyo tuner/amplifier between the RCA inputs and the tuner the retransmitted signal had a mid-frequency boost that I did not like. The RCA output sounded much closer to the original signal than the retransmitted one.

The receive/retransmit unit can be switched between 88.1 and 88.3 FM. Where I live, I cannot pick up any signal at 88.1, but 88.3 is jazz powerhouse WBGO(FM) in New York.

Strong signal

Rebroadcasting at 88.1 bled over to 88.3 and I could not pick up WBGO. At 88.3, my tuner had problems as it tried to find both the Kima and radio station, although the Kima signal was a bit stronger.

Just for kicks, I unhooked the antenna to my tuner and the retransmitted signal was strong enough to be picked up, but the radio station was not. Retransmitting at 88.1, the signal was heard when I tuned up to 88.3. When broadcasting at 88.3, however, I could not hear anything on 88.1.

With the antenna hooked up again, I walked around my room to see how far I could go without the signal fading. Five feet away, the signal would sometimes fade, but at other times it was fine up to 20 feet away. The stereo indicator on my receiver would stay lit until the signal between the units had problems.

Those who are afraid the retransmitted signal will interfere with standard broadcasting stations can simply turn the Kima off when it is not used. The retransmitted signal could only go five to 10 feet and certainly could not interfere with a radio in the next room.

Next, I put the transmitter in a room down a flight of stairs about 100 feet away. This is equivalent to putting the transmitter in a living room and the receiver in an upstairs bedroom down a hall.

The signal was not very strong. Because the antenna is permanently mounted to the

top, I held the receiver unit sideways to get a clear signal.

Then, I moved the transmitter down a second flight of stairs to a room about 250 feet away and could not pick up any signal through all the walls.

As a final test, I left the transmitter in a third floor room and carried the receiver to my car parked about 300 feet away. I did not receive any signal at my car.

I moved the transmitter to the front porch. With the receiver unit sitting on my trunk next to the car antenna, I carefully drove my car down the driveway. I made it about 300 feet when the signal died.

I found it interesting that the signal remained strong until it died altogether, as if a gate circuit had cut the audio once the signal fell below a certain level. Unlike conventional FM, there was no gradual loss or erratic intermittent signals one might expect when moving out of range.

I do not believe the signal can go 1,000 feet — maybe in a flat desert with few objects, true line-of-sight or other radio signals to interfere. I recommend using the Kima across a room or between two adjoining rooms.

Product Capsule:
Akoo.com
Wireless Audio System

Thumbs Up

- ✓ Easy to insert between sound card and speaker
- ✓ Signal attenuator and LED display
- ✓ Generally, a fun device

Thumbs Down

- ✓ Cannot go 1,000 feet under 'normal' conditions
- ✓ Antenna on receiver unit cannot be moved
- ✓ Limited to rebroadcasting on 88.1 and 88.3 MHz.

For more information contact the company in Illinois at (708) 583-9600 or visit www.akoo.com.

With a list price of \$99.95, the Kima is more expensive than a long cable to get audio across a room, but is considerably more fun. ●

PRODUCT GUIDE

O.C. White Squeak-Free Mic Stand

The 51900 Deluxe Series Ultraflex Mic ArmT and Riser from the O.C. White Co. combines the company's spring counter-weighted 14194 Mic ArmT with a 12-inch riser to provide height, reach and flexibility.

The mic arm is silent and squeak-free, using elastic Music wire springs. Steel springs often crackle, twang or squeak when moved; the Ultraflex Mic ArmT is silent and designed for broadcast applications. Price: \$149.

For more information from O.C. White, call the company in Massachusetts at (413) 289-1751 or visit www.ocwhite.com.



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Exabyte 8505XL 8mm backup, \$1000. Mike Jones, Lifeword Bdct Ministries, 535 Enterprise Ave, Conway AR 72032. 501-329-6891.

Panasonic SV-3700 DAT, \$450. Mike Jones, Lifeword Bdct Ministries, 535 Enterprise Ave, Conway AR 72032. 501-329-6891.

Sony DTC1000 DAT w/Radio Systems conversion, \$250. Mike Jones, Lifeword Bdct Ministries, 535 Enterprise Ave, Conway AR 72032. 501-329-6891.

Tascam PortaTwo cassette 4-track recorder, \$50. Mike Jones, Lifeword Bdct Ministries, 535 Enterprise Ave, Conway AR 72032. 501-329-6891.

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ITC cart recorder model PDII, \$100; Aiwa cassette deck model AD6900-MKII, \$250. J Price, 214-321-6576.

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Gates stereo statesman (2), 5 rotary pots, \$500 ea or 2 for \$850. Brian Larson, WNGN, 65 Kings Rd, Buskirk NY 12028. 518-686-0975.

McCurdy ss7400 12 channel p&g slide fadders (2) from classical station, \$2500 each. Brian Larson, WNGN, 65 Kings Rd, Buskirk NY 12028. 518-686-0975.

Autogram IC-10, 10 channel stereo, very good condition, \$1000. Tom Toenjes, KJTY, 6120 Riley Circle, St Marys KS 66536. 785-437-6549.

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J.L. Cooper CS-10/2 controller, \$200. Mike Jones, Lifeword Bdct Ministries, 535 Enterprise Ave, Conway AR 72032. 501-329-6891.

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◆ READER'S FORUM ◆

IBOC DAB

I read the commentary of Aaron Read in the Nov. 21 issue ("IBOC DAB Benefits Will Be Few"). I imagine this article will generate a lot of replies.

I compliment Radio World on its practice of publishing a variety of opinions on subjects that affect the radio industry and Aaron Read certainly is an opinionated person.

Fortunately for your readers, his cute and comical style of writing doesn't hide the fact that he is taking a very authoritative stance on a technology of which he obviously has little or no knowledge.

Charles Morgan
Chairman

National Radio Systems Committee
York, Penn.

Perfect Paul

Your Nov. 21 article "'Perfect Paul' to Be Dumped Next Year," about the National Weather Service's computer-generated voice, brought out comments that indicate exactly what is wrong with the thinking of too many people in radio.

'Listeners don't care if Porky Pig is the announcer, as long as the message is accurate.'

Too much time is spent worrying about "digital quality" and not enough time is spent worrying about the content of the broadcast message.

Believe me, when there is an impending tornado, listeners don't really care if the voice that delivers the message sounds "computer-like and too canned,"

as one engineer suggests. At that point in time, listeners want the message and they want it *now* ... they don't care if Porky Pig is the announcer, as long as the message is accurate.

I am not suggesting that progress in developing new broadcast technology should stop, but I am saying that "digital quality" is not going to be the salvation of radio. There are all kinds of sources for CD-quality sound already, but there is often only one source of immediate local information, and that is radio.

I doubt if satellite radio, compact discs, MP3 players or Internet streaming will ever be able to compete with radio when it comes to delivering local information rapidly, so let's all develop that strength.

Broadcasters must start thinking about the message rather than the messenger if radio is to survive.

Maynard Meyer

President/General Manager/CE
KLQP(FM)
Madison, Minn.

Sept. 11 and radio

Radio World asked for comments about how stations covered the events of Sept. 11.

For most of the day it was a wonderful synergy. Here at KAYA(FM) in Sioux City, Ind., my wife and I were doing our morning show, when, at about 8:10 a.m. Central time, a listener called to tell us about New York.

After about five minutes, we realized that we were not going to be able to cover this event properly, so we quickly patched in our local NBC affiliate, KTIV(FM), which we ran pretty much nonstop for an hour or so.

Meanwhile our network, American Family Radio, with its own news department, headed up by Fred Jackson, was trying valiantly to keep up. We switched back to them eventually, but the most interesting part of the story is that even they realized that they were out of their league and they switched over to AP audio for several hours pretty much solid.

Seems that there weren't any conservatives or liberals when our nation was under attack and no jokes about TV vs. radio.

Warren Wilson
Station Manager
KAYA(FM)
Sioux City, Ind.

Roasting A Good Cause

We believe the radio industry is more like a family than a cutthroat business. So naturally when the family gets together on occasion, the gatherings will involve speeches, good-natured ribbing ... and money.

That's exactly what the 16th Annual Bayliss Foundation Radio Roast will sport when it roasts Katz Media Group CEO Stu Olds on March 14. The party serves as more than an opportunity for launching potshots at Olds. The foundation supports scholarships for future radio workers. The roast is a fund raiser, with tickets weighing in at \$425 to \$525.

Want to go but can't shell out that much? The foundation has good news: It is sponsoring a contest with two pairs of VIP tickets as the prizes.

Enter by Jan. 31 at www.baylissfoundation.org/contest.html for the drawing. Anyone in radio who is interested in helping the cause can enter.

The foundation was established in memory of John Bayliss, a 25-year radio veteran in the management and sales areas who achieved "record billings, top ratings and high profit margins." The \$5,000 scholarships are awarded annually to up to 20 college juniors, seniors and grad students with strong credentials and a future in radio.

The lofty goals of the foundation and the great status of the roastees have made the event an annual get-together that attracts powerful radio vets. The honorees are selected by the foundation's board of directors who look for people who have made great contributions to radio.

Previous roastees include talk-show host Larry King and FCC Commissioner James Quello. Olds is being honored for his contributions to advertising as part of the Katz Media Group, which represents more than 2,100 stations as advertising representatives.

So take a chance at snaring the free tickets. Even if you don't get them, go anyway — the intern who is fetching your coffee might be the person who benefits!

— RW

I want to mention an observation made since the terror attack in September. Articles in Radio World, newspapers, magazines and so on tell how people have turned to AM radio news operations to find out what is going on. Some predicted a jump in listenership for many of the AM stations due to this.

AM radio is really the first electronic technology that people put in their homes. Here it is, 80 years, several presidents, a World War, a major economic depression, Korea, Vietnam, moon landings and what else have you and still, in times of crisis, people turn first to the oldest technology available.

With the changes in technology coming as fast as they are, I am sure there will never be another development that will last as long and serve us as well as AM, which is pretty much unchanged since its inception, sort of like the Harley engines with the same pushrods that were used in 1920.

The first major change to AM will probably be IBOC, but I think even with IBOC we will still be modulating the carrier power for many years to come. Viva La AM!

Ron Schacht
Chief Engineer
Citadel
Wilkes-Barre, Penn.

Write to Us

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READER'S FORUM

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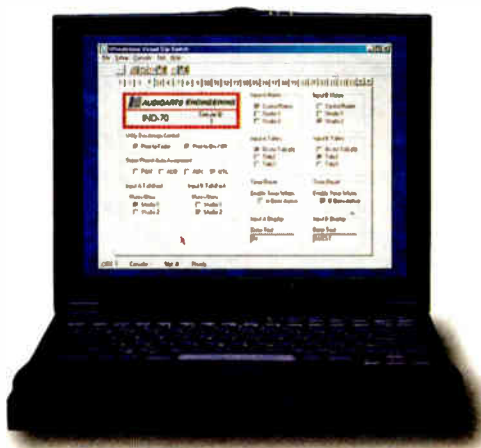
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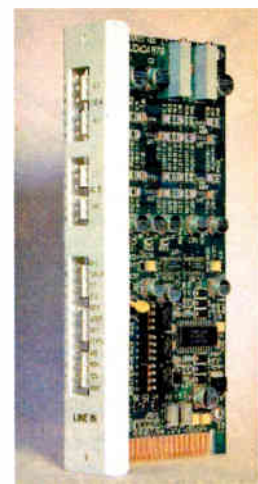
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