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A station cluster in Texas faced tough choices when Columbia disintegrated above Nacogdoches.

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$2.50 The Newspaper for Radio Managers and Engineers March 1, 2003

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'Jukebox Radio' Is No More

by Randy J. Stine

FORT LEE, N.J. After nine years, the saga of a New Jersey radio broadcaster who drew the attention of the FCC and broadcasters to questions about local program origination on translators is over.

Gerard Turro's two translators, W276AQ(FM) in Fort Lee, N.J., and W232AL(FM) in Pomona, N.Y., no longer retransmit the programming of WJUX(FM) in Monticello, N.Y.

"The FCC directed Mr. Turro to cease the arrangement to come into compliance with FCC translator rules," said Turro's attorney, Charles Naftalin. "The FCC asked that he stop the retransmission of WJUX' programming and he did by severing his relationship with WJUX."

Turro declined comment for this story through Naftalin, who would not speculate on Turro's broadcasting plans.

The two translators are rebroadcasting other content. The Fort Lee translator at 103.1 MHz in Bergen County has been retransmitting oldies from WKHL(FM) in Stamford, Conn., since at least the first of the year.

See JUKEBOX, page 5 ▶

NEWS ANALYSIS

Broadcast Ownership Rhetoric Heats Up

by Leslie Stimson

WASHINGTON The debate over broadcast ownership rules has intensified in recent weeks, with those who want higher TV limits squaring off against consumer groups who decry the effects of consolidation.

In radio, the discussion isn't focused as much on local ownership limits — participants do not expect those to be raised — but rather how a radio market is defined, experts say. This, too, affects the number of stations that may be owned in a market.

Media ownership has spurred public disagreement between at least two commissioners. To get more input from outside the Washington beltway, Commissioner Michael Copps scheduled two more public hearings, set for later

See OWNERSHIP, page 8 ▶

Photo: Thomas R. Ray III, CSRE of WOR(AM), New York

A tour of the WOR(AM) transmitter facility in Lyndhurst, N.J., attracted 130 people from as far away as Washington. WOR led tours of its HD Radio installation as part of an SBE Chapter 15 meeting. More HD Radio photos, page 5.

◆ NEWSWATCH ◆

Race for IBOC? Ibiquity Offers New Incentives

COLUMBIA, Md. Calling its first HD Radio incentive program an "overwhelming success," Ibiquity Digital Corp. announced another.

The first 125 for-profit, commercial stations to enter into a station license agreement after Feb. 1 would have the one-time fee for the audio license limited to a maximum of $5,000.

Also, non-commercial, non-profit stations that enter into a station license agreement by June 30 will have the one-time fee for the audio license waived completely.

A station must make its "best commercial efforts" to start digital broadcasting by June 30 and continue to transmit in digital until at least the end of 2004.

The company said approximately 130 stations in 40 cities had signed licenses to convert to digital by the end of 2002.

Copps Concerned About 'Retribution'

WASHINGTON Commissioner Michael Copps wants the FCC to set up a procedure to fight what he called retribution against those who testify against media consolidation.

"It has been a revelation to me that there are media professionals with strong feelings about the downsides of consolidation for the American people, who are afraid to speak for fear of retribution," he said in a speech.

"I hear privately that speaking out on this issue would cost many people their careers."

He said he was working with the other commissioners on an anonymous testimony procedure.

Copps also announced he would hold two media concentration hearings, one in Seattle at the University of Washington, the other at Duke University in North Carolina. Both will be in March. The FCC is in the process of reviewing local ownership and cross-ownership rules.

"We can't pretend everyone reads the Federal Register or has lobbyists to make their voice heard at the FCC," he said.

Response Rates A Concern

WASHINGTON A committee of broadcasters say they have "serious concerns" about declining Arbitron diary response rates.

The NAB's Committee on Local Radio Audience Measurement put out a "challenge" to Arbitron, asking it to present COLRAM with a "comprehensive plan" to improve response rates.

The group said response rates are at "critically low levels, particularly in some of the largest markets." It cited "Arbitron's equally alarming lack of aggressiveness in implementing measures to stem these declines."

Arbitron spokesman Thom Mocarsky replied that the issue continues to be an important priority. "We're spending more than ever than ever before on dealing with declining response rates."

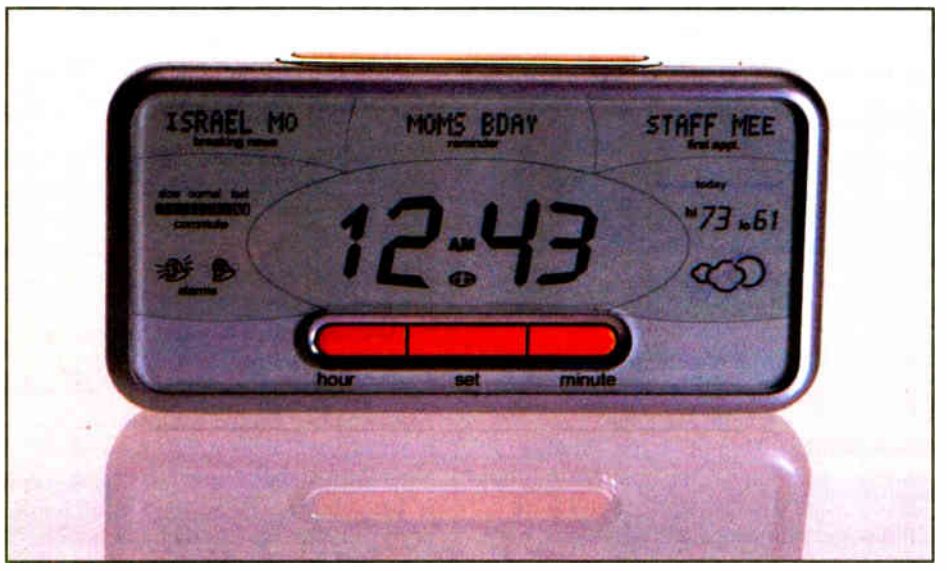
He said the company would "continue to work with COLRAM, the NAB and the Radio Advisory Council on addressing this important issue."

Index

Consumer Gadgets Go Beyond Radio

by Craig Johnston

The annual Consumer Electronics Show in January got plenty of coverage in the print and electronic media, so just about everyone saw Bill Gates and his Smart Personal Objects Technology wristwatch. It's of interest to the radio industry because it uses a wide-area network based on FM subcarrier technology to deliver weather reports and news updates to the wearer.



Alarm Clock Using SPOT Technology

The data service is called DirectBand. Microsoft and its partners say they chose FM as the data-carrying vehicle because the FM infrastructure exists and the FM sideband carriers can handle the small, continuous data transmissions the service requires.

Microsoft says it is working with Clear Channel Communications Inc., Entercom Communications Corp., Greater Media Inc. and Rogers Communications Inc. to supply stations for an initial coverage area in approximately 100 of the largest population centers in North America.

Prices of the watches will depend on design and manufacturer. Monthly service is expected to cost around $10.

Here's a sampler of other gadgets displayed at CES that people in the radio industry might find useful.

★★★

The station's conference room needs a Dolby 5.1 Surround Sound system, and that requires an array of five speakers, spread front and back, left and right across the room, and all the attendant wiring. Or does it?

Pioneer introduced its Sound Projector, a single module containing 254 discrete speakers that can be aimed individually to bounce sound waves off walls and the ceiling to provide 5.1 Surround.

The Sound Projector is cabled directly to the CD or DVD player and decodes the 5.1 Surround audio within the unit. The installed Sound Projector can be tuned to the specific room environment by using the remote control.

In order to match the look of flat-panel display screens, the speaker unit is 5 inches thick. On your way to the stereo store, stop at the bank; the Sound Projector retails for $40,000.

★★★

While we're in the conference room, there's nothing more pretentious than a plasma flat-screen sitting on the wall between viewing sessions. So VisionArt introduced framed canvas prints to hide those blank screens.

The art is in the form of limited edition Gielee prints of works from artists such as Paul Rodriguez and Jane Bazinet, a collection of 300 to choose from, numbered and signed by the artist. The prints can be combined with 28 custom frame styles.

The user pushes a button on the remote control and the canvas silently rolls up into the top of the frame to reveal the screen. A special printing process assures the print won't be damaged by repeatedly being rolled and unrolled.

The downside of a VisionArt screen: one more remote control.

★★★

When radio's consolidation hits its logical conclusion, there really will be only one person to operate a whole cluster of stations. Among that individual's challenges will be to find time to grab lunch. Any timesaver could be a lifesaver.

Enter Tonight's Menu Intelligent Ovens with its Internet-controllable refrigerated oven. The solo station-op puts his lunch into the Ethernet-connected TMIO unit when he or she arrives for work. It keeps the foodstuffs cold until the op issues cooking instruction via Internet or cell phone.

Look for the laptop-controlled latte maker next year, or did we just forget to walk down that aisle at the show?

★★★

Everywhere you looked at CES, someone was putting a Palm or Pocket PC to use for some task or another. Several exhibitors put customizable universal remote control menus on the tiny computers. Others had digital cameras and camcorders built into them.

One company solved a big challenge for Webcast listening. Among the downsides of Internet radio has been the need to use a PC connected to the Web in order to listen. The pocket transistor radio in the '50s freed the radio listener from sitting next to the old home console radio. Dell Computer's Axim X5 Pocket PC does the same for the Internet radio listener.

Using the Axim to listen to Internet radio requires a Compact Flash wireless card, and that the user be within range of a wireless network. While the combination microphone/speaker on the unit yields unsatisfactory audio, listening on headphones is terrific.

The best part is that the Internet radio channels can be changed at the PDA itself, without returning to a connected PC. At CES the unit was only capable of listening to Windows Media encoded stations, but RealNetworks said they have been talking to Dell.

★★★

Tonight's Menu Intelligent Oven

If incorporating PDAs into other technologies was one of CES' major trends, then close behind was building global positioning satellite receivers into various devices. Combine a PDA and a GPS, and you have Garman iQue 3600.

Where does the iQue 3600 fit into a radio station? As Garman's brochure states: "Our integrated software not only allows you to look up appointments or contacts, but also locates and routes you to them with voice-guidance commands."

Get a radio salesperson one of these and there's no reason for the individual to forget an appointment, or get lost driving there.

AccuWeather Has a Sunny Outlook

The morning was sunny but biting cold when I visited AccuWeather in State College, Pa.

I had a picture in my mind beforehand. I expected a bustling place, surrounded by satellite dishes. Inside, numerous sources of information would come pouring in over hundreds of computer screens, where it would be digested, analyzed and re-formed by dozens of meteorologists huddled dramatically over maps of isobars, wind-chill indicators and satellite photos, pooling their collective wisdom and crunching data with a powerful modeling system developed over several decades.

That's pretty much what I got.

AccuWeather serves 16,000 clients, among them 200 radio affiliates. Three hundred people work in this five-year-old, 52,000-square-foot facility, including 90 meteorologists. To walk onto the central Operations Center floor is to feel like you're in a meteorological Mission Control.

In the center of the big, high-ceilinged room are three "pods," where forecasters monitor weather in the west, central and east regions of the United States. Across the back wall is the international weather area.

Photo: Paul McLane

Expert Senior Meteorologist Dale Mohler works the monitors in the Operations Center.

"We get more information here than any National Weather Service office, certainly any TV or radio station," said Senior Vice President Dr. Joe Sobel. I'm obliged to believe him because he's a huge Mets fan.

NWS data, Doppler radar, satellite images, lightning strike imagery, military models and weather information from other governments are accumulated here.

They know snow

As I stand in the Ops Center, off to my right sits a bank of work areas devoted to snow forecasting. Clients really want to know about the white stuff. Snow coverage is a huge part of what radio stations do, of course. But founder Dr. Joel N. Myers served his first utility in 1962 and first ski area in 1963, eight years before signing a radio affiliate (suitably, its call letters are WARM). School districts and highway departments are customers.

Behind the snow bank is a TV camera, lights and backdrop. On the other side of the room are employees who compile weather pages for 850 newspapers, as well as Internet development people.

Behind me, against the near wall, is a hallway with 19 radio booths. The first, overlooking the operations floor, is the 8-by-12 office and workspace of Senior Vice President Elliot Abrams.

I'm delighted because I have listened often to this weather veteran in Philadelphia and New York. Abrams, a genial, stocky man wearing a gray polo shirt, is recording midday forecasts for WBZ in Boston. He tells stories between cuts with a straight face but a constant twinkle in his eye.

Arrayed before Abrams are seven computer monitors, a Shure mic on a boom, a small mixer setup and a Comrex Nexus codec. On the walls are charts: maps of the Chicagoland area and of New York and northern New Jersey; a list of past "Buffalo Big Snows"; and maps of the United States, stuck there with pins, showing weather patterns he has drawn by hand this morning.

Abrams serves approximately 19 stations with 80 cuts or live reports a day. He gets up at 3:30 a.m. He's been doing this job for 35 years.

Today is cold, and East Coast stations are asking for extra reports. AccuWeather boasts that such extra attention is one of its hallmarks. Another is aggressive updating of forecasts when something is "busting" — when conditions warrant.

I enjoy a chat with Abrams, during which he turns away to feed WBZ, then WBBM in Chicago. Then I head to the office of Sobel, who emphasizes that AccuWeather tailors its products for each affiliate.

"We're not a syndicator," he said. "We work for 200 radio stations. They want an old geezer, they get me. They want a

Continue on page 5 ▶

From the Editor

Paul J. McLane

Our giveaway this issue is a new phantom-powered tube mic from Audio-Technica.

The winner is Charlie Wooten, director of engineering and IT at Clear Channel Radio in Panama City, Fla.

With the AT3060, the company is aiming to bring the warm sound of classic tube mics to broadcast. It runs on 48V phantom power; it needs no separate power supply or custom cables. An AT8458 shock mount is included: it attenuates noise and vibration.

A large-diameter diaphragm cardioid condenser element produces high sensitivity and smooth sound with low overall noise. Features include a shock-mounted tube, large coupling transformer and silver satin finish. It's a lovely choice for on-air and production work.

Retail value: $599.

Sign up for this year's contest, if you have not already, at www.rwonline.com.

▶ Continued from page 4

poet, they get Elliot. They want a male, a female, someone crazy — each gets what they want."

Direct ingest

In the past, the broadcast staff relied on regular phone lines, then frequency extenders. Now most of the radio booths are equipped with Comrex ISDN codecs. WINS(AM) in New York has a dedicated circuit so the facilities can converse at any time. A weatherperson might send a recorded MP3 or WAV file to an affiliate electronically.

Coming will be direct delivery of AccuWeather content to automation systems, according to the product manager for radio services, Dean "DeVore" Otthofer.

He also detects more interest from music stations. He attributes this in part to awareness in the wake of 9/11 of the importance of information in non-news formats. I've heard similar comments from folks at the Associated Press.

Myers, founder and president, is a slim, proper man with a formal air who exudes a sense of pride in the business. Sitting in his spacious office, he tells me he was 11 when he decided he wanted to start a weather company. He started in earnest in 1962 while a Penn State grad student. His first media clients, and the AccuWeather name, came in 1971.

We discuss the university students he has taught and the challenges he faces now. One big change, he said, is that weather is a "continuing story" for consumers, thanks to CNN Headline News, The Weather Channel and services like AccuWeather. But even today, the obstacles involved in selling the concept seem to get him a bit nettled.

Elliot Abrams

"My whole life has been convincing media that weather is of great interest to the average consumer," he said.

For instance, when he first approached WINS in New York, the station treated weather as simple rip-and-read content, he said. Now WINS and AccuWeather are closely identified and the station airs AccuWeather reports around the clock.

"Weather affects *everybody*. (But) it's an investment. Stations need to put it on and promote it."

If a listener needs a forecast and your station doesn't have good weather information, he said, the listener will tune away. "You're conceding those listeners to someone else — maybe for good."

He seems amazed that he still has to make this argument.

Weather weenies

The company is active online. It provides content for 1,200 Web sites and enjoys 4.8 million unique users on its own each month. It offers Web subscriptions to premium services. Its latest product is AccuPOP, a free online tool for predicting the probability of precipitation in any given location.

Another change, according to Marketing Communications Manager Jamie C. Oberdick, is the number of weather enthusiasts — he affectionately called them "weather weenies."

I smile, but I find myself thinking that one obstacle to growth for AccuWeather may be its own success. Americans are indeed far more educated about the weather than we were 20 or 30 years ago. Media outlets, too, have many choices for content, and AccuWeather's services are not free. They cost a station, in cash or, more typically now, in barter (United Stations is its sales rep).

Such costs can be an obstacle to selling the service at a time when many a radio manager finds it attractive to strike a deal with the local TV outlet to use its weatherperson. A familiar TV name is an audience draw, some argue. The TV station might even pay the radio station for the exposure.

"Radio is enamored of TV," Sobel acknowledges. But, AccuWeather argues, "Where will the TV weather guy be when a big storm hits your market?" Answer: on TV, not your station. Further, in many small and medium markets, he said, the TV weather person will soon look to move to bigger cities. AccuWeather, by contrast, has a stable brand and personalities.

To those arguments, I would add: Why concede to another media outlet that it can do the job better than you can? Create your own strong weather brand.

I'm not endorsing any given weather provider here. And AccuWeather is itself not a local resource, although the company knows the importance of sounding local, and crafts its content as much as possible.

But I do favor the concept of a radio station developing its own *personality*. That's what drew me to Elliot Abrams when I was listening to him on KYW(AM) in Philadelphia. AccuWeather has prospered by understanding this concept.

DIGITAL NEWS

HD Radio Comes to Town

Stations are beginning to play up their HD Radio/IBOC service.

In the top photo, Dave Kroeger, principal engineer for Broadcast Electronics, and Gary Richardson, owner and engineer of WJLD(AM), Birmingham, Ala., check underneath the station's BE ASi 10 signal generator. The station said it was the first AM that was not an Ibiquity test station to go HD Radio. WJLD is also using a BE AM-1A transmitter for the digital signal.

In the second photo, Thomas R. Ray III, CSRE, corporate director of engineering of Buckley Broadcasting/WOR(AM) in New York, is shown hugging a production-model Visteon HD Radio that will appear in 2004 model year Ford, Lincoln, and Mercury vehicles. WOR led tours of its facility for SBE Chapter 15/NYC for those who wanted to see "New York's First Digital AM Radio Station."

The photo on page 1 of this issue is from the WOR tour.

Radio World welcomes photos from your HD Radio transition. E-mail them to *radioworld@imaspub.com* or mail to Radio World News Department, P.O Box 1214, Falls Church, VA 22041.

Radio Faces the 'Burden of Proof'

This is the text of a statement by Future of Music Coalition Executive Director Jenny Toomey to the U.S. Senate Commerce Committee on Jan. 30.

I am a rocker, a businesswoman and an activist. I speak to you today as a working artist and as executive director of the Future of Music Coalition, a non-profit think tank that pursues initiatives that can benefit citizens and musicians.

Most working musicians aren't superstars — rather, they are independent and local. For the past three years the FMC has worked with musicians and citizens groups on issues from Webcasting to health care. But one issue unites our entire constituency: access to commercial radio.

Given these concerns, last February we began an eight-month research project to examine the problem. In the study, we ask the basic questions: how has ownership of commercial radio changed? And does radio serve the essential regulatory priorities of localism, competition and diversity?

The radio study is over 150 pages. We have entered it in the record today, filed it as a public comment at the FCC, and it's posted on our Web site, *www.futureofmusic.org*. ...

We cannot summarize that data in five minutes, so I will confine my comments to three themes that must alter the focus of future debate on radio concentration.

First, the broadcast industry defends the radical restructuring by pointing at other entertainment industries and saying,

Jenny Toomey

"We're not as bad as those guys." But, they aren't "those guys."

Radio is not private property, but a public resource regulated by the government on behalf of citizens. For decades, it was based on a model of local ownership. In 1996, the national cap was 40 stations. So it's distressing that Clear Channel owns 1,240 stations and five other radio groups each own over 100 stations at the same time that we've lost over 1,700 distinct radio station owners since 1996.

But it's more distressing that in New York City, 79 percent of revenue is controlled by four companies. In Washington, D.C., it's 79 percent. In New Orleans, 90 percent. In Austin, 92 percent. In virtually every local market of the county, four companies or fewer control over 70 percent of the market.

In many cases, these owners are not locally based. This means that we have *less* competition than before deregulation, not more.

Second, the broadcast industry claims that deregulation has brought us more formats, and thus more diversity. But formats are a poor measure of diversity. Measuring music diversity by counting the number of radio formats is like measuring the variety of food in your pantry by counting the number of cans without looking at what is inside them.

We found substantial overlap between supposedly distinct formats. In the most extreme case, for the week of Aug. 2, 2002, the national charts for two distinct formats overlapped at a 76 percent level. In other words, 38 of the top 50 songs were the same. Third, the broadcast industry claims that fewer owners in a market leads to more diversity. They say radio companies will avoid competing against themselves in a single format.

On the surface, this makes sense. Why would a company that owns seven stations in a market want to compete with themselves? But this misses the fundamental logic of the value of a station group. The primary goals of a radio station group are to: 1) attract the largest possible number of listeners in the most attractive demographics and 2) ensure that if the listener changes station, they change to another station owned by the parent company.

The economic incentive is not to provide diversity of programming; rather radio companies seek to assemble overlapping and economically lucrative audiences that will generate the most revenue. On the expense side, the incentive for radio companies is to centralize operations, using more syndicated programming and applying new technologies like voice tracking to cut costs.

For example, in Denver, Clear Channel owns seven stations. Instead of offering blues, classical, jazz, folk, bluegrass, zydeco or other formats, this is what they program: news/talk, talk, rock, classic rock, modern rock, contemporary hit radio, and adult alternative.

We know that radio companies spend enormous resources to draw the largest possible audience in preferred demographics. But is that really how we define the public interest?

We have heard concern about radio consolidation expressed by musicians, unions, record labels, consumer and religious groups, small broadcasters, industry employees and elected officials.

Concern about the loss of local voices. Concern that stations are burying public service announcements in off hours. Allegations of "pay for play." Concern about increased advertising. Concern that public officials have fewer outlets to reach citizens. Allegations that talk shows won't allow questions from callers who "sound old" because it alienates younger listeners. Concern that community-based low-power radio licenses were scaled back because of the power of the broadcast lobby. And concern that musicians who publicly criticize the industry will be blackballed.

But the burden of proof should fall on the broadcast industry that pushed for these changes, and now they must explain how they serve localism, competition and diversity. I want to thank Chairman McCain and the committee. Mr. Chairman, we can do better.

I hope that today's hearing inspires citizens around the country to contact members of this committee to explain that our communities need access to radio. There are hundreds of thousand musicians in this country and while they may all not have a hit record in them, each one of them has a vote. And while they disagree about many things, they agree that there is something tragically wrong about what has happened to our radio and they agree that it has to change.

NEWS WATCH

Budget: $280.8 Million for FCC

WASHINGTON The FCC would receive funding of about $280.8 million in fiscal 2004 under President Bush's proposed budget. This compares to budget authority of $268.3 million in the president's budget for FY2003.

The proposal includes $6.1 million for more staff and programming initiatives, and $6.37 million for cost increases for salaries and benefits plus inflationary costs such as office space and supplies.

Fee income would offset 90 percent of the budget, according to the FCC, compared to 37 percent a decade ago.

Boccardi to Retire at AP

WASHINGTON Louis D. Boccardi will retire as president and CEO of the Associated Press.

"Boccardi has led AP worldwide operations for 18 years, half of his AP career. He will be 66 when he retires in late summer or early fall," the company stated. A replacement was not immediately announced.

Chairman Burl Osborne credited Boccardi with leading the rebuilding of services, the conversion to electronic photos and the launch of Associated Press Television News as well as a multimedia Internet site.

During his tenure, budgeted revenue grew from $200 million to $500 million in 17 years; bureaus increased from 215 to 242. Osborne called Boccardi "a tireless crusader on First Amendment issues."

Plans Set for College Media Show

NEW YORK Collegiate Broadcasters Inc. will produce the broadcast portion of the Spring National College Media Advisors Convention in New York, March 20-22.

Organizers expect 1,200 print, broadcast and online journalists and student media advisors.

CBI is a non-profit volunteer organization. Its section of the conference targets attendees looking for guidance on what to expect in the job market.

Fritts: Telecom Act a Success

This is the text of a statement by NAB President/CEO Eddie Fritts to the U.S. Senate Commerce Committee on Jan. 30.

NAB represents America's free, over-the-air radio and television stations. Today, there are nearly 4,000 separate owners of the 13,000 local radio stations that serve America's listeners. I'm pleased to testify on their behalf.

While the industry continues to change, one thing has remained constant: radio's commitment to serving local communities. This attribute distinguishes us from all competitors — from online music to satellite radio — local service to the community is that which separates us from our competition.

Today, the industry has rebounded financially but, just 10 years ago, 60 percent of stations were losing money.

— Eddie Fritts

Radio broadcasters are proud of their commitment to localism. A recent NAB study found that in 2001 alone radio stations contributed $7 billion worth of public service to their communities. That number includes the value of public service announcements, as well as monies raised for charities, disaster relief and the needy.

While this is an impressive figure, it does not tell the whole story. Radio's local connection allows it to offer services that cannot be measured in just dollars and cents. For example, the AMBER Alert has been able to return over 40 abducted children to their families largely due to radio. How can one put a price tag on successes like that?

Radio underscored its value in helping solve the D.C. sniper case. After hearing the vehicle description and tag number on the radio, a listener called authorities resulting in the suspects' immediate arrest.

And no dollar figure can account for radio's work following the events of 9/11. Stations across the country raised donations for rescue equipment and victims, organized blood drives and overall, reassured and informed Americans during that dark time.

These, of course, are just a few examples, and I could go on.

Today, the industry has rebounded financially but, just 10 years ago, 60 percent of stations were losing money. Many stations had gone off the air, depriving communities of the local service upon which they had come to rely.

It was in that state of affairs that the Congress and the FCC revised radio ownership rules. NAB believes the limits implemented through the 1996 Telecommunications Act enabled radio to better serve local audiences across the country as well as strengthening the industry economically.

As radio deregulation has moved forward, radio's critics have tended to overstate the effects of industry trends. Compared to other entertainment choices, radio is perhaps the *least* consolidated sector. The Hollywood movie studios, the record companies, direct broadcast satellite, cable systems, newspapers — even the Internet — all have more of their revenue share concentrated among the top ten owners than does radio.

Of course, radio's diversity is not measured by revenue shares.

Radio broadcasters recognize the importance of diversity. Chairman McCain has offered a proposal to foster greater ownership diversity through tax deferrals. We look forward to working with the chairman, the committee and the entire Senate in seeing that this important legislation moves forward.

Already, today, radio's formats mirror the diversities in American society. Spanish language formats have increased by over 80 percent in the last decade and other ethnicities are well represented on the dial, from Persian to Polish to Chinese to Haitian. The list goes on and on.

Radio also remains the most trusted source for music. According to Arbitron, two-thirds of Americans say that radio is where they turn *first* for new music. Ninety-five percent of Americans listen to radio weekly. Our listeners have good reason for tuning in: last year alone, radio debuted 3,000 new songs and over 550 new artists.

Eddie Fritts

In sum, Mr. Chairman, the Telecommunications Act has been a success for our listeners. And what's good for our listeners is good for our industry.

It was a goal of Congress when formulating the Act to keep radio a viable, vibrant and local medium. That objective has been met. Radio today is more financially stable. Radio's programming is as diverse as its audience. Today, radio remains the ultimate local, community medium. We look forward to continuing that proud tradition into the future.

Ownership

▶ Continued from page 1

this month in Washington state and North Carolina, in addition to the one already set for late February in Richmond, Va.

Chairman Michael Powell, however, expressed satisfaction with the input already received from the public.

He said the 13,000 comments filed on media ownership through mid-February proves citizens can air their opinions without the commission spending federal money to ferry agency staff around the country for hearings.

Copps is a Democrat who was nominated by President Bush. Powell is a Republican, nominated by President Clinton and designated as chairman by Bush.

Powell hopes to complete the biennial review of media ownership limits by late spring. The review is mandated by Congress to justify the existence of the rules, to revise or eliminate rules that don't reflect the media marketplace.

With the public comment period over, FCC staffers now turn their attention to reviewing the comments, leading radio owners wondering whether their local limits will be further relaxed and whether the definition of a radio market will change.

A rule that bans cross-ownership of either a TV or a radio station and a newspaper in the same market also is under scrutiny.

The caps

Experts contacted for this story believe the local radio ownership limits, the tiered system established by Congress when it passed the Telecom Act of 1996, are not likely to change.

Indeed, NAB and the major broadcast groups are not lobbying for changes to the limits, which allow one entity to own up to eight radio stations in a market.

However, some consumer groups are pushing for the local limits to be lowered, claiming that consolidation has forced out many independent owners who were too small to compete with larger neighbors.

These groups, and the National Association of Black Owned Broadcasters, say fewer minorities own stations compared to 1996. Some say consolidation also is responsible for less diversity in programming.

The act allows one company to own up to eight stations in a market that has 45 "voices," i.e., commercial stations. In 2000, commissioners then under Chairman Bill Kennard, a Democrat, proposed changing how a radio market is defined. This school of thought argues that the current method for determining the number of stations or "voices" in a market — by counting overlapping signal contours in a geographic area — allows one entity to own more stations in a market than intended by the Telecom Act.

Powell recently referred to these outcomes as "anomalies." One expert said such situations are unusual, but do occur more frequently since passage of the higher local limits in 1996.

In its Notice of Proposed Rulemaking in 2000, the FCC suggested that an "Arbitron-like" market definition, such as Arbitron Radio Metro Survey Areas, might better reflect today's markets, showing where a station's listeners are located and the identity of stations actually perceived by advertisers to be in a market.

When the FCC determines how many total stations are in a market, it counts those whose principal community contours overlap *at all* with the contours of any station "whose contours define the market." But to calculate how many stations a given group owns there, it counts only those whose signal contours overlap *all* the other signals.

Photo: Leslie Stinson

Musician Don Henley and NAB President/CEO Eddie Fritts don't see eye-to-eye.

NAB and some other large groups, such as Clear Channel, oppose using Arbitron Radio Metros, saying they could lower how many stations one company could own in a market.

Womble Carlyle attorney John Garziglia said the effect might be minimal in a large market, but could be significant in smaller and unrated markets.

"A change in the way the market is defined is likely to lead to a result where we're back to, in a small market, where someone can just own an AM and an FM." The way to success today for radio owners, he said, is to acquire enough stations to be able to compete against the larger groups.

No one raised the issue of changing radio market definitions in 1995 when the Telecom Act was being debated, he said.

At a Senate Commerce hearing on radio consolidation in late January, NAB President/CEO Eddie Fritts said consolidation basically saved radio stations in the 1990s, when many of stations in this country were losing money. He said cost savings and profits resulting from consolidation "have rescued the radio industry from economic failure."

NAB believes the '96 Act worked, Fritts said. Of the approximately 13,000 radio stations in this country, there are 4,000 owners. NAB and many large group owners believe local limits should remain untouched because radio's competitors in other media have grown, and because terrestrial radio now competes with 200 satellite digital radio channels in each market, he said.

Unlike many of his fellow senators who remain on the Commerce Committee, Chairman John McCain, R-Ariz., opposed the Telecom Act.

McCain's line of questioning for Clear Channel Communications Chairman/CEO L. Lowry Mays was intense, and he interrupted the head of the nation's largest radio owner repeatedly.

McCain asked if Clear Channel planned to acquire more stations. Mays said no, unless a deal that had significant advantages was discovered.

Also testifying was Robert Short, former owner of urban-formatted WRDS(FM) in Syracuse, N.Y. He said Mays' claim that Clear Channel provides a local service to the communities where it owns stations was "audacious."

Short, an African-American, said he was forced out of the business because he couldn't compete against Clear Channel. He wants ownership limits reduced so that other small radio owners don't share his fate.

NABOB Executive Director Jim Winston said that of approximately 13,000 radio stations, there were about 200 minority group owners in '96, but fewer than 100 such owners now.

McCain used the hearing to promote the re-introduction of his bill providing tax credits to owners who sell media properties to minorities, legislation supported by NAB. The bill replaces the defunct minority tax certificate program, eliminated by Congress in 1995 for alleged abuses.

In a February letter to Powell, Rep. Billy Tauzin, R-La., chairman of the House Commerce Committee, praised the commission's effort to develop a comprehensive record on the issue. If the agency cannot complete its goal by the intended deadline, Tauzin said he would "appreciate a detailed explanation of the circumstances and obstacles" involved.

NEWSWATCH

FCC Confirms Several Large Fines

WASHINGTON The FCC fined Piedmont Radio Co., licensee of WPID(AM) in Piedmont, Ala., $10,000 for not registering its antenna and tower and not maintaining a presence at the main studio during business hours.

The FCC stated the station did not respond to the original fine notice, levied in October, so the commission reaffirmed the penalty. The station had 30 days to pay or explain why the fine should be reduced or cancelled.

Separately, the commission confirmed a $15,000 fine against Small Town Radio Inc., licensee of WDGR(AM) in Dahlonega, Ga. The violations involved failure to maintain operational EAS gear and to enclose the tower within an effective locked fence.

The original notice was issued in November and Small Town did not respond.

And $10,000 was the fine against Marcel (NMI) Charles of Immokalee, Fla., for operating an unlicensed radio station.

The station was operating on 103.3 MHz, the FCC said; the original action was taken by its Tampa office. The notice of apparent liability was issued last summer and upheld this week. As in the other fines, the commission said Charles did not reply to its notice.

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Jukebox

▶ Continued from page 1

Turro's unorthodox operation included the origination of programming from a studio in Dumont, N.J., feeding the audio via telephone line to WJUX more than 100 miles away. He recaptured the audio at the 2.5-watt Pomona translator, which in turn was received by a Sony car stereo at the 34.5-watt Fort Lee translator site. The programming was then retransmitted on 103.1.

Critics of Turro's arrangement said he was using a back-door approach to reach listeners in the lucrative New York City and northern New Jersey market.

Bending the rules?

Complaints by Universal Broadcasting of New York, which owns Bergen County's only full-power radio station, WVNJ(AM) in Oakland, N.J., led to an FCC investigation into whether Turro was skirting commission rules regulating translators, which bar operators from directly producing programming for translators.

Turro asked the FCC in 1991 if an FM translator could purchase air time on the primary FM station it rebroadcasts. The FCC at the time gave the go-ahead for the project in a letter, Naftalin said.

Turro launched "Jukebox Radio" and its middle-of-the-road format in 1993. Turro and Wesley Weis, owner of Monticello Mountaintop Broadcasting Inc., licensee of WJUX, entered into a Network Affiliation Agreement, or time-brokerage arrangement, whereby Turro leased virtually the entire schedule of WJUX.

Turro stands with his station's promotional vehicle in 2000.

In 1996 the FCC said any financial agreement between persons owning translators and primary stations was improper. However, Naftalin said the FCC allowed Turro's arrangement with WJUX to remain in place until the case was resolved.

"The whole issue of compliance with the programming or carriage part of the translator rules was an unresolved issue that had been hanging around for seven years," Naftalin said.

In addition, the FCC held hearings in 2000 to address the issue of whether Turro lacked candor or misrepresented his use of the translators to the FCC, Naftalin said.

The FCC also examined the relationship between Turro and Weis, and whether WJUX complied with main-studio rules governing origination of programming.

Weis rented space from WVOS(AM-FM) in Liberty, N.Y., and hired several of its staffers to work for WJUX. The FCC concluded that Turro and Weis acted truthfully in their dealings with the commission.

"The FCC ruled in Turro's favor and that is why he remains a licensee in good standing," Naftalin said.

In early 2002 the commission ordered Turro to sell either the translators or the studio to distance himself from the licensee of WJUX. Naftalin said Turro sold the Dumont studio to his business manager, Graciella MacLeod. However, the FCC remained unsatisfied with the relationship.

In a Nov. 18, 2002, letter to Turro, the FCC wrote, "Turro personally paid off the substantial loan amount for the FM 103 studio and retained all documentation of the FM 103 loan. In contrast, (MacLeod) had no involvement in the repayment of the loan and no documentation.

"A personal loan guaranty by an individual establishes a prohibited connection with the borrower. Repayment of the loan by an individual also establishes a prohibited connection with the borrower," the agency stated staff in the letter.

The letter concluded by terminating Turro's temporary authority to rebroadcast WJUX for noncompliance, effective 10 days from the date of the letter.

FCC Audio Division Chief Peter Doyle said FCC rules governing the use of translators are straightforward.

"The rule says (there can be) no connection between a primary station and a translator if it is outside of the primary station's coverage area. In this case, we found continuing connections between the sides. There were numerous ways Turro could have avoided this, by either selling the translator or terminating the affiliation agreement. (Turro) failed to act until we threatened to cease his operation," Doyle said.

Doyle said it was a "unique case" with many factors involved, which is why the case took nearly 10 years to settle.

"This often happens when we do not receive sufficient information to make decisions ... things are not wrapped up in a timely matter. In retrospect, the advice they received early on was contrary to FCC guidance. It was a long and protracted process, but we were only interested in upholding the FCC's broadcast standards," Doyle said Naftalin said a proposed sale of the two translators to Press Broadcasting Inc. in Trenton in 1999 never materialized.

"With the delay in the sale because of the FCC hearings ... both parties amicably walked away from the deal," Naftalin said.

Turro has said in the past that he considered Jukebox a success. "We served the community, generated revenue, gave people jobs and paid taxes," he said.

There were numerous ways Turro could have avoided this, by either selling the translator or terminating the affiliation agreement.

— FCC's Peter Doyle

◆ NEWSWATCH ◆

Clear Channel Hires Director of Vertical Real Estate

COVINGTON, Ky. Clear Channel Radio hired Scott Quitadamo to the new post of director of vertical real estate. He worked for two years in wireless sales and leasing with American Tower. With Clear Channel, it will be his job to marketing and leasing the company's towers, billboards and other properties. The company had been contracting out that task.

Radio Senior Vice President of Engineering Jeff Littlejohn made the announcement. Quitadamo has offices in Covington, Ky., and Marietta, Ga.

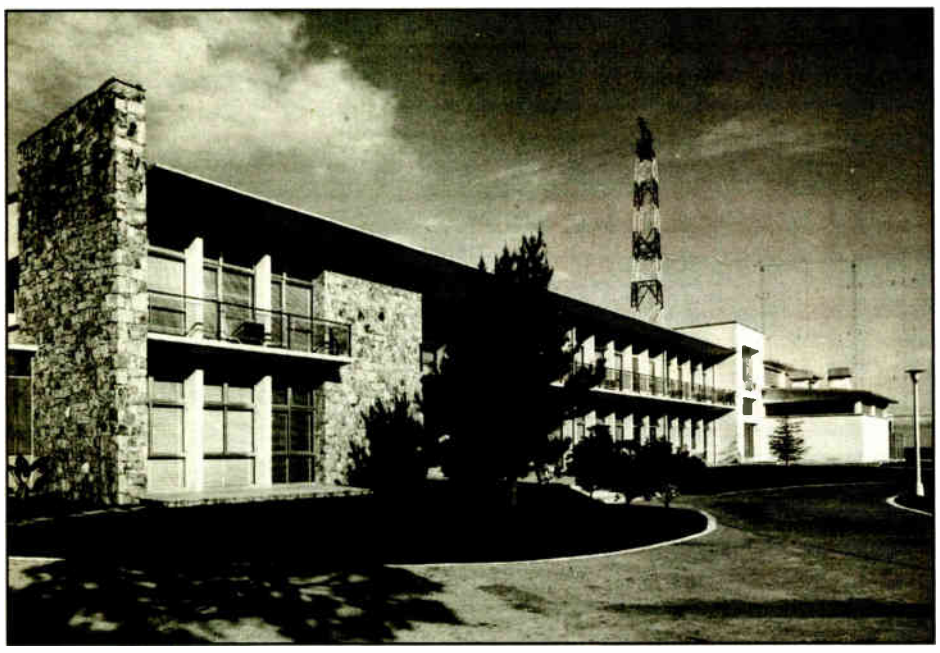
FIRST PERSON

The Demise of Playa de Pals?

Radio Liberty Fans Wonder Whether One of the Great Shortwave Stations Will Really Be Dismantled

by David L. Hollyer

A leading Spanish newspaper recently reported that the governments of Spain and the United States had reached a political agreement for the cancellation of the lease contract under which the U.S. government has maintained and operated the facilities of Radio Liberty at Playa de Pals.



The transmitter building and offices at Playa de Pals are the former home of Radio Liberty in Spain. These photos date from the early 1960s.

The Spanish Senate approved a motion to dismantle the antennas and structures that occupy the 1-1/2 kilometers fronting the Pals beach. The City Council of the town of Pals declared that 90 percent of that terrain would be declared a "green area."

The fate of the historic facility remains in doubt.

Russian service

For more than 40 years, the Radio Liberty shortwave transmitters at Playa de Pals, on the Costa Brava in Spain, pumped out broadcasts of news and information around the clock to listeners in the former Soviet Union and people of that area who could understand Russian or one of the associated languages. Their targets included most of Central Asia via second hop.

The brainchild of the late Colonel S.Y. McGiffert, chief engineer of Radio Liberty, the site at Playa de Pals, about 75 miles north of Barcelona, was selected in the late 1950s after he and an engineering team investigated many kilometers of beachfront locations in Spain. It was chosen as the best possible spot for banging in a shortwave signal into the Soviet Union.

The colonel demanded a site with ocean in front of it to provide maximum reflection area for the transmitting for the transmitting antennas. He got everything he wanted in the Playa de Pals location.

He also got an 82-acre chunk of land, arguably one of the best pieces of beachside real estate in all of Spain. And thereby hangs a tale. The colonel had powerful connections in Washington that helped him negotiate for the site and eventually obtain a lease on it despite protests of envious development interests that were already aware of the emergence of the Costa Brava as a major tourist mecca.

McGiffert never did things halfway. He hired gilt-edge engineering firms to design the antenna arrays, towers and support structures. Work to lay out roads and build the office/transmitter building started on the site. Installation of four Continental Electronics 250 kW transmitters was begun by engineers from Continental Electronics, assisted by staff technicians. An additional stand-alone 100 kW Telefunken transmitter was installed.

Antenna Groups "A" and "C" were completed first and situated between the antenna switchhouse and the sea. "A" and "C" Group towers were constructed by Brown-Boveri Co. The towers were freestanding, several hundred feet high. Strung between them were the antenna arrays. Made up of cage-type radiating elements, they were backed up by a reflector grid.

In Group A, the two antennas covered the 9, 11, 15 and 17 MHz bands, while in Group C the two antennas covered the same ranges. The configuration consisted of three bays in line, each bay with four stacks. Remote switching permitted using the upper and lower antenna elements or both to achieve vertical "slewing" to change from a low take-off angle to a higher take-off angle.

Vertical "slew" angles were changed in accordance with the ionospheric layer height at the time of transmission. Horizontal "slewing" or steering of the beam from center to 11 degrees either side of center was accomplished remotely by cutting in delay lines.

The design was elegant and state-of-the-art.

Standing tall

When I arrived in Playa de Pals in the fall of 1961, Group B antennas near the entrance were under construction by Spanish firm Miguel Mateu. These were for operation on 6, 7, 11 and 15 MHz. Work on Group D antennas, at the far end of the beach, had not yet started, because the spot for their installation was swampy. It had to be "dewatered," or pumped more or less dry, for a year before the massive cement foundations for the guy anchor could be poured.

We employees kidded the resident civil engineer, the late "Toby" Taylor, that he was trying to pump the Mediterranean dry.

Eventually, the dewatering work was finished and the pouring of the massive cement bases for the ground anchors was completed. The erection of the steel support towers for the radiating elements and the reflector grid was begun. It took months.

Back at the station, work advanced on the audio control room and internal wiring. Part of the building was devoted to offices and the remainder to the technical installation.

The facilities were great. They included a good restaurant, with meals partially subsidized and affordable. As most employees didn't have automobiles, busses brought them to the site from centralized pick-up points in nearby Palamos and Palafrugell, where most of the Spanish employees lived.

Eventually work was completed on the Group D support towers, built by CIFA of Milan. And they were tall. The tallest of four guyed towers stood over 540 feet, close to the height of the Washington Monument.

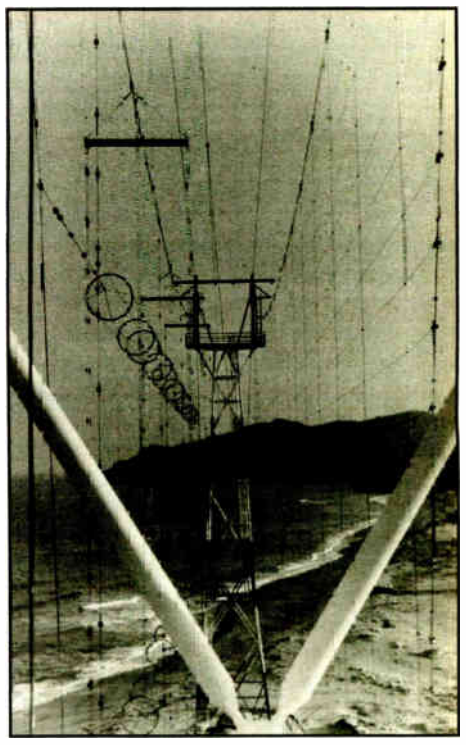
One pair of the guyed towers supported the antenna elements, while the other pair suspended the reflector grid. The structure was designed cleverly so that both the antenna and the reflector were held up by cable, which ran on pulleys.

Whenever the breeze blew — and this was often, at the beach — the front antenna array would tend to belly in. Tied to the ends of the support cables was an elaborate system of counterweights in frames at the base of the towers. The reflectors were equally counterbalanced. In a stiff breeze, both the antenna elements and the reflector grid would belly in, becoming concave. But thanks to the counterweighting, they would maintain their critical separation space and hence keep an excellent standing wave ratio, even during periods of heavy wind.

There were three antennas in this group. D1 operated on 7 MHz; D2 on 9 and 11 MHz; D3 worked on 15 and 17 MHz. D1 consisted of one bay having four stacked horizontal cage dipoles backed by a screen reflector. D2 and D3 consisted of two bays, each having eight stacks of horizontal cage dipoles backed by a screen reflector.

D2 and D3 could be slewed vertically to three positions. Through remote electrical switching, the antenna elements could be combined to provide three vertical take-off angles: a low of 4 degrees, a medium of 8 degrees and a high angle of 12 degrees.

Take-off angles were selected to accommodate any ionospheric height for a specific Russian target. The antenna could be "slewed" or steered laterally plus or minus 12 degrees off center by introducing a delay line between the bays.



View of Beach from Group C Antenna Tower. Note the cage construction of antenna dipoles.

What a magnificent antenna. It represented the most sophisticated and versatile antenna design available, which even today has not been improved upon.

Phaseout

In preparing this story, I would be remiss if I didn't acknowledge the assistance of my colleague Valenti Carbonell, a consulting engineer in Palamos, Spain. Over the years, he filled many engineering positions at the transmitter site. Whenever I've forgotten a detail or needed information on the antennas, Valenti, with his encyclopedic knowledge of the antennas, provided an assist.

Over the years there were technical changes at the site. A 250 kW General Electric transmitter was installed. The 100 kW Telefunken was retired and a Marconi 250 kW installed.

The voice-quality program line used to bring in program material from Munich gave way to better program lines and eventually to a satellite system, which delivered programs from the International Broadcast Bureau in Washington.

I left Playa de Pals in 1964 to work at Radio Liberty headquarters in Munich. Thirty-one years later, in the spring of 1995, I was summoned out of retirement to take a job at Playa de Pals to replace the retiring manager. It was to be a short-time assignment as managing director. The facilities and assets of Radio Liberty were being turned over to the IBB, a government umbrella agency, which controlled the Voice of America, Radio Free Europe, Radio Liberty, Radio Free Asia and Radio Marti.

My stay lengthened into six months, during which time a team from Washington came in to cut the staff drastically, terminate bus transportation and subsidized meals. It was a process to cut costs and staff dramatically.

A new IBB manager arrived and took over management duties. The station continued in service until May 25, 2001, when the government terminated operation of Radio Liberty, abruptly stopped broadcasting and sent the

See PLAYA DE PALS, page 14 ▶

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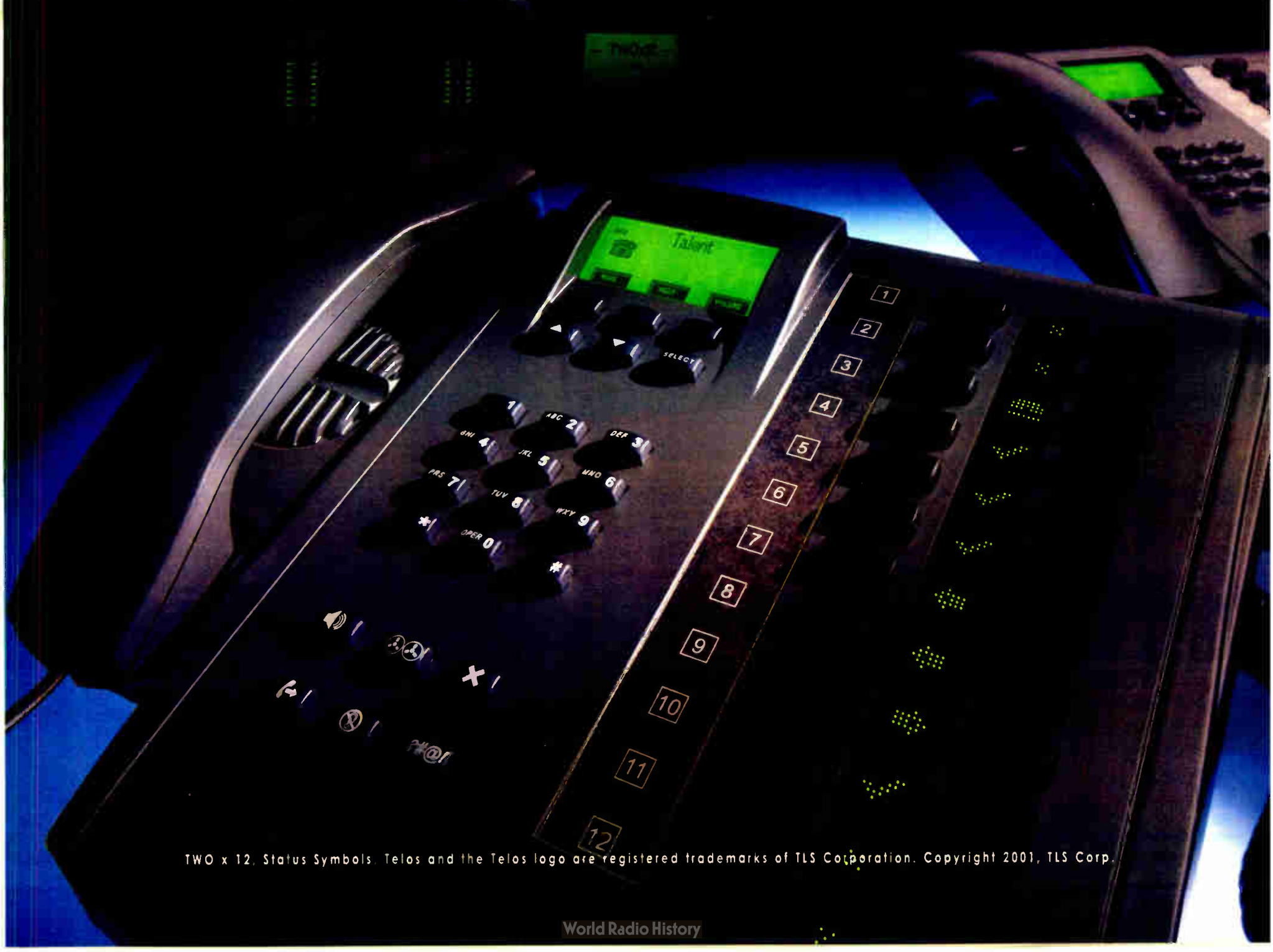

Plumbing

▶ Continued from page 14

radio studios that are co-located with TV facilities in major markets have been done with fiber; but the cost of fiber-ready terminal equipment makes this a less attractive option for many.

Even if a station is retaining an analog plant to the transmitter, with an eye to going digital at a later date, it is still best to pull digital cable, Coates said.

"Because of their impedance characteristics and low capacitance, digital wiring is also the best analog cable available."

Belden reps often are asked about using the company's popular 8451 shielded twisted pair for digital.

"This is not a good idea," Coates said. "8451 has an impedance of 45 to 50 ohms, while the AES standard calls for 110 ohms. The resulting mismatch can cause problems."

While a few brave souls have run AES/EBU digital audio through 50 feet of 8451 without problems, the practice is not recommended.

Punch blocks, the standard device for interconnecting analog cables, continue to be popular in digital installations, but there are some precautions that need to be taken.

Jay Tyler, a sales engineer with Wheatstone, said, "Some customers have used the traditional telephone-type '66' blocks with digital cable. Since digital cable uses a smaller diameter wire than analog cable, '66' blocks don't hold it well.

"The end result is intermittent connections, an inability to maintain the AES standard of 110 ohms throughout the plant." Tyler recommends the use of Krone or ADC blocks with digital cables.

Another common pitfall with digital installations noted by Tyler and by Phil Owens, also of Wheatstone, is not having the proper test equipment to verify system performance.

Both stress the importance of having the ability to measure parameters such as the preamble and flags set in the AES bitstream, block error rate, jitter and reflections.

"You want to know if your digital signal is in the comfort zone, or right on the edge," Owens said. The Tektronix 764 AES analyzer is a popular tool for checking plant performance.

Maintaining correct audio levels in a digital plant is an ongoing problem. There is no fixed standards for digital levels.

"Different parts of the audio industry incorporate different digital standards, so there is no standard," said Uhl of SAS. "With analog tape saturation the degradation was subtle; but with a digital medium, when you pass digital maximum, all you get is garbage, so the need to maintain levels is more critical with digital gear."

A few years ago, digital audio plants were designed with a centralized source of sync, as is customary with television facilities. That requirement is rapidly changing.

Belden Cat-6 Cable

"It's becoming less important to put together a whole synchronous digital system from input to output," said Owens. "Most devices now have sample rate converters on their inputs."

That's not to say there isn't a need to determine common sample rates when planning a studio. For instance, having sources such as CD players and an automation system with sampling rates of 44.1 kHz connected to a console running at 48 kHz, connected in turn to a processor with a 32 kHz input, results in numerous up and down conversions, with a potential for signal degradation.

Tyler recommends taking the time to determine the most common sample rate and trying to buy gear accordingly. The goal should be a plant with as few analog-to-digital, digital-to-analog and sample-rate conversions as possible.

Another point to ponder with sample-rate converters is that they often remove subcode information from the digital signal.

"This may be more of an issue in the future," Owens said. "If IBOC happens and stations want to start streaming song titles so they get displayed on receivers, that information will need to get passed along somehow."

Tom Vernon is a technical training consultant working in Philadelphia. Reach him via e-mail to TLVernon@blazenet.net, or call (717) 367-5595.

A Terminology Sampler

ADC- Analog-to-digital converter, a device that converts audio signals from analog to digital form

AES/EBU - A digital audio interface standard used by most broadcast equipment

Category Cable - A classification of twisted-pair cables capable of handling both analog and digital signals. The most current implementations are Cat-5 and Cat-6.

Codec - Short for "coder/decoder," a device that converts audio signals from analog to digital form acceptable to digital transmission systems. It then converts these digital signals back to analog form on the device's output.

DAC - Digital-to-analog converter, a device that converts digital audio signals to analog form

Fiber optic - A type of cable using strands of glass to guide a beam of modulated light

FSD - Full-scale digital, the level at which an analog-to-digital converter reaches the end of its number range. Also known as 0 dBFs

Jitter - Instantaneous timing errors in the position of signal changes or transitions

Router - Device analogous to telephone exchange for digital audio and control signals

Salvo - A collection of sources and destinations stored in a router's memory that can all be switched at once. Useful for reconfiguring studios.

Sampling Rate - Sampling is the process of turning analog sounds into digital. The system takes "snapshots" of its frequency and amplitude at regular intervals. The higher the sample rate, the more accurate the sound reproduction, and the larger the disk space needed to store it. Common sample rates are 32, 44.1 and 48 kHz.

Sample-Rate Converter - Circuitry that converts the sampling rate of a device's input signal to that of its internal clock.

S/PDIF - Sony/Philips Digital Interface, a consumer-grade digital audio interface standard.

◆ NEWSWATCH ◆

Pubcasters Criticize Budget

WASHINGTON Four of the country's top public broadcast officials say President Bush's 2004 budget would "seriously compromise our ability to deliver the services we are required by law to provide to the American people."

The statement was issued in response to the president's 2004 budget plan by Robert T. Coonrod of the CPB; Pat Mitchell of PBS; Kevin Klose of National Public Radio; and John Lawson of the Association of Public Television Stations. All are the president/CEOs of their respective organizations.

They said public broadcasting is at a "critical technological crossroads," citing the deadline next year for public TV to convert to digital transmission and marketplace pressures on public radio stations to do so.

SBS Disputes Ruling in Suit

MIAMI Spanish Broadcasting System said it disagrees with a ruling by a judge and will appeal, after the judge in its suit against Clear Channel Communications and Hispanic Broadcasting Corp. granted the defendants' motion to dismiss.

"We will continue to prosecute this case vigorously and have every confidence that SBS's claims will be reinstated and vindicated upon appeal," SBS stated.

Last summer, on the heels of an announced acquisition of HBC by Univision, SBS sued HBC and Clear Channel Communications, the largest shareholder in HBC. SBS alleged that Clear Channel and HBC "adversely affected SBS' ability to raise capital, depressed SBS' share price" and made acquisitions more difficult for SBS, according to the suit filed in U.S. District Court for the Southern District of Florida.

SBS alleged that the goal of HBC and Clear Channel was to eliminate SBS as a competitive threat. Clear Channel called the allegations "absurd and unfounded" at that time.

Sales: Year of Recovery

NEW ORLEANS Radio sales were up 6 percent for all of 2002 compared to the previous year, according to the Radio Advertising Bureau, which called it a "remarkable recovery." National advertising led the way, up 13 percent, while local revenue, which is the bulk of the industry's income, increased 4 percent.

"These growth rates represent a 98 percent recovery against 2000, radio's highest growth year since 1985," the organization said. The news was released during the RAB convention in New Orleans. Radio's percentage of the ad pie is 8.2 percent.

President/CEO Gary Fries predicted "continued acceleration and growth," forecasting revenue to be up 6 to 8 percent this year. "This is healthiest environment that I have ever seen," he said.

Entercom Moves Along With HD Radio

In the next month or two, Entercom's FM stations in Boston and Seattle will be converted to HD Radio, after which the group will move on to other markets.

Supplier Broadcast Electronics said its client would convert KISW, KQBZ, KMTT and KNDD in Seattle using FXi digital exciters and FMi-201 broadband transmitters. The setup will high-level combine analog FM and digital through a shared main ERI master antenna, BE said.

"Using a new ERI approach to high-level combining, Entercom will introduce a separate HD Radio path into one polarity of the circularly polarized antenna so that HD Radio can broadcast at the same time as the analog FM, which is radiating from the opposite polarity of the antenna," BE stated.

"The approach will reduce the injector loss typical of high-level combining ... eliminating the need for Entercom to purchase higher-powered HD Radio transmitters to handle the injector load."

Entercom will install FMi-201 transmitters for each station's HD Radio path. The BE FXi 60 and 250W exciters with FSi-10 signal generators will generate the digital signal, BE said.

Another Entercom station in Seattle, KBSG, is on a separate Shively antenna system and will be converted to HD Radio using an FXi exciter and a FMi transmitter.

Also converting to HD Radio are WQSX(FM) and WAAF(FM) in Boston.

BE had supplied Entercom with two exciters and a transmitter for conversion testing and demonstrations on a shared antenna at its Seattle aux site. "The additional equipment will complete Entercom's conversion to HD Radio FM in Seattle and Boston," BE said.

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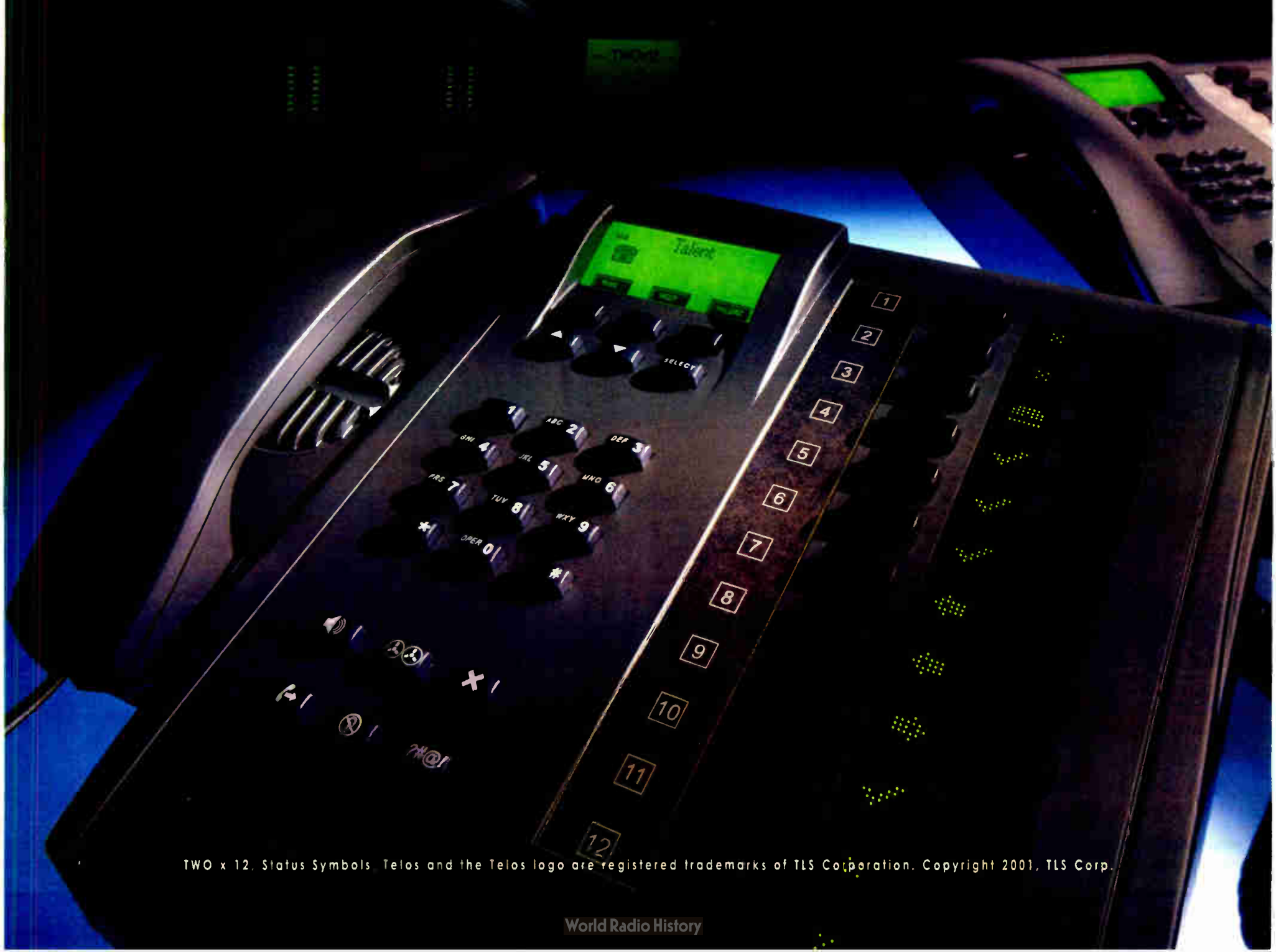


Digital 'Plumbing' at the Studio

by Tom Vernon

As broadcast studios transition from analog to digital, much attention has been focused on the most visible items: automation systems, consoles and source equipment.

Less publicized, but equally important to an efficient operation, is the infrastructure that connects everything. Call it the audio plumbing.

In the analog days, this discussion would include shielded twisted-pair cable, spade lugs, patch panels and massive solder terminals. Today's digital plumbing involves routers, fiber optic, AES/EBU and "category" cabling, AES/EBU distribution amps and synchronizing devices.

Radio World asked several suppliers to review the concepts that are likely to come up in discussions with clients during the planning of studio upgrades.

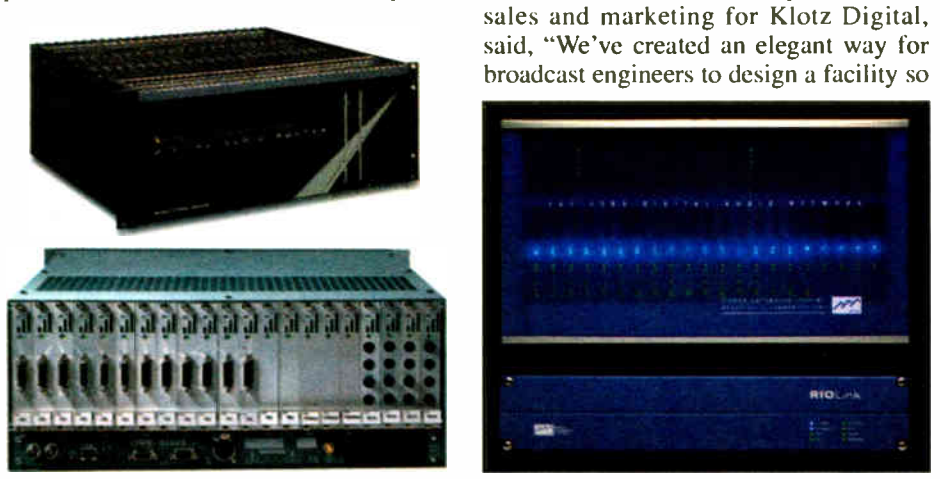
Dayparting and more

While the current generation of digital consoles appear similar to their analog and digital predecessors, there has been a paradigm shift in how they actually function.

Rather than routing audio through the console, as had been the norm, it can now be routed from a terminal room switcher, allowing for greater flexibility and a simpler wiring infrastructure. Ultimately, some experts say, the studio console is becoming more of a logic controller for a remote router, with the two connected by a single fiber or Ethernet cable.

Just like local-area networks or LANs, routers can be connected in "star" or "ring" configurations. Mike Uhl of SAS says there are advantages to the dual concentric ring style favored by SAS.

"We have a built-in backup in case one path is broken, whereas a star setup has no redundancy, you lose either transmit or receive functions if a link is severed."



Clockwise From Upper Left: The Wheatstone Bridge, SAS 32KD and rear view of Klotz VADIS 880

Uhl believes a star configuration is inefficient, requiring more hardware. Typically, each frame requires its own PC card, and that, he said, takes up real estate that could better be used for audio cards.

Designing an efficient digital infrastructure also requires more than substituting digital boxes for analog boxes in a flow diagram.

This certainly is true when routers are used in consolidated operations, where effective use of resources is paramount.

For instance, Chris Crump, director of sales and marketing for Klotz Digital, said, "We've created an elegant way for broadcast engineers to design a facility so it is incredibly functional, reducing a lot of additional hardware, wiring and need for physical space."

This approach to technology is attractive to general managers when they add up the cost savings. "You need to look at the square footage costs of studios, and multi-purpose rooms are an effective way to economize."

Crump said the new generation of router technology, such as the Klotz VADIS platform, makes it possible to change the purpose of studios by daypart.

"Many stations are only live in the mornings, and management wants to use the same studio for production during the remainder of the day, saving the cost of building another production room."

Using a router feature called offer and accept, stations can not only change the inputs to a console simultaneously, but change the control logic for rooms as well.

Digital technology also has brought new ways of designing signal flow in the plant.

Michael Uhl, director of sales for Sierra Automated Systems, said, "The great advantage of an audio router over other types of distribution systems is that you can minimize all the plumbing by not running wires for every source into the studio and have some type of patch bay or remote line selector in the studio select from all those sources.

"Rather, you run a couple lines into the room, and into a control head, which allows selection of hundreds of inputs to the studio. It cuts down on the amount of wiring, time spent installing the wiring and costs. This increased capacity means more things can be run into the studio than in the past. Non-traditional sources might include microphones and delivery systems."

Intelligent studio design with digital technology takes careful planning, and there are some common mistakes.

Uhl stressed the need to anticipate.

"Most studio installs plan for today's needs, but don't adequately address the future. No facility goes without changes, so it's good to plan for additional wiring, including category cable and fiber. In most cases it's difficult to add additional conduits or wire troughs between the terminal room and studios after the initial construction is completed."

Plan ahead

Future-proofing a facility includes not only planning for the number of wires, but also the type.

Kip Coates, marketing manager for Belden Corp. said, "We recommend that broadcasters use the highest performance product they can install. That means Category-6 cable for the IP infrastructure, which is good to 250 MHz, and making sure AES cables are swept to 25 Mhz."

Sales of fiber cable to broadcasters have been comparatively limited. A few

See PLUMBING, page 16 ▶

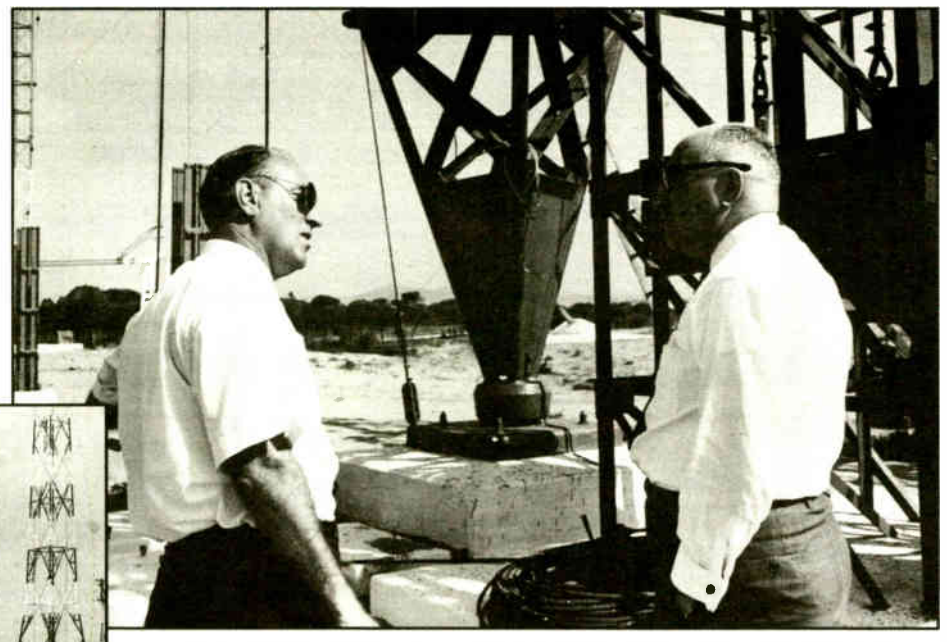
TECHNOLOGY FOR MANAGERS

Playa de Pals

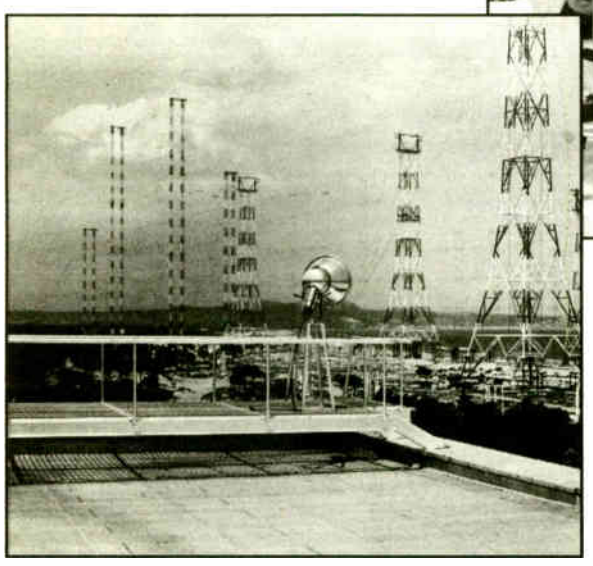
▶ Continued from page 12

staff home.

IBB claimed that their former shortwave listeners were now well-served by local FM and satellite broadcasts and that shortwave transmissions had outlived their usefulness. The station was mothballed, with the specter of dismantling in the offing.



Then-Assistant Manager Dave Hollyer, left, talks with Col. S.Y. McGiffert, director of engineering for Radio Liberty, beneath the 540-foot-high reflector support towers of Antenna Group D in 1964.



This view of the antenna field was taken from the roof of the transmitter building. The tall towers are part of Group D.

As I write, some changes have taken place. The U.S. Congress has apparently had second thoughts about the cancellation of the lease contract and the dismantlement of the Playa de Pals transmitter site. It has gone back to Radio Nacional, the Spanish government agency that holds the lease, to request that the lease cancellation and the dismantlement be rescinded and that permission be granted to reactivate the transmitter site and use it for broadcasting to the Muslim population, presumably in Central Asia.

Up to now, no decision has been taken to allow that to happen. Meanwhile, powerful Catalan political forces strongly oppose any such cancellation. Having had that beautiful beach property almost within their grasp, they understandably are reluctant to have it slip through their collective fingers. At least one informed source in Spain feels the station is off the air forever. Radio Nacional apparently intends to transfer the real estate to either the national or provincial government, and the Playa operation has lost all of its operating permits, of which there are three (national, provincial and city). The political problems to re-obtain these licenses may be insurmountable.

In the meantime the facility's fate is in limbo. Those who admire the site, myself included, would hate to see the destruction of such a valuable facility. If the U.S. government is able to make its case and put this site back into operation to continue its war of words, Pals may yet light up its transmitters again and pump its broadcasts to a Muslim population.

The outcome is unclear and bets go either way. As the Spanish might express it, *quien sabe?* Who knows?

The author was managing director for Spain of Radio Free Europe/Radio Liberty.

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Plumbing

▶ Continued from page 14

radio studios that are co-located with TV facilities in major markets have been done with fiber; but the cost of fiber-ready terminal equipment makes this a less attractive option for many.

Even if a station is retaining an analog plant to the transmitter, with an eye to going digital at a later date, it is still best to pull digital cable, Coates said.

"Because of their impedance characteristics and low capacitance, digital wiring is also the best analog cable available."

Belden reps often are asked about using the company's popular 8451 shielded twisted pair for digital.

"This is not a good idea," Coates said. "8451 has an impedance of 45 to 50 ohms, while the AES standard calls for 110 ohms. The resulting mismatch can cause problems."

While a few brave souls have run AES/EBU digital audio through 50 feet of 8451 without problems, the practice is not recommended.

Punch blocks, the standard device for interconnecting analog cables, continue to be popular in digital installations, but there are some precautions that need to be taken.

Jay Tyler, a sales engineer with Wheatstone, said, "Some customers have used the traditional telephone-type '66' blocks with digital cable. Since digital cable uses a smaller diameter wire than analog cable, '66' blocks don't hold it well.

"The end result is intermittent connections, an inability to maintain the AES standard of 110 ohms throughout the plant." Tyler recommends the use of Krone or ADC blocks with digital cables.

Another common pitfall with digital installations noted by Tyler and by Phil Owens, also of Wheatstone, is not having the proper test equipment to verify system performance.

Both stress the importance of having the ability to measure parameters such as the preamble and flags set in the AES bitstream, block error rate, jitter and reflections.

"You want to know if your digital signal is in the comfort zone, or right on the edge," Owens said. The Tektronix 764 AES analyzer is a popular tool for checking plant performance.

Maintaining correct audio levels in a digital plant is an ongoing problem. There is no fixed standards for digital levels.

"Different parts of the audio industry incorporate different digital standards, so there is no standard," said Uhl of SAS. "With analog tape saturation the degradation was subtle; but with a digital medium, when you pass digital maximum, all you get is garbage, so the need to maintain levels is more critical with digital gear."

A few years ago, digital audio plants were designed with a centralized source of sync, as is customary with television facilities. That requirement is rapidly changing.

Belden Cat-6 Cable

"It's becoming less important to put together a whole synchronous digital system from input to output," said Owens. "Most devices now have sample rate converters on their inputs."

That's not to say there isn't a need to determine common sample rates when planning a studio. For instance, having sources such as CD players and an automation system with sampling rates of 44.1 kHz connected to a console running at 48 kHz, connected in turn to a processor with a 32 kHz input, results in numerous up and down conversions, with a potential for signal degradation.

Tyler recommends taking the time to determine the most common sample rate and trying to buy gear accordingly. The goal should be a plant with as few analog-to-digital, digital-to-analog and sample-rate conversions as possible.

Another point to ponder with sample-rate converters is that they often remove subcode information from the digital signal.

"This may be more of an issue in the future," Owens said. "If IBOC happens and stations want to start streaming song titles so they get displayed on receivers, that information will need to get passed along somehow."

Tom Vernon is a technical training consultant working in Philadelphia. Reach him via e-mail to TLVernon@blazenet.net, or call (717) 367-5595.

A Terminology Sampler

ADC- Analog-to-digital converter, a device that converts audio signals from analog to digital form

AES/EBU - A digital audio interface standard used by most broadcast equipment

Category Cable - A classification of twisted-pair cables capable of handling both analog and digital signals. The most current implementations are Cat-5 and Cat-6.

Codec - Short for "coder/decoder," a device that converts audio signals from analog to digital form acceptable to digital transmission systems. It then converts these digital signals back to analog form on the device's output.

DAC - Digital-to-analog converter, a device that converts digital audio signals to analog form

Fiber optic - A type of cable using strands of glass to guide a beam of modulated light

FSD - Full-scale digital, the level at which an analog-to-digital converter reaches the end of its number range. Also known as 0 dBFs

Jitter - Instantaneous timing errors in the position of signal changes or transitions

Router - Device analogous to telephone exchange for digital audio and control signals

Salvo - A collection of sources and destinations stored in a router's memory that can all be switched at once. Useful for reconfiguring studios.

Sampling Rate - Sampling is the process of turning analog sounds into digital. The system takes "snapshots" of its frequency and amplitude at regular intervals. The higher the sample rate, the more accurate the sound reproduction, and the larger the disk space needed to store it. Common sample rates are 32, 44.1 and 48 kHz.

Sample-Rate Converter - Circuitry that converts the sampling rate of a device's input signal to that of its internal clock.

S/PDIF - Sony/Philips Digital Interface, a consumer-grade digital audio interface standard.

◆ NEWSWATCH ◆

Pubcasters Criticize Budget

WASHINGTON Four of the country's top public broadcast officials say President Bush's 2004 budget would "seriously compromise our ability to deliver the services we are required by law to provide to the American people."

The statement was issued in response to the president's 2004 budget plan by Robert T. Coonrod of the CPB; Pat Mitchell of PBS; Kevin Klose of National Public Radio; and John Lawson of the Association of Public Television Stations. All are the president/CEOs of their respective organizations.

They said public broadcasting is at a "critical technological crossroads," citing the deadline next year for public TV to convert to digital transmission and marketplace pressures on public radio stations to do so.

SBS Disputes Ruling in Suit

MIAMI Spanish Broadcasting System said it disagrees with a ruling by a judge and will appeal, after the judge in its suit against Clear Channel Communications and Hispanic Broadcasting Corp. granted the defendants' motion to dismiss.

"We will continue to prosecute this case vigorously and have every confidence that SBS's claims will be reinstated and vindicated upon appeal." SBS stated.

Last summer, on the heels of an announced acquisition of HBC by Univision, SBS sued HBC and Clear Channel Communications, the largest shareholder in HBC. SBS alleged that Clear Channel and HBC "adversely affected SBS' ability to raise capital, depressed SBS' share price" and made acquisitions more difficult for SBS, according to the suit filed in U.S. District Court for the Southern District of Florida.

SBS alleged that the goal of HBC and Clear Channel was to eliminate SBS as a competitive threat. Clear Channel called the allegations "absurd and unfounded" at that time.

Sales: Year of Recovery

NEW ORLEANS Radio sales were up 6 percent for all of 2002 compared to the previous year, according to the Radio Advertising Bureau, which called it a "remarkable recovery." National advertising led the way, up 13 percent, while local revenue, which is the bulk of the industry's income, increased 4 percent.

"These growth rates represent a 98 percent recovery against 2000, radio's highest growth year since 1985," the organization said. The news was released during the RAB convention in New Orleans. Radio's percentage of the ad pie is 8.2 percent.

President/CEO Gary Fries predicted "continued acceleration and growth," forecasting revenue to be up 6 to 8 percent this year. "This is healthiest environment that I have ever seen," he said.

Entercom Moves Along With HD Radio

In the next month or two, Entercom's FM stations in Boston and Seattle will be converted to HD Radio, after which the group will move on to other markets.

Supplier Broadcast Electronics said its client would convert KISW, KQBZ, KMTT and KNDD in Seattle using FXi digital exciters and FMi-201 broadband transmitters. The setup will high-level combine analog FM and digital through a shared main ERI master antenna, BE said.

"Using a new ERI approach to high-level combining, Entercom will introduce a separate HD Radio path into one polarity of the circularly polarized antenna so that HD Radio can broadcast at the same time as the analog FM, which is radiating from the opposite polarity of the antenna," BE stated.

"The approach will reduce the injector loss typical of high-level combining ... eliminating the need for Entercom to purchase higher-powered HD Radio transmitters to handle the injector load."

Entercom will install FMi-201 transmitters for each station's HD Radio path. The BE FXi 60 and 250W exciters with FSi-10 signal generators will generate the digital signal, BE said.

Another Entercom station in Seattle, KBSG, is on a separate Shively antenna system and will be converted to HD Radio using an FXi exciter and a FMi transmitter.

Also converting to HD Radio are WQSX(FM) and WAAF(FM) in Boston.

BE had supplied Entercom with two exciters and a transmitter for conversion testing and demonstrations on a shared antenna at its Seattle aux site. "The additional equipment will complete Entercom's conversion to HD Radio FM in Seattle and Boston," BE said.

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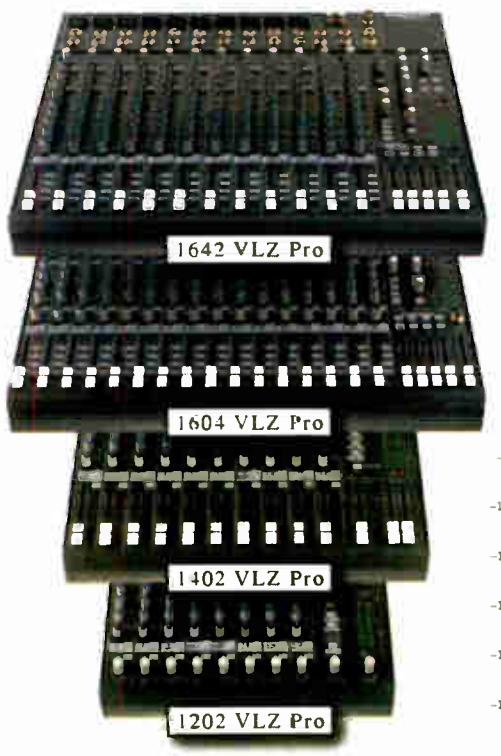

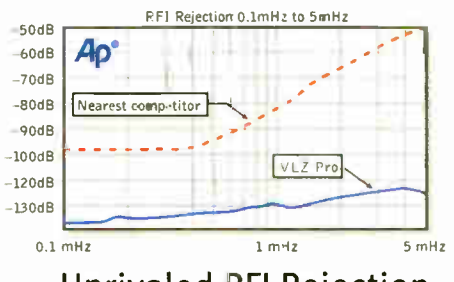

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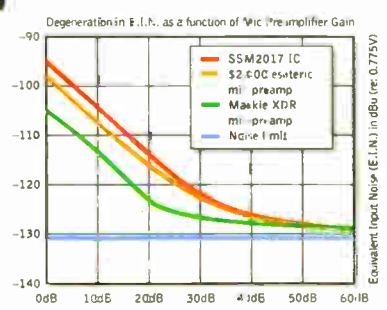

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Radio Presses On Under Shuttle Path

by James Careless

Feb. 1, 2003. For KICKS105's APD/Production Director Sean Ericson, it was supposed to be just another Saturday remote.

However, by the time Ericson started broadcasting from the Tipton Ford dealership in Nacogdoches, Texas, the world had changed. An hour earlier, the shuttle Columbia had exploded 200,000 feet above east Texas. The explosion shook the community. The debris fallout rained at least 1,200 pieces onto Nacogdoches alone.

Some of those pieces had fallen on the dealership itself. The result: when Sean Ericson hit the airwaves at 10 a.m., he was no longer just working another remote. Instead, Ericson and Tipton had become part of the story.

Remote decision

Billed as "The Country Leader," KYKS is one of four Clear Channel Communications stations in Lufkin, Texas — the "Lufkin Group" — 15 miles south of Nacogdoches. The other three are news/talk KSFA(AM), classic rock KTBQ(FM), and all-hit KAFX(FM).

At 9 a.m., Ericson was at the studio preparing for the remote.

"Even though the station is made of concrete, including the roof, I was shocked by the intensity of the noise and the shaking of the building as the shuttle passed overhead," he said.

He wondered if a local factory had blown up. "I called up the local police department to find out what was going on," he said. "That's when I was tipped off to the shuttle situation."

Ericson drove to Tipton Ford, where the client was drawing the names of three engaged couples in its month-long "Tie The Knot" promotion. The couples were to get married at Tipton two weeks later.

Sean Ericson interviews Mike Floyd, business manager at Tipton Ford.

The couple that won the most listener votes would then win a seven-day Caribbean cruise.

KICKS105 management and the client faced a decision. Going ahead with a standard remote seemed inappropriate. However, a lot of time and money had been spent building up to this broadcast.

A Piece of Shuttle Debris

After some discussion, it was decided that the Tipton remote would go ahead in an upbeat yet low-key fashion. To set the tone, Ericson summed up the Columbia situation for Nacogdoches residents, warning them to stay away from the debris. He held a moment of silence in respect for the fallen astronauts. Then the remote went ahead with its regular cut-ins while Assistant Music Director/Imaging Director Morgan Mason ran the board back at the station.

Parking lot debris

When not on air, "we walked around the dealership's parking lot, where we found pieces of debris," Ericson recalled. "Neighboring homes within walking distance had larger pieces of debris. And in the downtown area, just three minutes' drive away, were even bigger parts of the shuttle, some which were shown on national television."

"It was actually frighteningly normal," he said. "Even as we walked through the lot and identified pieces of debris, and then called the authorities, there were people jogging down the street. There were people continuing to come in and register for the prize before we gave it away. I think that people were aware of what was going on, but it hadn't sunk in."

Back at KICKS105, Morgan Mason had her hands full.

"Within five minutes of arriving at the studio, one of our stations in Houston called me for a live report," she said. "Somebody handed me a piece of paper with information on it. As I was reading it on air, I couldn't decipher the person's handwriting. This, plus the stress of the moment, officially flustered me. My voice cracked, and it took everything in my power not to lose it."

As more debris reports came in, Lufkin Group Operations Manager Danny Merrell called for help. Unfortunately, a lot of people were on vacation, including him.

"I was in Hot Springs, Arkansas," Merrell said. "As a result, I did what I could over the phone. The best we could muster were five part-timers."

With the handful of staff, the four stations did what they could. Soon, a pattern emerged. KICKS105 stuck to format, with frequent news updates on the Columbia disaster and how to cope with debris. KTBQ went to a "rolling news format," using local and national news clips.

"We were so short-handed that we even sent Q's PD to a press conference," Merrell said, "just to find out what was going on."

KAFX and KSFA, which was running nationally syndicated talk content, stayed within format as well.

To say the least, it was "an extremely hectic day," Mason said, with listeners calling to report debris findings. Most did as they were told and left the pieces alone. However, "we had people calling us and saying, 'I've got this piece of debris in my truck,'" she said. "It was hard to make people understand that the pieces of Columbia weren't souvenirs, that there were evidence, and that all of them were needed to figure out what went wrong."

Meanwhile, local officials seemed confounded by the Columbia disaster.

"We've had hurricane evacs that went without a hitch," Merrell said. "However, we'd call government people asking what to do (about the shuttle debris), and they just didn't have the answers."

Eventually, as the story clarified, the state of alert eased at the four-station complex. Within two days, the broadcast day was back to normal.

However, the memories remain.

"I wasn't living in New York when 9/11 occurred, and so it was hard for me to grasp what people there went through," Mason said. "Today, I understand their sense of loss. I know what they were feeling."

'Tomorrow Radio' Could Save IBOC

NPR's Bold Move to Add Secondary Audio Might Drive Consumer Demand for HD Radio Receivers

As you've read in this column and elsewhere, there is considerable concern that the audio quality increase of HD Radio alone will not be sufficient to generate mainstream acceptance of the new format, and that the technology may languish as a result. This would lay waste to the considerable investment made by broadcasters, not to mention the R&D efforts of Ibiquity and others in designing the IBOC systems.

Nevertheless, hope may not be lost, thanks to a new initiative of public broadcasters and equipment manufacturers.

The Big Picture

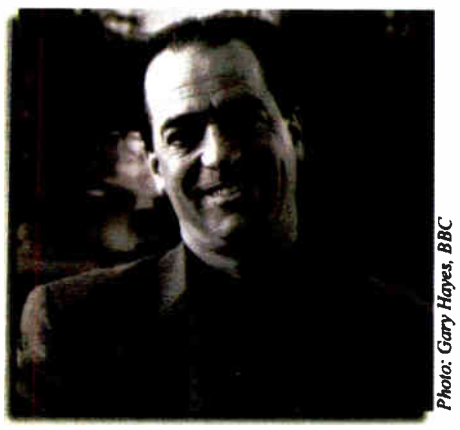

Photo: Gary Hayes, BBC

by Skip Pizzi

Despite the Ibiquity design that requires a broadcaster's IBOC digital audio service to be a simulcast of its analog audio program, and the FCC's initial rulemaking that mandates this approach, National Public Radio has launched its Tomorrow Radio project (see Feb. 12, page 6), which would place secondary audio services in the auxiliary data portion of the IBOC signal.

The concept would reduce the bit rate of the FM-IBOC main digital audio channel from 96 kilobits per second to 64 kbps, and assign 32 to 36 kbps of the IBOC datacasting bandwidth to a second compressed digital audio stream. At that bit rate, the second audio channel would be of limited quality, but it could serve well for a mono voice service, quite suitable for much of the programming that public radio stations often provide.

(Note also that the concept affects only the FM-IBOC service, again addressing the specifics of the public radio environment, where most stations are FM.)

This arrangement would allow each public radio FM station to provide a digital simulcast of its analog service, along with another lower fidelity channel for a second service.

Implementing this at the station would not be too difficult from a technical perspective, requiring fairly straightforward modifications to IBOC encoder and exciter designs, or perhaps even a simple sidecar extension to first-generation devices in the field.

The real challenge to this model arises on the receive end, where substantial design changes might be required to feed auxiliary data into the PAC audio decoder — originally intended to be fed only by the main digital audio channel's bitstream. (Alternatively, a separate codec could be dedicated to the second audio service, using a different algorithm optimized for the lower bit rate audio envisioned in the Tomorrow Radio design.)

Also, some method of switching between primary and secondary digital audio services would be required in the receiver. IBOC radio manufacturers already plan the inclusion of soft keys on a front-panel display screen, so one of these buttons could be programmed to serve such a switching function when a second audio signal is detected.

NPR has launched the Tomorrow Radio project with the expectation that it will run for five to seven years. Initial partners Harris Broadcast, Kenwood and KKJZ(FM) in Long Beach, Calif., may be joined by others soon. Several manufacturers have already expressed interest in doing so.

Project plans

Current plans call for development of an experimental dual-service broadcast over KKJZ using Harris exciters and Kenwood receivers. A Texas Instruments chipset involved in the receiver prototype should be completed in the summer, and the on-air testing is expected to commence in the fall.

The primary goal of the initial test is to prove the feasibility of the concept, particularly with respect to the robustness of a second audio service that has no analog backup. The goal is to show that at least within the primary coverage zone of a station (down to ~40dBu) that a low-bit rate, digital-only second audio service can be reliably received on a mobile platform, while retaining acceptable quality in a slightly reduced bit rate for the primary digital audio (analog simulcast) signal.

The concept calls for an HD Radio receiver to default back to the primary digital signal should the secondary audio signal become unusable, perhaps with the insertion of an aural and/or graphical message that the secondary signal had been lost.

If the initial tests are successful,

See PIZZI, page 20 ▶

Pizzi

▶ Continued from page 19

subsequent rounds will refine the design, and second-generation IBOC receivers with secondary audio channel capability could be available by late 2004.

Driving Miss HD

Although this service was not included in the initial design of HD Radio, and a simulcast-only model for digital conversion was supported by commercial broadcasters, public radio's needs are divergent. For the latter group, a quantitative expansion is important, given the large availability of (and listener demand for) non-commercial content, and the limited shelf space in which to broadcast it.

Mike Starling, NPR's vice president of engineering and Tomorrow Radio project leader, stresses that this second service is not a true doubling of the spectrum, but would allow any broadcaster that wished to include some additional content in its signal, on a full- or part-time basis, to do so flexibly.

It's too bad this capability wasn't in the initial design of HD Radio.

While this effort has had to originate from the outside and as a second-generation add-on, Starling states that, "Ibiquity has assured its support for the Tomorrow Radio project." In fact, he feels the industry at large is supportive.

"I'm pretty gratified at the response from manufacturers," he said, adding, "No one has stood in the way of this, and in fact some manufacturers have cleared a lot of road-blocks to allow us to pursue this activity."

Starling believes that secondary-audio capable IBOC receivers could eventually become the de facto standard, likening them to FM stereo receivers, which ultimately far outsold the mono designs of the original standard, even though the additional capability was optional.

Starling also expects that the FCC rulemaking on digital radio will be an iterative process, and he points out that several commissioners already have expressed interest in their initial rulemaking that such future service expansions might be offered.

"We're cautiously optimistic at this point," Starling said, and thinks that at some appropriate point the Tomorrow Radio project may result in a contribution to the rulemaking that adds secondary audio service as a standardized feature of U.S. digital radio.

Certainly this project faces an uphill climb, and its success will only come with considerable sales of currently hypothetical second-generation IBOC receivers. Yet the economics of public radio — where content for such second services already exists (some public stations currently provide this content on an AM sister station), and considerable revenue comes directly from satisfied listeners — might allow for the successful evolution of, and a comfortable transition to such technology in ways that a commercial environment might not.

Ultimately, the entirety of IBOC technology might benefit through accelerated acceptance, and once established, some commercial broadcasters could eventually choose to incorporate the technology, as well.

It's too bad this capability wasn't in the initial design of HD Radio, and ironic that non-commercial interests may come to the rescue of the American radio industry's digital future. We'll keep an ear turned to Tomorrow Radio, so stay tuned for updates on the project's progress in future columns.

Skip Pizzi is contributing editor of Radio World. RW welcomes other points of view.

Klotz Plans More Seminars

Klotz Digital America and its subsidiary Graham-Patten Systems plan to mount more of their "roadSHOWcases" this year, after conducting two in California and Texas in recent months.

The company reported a good turnout for its event in Dallas in December. Broadcast Electronics and ERI conducted an early-bird IBOC session; Mike Dorrough discussed his proposal for 200 percent sinusoidal AM modulation.

Chris Crump of Klotz, left, discusses products with booth visitor.

The December event was held in conjunction with Dallas/Ft. Worth SBE Chapter 67; approximately 20 manufacturers took part. A Klotz spokesman said the company would like to hear from other interested chapters.

For information contact Dave Burns at (765) 935-3893 or e-mail to d.burns@klotzdigital.com.

I'm an Engineer, Not a Bricklayer!

by John Bisset

For too many years, engineers have had the jobs of plumber, electrician, even exterminator when it comes to our day-to-day duties.

I'm not sure how it began, and to be fair, I was just as guilty as a chief, doing almost everything the GM asked — moving desks, unstopping the toilet, changing light bulbs. We've all been there. Maybe some of us still are.

Fig. 1: Just because you *can* doesn't mean you *should*.

To be fair, in my case, the GM would always help, and he'd get the other managers (PD, SM, OM) to lend a hand as well. You don't mind expanding your skill set when you're not the only one doing the unpleasant job.

Nowadays, there's little camaraderie, it seems. The chief is directed to handle the problem. End of discussion.

That's the point at which you need to call in the professionals. Toilet overflowing? Call the plumber. A hundred boxes of bumper stickers arriving that need to be carried up two flights of stairs? Call Manpower and hire a couple of day laborers. You can supervise them, but don't get stuck doing the work yourself.

The key to delegating is to have resources readily at hand. Visit with your local Manpower or day-labor company. Find out what's available. Put together a resource list of plumbers, air-conditioning repair services, exterminators, and develop relationships with them.

When I worked with a country format, most of these service companies listened to the station. I'd drop off a few of the station T-shirts when the account was established. Yes, some even were willing to trade their services.

Fig. 2: Let the experts hang heavy stuff.

The key is that we were front-of-mind, and they'd take good care of us because the liked the station. Use your resources to work for you

As a CE, you probably can fix the plumbing or handle changes to the electric system. The caveat here is that you are not licensed to do this.

So you wire up the new transmitter. If something happens that invites an insurance claim, you'd better believe the insurance company will investigate any reason to deny the claim. Electrical wiring installed by an unlicensed individual could open you up to all kinds of liability.

Fig. 1 shows a couple of Square D disconnects that most engineers could install. The smart engineer will leave this kind of work to the licensed electrician.

This is doubly important for contract engineers. Unless you hold a valid electrician's license, don't even think of saving your client a buck by doing the job yourself. If a catastrophe strikes, you can rest assured the "savings" will be forgotten, and your whole business could be at risk.

★ ★ ★

Fig. 2 reminds us that this liability extends even to hanging speakers.

In this studio, prepared by Radio One in Washington, they hired the building renovation contractor to mount the speakers. (Note in the figure how the cables were enclosed in a flexible black split-sheath to keep the unsightly wires from view.)

Having a speaker fall can really spoil your day. Again, it's not that you can't do

See WORKBENCH, page 22 ▶

TECH TIPS

A Few of My Favorite Tools

Buc Fitch Explains Why He Brings Not One, But Eight Toolboxes When He Hits the Road

by Charles S. Fitch

"When are you going to send me programming from your location?"

This question over the walkies from the station took us by surprise. We had in fact been sending signal from our remote over the RPU link for more than 20 minutes, or so we thought. At 6:40 the station had acknowledged our signal. Now it was almost show time, but no signal.

What had happened?

It was the 100th birthday of the Philadelphia Phillies baseball team. On this May night in 1983, we were behind home plate to broadcast the pregame ceremonies to mark the big occasion at Veterans Stadium.

Essentially we were isolated inside a chaotic house of 50,000 fans. Our connection with the station was via an antenna mounted on a 50-foot mast on our remote truck, out in the parking lot. A 500-foot umbilical cable connected us to the truck and transmitter.

Quickly it became obvious that the problem was "out there," while we were "in here." Being the only real tech type on this remote, I took off for the truck.

Security in the stadium was severe. I knew that it would take nearly an hour — way beyond the length of the show — to get out to the lot. So I took off following the direct route of the cable, coming eventually to a six-foot-high concrete wall with a chain-link fence on top, separating the stadium from the lot.

I vaulted to the top of the wall (this was in my younger days), swung over the fence, hung by my fingertips and dropped to ground on the opposite side. A quick dash to the truck and I was inside.

I realized that the power supply on the transmitter was dead. I needed about 24 volts of DC, and fast.

We had a little portable TV with a 24-volt battery tray on the bottom, but it was eight screws and two clip leads away.

Thus our whole broadcast hung on whether I had remembered to put my screwdrivers and clip leads back into my briefcase.

My life was contained in that black beauty, but in my controlled panic, I simply dumped it all on the truck floor. Blessedly, I found myself looking at the small Phillips screwdrivers and two clip leads sitting there atop the pile.

Like a whirling dervish, I took off the screws, bared the contacts and applied power to the transmitter just as the opening theme and sponsor credits ran out.

We made it, barely.

Sometimes the difference between success and failure in this business comes down to a single tool.

Socrates said you would know a craftsman by his tools. Plato said there is a tool for every task. These gems of wisdom were spoken nearly 2,500 years ago but remain true today.

To do your best work, you need a wide compass of proper and adequate tools in serviceable condition, and you have to be familiar with their use, limitations and operation.

Truly there is a tool for every task. My eight toolboxes are proof.

"*Eight* toolboxes?" you ask. Yes, and here they are, organized by function or type of use. In some cases, one must cluster certain tools to be effective.

For an exact list of what's in each box and why, visit the Radio World Web site at *www.rwonline.com*.

✓ Box 1 holds general tools. If I can only take one box, this is the one. Ninety percent of my work is done with this box. It includes small hand tools such as screwdrivers, Allen wrenches, a small drill, my electrician's pouch and of course my trusty, fiberglass, 24-ounce, Craftsman hammer.

✓ Box 2 holds light specialty tools such as a torpedo level, small punches,

Workbench

▶ Continued from page 21

it — we all can — but whether it's worth the liability to you.

At an SBE meeting recently, a group of engineers and I discussed why we are so willing to go the extra mile, save the boss the cost of a licensed electrician, even foolishly climb towers to change a bulb. No one had a concrete answer, but we all agreed hindsight was 20/20 and we'd done some pretty stupid things in our careers. All of this to save the station, the boss, someone — other than ourselves — some money.

I worked with a very wise director of engineering who chastised me for not turning in receipts from Radio Shack or the electronic wholesaler.

It was only a couple of bucks, I reasoned. He told me that until my name was on the corporate documents as part owner of the station, I was cheating myself. Wise advice, and I learned to break that habit, I hope you will too.

No freebies

This is especially true for contract engineers. You are not running a charity. Dismissing debt, giving away your advise, not charging for parts just perpetuates the attitude that your services are not worth something, and you can be taken advantage of.

So we're going to let the professionals handle the problem from now on, right? Bill Smith is a telecom technician with National Grid Service Co. in Brockton, Mass. He offers advice along this line.

Bill read what we've discussed in *Workbench* about handling rodent problems at the transmitter site. Bill's advice, *if* you decide to clean up this problem, be sure to wear gloves, Tyvek coveralls, face protection and respiratory protection. Bill cautions that rodents carry such nasty things as Hantavirus. No radio station is worth risking your life over such an illness.

In the case of National Grid, a large electric utility serving New York and New England, they have a significant rodent problem in both their substations and radio sites. Company policy is to hire an outside contractor, experienced in handling these problems, to clean up the site. After the extermination, the technicians will go in and attempt to secure the site from rodents.

The issue of disease holds true not only for rodents but birds and other wild animals that may inhabit your site. Perhaps the best way to assess any situation that deviates from your technical duties as an engineer is to ask, "Will performing this task endanger me or put me at risk?" If the answer is yes, grab that phone and call a professional.

★ ★ ★

I mention that contract engineers shouldn't treat their business as a charity. Look to the major transmitter manufacturers if you want an example of running a successful business. They don't apologize for the rates their field service technicians command, nor should you.

As for parts, they buy a part but realize it may sit on their shelf for a couple of years. To sell it for what they paid for it two years ago would quickly bring the company to its knees.

Just as you invest money in bank, bond or stock, you expect your investment to grow. Storing parts on a shelf is an investment, too. It also explains why the $5 chip is sold for $10. It may sit on the shelf for several years.

Even the best stocking efforts by manufacturers can be thwarted by parts discontinuance. For example, high-voltage rectifier stacks that are no longer in a manufacturer's supply may be found at *www.hvca.com* or call (732) 938-4499. This company stocks a variety of parts that are useful in repairing transmitters.

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.

crimpers and riveter.

✓ Box 3 is mainly for ratchets in three sizes: 1/4-, 3/8- and 1/2-inch, with cross-size adapters and related items.

✓ Box 4 contains heavy specialty tools such as large wrenches and a 100-foot tape measure.

✓ Box 5 is for extra-heavy tools including large pipe wrenches, 3/4-inch ratchets and large conduit punches and hole saws up to 2-inch. For any job that requires larger than 2-inch, we bring in the industrial electricians.

✓ Box 6 holds video/RF tools including low-loss jumpers, my trusty Bird Wattmeter, five select elements and nearly 100 adapters. This is proof of Buc's Cliché No. 1, "The Universe Is Divided Into Two Equal Parts: Connectors and Adapters."

✓ Box 7 contains audio and data tools — essentially the same as the RF box, but for audio. It includes a small audio oscillator and the invaluable CD put out by Ed Dulaney with every special audio sample you might want including touch tones.

✓Box 8 is for expensive, delicate stuff. This is where my digital voltmeter, inclinometer for satellite antenna adjustment and amprobe are kept. This box actually is a hard-shell makeup case. It may or may count as a tool-box, but it does a great job of protecting expensive items.

In addition to these, I have a few carry-ons including a 3/8-inch chuck, 14-volt cordless drill in its own carryall and an ancient carpenter's box with woodworking tools such as a precision planer and an assortment of wood chisels.

Even if you are a master virtuoso with a tool, if you can't locate it, it won't help you. Keep your tools in a known spot. Replacing each in the same location as a matter of habit will reduce the chance of lost tools, a problem that can bring any project to a halt.

From my vast experience in construction, I can warranty that most master craftsmen are master artists. A peculiarity of artists is that their tools are organized "just so." Exact personal organization is a strong trait that has been used as a plot device in murder mysteries, including Lord Peter Wimsey's tale "Five Red Herrings." Organize your boxes to save time, energy and frustration.

Mark your tools. Our work in broadcasting often takes place in collaborative environments. A few toolmakers dominate the industry (Sears Craftsman, Xcelite, Klein, Jensen and Snap-on) because of their quality and selection of product; so sometimes multiple copies of the same tool will be at hand in your work theater.

Buy several hundred name and address labels and paste them all over your tool boxes, test equipment and anything of yours that is worth more than the label. This practice causes misanthropes to think twice about stealing; and it's good publicity for you. Etch your initials or ham call with your Dremel tool onto anything metal of value.

Scotch 33+ makes a great generic, quick-find marker. This versatile, durable electrical tape comes in a spectrum of colors. My personal tool color is super-hot red. My close associate, the exceptional engineer Bill Rosenfeldt, uses cool blue. Kevin Smith, a contract engineer in upstate New York and another regular construction partner, uses a minty, refreshing green.

When four or five of us work together, the tape on safety glasses, ear protectors, hard-hats and ratchets makes the room look like one of those early, garish Technicolor movies minus the leading lady. At the end of the day, though, we get our tools back into the right boxes, ready for use another time.

Respect your tools and those of others. A favorite instructor at MIT once told us, "A tool is a machine that makes money. Everything else is a hobby." He was right. Take good care of your tools and they'll take good care of you.

Charles S. Fitch, W2IPI, is a registered professional consultant engineer.

IBOC Q&A

Harris on HD Radio

This is one in a series of question-and-answer articles about how to implement HD Radio. Past answers are posted at www.rwonline.com *under the tab "IBOC DAB."*

Here, we query Dale Mowry, vice president of transmission systems for Harris' Broadcast Communications Division.

***RW:** How do the design of Harris products for HD Radio/IBOC reflect what you learned in the DTV process?*

Mowry: Digital is digital, no matter the flavor of the media. Harris has been involved in the development of digital broadcast transmission from the start for HD Radio and in the development of the North American standard for digital television with the Advanced Television Systems Committee.

The ATSC approached Harris in 1990 and requested that we develop a RF Test Bed for the Advanced Television Test Center, which was used to evaluate every advanced television system proposed for the United States.

Harris Broadcast is the only company that designs and manufactures both DTV and HD Radio transmission equipment. With majority of the installed digital transmitters carrying the Harris label, Harris has amassed a huge breadth of knowledge in digital transmission through its development of digital television transmitters in our Mason technology development center. The same teams that developed our Apex Digital Television Exciter technology have developed HD Radio technology such as the Dexstar AM/FM HD Radio exciters.

The technology for Digital Television (ATSC and DVB) and HD Radio is similar in many ways (digital modulation, RF mask compliance, linearity requirements, etc). For example, our understanding of COFDM's sensitivities has enabled implementation of HD Radio with fewer impairments generated in the equipment itself.

Harris has designed linear broadcast transmitters for years. Harris' understanding and experience in developing these products was helpful when dealing with amplification design elements for FM HD Radio. In the development of television transmitters, we acquired a significant knowledge base on non-linear correction and on compensating for amplitude and phase variations.

We have made a huge investment in time and money to develop digital adaptive pre-correction for digital television. We've learned from DTV how to design pre-correction schemes that work — we now understand the strengths and weaknesses of numerous linear and non-linear pre-correction techniques. For instance, we have used this technology to create a new low-power, AM analog/digital transmitter, DAX, which offers an exceptional digital signal.

All digital television transmitters make use of mask filtering. With DTV transmitters, we've had to do custom correction for mask filters and found that with the certain amplifiers the mask filter can be eliminated. And when a mask filter is necessary, we've found that it is a lot easier to set up or compensate for the filter when we do proper pre-correction. In fact, with good precorrection and amplifier technology, we can get more from our power modules, which can increase power and cost savings for customers.

To date, our service teams have installed more than 400 DTV transmitters, and because of the high number or simultaneous installations, Harris has made a sizeable investment in specialized digital test equipment. That investment will enable Harris to offer cost-effective installation assistance for HD Radio.

Harris has taken the lead in digital radio since its inception, beginning with the introduction of our fully HD Radio-ready DX-10 AM transmitter in 1987, which featured digital amplitude modulation, and the HD Radio-ready DX-50 in 1989. Harris introduced the first digital FM exciter, Digit, in 1993. In 1999, the first Z-IBOC transmitters were introduced and were followed by the Dexstar second-generation HD Radio digital exciter in 2002.

RW welcomes other HD Radio questions and other points of view.

If you call and order more stuf for silly photos like this one.

Order direct from Laz Harris by calling 877.564.0570 or e-mailing him at lazh@bswusa.com

Actually, we put BSW Sales Representative **Laz Harris** up to posing for this photo because we're trying to illustrate a Visual Metaphor: Keeping up with digital technology can be a real juggling act.

Not to worry. Laz uses his weekends and evenings tracking and mixing a wide variety of audio projects. He *knows* digital mixers, digital audio cards, software and computer interfaces because he uses them.

When you call him, you don't get an order taker, you get a seasoned expert with years of hands-on experience.

Along with Tom, John, Shannon, Ryan, Paul, Ric and Steve, Laz is another reason why Broadcast Supply Worldwide really *is* your best source for professional audio — our friendly folks know how to take care of you whether you need an I/O card or a production studio full of gear.

Call us today and help stop Laz before he can pose again.

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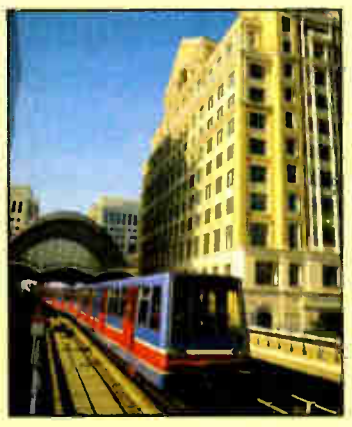
BROADCAST SUPPLY WORLDWIDE



Artist's conception of private train linking our main corporate headquarters with BSW president Tim Schwieger's private golf course and yacht basin. Slated for completion sometime before the end of the millenium pending a significantly increased order rate from our customers.

FREE Bag

BSW Exclusive – Free Comrex Gear Bag with Codec Purchase!

The affordable Comrex BlueBox combines a high speed modem with a digital audio codec to produce high-quality 15 kHz audio from a standard dial-up line. You also get a cellular hands-free interface to send high-quality audio over wireless services. **Features:** one mic/line switchable input, one headphone output and one line level output on XLR; a -10 dbu tape input allows connection to a minidisc or DAT player; internal peak limiter; data Port allows connection to GSM phones; cellphone jack. Free bag while supplies last.

BLUEBOX List 2,800^{00} **Call For Price** COMREX

New Rolls AM/FM Tuner

The Rolls TU78 Pro Tuner is a small and affordable solution for any compact AM/FM tuner need. It has 75 ohm FM and 300 ohm AM antenna inputs, stereo line-level RCA outputs, a variable tuning control and an AM, FM stereo, FM mono band select switch. An LED indicates when a station is locked, another indicates a stereo output signal is present at the outputs.

TU78
List 116^{00} **79^{00}** ROLLS

Popular Gemini CD Player

This super affordable rack mount CD player is the most popular of Gemini's pitch control models with up to ± 12% pitch control with pitch bend. Besides the cool play functions, the CDX601 makes use of Gemini's Auto Disc Calibration System (ADCS) to recalibrate the CDX601's laser to each new CD you play. **Features:** multi-speed jog wheel search; instant start; digital output.

CDX601
List 329^{95} **199^{95}** gemini

RE20 75th Anniversary Special Edition Microphone – Exclusively at BSW

Here is your chance to own a piece of history. Be the first on your block to own the Special 75th Anniversary Edition Electro-Voice RE20 Microphone. This limited edition collectors mic is an RE20 through and through but is painted black and has a special 75th Anniversary Logo. This mic will look and sound great in your studios. It comes complete with a wooden box, serial number certificate and stand clamp. Hurry, once these are gone...there will be no more.

RE20-75SE
List 798^{00} **429^{00}** EV

f, Laz won't have time to pose

BSW Exclusive Offer on VoxPro Digital Editor

Buy two VoxPro PC software/ controllers and get VoxPro PC Network for only $99.00!

Audion's VoxPro PC software system is the fastest, easy-to-use two-track recording and digital editing system used today by deejays, producers and reporters nationwide. VoxPro PC software uses a hardware USB- or Serial-port controller for fast recording/editing as well as on-air "Hot Key" playback. In addition to importing and exporting files, the system is seamlessly networkable, allowing files to be moved instantly back and forth between the production room, on-air studio and newsroom (with PC network software).

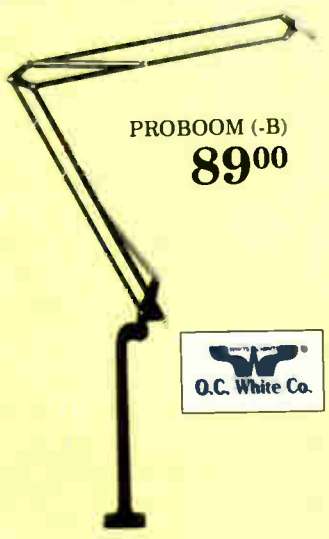
Right now, buy two VoxPro PC software/controller bundles, and get VoxPro PC Network software for only $99.00 - a savings of almost $600.00! VoxPro PC Network links two or more VoxPro PC workstations using Novell, NT or peer-to-peer networks.

This is a limited time offer exclusively from BSW. Call for sale prices and more information.

AKG Studio Mic

The sound is pure AKG, but the price is far below what you'd expect for a premium large-diaphragm electret condenser. The C3000B's two switches select options for bass roll-off and pre-attenuation. **Features:** cardioid pattern; 1" diaphragm; gold-sputtered membrane; switchable 10 dB internal pad; internal windscreen; shock mount.

C3000B
List 536.00 **299.00**



PROBOOM (-B)
89.00

Top Selling Microphone Boom

ProBoom is the best value in studio microphone booms. This 41" arm comes complete with 12" riser for table top mounting and two sets of upper springs to accommodate all mic sizes and weights. Additional mounts for wall mounting are available as options. Order beige (#PROBOOM) or black (#PROBOOM-B).

Hot MiniDisc Walkman

The Sony MZ-N707 MiniDisc recorder will allow you to record MP3s, and use affordable MDs for storing over 5 hours of music on one 80-minute disc.

This MD machine also plays back in ATRAC3 and supports multiple internet audio formats. Enjoy up to 56 hours of listening using one "AA" battery, and up to 20 hours of listening using the rechargeable battery (LP4 mode). Supplied accessories: charging stand; rechargeable battery and AC adaptor; car kit; remote control with editing functions; headphones.

MZN707BLUE List 279.00
219.00

"AutoFill" Broadcast Delay

The low-cost Eventide BD960 not only provides a delay, it replaces naughty words with a station's own "zapper"! In the past it was necessary to wire the delay "Dump" switch to a cart machine and a relay to kill the caller, so to speak, and let the recorded filler do its work. This latest Eventide unit, dubbed the "AutoFill Broadcast Delay" does the job all by itself. Included in the 1U rack mount unit is a section of nonvolatile memory (NVRAM) that will store up to eight seconds of filler of the station's choice. Audio quality is excellent – 24-bit/48 kHz sampling. Call today.

BD960
List 1,995.00 **Call For Price**

Industry Standard Voice Processor

The Symetrix 528E is the industry standard analog voice processor with 5 major functions in a single-rack-space unit. **Features:** microphone preamp with a switchable 15 dB pad; front panel mic/line level switch; 48-volt phantom power; voice symmetry switch (phase rotator) that corrects for excessive positive or negative signal peaks; de-essing with frequency and range controls; compression/limiting with downward expansion; 3-band parametric equalization; balanced XLR mic and line level inputs; balanced XLR and unbalanced 1/4" outputs; 1/4" in and out patchpoints on each section.

528E
List 749.00 **499.00**

Incredible Value Headphone 5-Pack

Five AKG K110M headphones for $89.00! We're not kidding. These durable, great sounding headphones have sealed ear cushions, a self-adjusting headband and low 32 ohm impedance. A BSW exclusive!

K110MPKG
89.00

BSW Exclusive Microphone 5-Pack

The Audio-Technica ST95MKII is a quality sounding dynamic mic that is perfect for PA and studio recording. **Features:** On/Off switch; XLR output; low impedance; cardioid pick-up pattern. Includes stand adaptor.

ST95MKIIPKG
99.00

Don't Forget Stands and Cables

These durable mic stands for less than $18 each in the 5-pack are an incredible bargain exclusively from BSW.

Also save on quality, low-loss 25 ft. mic cables at a great price. Money saving 5-Pack!

MS200PKG **89.00** M25PKG **49.00**

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Broadcast Supply Worldwide.
Your Best Source for Professional Audio Products.

Broadcast Electronics said it began receiving "significant orders" for HD Radio gear by the Ibiquity fee waiver deadline. It received early orders from major groups and several independent stations, among them **Entercom, Clear Channel, Greater Media, Spanish Broadcasting System, Crawford Broadcasting** and **Multi-Cultural Radio Broadcasting**.

"Independent broadcaster **WJLD(AM)** in Birmingham, Ala., became the first non-experimental AM station to air HD Radio on December 20, 2002," BE stated. The station is using an ASi 10 signal generator and AM-1A transmitter.

Clear Channel Communications ordered BE HD Radio equipment for stations in Detroit, San Francisco and Los Angeles. Spanish Broadcasting System's WRMA(FM) in Miami was to be the first in that group to implement HD Radio. Crawford Broadcasting ordered an HD Radio transmitter and exciter for WPWX(FM) in Chicago.

"We're definitely past the experimental stage with HD Radio," said Entercom Vice President of Engineering Marty Hadfield in Seattle. Among the early Entercom adopters: FM stations KISW, KQBZ, KMTT, KNDD and KBSG in Seattle and WQSX and WAAF in Boston. ...

Harris Corp. said it had approximately 45 orders in hand from early adopters in January. **WRAL(FM)** in Raleigh-Cary-Durham-Chapel Hill, N.C., began broadcasting an HD Radio audio signal with a Z-HD-6 solid-state digital DAB transmitter and Dexstar AM/FM IBOC exciter.

"As the first commercial company in the nation to be licensed to broadcast high-definition television and the first to provide a digital newscast, WRAL(TV), Capitol Broadcasting, has always had a very strong commitment to digital broadcasting," said Ardie Gregory, WRAL(FM) vice president and general manager.

Separately, **WUSF(FM)**, an NPR affiliate and the public station for the University of South Florida in Tampa and for west central Florida, ordered a Harris HD Radio-ready Z-HD 12 FM Transmitter, Dexstar FM Exciter, **Orban** Optimod-FM 8400/HD/FM digital processor and auxiliary digital transmission equipment.

"WUSF will use the separate amplification model ... and will be one of the first public broadcast radio stations to broadcast HD Radio," Harris stated. ...

Elsewhere, **Televisa/Radiopolis** chose **Burk Technology** to provide 35 GSC3000 transmitter remote control systems for sites throughout Mexico.

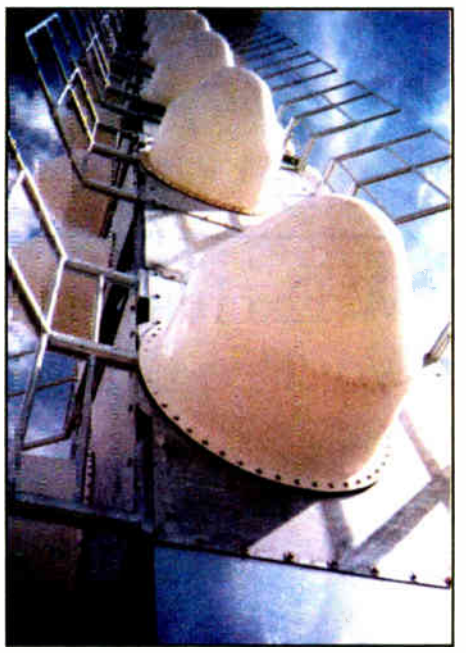
The media group is installing the equipment as part of a remote site project at 17 AM and FM stations in Mexico City, Veracruz, Mexicales, Monterrey and San Luis Potosi. The sale was coordinated with supplier **AURI**. ...

KCMT(FM) in Tucson, Ariz., is on the air with a **Nautel** Q40. The supplier says the Arizona Lotus station, airing a new Hispanic format with a 100 kW signal, is the first in the United States to broadcast with 40 kW solid-state transmitter power from a dual power block Nautel Q40. ...

Neumann says **Hispanic Broadcast Corp.** has purchased seven TLM 103 microphones as part of an upgrade project at the home of three stations in San Francisco.

Raul Velez is chief engineer there. The facility now has 14 TLM 103s. **Leo's Pro Audio** recommended the mic. ...

In Iowa, **Smarts Broadcasting** completed installation of an **apt-X** Smartcaster digital automation system. FM station **KPVL** in Postville is described as the first turnkey install completed by Smarts that includes both studio and transmitter sites.



Jampro Antennas and more than a dozen Salt Lake stations have completed a major FM master antenna project at Farnsworth Peak.

KQMB/KSFI. Ownership groups involved include **Bonneville, Capitol Broadcasting, Clear Channel, Citadel, Listeners Community Radio of Utah** and **Simmons Group.** ...

KLTX(AM) bought four **Orban** Opticodec 7400 codecs to transmit programming from its Pasadena, Calif., studios.

Simon Hancock, senior studio manager of BBC Radio Resources, left, works with Paul Hughes, general manager of the BBC Symphony Orchestra, on the Studer D950 M2 console.

According to APT, the project also uses one of its new Program Channel Access Unit cards for an STL link of several hundred yards. The card sends 15 kHz stereo audio over a 256 kbps data rate using apt-X compression. The card is a joint venture of Pulsecom and APT. ...

Jampro Antennas and a clutch of Salt Lake stations completed a major FM master antenna project at **Farnsworth Peak** in Utah. Total power: about 325 kW.

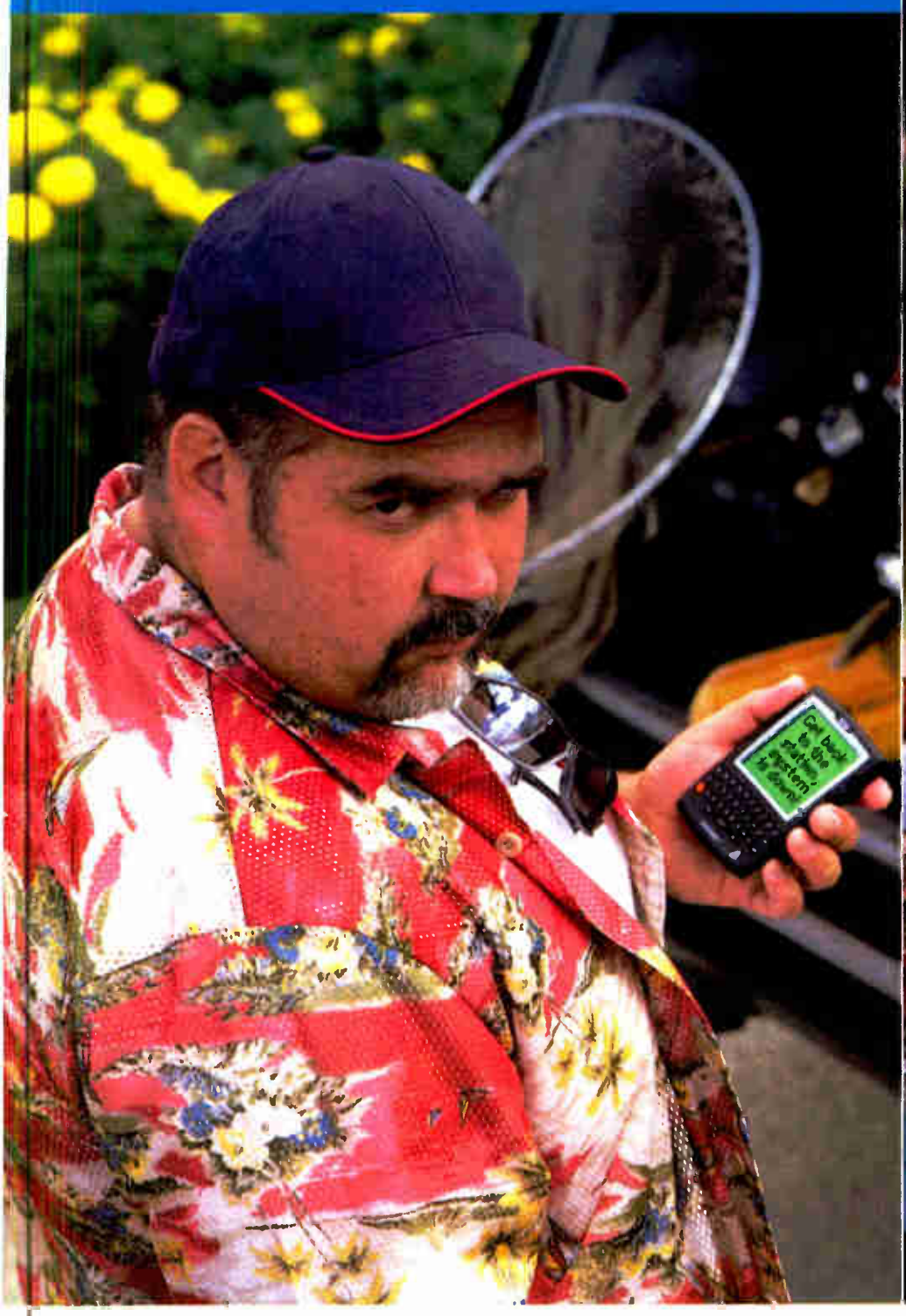
The antenna, combiner and filter system were engineered by Jampro in cooperation with KSL; KBZN; KKAT; KISN; KUBL/KBER; KRCL; KSOP; KCPX/KOSY; and KXRK/KRSP/KQMB/KSFI. Ownership groups involved include **Bonneville, Capitol Broadcasting, Clear Channel, Citadel, Listeners Community Radio of Utah** and **Simmons Group.** ...

The chief engineer is Dan Feely. The codecs feed program to XEXX(AM) in Tijuana over the Internet, using TCP/IP. He also has used the Opticodec 7400 to feed programming to another station via a T1 circuit. **BSW** sold the units to the station. ...

The **BBC** installed and commissioned a **Studer** D950 M2 digital console in the BBC Symphony Orchestra studio at Maida Vale, west London. The 56-fader D950, the first large-scale digital console to be installed in a BBC Radio music studio, is fitted with Studer's Virtual Surround Panning software. ...

The University of Iowa's **WSUI(AM)** uses **Telos Systems'** Zephyr Xstream ISDN transceiver for remotes. Jim Davies is chief engineer for WSUI and KSUI(FM); the Xstream is used for "Iowa Talks," a program that originates off-campus and features interviews and live music.

Vacation?
What Vacation!



You need iMediaTouch.

Is your digital audio delivery system spoiling your your free time?

Since 1984, over 500 radio stations around the world have trusted iMediaTouch broadcast automation software. With a host of award winning features designed to save both time and resources without breaking the bank, the iMediaTouch digital audio delivery system is easy to use and dependable time after time.

iMediaTouch broadcast automation software.
Big market dependability. Small market affordability.

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Toll Free 888 665 0501 or visit www.omt.net

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omt technologies

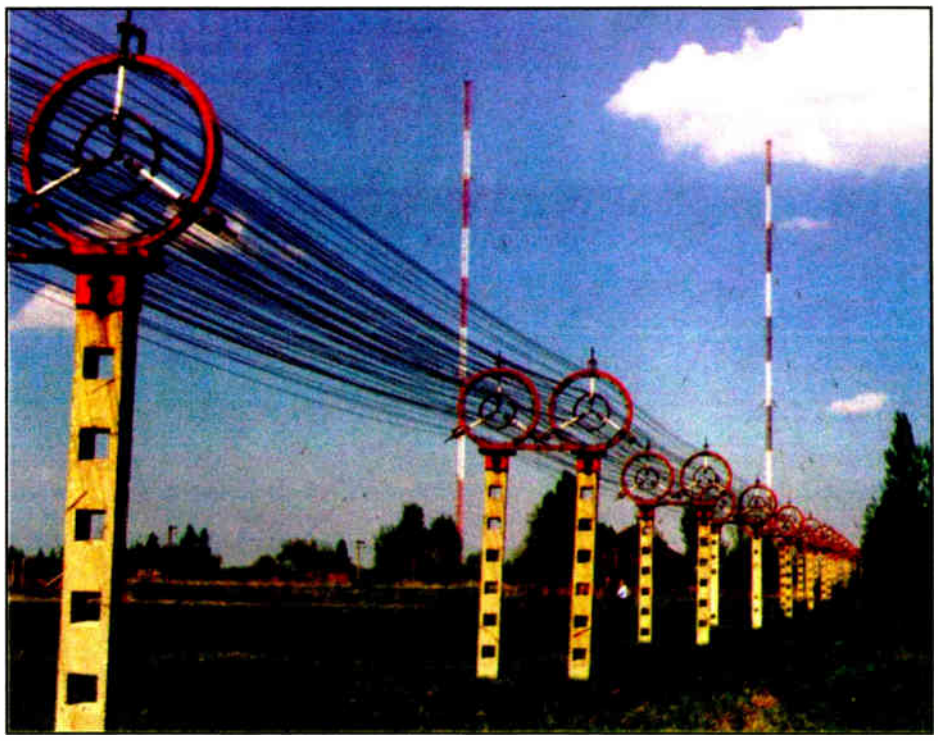
Russia's RTRS Fights Network Chaos

by Bernd Trutenau

A return to centralized control is curbing what had become a chaotic spread of transmission networks across Russia.

More than a year has passed since the re-establishment of a single body to oversee Russian radio and television transmitter networks, Rossiyskaya Televisionnaya i Radioveschatelnaya Set or RTRS.

Today, RTRS owns approximately 15,000 television and 3,000 radio transmitters, and unites 94 network branches in the Russian regions. The new state corporation replaced old Soviet-era structures that competed with each other in the marketplace, and, not infrequently, blocked each other's operations.



This is a Soviet-era high-power transmission center with equipment from the Komintern transmitter plant.

Constant struggle

Over the past 10 years, regional state network owners in the Russian provinces, for the most part, have worked independently from Moscow. Due to financial difficulties, these operators sometimes replaced relays of national programs on some frequencies with different programs if another broadcaster offered a higher price for the airtime.

On other occasions, regional utility companies switched off transmitters for days or weeks because of nonpayment of electricity bills. The Russian national radio companies were facing a constant struggle over their frequencies.

As a result, some local governments took network development into their own hands and established state companies to run the regional transmitter networks. Some of these regions have still not handed their networks over to RTRS.

As a nation with large, scarcely populated areas, long- and medium-wave transmitters still are a primary means of distributing national radio programs across Russia. In the days of the Soviet Union, AM transmitters of up to 2.5 MW were installed at major broadcasting centers around the country.

These transmitters were manufactured at the Komintern plant in St. Petersburg. The transmitters, designated PDSV-500 through PDSV-2500, were of similar design, but each was adapted to local requirements.

However, these transmitters consume a large amount of electricity, with an efficiency of only 55 percent or less. Many are now operated on reduced power.

No new transmitter of this power class has been installed during the past 10 years, even though one of the successors of the now dissolved Komintern plant, St. Petersburg-based RIMR, still has the capacity to build such units.

updating its environmental laws to meet European standards, and many transmitter locations with high radiation levels close to housing fail to comply with the new norms.

Reserve capacity

This means that RTRS has to run many transmitters on reduced power, and it has to find new locations. In Kaliningrad obalst', the regional state broadcasting company requested an increase of its medium-wave power output from 30 kW to 75 kW.

This was not permitted at the old site in downtown Kaliningrad so the new transmitter (a Russian-made DSV-75 unit) was installed at the Bol'shakovo transmitting center, 50 kilometers east of Kaliningrad.

In Saransk, the capital of the Republic of Mordovija, a 30 kW Tesla transmitter was closed down and replaced by a new 100 kW transmitter some 60 miles away in Kovylkino, at a transmitting center that was used for jamming during the Cold War.

In Astrakhan, a provincial capital on the Black Sea coast, two transmitters in the town center are to be dismantled and moved outside of town following pressure from environmental authorities.

While there is no new production of high-power transmitters, there is a significant reserve capacity of this power class all over the country.

In 1999, the Ostankino Radio-1 AM network was switched off when the station could no longer afford the lease. Radio-1 was a former all-Russian state network, which was dissolved by former Russian President Boris Yeltsin in 1998, but it soon reappeared under private ownership on the old frequencies.

Some of the Radio-1 frequencies were offered to private operators in a bid in 2001, but drew no response. Now RTRS is intending to use the frequencies to fill coverage gaps in national programs.

A first transmitter, in Bol'shakovo in Kaliningrad oblast', went back into operation on Aug. 1, 2002. It is a 1.2 MW system operating on 171 kHz, but running at 600 kW with an omnidirectional antenna. It provides Radio Rossii to listeners in Kaliningrad oblast', as well as to Russian ships in the Baltic and North Sea and to listeners throughout the Baltic region.

The RTRS regional branch in St. Petersburg is considering putting a 1 MW transmitter into operation on 801 kHz for similar purposes.

On occasions, regional utility companies switched off transmitters for days or weeks because of nonpayment of electricity bills.

The lack of transmitter efficiency is partly compensated for by antenna systems. Russian scientists developed a number of highly effective antennas for long- and medium-wave broadcasting, such as the SV2+2 and ARRT models and the high-gain directional Zarya antenna.

But the maintenance of broadcast antennas is another challenge for RTRS. Due to a lack of funding in recent years, many antennas are in bad condition and some have fallen, including a long-wave mast near Irkutsk.

Until the fall of the Soviet Union, the high-power long- and medium-wave transmitters from 150 kW upwards were manufactured in the USSR, while smaller transmitters came mainly from Tesla of Czechoslovakia.

Since the 1950s, Tesla has supplied more than 40 30 kW AM transmitters, 190 25 kW transmitters and 130 7 kW transmitters. Most of these have been in operation for 40 years or more and are being phased out. Many have been decommissioned or are only used for local broadcasting for a few hours a day.

Furthermore, Russia has been

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Thirty-three years ago, three engineers at Eimac found that they could take a failed tube which had been returned from the field after many thousands of hours of operation, take it apart, replace worn parts and reprocess the tube like new. They found that the quality was good and that the life was excellent.

They approached management with the idea of building a business based on rebuilt tubes. Eimac, at the time, declined on the grounds that they would be competing with themselves. The three engineers disagreed, and left Eimac to form their own company, ECONCO.

Over the following many years, ECONCO has built a fine reputation for quality and customer service and has become the world's largest tube rebuilder, with more than 80 employees and a modern 50,000-square-foot facility in Woodland, Calif.

ECONCO knows how to make quality tubes because unlike original tube manufacturers, ECONCO performs an analysis on all tubes after failure, and therefore learns how and why they fail. Plus, we rebuild more than 450 different tube types from the several manufacturers and so we know the strengths and weaknesses of the various tube designs.

The Navy experience

A case in point is the U.S. Navy. For many years, our customers have told us that the life of ECONCO rebuilt tubes exceeds that of new tubes. However, we did not have statistical evidence to back this up.

Now we have that evidence. Long power-tube life is an important part of the cost of operating the U.S. Navy's AEGIS missile system. Accurate records are kept on the life of the power tubes that are purchased new, compared to those purchased rebuilt from ECONCO.

The statistical evidence is compelling. There is now no question that our company's processing results in rebuilt tubes with much longer life than new tubes from the original manufacturer. The evidence is so striking that the Navy has twice presented ECONCO awards for excellence (the first time a power-tube company has been twice honored), stating that the life of our rebuilt tubes exceeds that of tubes purchased from the original manufacturer by a full 30 percent.

ECONCO is proud to now have this unassailable confirmation of the statements of our broadcast and industrial customers over the years. The power tube used by the Navy is the Y633, a water-cooled version of classic RF transmitting tubes, such as the 4CX10,000D and 4CX15,000A. Basic construction and design are the same, so the Navy's quality assessment results can be directly extrapolated to the tubes used in broadcast service.

New tubes too

Over time, ECONCO has developed processes for manufacturing tube parts, including anodes, cathodes, grids, etc.

With this knowledge, there was a natural progression to manufacture new tubes. Today, ECONCO makes new tube types for most of the broadcast transmitters throughout the world.

Through our history, we have worked hard to build and maintain a reputation for quality rebuilding of tubes for broadcast, industrial and government applications. Now with our new tube manufacturing, the combination of our knowledge of failure mechanisms for 450 tube types from many different tube companies contributes to ECONCO's ability to design, fabricate and process rebuilt and new tubes of superior quality.

Why do ECONCO tubes last longer?

Processing: ECONCO has the finest furnaces and pumps available.

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You can now obtain these newly manufactured broadcast tubes from ECONCO: 3CX2500A3, 3CX2500F3, 3CX3000A7, 3CX10,000A7, 3CX10,000E7, 3CX15,000A7, 3CX15,000E7, 4CX3500A, 4CX7500A, 4CX5000A, 4CX10,000D, 4CX15,000A, YU148. ●

PRODUCT EVALUATION

Tascam Workstation: The Joy of SX

by Alan R. Peterson

There are many paths you may take to get to the production rig of your dreams.

You can go the budget PC route with a mini-mixer, plow the bucks into a big Mac ProTools system, build a room around an Audicy or consider what the engineers at Tascam call a "digital production environment."

The Tascam SX-1 is such a choice. This behemoth of a workstation combines an automated 32 x 8 x 8 digital mixer with a hard-disk recorder, full-featured MIDI sequencer, a pile of DSP effects from Tascam and Antares and a CD burner.

And it does so in one very large, very heavy black case that looks flat-out cool as the heart of an audio production system.

Similar workstations are out there; only a few months ago, we checked out the Yamaha AW-4416. With an extra feature here or there, all are immensely powerful and, to a degree, complicated almost to the point of confusion to the radio-minded person. The SX-1 certainly qualifies.

If you are in business creating music for broadcast, commercial production or are doing anything other than day-to-day spot or liner production, this is an excellent system around which to build.

If, on the other hand, you are cutting a spot with voice, sound effects, two music changes and a touch of echo at the end, the SX-1 is excessive and perhaps should not be your first choice at the radio station.

But boy, is it a terrific system for the big projects.

The digital mixer section occupies slightly more than half the work surface of the SX-1. It is fairly simple in appearance: motorized faders, rotary encoder controls and a fistful of illuminated buttons.

Above the mixer, you will find monitor controls and a line of buttons to select Fader Banks. Note there are 16 faders and one Master slider. These buttons let you switch between input channels 1-16, 17-32 and all the group returns and aux busses you can handle. This multifunction approach keeps the mixer to a manageable size.

Getting physical

To the right of center, function buttons switch you through display modes (more on the display coming up), mixer automation, editing and library management. The last item allows you to call up routing configurations and favorite patches, which certainly beats rifling through mystery folders on a standalone computer system.

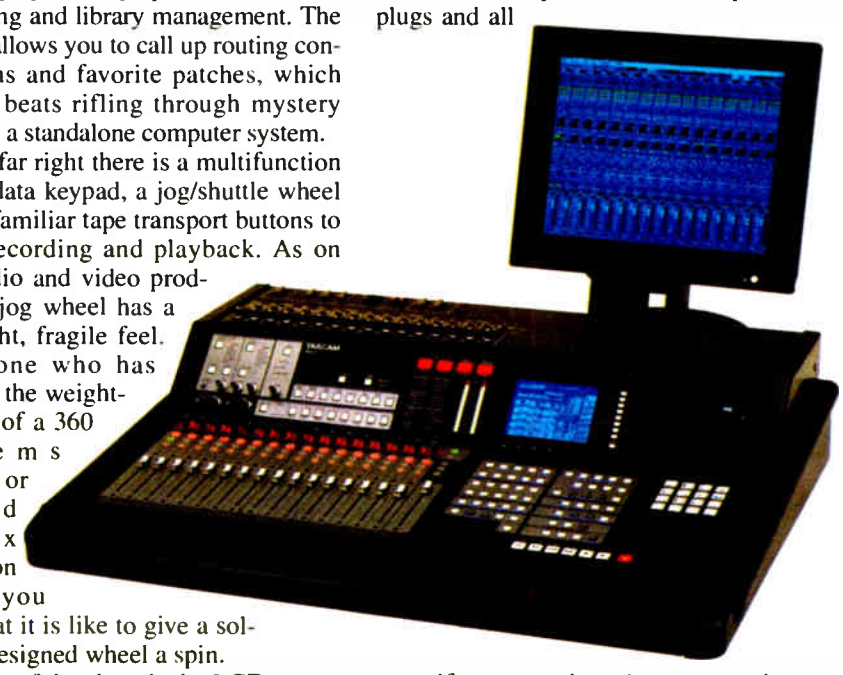
To the far right there is a multifunction numeric data keypad, a jog/shuttle wheel and nice familiar tape transport buttons to control recording and playback. As on many audio and video products, the jog wheel has a lightweight, fragile feel. For anyone who has ever spun the weighted wheel of a 360 Systems Short/cut or the old Fostex Foundation editor, you know what it is like to give a solid, well-designed wheel a spin.

The star of the show is the LCD screen that shows track playback, waveforms, mixer functions, DSP settings and more. Perhaps "co-star" is a better choice of words, as the SX-1 is complete when connected to a VGA computer monitor.

We have all marveled at the all-inclusive screens that tell us everything about our digital mixers. But the functions found in the SX-1 really do require a full monitor screen, especially when viewing the multitrack view or the mixer. Indeed, the mixer fills the screen with a remarkably complex virtual console complete with aux sends, dynamics and EQ stages. But with 16 faders filling the screen, the controls are tiny.

There is space on the top of the SX-1 to mount a VGA monitor, but the Tascam manual suggests not doing so with a CRT unit. A flatscreen display is a better choice.

A look around the back reveals the unmistakable layout of a PC backplane — plugs and all



— as if someone shoved a computer into a large hole into the SX-1.

Potential customers might consider this a cheap-out: If Tascam can build a system around a common PC — and not even spare the effort to disguise it — why not just buy a PC and get on with life?

Granted, the same thought briefly crossed my mind. But it makes sense. There is no fiscal advantage in Tascam reinventing the wheel and designing computerized innards when OEM hardware has already been perfected and costs less to implement. So what if you can see the backplane? Would it work any differently if a black panel covered it?

Before the "I hate PCs" movement gathers breath, the SX-1 does not run under Windows. Tascam engineers are using BeOS, the Be operating system, which was designed from the outset to be a stable and outstanding multimedia performer.

Actually, the BeOS-driven CPU only serves as a traffic cop for the system. Eight internal SHARC DSPs handle audio computations: six take care of audio routing, EQ, dynamics, bussing and summing. Two DSPs run the plug-in effects, and are split into four quadrants, allowing four stereo effect processors to run at once.

The configuration of the SX-1, therefore, has more in common with a DSP-based ProTools TDM system than it does with a typical PC-based DAW using the CPU for tracks and plug-ins.

Then there is the 88-pound weight of the SX-1. Hoisting a large PC onto a tabletop is tough enough for some people, but two people will be needed to prepare this unit for performance in the studio.

Running it

For anyone who has used a combined audio/MIDI software product such as Cakewalk or Cubase, the idea behind the SX-1 is similar.

Both audio and MIDI data can be recorded, edited, processed and mixed down, then burned to a CD. But do not expect a cute little computer program here. The SX-1 is called a "production environment" for a good reason.

Except for the presence of a keyboard and mouse, the computer never really gets in the way on the SX-1. The BeOS operating system is transparent, so you are literally using a dedicated recording and mixing system, not a PC that just happens to be a music environment at the moment.

Much of what you need to know can be gleaned from the 38-page "Quick Start Guide," with the longer "Reference Manual" delivering most of the fine

See TASCAM, page 32 ▶

PRODUCT GUIDE

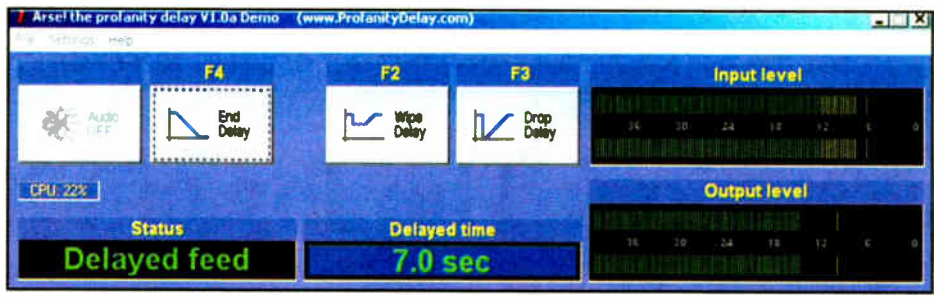
MDO Promotes New Profanity Delay

The Arse! Delay from MDO UK is a profanity delay for broadcast use that provides up to 30 seconds of stereo delay.

During a live program the operator can control the system with two buttons. According to the company, the Arse! Delay is an all-software PC solution that is advantageous over traditional standalone delays. A large, full-color display on a PC monitor provides status information on the current level of delay, audio levels, mode and user options.

Countdown clocks to cue points are also shown. The system can be controlled with a mouse, user-defined keyboard hotkeys or with an external keypad. These controls can be built into existing control surfaces in the studio.

Delay can be built in using several methods. The delay-build function builds the delay imperceptively over a period of a few minutes with a dual-mode technology tailored for use in speech-only or music/speech mixed program segments. For a quicker build, the Arse! Delay system can play filler audio directly from the PC hard disk, a jingle, sweeper or promo, for example, while the delay is gathered. The audio is played from a WAV file and if the filler is longer than the needed delay period, an on-screen countdown to the cue point is shown to aid the user.



An advanced Wipe Delay function allows the user to edit out the last few words spoken, removing words from the end of a sentence and preserving the remainder of the delay and permitting the talk/phone-in segment to continue uninterrupted. The delay immediately starts to rebuild. At the end of a delayed segment the delay can be played out or transparently removed over a period of a few minutes.

Requirements: Windows XP, 2000, Me or 98 with a standard Windows-compatible sound card. Price: $970; a studio grade sound card is available for an additional $250.

For more information contact MDO UK in the United Kingdom at 011-44-121-256-0200 or e-mail sales@profanitydelay.com. *A trial version is available on the Web at* www.profanitydelay.com.

Tascam

▶ Continued from page 31

details. Read both for best results.

Voice recordings captured with my Earthworks microphone were made a great deal more enjoyable by the application of the Antares Mic Modeler, licensed by Tascam for use in the SX-1. The clinically flat response of the Earthworks microphone was jazzed up with an emulation of a round-sounding Neumann U87.

While I had no U87 with which to do an accurate A/B comparison, the effect nonetheless was impressive. Other great microphones in the preset library include the AKG 414 and the Manley Reference Gold, among others.

Oddly absent were models of the broadcast favorite E-V RE-20 and the classic RCA 77DX, although finding a single mic representative of the entire 77 line has to be impossible today.

Once a sample voice track was committed to the internal hard drive, I went after it with some steep compression, a little over-the-top "smile" EQ and a drop of Boss Jock reverberation, all variable and patchable.

DSP processing on the SX-1 is quite capable, but do not expect spacey Harmonizer-type effects. These are bread-and-butter processing and effect algorithms we all need and depend on.

Useful jacks

Music tests consisted of recording a few electric guitar tracks directly into the SX-1, and running some MIDI data via my classic Roland D-50 keyboard and an E-mu Proteus orchestral module. The SX-1 has 128 MIDI tracks and four MIDI Out jacks, which means you may actually get to *use* that many tracks for a change.

Any recorded audio is subject to the same DSP effects as on voice, so I will not repeat myself here. Know too that the SX-1 was not designed to be a "mini-studio" for musicians; there are no dedicated buffered inputs for instruments, so an electric guitar connected directly to the SX-1 mic inputs will be loaded down by the low-Z inputs and sound muddy.

Expect the standard audio editing conventions of cut, copy, paste, split, clear, reverse and normalize, all nicely implemented on the SX-1. Again, use the VGA monitor to do this — you will quickly appreciate the larger viewing area when doing some hairsplitting.

You may import audio files in WAV, AIFF, SDII, BWAV and AU formats. The SX-1 records and converts to SDII and BWAV formats. Audio quality is 24-bit, 44.1 or 48 kHz sample rate; there is no 96 kHz option, but one is not needed for most general music or radio production.

The SX-1 lacks an internal MIDI sound generator, much as you might find a software synth on a computer soundcard, which is fine. Connect whatever sound generators and modules you want to the MIDI Out jacks without getting locked into the limited set of sounds found on the computer.

I was pleased to see so many features under the MIDI menus, including Piano Roll editing (where note data appears on screen as a series of dots and dashes like on a player piano roll), Event editing and all the cut/copy/pasting I could want. Fleshing out repeated phrases in a music track by grabbing MIDI passages and pasting them into new locations was as effortless as in any other MIDI package out there and a great deal faster.

As radio production does not depend heavily on MIDI, I will not dwell on this aspect of the SX-1. I enjoyed its depth of functions very much, but if you do not need MIDI in your studio, you would just be paying for an expensive feature you would not use.

During my test music recording, I heard a high-pitched noise induced through the guitar pickups whenever I touched a fader. This was due to a touch sensor in the fader that implements an automated function in the unit whenever touched. It was peculiar but not necessarily a problem; nobody can play guitar and run console faders simultaneously unless they have three arms.

Speaking of the faders, may I say *bravo*. While I have no problem creating mix decisions by drawing "rubberbands" on a track view, having real faders under my fingers remains a wonderfully organic experience. And thanks to the ability of the SX-1 to memorize and automate a mix, it is possible to recall that same mix every time, or to create and save as many variations as you want to.

Besides, clients will love watching those motorized faders move themselves.

Idle port

Extras that have made it onto the Tascam SX-1 include a SCSI port for greater storage capacity, an ADAT-compatible 9-pin I/O connector, time code port and expansion slots for additional optional inputs and outputs as desired.

The unit can sync up to video if desired, with the ability to set frame rates, pullups and pulldowns.

There is also an Ethernet (network) port on the PC backplane. It is idle now, but will be turned on in version 1.5, at which point the SX-1 will function as an FTP server. By giving the machine an address on your network, you will be able to move files back and forth via the FTP.

I don't know if you are bothered by indicator lights that leave "tails" in the air as your eyes move, but the LEDs on the SX-1 worksurface are clocked at a high rate and flash rapidly. Some may find this fatiguing in a dark control room, some do not. Your call.

In summary, the Tascam SX-1 is a magnificent piece of engineering, with a mixing surface that feels comfortable and serious, and with audio quality you would expect from the folks who have made everything from portable cassette multitracks on up to full-bore studio gear. Editing features are powerful, the on-board DSP keeps you from wishing you had "just one more reverb box," and the internal CD recorder lets you walk away with a finished product immediately.

I reluctantly must repeat that, for day-to-day radio production, this is not the system for you. The learning curve can be steep, the features intimidating, and the unit's perceived inability to squirt a finished and labeled piece of production out over the LAN to the audio server make it less desirable than a simple PC/software solution.

Price in line

Also, cooling fans and disk drive noise might preclude its use up close to a microphone.

Is the six-grand price tag a turnoff? It might be for folks more used to buying PCs and basic DAW software than for users who remember what a quality 16-track reel machine and an effects rack cost only a decade ago. The price seems in line, given the features.

Instead, look to the Tascam SX-1 as a unified production system better suited for the big projects outside of the station: MIDI production music and jingle creation, large-scale multi-mic recording, serious audio mixing and realtime processing. Use it to move into audio-for-video later on. And with software upgrades periodically issued on CD-ROM, the SX-1 will stay fresh and timely for a while to come.

Alan Peterson is a longtime broadcaster, MIDI musician, production engineer and contributor to RW. Reach him at alanpeterson@earthlink.net.

Extras include a SCSI port for greater storage capacity, ADAT-compatible 9-pin I/O connector, time-code port and expansion slots for optional inputs and outputs.

Product Capsule:
Tascam SX-1
Digital Production Environment

Thumbs Up

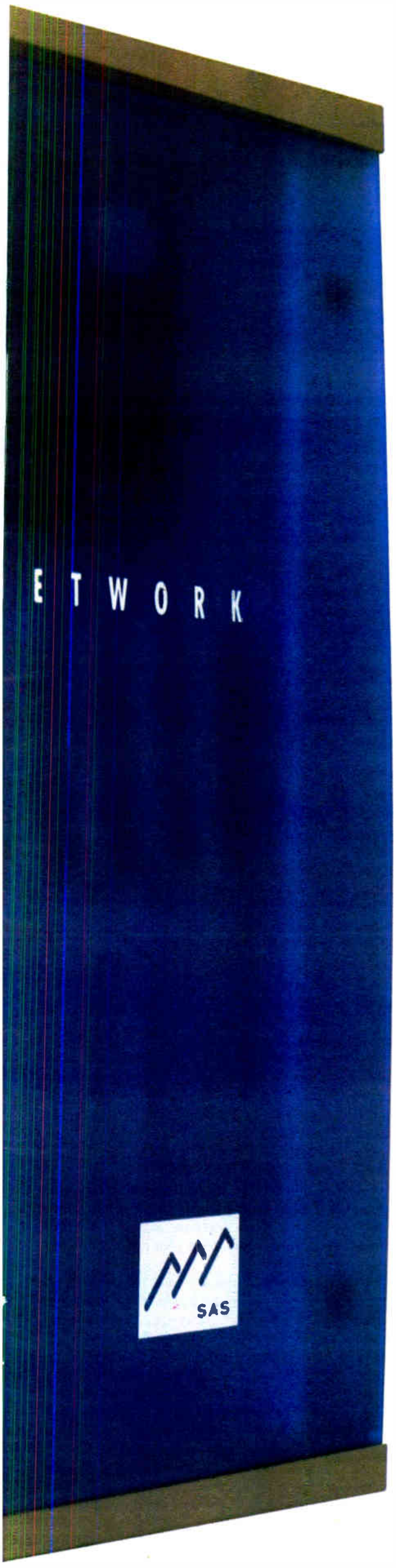
✓Performs under BeOS
✓Extensive audio and MIDI editing capabilities
✓Antares Mic Modeler built in
✓Full-featured mixer surface
✓Software upgradeable

Thumbs Down

✓Too many features for straight-ahead radio production
✓Expensive, given the features that may go unused

Price: $5,999.99

For information, contact Tascam in California at (323) 727-4778 or visit www.tascam.com.



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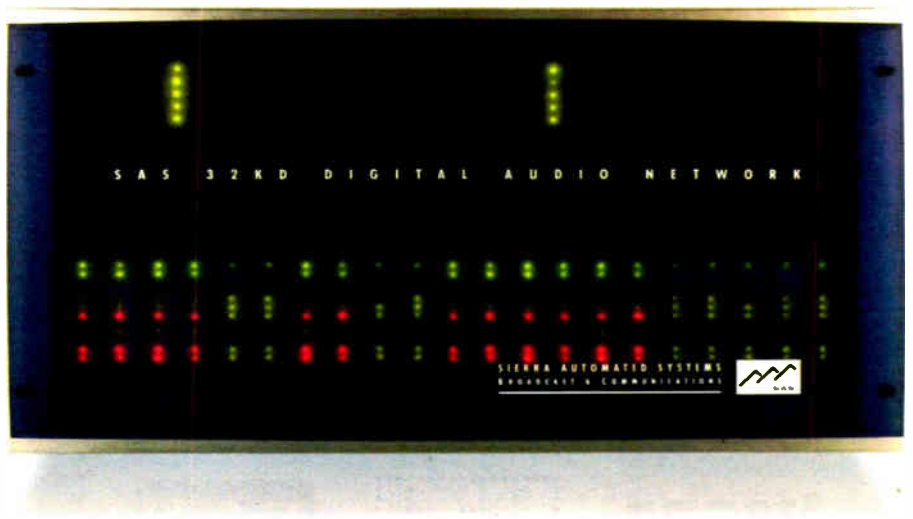

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Ending Those Console Cravings

by Alan R. Peterson

Right about this time last year, I was beating the bushes with both hands, hoping to flush out an old retired Harris Gates Gatesway 80 console.

Having pulled "Annandale Terrace Radio" out by the roots when I moved from Annandale to a new town in 2001, I had hopes of reviving my little Part 15 AM station in my new digs — calling it "Rolling Valley Radio" after the subdivision where my house is.

But I wanted more than my little five-pot Sparta mono mixer as the heart of the operation. I wanted to replace it with a board that had some guts and a real radio feel to it. I wanted a rotary pot job to give it a nostalgic air, but also some serious ambiance.

Ford I thought I kept in pretty good running condition.

So I arrived at the studio. You may see in the picture what was waiting for me there: an old Harris Executive, a stereo console designed for the age of turntables, reel tape, network newscasts and cart machines, doing its best to keep up with MiniDiscs, CDs, computer automation and digital audio processing for production.

Tired but still working, the old boy bore a dusty but proud countenance (consoles are always masculine, I have determined). And despite its age, it had the upright bearing of an old admiral being wheeled down the boulevard in a veteran's parade. It surprised me to see it still in use.

The problem: no audio was passing through it, even though the speakers

Photos: Alan R. Peterson

Yikes! When was the last time you had to service a Harris Executive? Al had to get it to work or replace it with modern gear.

When I ran it all through my head, the mixer I ended up with in my mind was the very one on which I started out my career: a '70s vintage, eight-pot monophonic Gatesway 80.

I had to find one.

I burned up the newsgroups and every broadcast classified posting I could find. I got on ham radio lists, called rural stations and retired engineers, begging for a Gatesway that might have been hiding in the junk room or up at the transmitter site.

I am here to tell you not to worry about it anymore. I just had an experience that convinced me those old consoles might be better off left in glorious retirement.

When my previous position as operations manager went south back in November, I immediately took to the free-lance life again to meet the bills. If there was a camera that had to be hoisted, a cable that needed to be pulled or a RAM upgrade that had to be rammed in, I was on the scene. No job too small, no paycheck too big. In fact, the bigger the better.

One call I took was from a prominent educational institution in Northern Virginia that has an extensive broadcast curriculum. They had a production studio with an "older" console that was not functioning right and wanted someone to look it over and, if necessary, replace it with a modern Behringer mixer they already in house.

I would rather have tried to save it. It hurt my sensibilities to pitch a piece of working gear just because it might be a little old. Case in point: my last car, which was a 1988 thumped and the VU meter lights came on when powered up. My initial guess was a fried program amplifier section, if the internal audio amp was still functioning.

These mixers were designed with faceplates and panels that can be tipped up or down to gain service access. I tipped the front down, not totally ready for the tangle that awaited me inside.

What does this do?

If you work on enough modern consoles, you lose the memory of what went into the classics. If you too have forgotten or never had the pleasure, feast your eyes on the second photo.

In place of ribbon connectors tying circuit boards together, the inside of the Executive was thick with military-spec braided cable, some with little number stickers. No sealed potentiometers, voltage-controlled amplifiers or Schadow switches here, but giant step attenuators and telephone-grade switches with more blades than a Swiss Army knife.

Instead of small PC boards with TL084 chips and tiny little bypass capacitors, there were slide-in circuit cards with discrete components … you know, the ones where you actually troubleshot down to the *component* level!

Muting and control relays were big enough to switch loads at a lighthouse. And the smell of the warm components was a war surplus-y, short-wavey, wax papery, galvanized metallic one, like the smell of 1950s vintage ham radio gear still in use.

Continue on page 35 ▶

▶ Continued from page 34

Faded service stickers were everywhere in the console and handwritten footnotes peppered the manual: "Added 50 pF cap to stop oscillation on Audition Amp input," or "Changed PS rectifiers to 250 PIV units, 7/20/80." When there are more footnotes than factory text on the pages, it may be fair to say retirement time for that mixer is imminent.

Still I was willing to try. As it turned out, there were separate power supplies for most of the console and for the program and monitor amplifiers. The main supply was held down by one remaining screw instead of four, which meant it was free to wobble around inside the chassis. That is what it did and shorted out against a cable shield, popping some mutant 30V slo-blo fuse not made anymore. The monitor amps stayed on as they had their own separate source of juice.

The fuse was replaced, the supply remounted and the power restored. The poor mixer sounded awful. There was hum everywhere, the mic channel was distorted, a turntable pot had nothing through half its travel, then burst to life at the 12 o'clock position.

Impedance mismatches and awkward levels meant crummy audio quality on some unbalanced sources. One monitor channel was completely out and the remaining one went into oscillation after 20 minutes of warmup.

My own reaction actually surprised me. Restoring this classic to a functional state, even as a hobby, was not even *tempting* this time. Parts like those fuses or even germanium transistors are impossible to get now. Clearly it was time to cut the old boy free and I was not about to debate the issue.

Wise decision, Grasshopper ...

In all probability, students working in this studio would never have encountered such a console anytime in their careers; I don't care how far out in the sticks the station is or what format it airs.

With the exception of a few notable consoles (like the oldest working unit in the country up at a camp in Pennsylvania), most student broadcasters are statistically likely to encounter modern digital technology at even the smallest of stations.

The decision was made by the school administrator to retire the Executive board and drop in the Behringer, and, at the same time, make the room digital-ready with a computer-based editor. For cross-compatibility with the other studios, one turntable would come out, all three cart machines would stay in.

Despite the way inexpensive mixers are mass-manufactured today, I do appreciate one facet of their design. Each line input is high impedance and comes with trimmer knobs. Impedance mismatches are almost a thing of the past and one no longer needs to assemble little resistive pads to tame levels from playback decks.

Zeroing those levels took almost no time in the new room. With Cool Edit mounted on the computer, a 1 kHz tone was generated at 0 VU analog (in this room, about -12 dB on the Cool Edit on-screen meter).

Once the soundcard and the board got along, carts, MiniDisc, cassette and reel settings took maybe four minutes. And as a bonus, we recorded a new calibration tone cart, although the tone file on the PC is infinitely more stable than the cart will ever be.

The room no longer has a stodgy look or feel, and the new console sounds incredible. It has become a room I would actually enjoy doing production in myself.

Too many previous repairs, too confusing, no reliable source for parts. The interior of the console.

Don't feel bad about the old board. It won't be scrapped. In fact, this Executive is shifting emphasis from "admiral" to "ambassador" as being a showplace spokes-console in the lobby.

Rather than power up the whole board, we are using a wall-wart power supply to light only the VU meters, with a little Walkman receiver connected right to the meters to make them dance.

All controls, switches and attenuators now do nothing, but the size and complexity of that big imposing console almost invites you to walk over to it just to spin the dial, flip a lever and grin.

I really did hate to yank that console out of service. Part of me still likes to see functional gear continue at the task for which it was designed but I believe I got over most of it. Still, if you have a Gatesway 80, contact me anyway.

PRODUCT GUIDE

Digital Router Sums and Distributes

The AEQ Impact is a digital router with modules of 12 x 12 AES/EBU circuits. Impact is scalable in blocks of up to 60 x 60 circuits (equal to 120 x 120 mono), and can accept analog signals with Caddy A-D/D-A converters.

The Impact sums any number of inputs over each output and distributes any input over the required outputs.

The unit also routes digital and analog audio signals in radio and television program production centers. It adds routing capabilities to radio broadcast consoles that do not possess them. It can be customized to operate 400 x 400 circuits and can be remote-controlled through the Easy Control Port, an RS-422 control connector.

For more information contact AEQ in Florida at (954) 581-7999 or visit www.aeqbroadcast.com.

Henry Engineering Introduces Small Mixer

The new Micromixer from Henry Engineering is a four-input, two-output stereo mixer for line-level audio sources.

The compact mixer is useful for combining two stereo sources or four mono sources to a stereo output. Proprietary MicroAssign switches permit any input to be routed to the left, right or through both outputs. With its built-in power supply, the Micromixer needs no wallwarts.

The unit is rackmountable in a one-third width by 1RU high space. Up to three units can be mounted to an optional 1RU rack shelf.

For more information, contact Hank Landsberg at Henry Engineering in California at (626) 355-3656 or visit www.henryeng.com.

BUSINESS DIGEST

Italian Designer Seeks U.S. Partners

Italian company S.M. Sistemi Modulari is seeking partners who can help it to enter the U.S. market for its design and acoustical services.

The company is a "broadcast stylist," using elements from the Italian school of design to develop studios for clients who want sophisticated working environments.

S.M., established about 20 years ago, is owned by Giuseppe "Pino" Stillitano. It offers architectural and technical services and touts its ability to interpret the personality of its clients.

Representative of its work is a project in Milan, a four-floor studio and office complex of commercial station Radio Deejay. The bright colors and sinuous design reflect the station's youthful target demographic.

Another project was for Radio Italia, the first private station broadcasting only Italian music and owner of Video Italia. The Radio and Video Italia group occupies a complex of offices, studios and concert rooms in the broadcast operation "heartland" of Lombardy, northern Italy.

S.M. restructured most of the building to reflect the company's adult audience. Natural materials such as wood with fabric produced warm colors and soft tones.

The company hopes to establish relationships that allow it to offer its services to U.S. broadcasters.

For information from S.M. Sistemi Modulari, contact the company in Italy at 011-39-039-48-46-95; or send e-mail to *info@s-m.it*; or visit *www.s-m.it*.

PRODUCT EVALUATION

O.C. White Mic Boom Won't Stray

by Stephen Murphy

Business is booming — quite literally — for Mass.-based O.C. White. The company manufactures a range of industry-specific lighting and mechanical products with one thing in common: adjustable boom arms.

Otis Charles White, a small-town dentist founded his eponymous company in 1894 with his pioneering design for a gas-fueled adjustable dental light.

The company's adjustable magnification and lighting products are ubiquitous in many disciplines and areas of manufacturing including medical, photographic, quality control, critical safety inspection, microscope lighting and electronic magnification.

Microphone boom arms are a natural extension of the company's industrial reach, so it should be no surprise that O.C. White has been successful in the broadcast industry as well.

Features

For this review, O.C. White provided a ProBoom Elite 61900-BG arm that features two spring-loaded adjustable segments and a fixed base/riser.

The riser/base is a 15-inch vertical metal tube that has a rectangular 3-inch by 2-3/4-inch base that permits either through-the-counter wiring or side exit. Four screw holes are provided for attaching the base to the target surface.

The riser comes prewired with a Gepco 24-AWG microphone cable that terminates in a female XLR jack near the top of the riser. A nonterminated four-foot length of the cable extends from the riser base for attaching to a connector or patch bay or other existing audio system.

A 40-inch XLR cable is required to get the signal from the microphone to the female XLR jack at the top of the desk-mount riser. A removable plastic strip hides the wire channel running down the spine of each segment. This strip permits quick and easy installation of the user's microphone wire. Simply drop the wire in place and zip the wire covers in place.

The two-segment spring-loaded boom arm attaches to the riser via a heavy-duty swivel socket. Each arm segment measures 18 inches and features two soft gold-plated "music wire springs." According to the manufacturer, the music wire springs enhance the dampening effect, obviating the need for "flocking" the springs. O.C. White states that the ProBoom arm can hold up to eight pounds when used with the optional heavy-duty springs.

Mounting the riser and boom assembly to my desktop using wood screws was quick and straightforward.

Mounting

Mounting the riser and boom assembly to my desktop using appropriately sized wood screws was quick and straightforward. But it did not take long for me to realize that the corollary to a heavy-duty boom arm design that holds up to eight pounds is that a greater amount of force is required to move the arm, especially at the joint just above the riser.

This force, in turn, transfers to the spot where the base attaches to the desk. The screw holes already showed signs of loosening.

I removed the screws, drilled clear through the solid oak surface and switched to the widest bolts that would fit through the base holes, fastened on the underside with nuts and large diameter washers. The heavy-duty arm now had appropriately heavy-duty mounting — desk and mic arm were now evenly matched.

Although this experience should probably be considered "operator error," I relay it as a warning to all who intend to mount this arm on fiberboard-based counters or thin wood surfaces.

Properly mounted, the arm functions with excellent sturdiness that does not stray from its designated position (a continual annoyance endemic to cheaply built spring arms).

The well-matched soft gold-plated springs generally are quiet, as advertised, providing a professional on-air performance. Normally, care should be taken in making sure the springs have not migrated toward contact with the arm assembly over time — metal against metal does not a quiet arm make. The ProBoom, however, has integrated slots in the spring holders that is claimed to prevent the springs from moving from their original position.

Product Capsule:
O.C. White ProBoom Elite Microphone Boom

Thumbs Up

✓ Well-constructed
✓Sturdy enough for heavy broadcast microphones

Thumbs Down

✓Must be permanently mounted to solid desk surface; an optional 2-inch capacity table-edge clamp is available as an option

Price: $199

For information ocontact the company in Massachusetts at (413) 289-1751 or visit www.ocwhite.com.

Summary

As in other industries, O.C. White's broadcast microphone arms are a success story. With proper mounting and minimal care, this mic arm should withstand many years of continuous, high-traffic studio use. To wit, O.C. White backs its product with a lifetime warranty. The G1900-BG arm is now available for shipping.

Stephen Murphy, former editor of Pro Audio Review *magazine, is a freelance engineer/producer with 20 years experience in audio, radio and video production.*

Products & Services SHOWCASE

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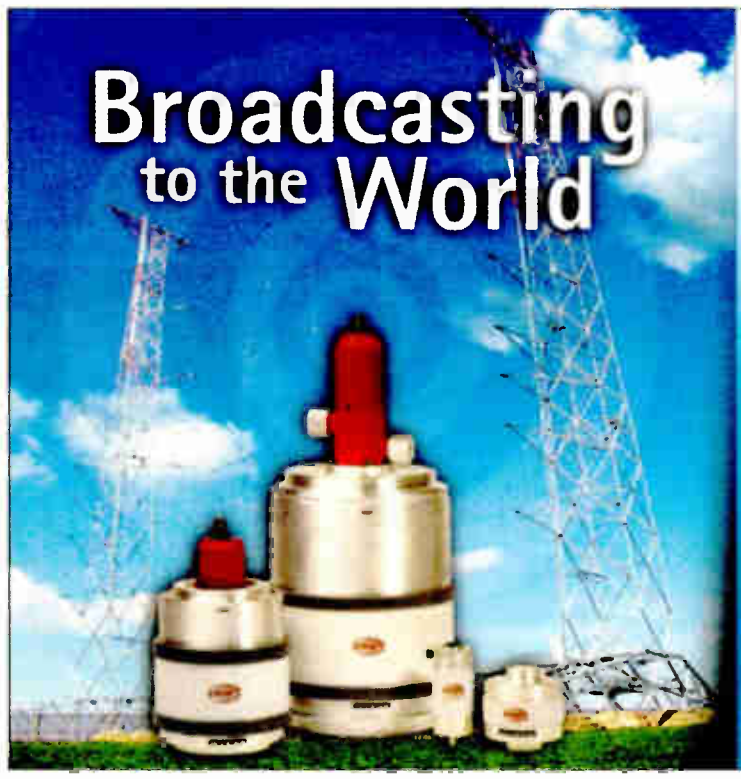

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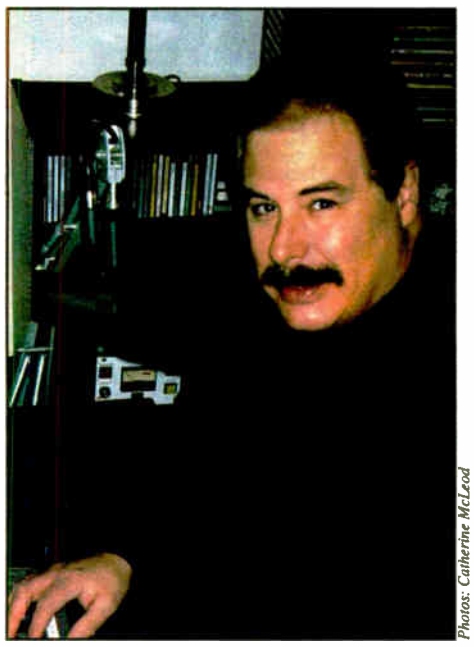
FIRST PERSON

The Studio Doug Built on eBay

by Doug McLeod

This is the story of a childhood dream revisited after more than three decades, on a budget.

When I was first discovering radio at the age of nine or so, I — in common with many Radio World readers, I'll bet — built a "studio" in my bedroom. It consisted of a cardboard console, a microphone fashioned out of a toilet paper tube and some polka-dotted wrapping paper that sort of resembled an RCA DX-77 ribbon microphone, a 3-inch-reel tape recorder and a portable record player.



Photos: Catherine McLeod

Doug McLeod produces a voiceover in his home studio.

The key to the whole setup was that the gearshift speed changer on the record player could be finessed to a position between 33-1/3 and 45 rpm, which put the motor in neutral. Thus, records could be cued and a tight board run for my fantasy DJ shows.

Fast forward

Today, while the radio heavyweights build out their studio clusters, I have completed a buildout of my own. Once again I have a studio in my room, only this time it resides in a nook in my home office. And this time I get paid for playing there.

Apart from some old furniture that I pressed into service and a few pieces of equipment that I already owned, everything in my studio was purchased online at eBay, "The World's OnLine Marketplace." Total outlay: less than $1,500. Believe me, if I can make that work, anyone can.

As with many great undertakings, this one began on a much smaller scale and with a different purpose.

After completing my 15th season as a TV play-by-play announcer in the National Hockey League, I decided I needed a home studio in which to voice the many spots, tags, promos and TV voiceovers that were part of my job. Rather than make endless trips to a post-production house or to our flagship radio station, I could do the voice work more quickly and easily in a home studio.

I owned a Shure SM7 microphone, Symetrix 528 mic processor, Sharp MiniDisc recorder and a Rane HC6 headphone amplifier. Adding Cool Edit to my laptop gave me all the flexibility I thought I would need.

Then strangers rode in from the East.

Now, stop me if you've heard this one: a pack of out-of-market management types entered the picture and went after the bottom line with a chainsaw. Their first move was to simulcast our games using the less expensive radio guy. Suddenly, I had the opportunity — in fact, the necessity — to ramp up my voiceover business and begin a long-planned foray into syndication.

The studio sits in a home office alcove.

That plus a desire finally to wade through years of accumulated audio flotsam out in the garage convinced me to try for a studio that would include almost every audio source, analog and digital.

While I did not set out to equip the studio almost entirely from eBay, that is how it turned out.

Through a number of transactions, I picked up almost every piece of source equipment I needed over a span of about eight months. My equipment list (see sidebar) includes the expected digital stuff and some tape-based gear, as well.

It also includes a couple of items that would be anachronisms in most radio stations: a turntable and a cart machine.

The Technics turntable was a must because I have amassed an enormous amount of material on vinyl, much of which is not available on CD. As for the cart machine, that is partially for my wife. We met at an all-news radio station more than 20 years ago. Almost every example of her work as a radio reporter is preserved on carts, and we needed a way to archive them without asking favors at radio stations.

An obvious red flag to an engineer (apart from the fact that a sports announcer is fiddling around with all this stuff) is the fact that most of my source gear is unbalanced. I had to be careful not only that the input and output levels all matched but that no stray RF, particularly from my computer, fouled up the works.

Patchbox saves the day

Fortunately, Hank Landsberg at Henry Engineering ironed it all out with one of his latest cool tools, the Henry Patchbox. It is a terrific little distribution amp that tames both balanced and unbalanced signals. My Patchbox is the only piece of new gear that I purchased specifically for this project and it is the heart of the studio.

With the Patchbox and the right cables

See EBAY STUDIO, page 41 ▶

PRODUCT GUIDE

NetStar Is Codec For Broadcast

NetStar from Musicam USA is a new digital audio codec that provides what the company touts as new methods and ease of use for sending and receiving real-time audio, contact closures and ancillary data.

NetStar has a standalone, 2RU chassis. Stereo analog and AES/EBU inputs and outputs are standard. It can send and simultaneously receive bidirectional audio through a variety of transmission methods, including IP, ISDN and dedicated data circuits.

The codec supports many coding algorithms including G.711, G.722, MPEG 1 and 2 Layer II and MPEG 1 and 2 Layer 3, ensuring back-compatibility with CCS and other codecs. NetStar also provides MPEG 2 AAC and MPEG 4 AAC Low Delay for excellent audio performance at lower bit rates. Bidirectional, uncompressed linear audio over IP is provided as well.

For more information contact the company in New Jersey at (732) 739-5600 or visit www.musicamusa.com.

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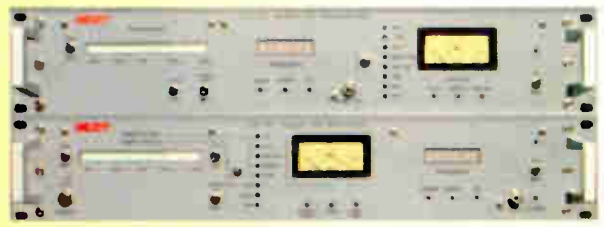

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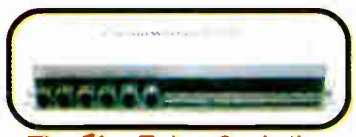

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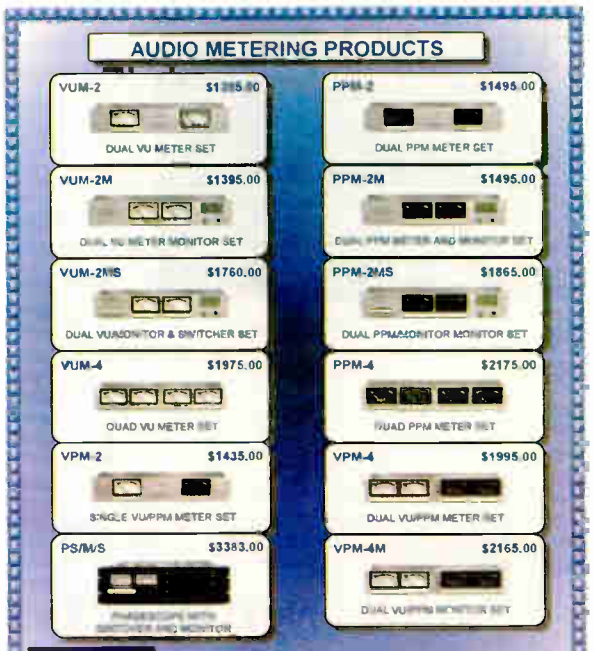

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eBay Studio

▶ Continued from page 39

from Radio Shack, wiring this studio was not much more complicated than hooking up a home stereo — albeit a big home stereo.

Studio wiring is straightforward. The first four pots of the Behringer 1604 are monaural. The mic preamp is plugged into Fader 1. Fader 2 is for a second mic or the mono ITC cart machine. Faders 3 and 4 are dedicated to the left and right outputs of my computer soundcard.

The other four pots are stereo and mix CD 1, CD 2, the Technics turntable and the output of a Sescom PO-12 passive input selector box.

The PO-12 handles the unbalanced outputs from the other source gear. This includes the Tascam DA-30 DAT deck, Tascam 112 cassette, Tascam 32 reel-to-reel, Sharp portable MiniDisc and a patch from a TV output.

A Broadcast Tools Console Controller II takes a split from the mic preamp for speaker muting purposes. It is also fed by a Sony portable radio and can switch between over-the-air feeds and board output. The unit provides a volume control pot for the studio speakers, too, and activates a Prolite on-air light.

The main output of the 1604 can be balanced or unbalanced. I send a balanced stereo feed via XLR cables to the Henry Engineering Patchbox, which distributes clean, unbalanced audio to the inputs of the MiniDisc, DAT, cassette and reel decks. It also sends balanced audio to the cart recorder, Rane HC-6 headphone amp and computer soundcard.

The equipment is mounted in a hodgepodge of used furniture that had been sitting in my garage.

A cherry computer credenza from Bombay Company holds the mixer and CD decks. The cart machine and turntable sit on a more-or-less matching bookcase that came from Ikea several years ago. Another bookcase holds the reel-to-reel deck and a fax machine.

Between them, I fashioned a rack out of an old home stereo cabinet with the glass door removed and rack rails added. The only new furnishings are a $70 chair from Office Max and a cool Atomix atomic clock ($39) from Restoration Hardware.

Do your homework

If you are going to pick up equipment on the used market I have some advice, which can be summed up by the Latin phrase *caveat emptor*, or buyer beware. You must know what you are buying and you have to be careful.

Know exactly what you are looking for before you begin bidding. For example, I needed a CD burner that would dub CDs at faster-than-real time and also give me two independent playback decks. I went to a couple of local electronics stores where I discovered that a consumer unit would meet my price goal but that some dub only at 2x speed while others do not provide independent playback outputs for each deck.

Armed with this research, I decided on a Harman Kardon CDR-20 dual record-play deck with 4x dubbing speed and separate playback outputs. I hit eBay and found a lightly used unit in its original box for less than $200. Similar homework went into my other buying decisions.

Knowing how the equipment has been used is critical. When I searched for a cart deck, for example, the last thing I wanted was one that had been in a radio station control room. I cannot think of a piece of equipment that received more abuse in its day.

With patience, I found a deck that had been used in a TV master control room. Still some abuse potential, of course, but I figured that it would have been used less and treated better by TV technical personnel, and so it proved.

No matter what you are shopping for, remember that eBay essentially is a worldwide garage sale where you do not know the neighbors. Article 11 of the eBay User Agreement is chock full of disclaimers that make it clear that you are responsible for determining whether an item is workable and suitable for your needs.

Although many people are put off by pig-in-a-poke shopping, there are good ways to avoid rip-offs on eBay. The most important thing you can do is to read the item description carefully. Some sellers provide good details but many do not. If a listing does not specifically say an item will do something, it probably will not. Most items are sold "as-is," but some sellers provide warranties.

If you have a question, be sure to ask *before* you bid because your bid is a business contract. eBay makes it easy to do this with the "ask seller a question" e-mail link that is part of every listing.

To find out if the seller is a solid e-citizen, carefully read the comments in Feedback Profile of your seller. The link is just below the "Seller (Rating)" listing. On eBay, as in life, bad people exist. And, as in life, you often can sniff them out with a little effort.

I will be the first to admit that building a studio from online sources carries a degree of risk. Homework and due diligence remove a lot of that risk, however, and the result can be a terrific little facility at an extremely agreeable price.

Good luck and good hunting. Now if you'll excuse me, I have to go play in my room.

Doug McLeod has been a radio and TV announcer for more than 30 years. He just completed his 15th season as a National Hockey League TV play-by-play announcer and is CEO of Desert Tracks LLC in Scottsdale, Ariz. He produces radio/TV commercials and voiceovers from his studio.

Doug McLeod's eBay Studio Gear

Tascam DA30 DAT	$177.30
Tascam 32 reel-to-reel	$175.00
Tascam 112 cassette	$149.00
Harman-Kardon dual CD burner	$169.99
Behringer 1604A mixer	$115.00
ITC PDII cart recorder	$49.00
Technics SP15 turntable w/Technics base and Audio-Technica arm	$250.00
Stanton 310 phono preamp	$30.00
Crown D75 power amplifier	$75.00
ESE digital timer	$35.00
Luxo mike arms (package of 4)	$100.00
Broadcast Tools Console Controller II	$50.00
Prolite On-Air light (package of 4)	$100.00
eBay total:	$1,475.29 (+ shipping)

Views at the studio. The author uses a Behringer mixer with Broadcast Tools Console Controller II, ESE timer, Sescom switcher and Shure SM 7 microphone.

SHORT TAKE

A Matter of Timing

The old Orange Crush clock on the wall finally gave it up. Its sweep second hand, with a neat little orange on the end, sputtered, stammered and died just before Thanksgiving.

Rather than get too sentimental, I called Radio Systems and opted for a digital solution that gave me options, features and some pleasant surprises. I chose the thin Model 14408 CT-2002 clock/timer — a mere 1 inch deep, 2.5 inches high and 7 inches wide.

The larger rack- or wall-mounted studio model, with its 2-inch-high display, was too much for my cozy studio and defeated the need for a portable location unit.

The thin model features a clock; an up-down timer; preset down times, SMPTE time code, top-of-hour reset; master/slave operation and RJ-45 quick connectors. That is all handy; however I use two features continually: the clock and timer, both activated with the optional remote control — an absolute studio necessity.

The Orange Crush clock was a gift from the local soft drink distributor while the Radio Systems clock/timer ran $135 plus an additional $25 for the remote. Expensive? Not for a tough, handmade, all-metal instrument that is continually viewed 24/7/365.

For more information contact Radio Systems in New Jersey at (856) 467-8000 or visit www.radiosystems.com.

— Christopher Springmann

BROADCAST Equipment Exchange

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ACOUSTICS

Want to Sell

ANTENNAS/ TOWERS/CABLES

Want to Sell

Pirod SS 80-180'; Utility 340 SR, 25 sections. 513-521-1729.

Jampro midpower 96.5 FM and 94.9 FM antennas, new in box, BO. Steve Sisson, Sheridan Media, 1716 KROE Ln, Sheridan WY 82801. 307-672-7421.

COMPLETE FACILITIES

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Want to Buy

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Antex SX-36 audio card, two available, excellent condition, buyer pays shipping, $500 ea/BO. Bob Rivkin, KPLM/KJJZ, 441 S Calle Encilia #8, Palm Springs CA 92262. 760-320-4550.

API 0361 3.5" VU meters, A & B scales available, $35 each; Assorted VTC audio transformers, A-20, LS-33, LS-30, some N.I.B. Delinta, 972-641-0271.

MONITORS

Want to Sell

Used Mod Monitors, McMartin & Belar. Many to choose from, tuned & calibrated on your frequency, full guaranteed. Goodrich Ent. 402-493-1886.

RECEIVERS/ TRANSCEIVERS

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Dayton Industrial AF 200 FM SCA receiver. Factory installed rack mount option, brand new, $120/BO. Ray Knudson, KNXR, 1229 Park Ave, La Crosse WI 54601. 608-782-2254.

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Moseley MRC 1600 remote control, 16 channel, good condition, $350. Tom Toenjes, KJTY, 6120 Riley Creek, St Marys KS 66536. 785-640-6047.

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Profitable California FM on beautiful Mendocino Coast. Popular tourist destination. $350K. 707-367-1597.

Want to Buy

AM/FM/CP, no station to small, areas: RI, CT, MA or FL. Contact Michael Cardillo, 151 Morgan St, Cranston RI 02920. 401-942-8341 or email: mondomikeradio@aol.com.

Christian Florida AM station.....lost phone # and am very interested to speak with you again. Please call 401-942-8341 ASAP!

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CCA FM-3000-D, 3KW FM. Continental Communications. 314-664-4497, email: contcomm@sbcglobal.net

Harris FM-3-H, 3KW FM. Continental Communications. 314-664-4497, email: contcomm@sbcglobal.net.

Harris MW-10-B, 10KW AM. Continental Communications. 314-664-4497, email: contcomm@sbcglobal.net.

McMartin BA-1K, 1KW AM. Continental Communications. 314-664-4497, email: contcomm@sbcglobal.net.

McMartin BF-5K, 5kW FM. Factory rebuilt in perfect, like new condition, includes new tubes, tested & tuned on your frequency. Guaranteed, fully adjustable from 0 to 5.5 kW. Goodrich Enterprises Inc, 402-493-1886.

Collins 831-D2, 2.5 KW FM, good condition, $3900. Tom Toenjes, KJTY, 6120 Riley Creek, St Marys KS 66536. 785-640-6047.

Continental 316F 10 KW 1030 kHz, complete, was on air until removed from service, $2500/you ship. Dave Bischoff, Pamplin Broadcasting, 888 SW 5th Ave, #790, Portland OR 97204. 503-552-3291.

Continental 316F AM 10 KW 660 kHz, complete, was on air until removed from service, $2500/you ship. Dave Bischoff, Pamplin Broadcasting, 888 SW 5th Ave, #790, Portland OR 97204. 503-552-3291.

Gates/Harris BC-5Hb, 5 KW AM, good condition, $4500. Tom Toenjes, KJTY, 6120 Riley Creek, St Marys KS 66536. 785-640-6047.

RCA BTF 20 E1, 20 KW FM, good condition, $6000. Tom Toenjes, KJTY, 6120 Riley Creek, St Marys KS 66536. 785-640-6047.

Tepco J-340 M, 10 to 40W Fm translator with local modulator includd, excellent condition, maintained by manufacturer technicians, $2250/BO. Ray Knudson, KNXR, 1229 Park Ave, La Crosse WI 54601. 608-782-2254.

Tepco J-3750, 250W FM RF power amplifier, excellent condition, maintained by manufacturer technicians, $1250/BO. Ray Knudson, KNXR, 1229 Park Ave, La Crosse WI 54601. 608-782-2254.

Two Collins FM xmtrs, 831F2, 10KW tuned @ 93.7, & 831G2, 20 KW @94.9, both functional & in excellent condition considering age, one dismantled for moving. One original exciter included, $6000 ea/BO. Steve Sisson, Sheridan Media, 1716 KROE Ln, Sheridan WY 82801. 307-672-7421.

Want to Buy

Two card extenders for Continental 816RA2 transmitter. Bob Rivkin, KPLM/KJJZ, 441 S. Calle Encilia #8, Palm Springs CA 92262. 760-320-4550.

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Friendly, industrious, commercial FCC 1st Class with radar-amateur radio extra licensed, asst CE, seeks FT, PT, contract, with AM/FM, cable, TV, preferred within 75 mile radius of metro NYC area. 718-969-5224 or write: Mitchell Rakoff, 81-12 Roosevelt Ave #702, Jackson Heights NY 11372-6746 or email at mitchellrakoff@yahoo.com.

Hard working, exciting, original & fresh sports broadcaster seeks employment. I will take your station to the top! Delinta, 972-641-0271.

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What's up America? Are you finally ready for someone who is totally diverse? Ready to go where opportunity is knocking. Dustin 316-304-9526.

ACTION-GRAM

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Please print and include all information:

Are you currently a subscriber to Radio World?
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Contact Name _____

Title _____

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Brokers, dealers, manufacturers and other organizations who are not legitimate end users can participate in the Broadcast Equipment Exchange on a **paid** basis. Line ad listings & display advertising are available on a per word or per inch basis.

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38	Autogram Corporation	www.autogramcorp.com
22	Belar	www.belar.com
40	Bext	www.bext.com
31	Bradley Broadcast	www.bradleybroadcast.com
19	Broadcast Software Int'l (BSI)	www.BSI.RW3.1.03.pdf
10	Broadcast Tools	www.broadcasttools.com
24,25	BSW	www.bswusa.com
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Radio World, March 1, 2003

GUEST COMMENTARY

The Cost to Put an LPFM on the Air

One Radio Station's Trash May Not, in Fact, Be a Low-Power Station's Treasure

by Daniel Slentz

It does not take $100,000 to put a good LPFM on the air. It also can't be done for $5,000. My research shows that it takes about $30,000 in gear and tower costs to launch a reliable, technically stable LPFM that sounds good.

Certainly many variables could affect this. For instance, if you are in the Florida Keys, your tower needs to be built with hurricanes in mind. For our own LPFM station, we saved on installation labor through sweat equity from the volunteer staff and myself.

As you plan your own LPFM, you may be tempted to look for used gear. Recently I've noticed a lot of the online auction companies listing broadcast gear.

Not everyone selling gear on eBay or other sites is out to grab low-power broadcasters' limited funds. But unfortunately I've seen a lot of gear listed as "broadcast" that is antiquated or no longer manufactured or supported. Worse, I've seen non-type-accepted transmitters, antennas and equipment that could result in fines if used on the air.

There is a lot of good gear, new and used, available to LPFM broadcasters through legitimate resellers. For low-power stations planning to get on the air, here are some tips.

Specific brands mentioned are based on my own experience. But remember: nothing — not this article, or any other — can replace the expertise of your own engineer, either as an employee or a consultant, to help you. This article simply helps you ask the right questions.

Careful shopper

Your transmitter needs to be reliable and, most of all, put out a clean signal. I wouldn't consider going on the air with a 40-year-old tube-type transmitter. Many LPFM outlets will lack an engineer experienced enough to maintain this stuff.

As a buyer, I'd go with new gear from a long-time manufacturer. Crown, Broadcast Electronics and Harris come to mind; there are many more. Warranty and tech support should be readily available. A good reseller will support you even if the manufacturer isn't the quickest to respond.

If you must buy used, look for a product still being manufactured and supported. The old saying "you get what you pay for" generally is a good rule of thumb. Steer away from suppliers that aren't easily recognized by experienced engineers.

Find an experienced engineer in your market to take a look at a possible equipment list and make suggestions. If you feel funny asking for help from another station's engineer, remember, you are helping to protect them by seeking equipment that is not prone to cause interference. That engineer may even have an old piece of gear or two to offer. It doesn't hurt to ask. Try to find a way to pay an experienced engineer for their expertise.

To the listener at home, an LPFM should not be distinguishable from traditional commercial or public broadcasters.

A listener won't have a button that says "AM/FM/LPFM." Why make it obvious by giving your station a whining sound, hum on the audio, no stereo pilot or lifeless sound? You will only project an image of a rookie, home-brew radio station.

And will it matter to a listener that her life may have been saved by an EAS announcement aired on an LPFM vs. a traditional broadcaster? Not a chance.

You don't have to spend a fortune to sound good to the average listener if the job is done right in the first place.

Don't shop the music store for a compressor/limiter. Look at long-time broadcast processor manufacturers for a less-expensive unit. Certainly $10,000 to $15,000 would be too costly for most LPFMs, but the big names in the audio processing field generally also offer stripped-down versions of their products, and good models from other reliable vendors are available in the low thousands.

There is a lot of good gear available to LPFM broadcasters through legitimate resellers. Here are some tips.

Remember, the same peak-per-minute rule applies to us all. Keep your audio in the legal limit.

Although LPFM uses sufficiently low power that monster antennas aren't required, "Billy Bob's LPFM Antenna Company" would not be my first choice. A clothing hanger with an N-connector does not qualify as an antenna. And the greatest transmitter on a crappy antenna does not radiate a signal effectively. That antenna could make or break the success of your 100 watts.

Again, look at trusted names in broadcast antennas. A major broadcast gear reseller will have knowledgeable sales people who can offer great recommendations. Yes, they're in the sales business; but they know that you're coming to them with a tight wallet and looking for good help. Take their recommendations.

Northern climate readers, don't forget to research radomes or de-icers, products to keep your antenna from freezing over. Ask your broadcast sales person. If they don't know, find a vendor who can help you.

Don't buy important components like feed line at a retail electronics shop. Although Radio Shack can be a great source for parts in a jiffy, stores like this are not in the business of supplying critical on-air gear for radio stations. Work with your consultant and sales person to choose the right product. Line loss can be a real signal killer.

Choose your audio board with care. Home brew is not recommended. You need dependability and a phone number to call if you have a problem.

Companies like Mackie and Behringer make good audio boards, but they generally are not designed for on-air broadcast. If your LPFM is looking for a production board, a decent sound mixer board should work. But for on-air, you will want mix-minus (phone) ability, muting relays, on-air relays, board firing relays and other features unique to radio.

Yes, some of these can be added after the fact, but then things become home brew, less reliable, more complicated. Your costs creep up.

Use common sense

A word of caution about used audio boards: they are being sold for a reason. Anything older than about 10 years probably has been beaten senseless. It is not likely to be the reliable board it once was. It may be noisy and not supported by the manufacturer, if that company is even still in business.

There are good manufacturers offering smaller audio boards with the necessary features at a reasonable cost, in the low thousands of dollars.

Remember when making your equipment choices that LPFM is a training ground with a lot of rookies and people who won't treat gear gingerly.

Some notes about other popular gear in the studio:

CD players — Sometimes the throwaways work just fine. Remember that consumer CD players can't be fired from the console without modification, which may void warranties. Sometimes wireless remotes can be modified, but you need to be creative.

Cart machines — I can't understand why anyone still would want to use these. I notice eBay selling a lot and guess they're being bought by LPFMs. At one time you couldn't live without them; now it's hard to live with them thanks to the cost of replacement heads and pinch rollers, bent shafts, phase problems, crappy carts and pressure pads. Avoid them.

Why not go for virtual carts instead? Research a good digital audio management system. The Oct. 23, 2002, Radio World included an entire *Buyer's Guide* section with contact information for companies that make automation and audio management products.

Just one example of an excellent vendor is Broadcast Software International. I am a beta tester for their software and think they do a great job. The Simian system is suitable if virtual cart machines in a completely automated, live-assist or manual environment are needed. Wavecart is a virtual 10-slot cart machine that, like the old analog decks, can be told to transition from one virtual "deck" to the next.

Daniel Slentz

The marketplace offers many good audio management products with a broad range of pricing and features.

Reel to reels — These bring many of the same problems described above for carts. With the availability of hard-disk editors, the reel machine is no longer needed for the fast phone recording and playback that many stations once used it for. CD burners are affordable and may be built right into your PC.

As for recording, a PC used as a recorder or a traditional cassette deck will work. I use cassettes for imported material. There will be phase and sound quality issues, but the format remains readily available and inexpensive.

Mics — I'm a die-hard Electro-Voice RE-20 fan. Many companies make fine upscale microphones for on-air use. But if money is really tight, ask your vendor to recommend an affordable alternative, perhaps a model that is intended as a handheld mic with a good reputation for durability, like the Shure SM58. The popular EV 635A is a fine field mic, but its omnidirectional pattern will pick up room noise.

Modulation monitors and EAS gear — Talk to your engineering consultant about what monitoring and alert gear you need to play by the rules. I wouldn't buy used in this category except from a trusted source.

Mod monitors are there to reflect accurately what you're putting out. How accurate is tube-type model going for $40 on eBay going to be? And the FCC now requires LPFMs to install certified EAS decoders. Lives may depend on the reliability of your EAS gear. Do it right.

In closing, talk to several broadcast equipment vendors. Be honest about your general need to keep within a budget, and then choose a salesperson who will take the time to help you. A good vendor is a source of valuable insight.

Talk to radio station engineers. Most will be happy to give you a hand when it comes to selecting gear. Find one whom you trust and hire him or her.

Be cautious when buying used gear, particularly if you don't know the vendor or source. Is the model outdated? Is it still compliant with any pertinent rules? Does it function properly? Does the factory still support it with parts and service?

It was an uphill battle for LPFMs to come into existence. Let's show the people who didn't want it that we'll be a good neighbor and not a blemish on the radio dial.

The author is audio/visual services manager for the Longaberger Company.

◆READER'S FORUM◆

IBOC and AM

Just read the editorial in the Jan. 15 edition, "Those Mysterious Digital Noises."

Call me a dinosaur, but exactly what *are* the "potential benefits" IBOC offers AM broadcasters?

I know as a publisher who makes a living by selling ad space to manufacturers — especially with new technology — you are more or less forced to agree with their contentions if you wish to keep their advertising. Still, I have seen very little "benefit" to be derived by an AM broadcaster. If there *are* benefits, I think Radio World as the leading periodical should write its *own* story on them based *solely* upon tests performed *by* Radio World.

Jerry Arnold
Director of Engineering
Bright Tower Broadcasting
Terre Haute, Ind.

Commemorating Scott Beeler

We are putting together what we hope will be a fitting tribute, the Scott Beeler Memorial Golf Tournament, to a man who meant so much to us. All of the proceeds will be sent to the Scott Beeler Memorial Trust Fund and benefit his now very pregnant wife and the family's kids.

While we have enough money to go ahead with the tournament, it would be nice to find a few more hole sponsors. Several sponsorships remain available for $1,500. There are additional sponsorship opportunities at a lower dollar figure.

Regardless, the tournament will go on. We are now signing up teams to play at $500 per foursome. The tee-off will be at 9 a.m. on Saturday, April 5. We will play the Lexington Course at Revere Golf Club in Henderson, Nev. (For more information, visit *www.revereatanthem.com.*)

This is one of the best courses in Las Vegas and offers breathtaking views of the Vegas Valley. Anyone wishing to sign up for play may contact me at SAS (*brian@sasaudio.com*), Cam Eicher at Logitek (*cam@logitekaudio.com*) or Mark Goins at Harris (*mgoins@harris.com*).

Thanks to Radio World and our generous sponsors for helping make this a successful event. It means a lot to us, and to Scott's family, who, by the way, will be represented in the tournament by Scott's stepfather, Tom Stout.

Let's tee 'em up!

Brian McConnell
Regional Sales Manager
Sierra Automated Systems
Las Vegas

Pirates of the IBOC?

In reference to the Jan. 15 article by Skip Pizzi, "Will HD Radio Be a Royal(ty) Pain":

Are they serious to think that people are going to be busy capturing music from IBOC "perfect" stations? Most stations overlap their audio, which to me, is just as irritating as the songs on 8-tracks that were split in half and (in my opinion) would be useless or less than ideal if I were creating my own mix for use on a personal playback device.

Being a broadcast engineer in the midwestern part of the United States for most of my career, I have engineered for stations that operate in less-than-ideal conditions. I haven't had the opportunity to listen to IBOC in these terrains, but if its anything like a CD, once it's scratched, it fails to work completely.

I have some real apprehensions about the robustness of IBOC to function in place of a noisy analog signal. The slightly noisy FM signal is still listenable for most people's taste, but might be completely unusable in the digital domain.

In the spirit of the article, I think that it should be enough to assume that most people aren't going to be taking up a hobby of collecting music from an on-air source because of IBOC. I think that most people are turned off (using on-air recording as a source) by the segues or overlapping between songs, and if they are seeking acoustically perfect songs, they would be likely to get them from other sources.

I think a better way to solve this dilemma is to require that all stations using IBOC to make more than 70 percent of their songs overlap with something else. Any radio station that is in a money making venture wouldn't consider playing their music "album style" with three seconds dead air between each song. This type of thing is popular with classical music stations, but that is the only format I can think of where a lack of overlapping is popular.

I wish the guys at the RIAA would get real. It's amazing what they'll pay a lawyer and waste their money on.

Jason Walther
Contract Engineer
Walther Broadcast Services
Central Michigan

More Incentives for HD

Kudos to Ibiquity Digital for sensing a need and continuing to offer stations incentives to adopt HD Radio early.

As reported on page 2, the first 125 commercial stations to qualify after Feb. 1 would see their one-time audio license fee limited to $5,000. Better news is that all noncom stations that sign up by midyear will not have to pay that particular fee at all.

Ibiquity officials no doubt are aware of the risk of launching HD Radio only to see demand sputter after the first few early adopters sign on. It's their intention to nudge the marketplace into keeping those signups coming.

Meanwhile, the company took a higher profile than expected at the recent RAB convention, which is normally the domain of radio sales folk, not technologists. Ibiquity apparently feels it's time to reach out more to both engineers and managers. President/CEO Bob Struble attended RAB for the first time and said he was impressed.

"RAB members and the organizations they represent are keys to the success of HD Radio technology rolling out in the coming year," he told us.

And it is rolling out. As we write, press releases are arriving almost daily from transmitter companies receiving orders for HD Radio gear, from groups big and small. With 130 stations in 40 cities already committed by the end of 2002, and more presumably eager to take advantage of the incentive, the outlook for HD-R on the transmission side is looking up.

Copps Seeks to Protect Dissenters

More troubling are recent remarks by the FCC's Michael Copps, who called on fellow commissioners to set up a special procedure to fight retribution against those who testify against media consolidation.

"I hear privately that speaking out on this issue would cost many people their careers," he said in an official FCC statement. He wants to set up an anonymous testimony procedure.

Although Copps didn't say so directly, this retribution presumably comes from broadcast group owners (who else could it be?). In radio, this, we assume, would be directed not only against performers, whose music radio would not play, but against station employees and others within the spheres of the broadcasters.

We'd be naïve to think big businesses don't work hard to get their way. Radio has indeed become a big business. And any worker in any industry should think twice about publicly condemning an employer.

But we also want to believe that the great majority of radio people — from the Lowrys and the Mels to the part-time Joes who run the board — are decent, honest folk. If Copps has good reason to hint that any given broadcasters are acting in this way, he needs to air details. It's a vague and generalized slam otherwise.

Meanwhile, allow anonymous testimony. We understand the reasoning for that. But also takes steps to make sure this new system does not become merely a channel for disgruntled ex-employees and other special interests to bash radio without fear of public disclosure.

— RW

More Opinion On Page 45

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THINK *INSIDE* THE BOX

ONE INTERCONNECT DOES IT ALL!

THAT'S RIGHT— ONE DUPLEX FIBEROPTIC LINK OR A SINGLE CAT-5 WIRE = 64 channels of simultaneous bi-directional digital audio, intercage communication, logic signals, X-Y controller commands, plus auxiliary RS-232 data streams. *This single interconnect between your studio and central rackroom can save you thousands—if not TENS of thousands—of feet of wire in a typical installation!*

THE WHEATSTONE BRIDGE DIGITAL AUDIO NETWORK ROUTER can start small with a single cage and only a few cards, or fully populated units can be stacked to form larger systems. Wheatstone's STAR TOPOLOGY ARCHITECTURE lets you connect multiple locations to your central rack room, providing shared resources for all yet still permitting independently functioning studios, each with its own combination of plug-in modules specifically suited for a select set of gear.

SIGNALS ARE ROUTED entirely in the digital domain. All AES cards have sample rate converters on each input, freeing you from worry about varying sample rates throughout your facility. A family of plug-in connector modules makes installation easy, letting you mix varied signal technologies and standards all within the same cage. WHEATSTONE'S intuitive graphic based setup software handles system configuration, matrix selection and salvo pre-sets. All systems interface directly with Wheatstone consoles for seamless source selection and display.

THE BRIDGE
DIGITAL AUDIO NETWORK ROUTER

Wheatstone

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