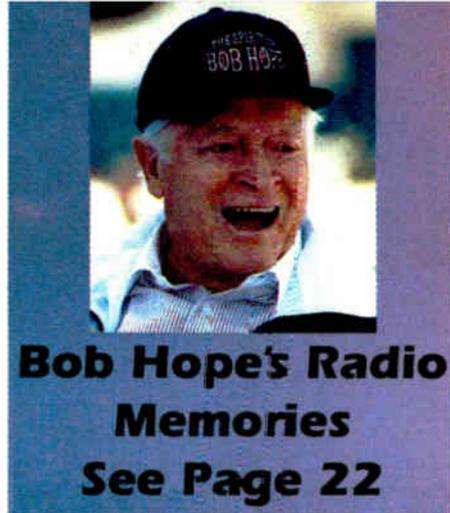


Radio World®



Vol 22, No 11

Radio's Best Read Newspaper

May 27, 1998

LPFM Proposals Draw Fire and Ice

Amnesty Proposed for Current Radio 'Pirates' in A Possible New Low-Power Radio Service

by Leslie Stimson

WASHINGTON Supporters who believe there should be a new class of low-power radio service and opponents who feel the spectrum is crowded enough are battling it out in comments to the FCC. The time period to file comments on three petitions for rule making for a new class of low-power service has just ended. Now regulators will decide whether to proceed further with the issue.

The proposals on which broadcasters and others filed opinions include suggestions of new low-power stations with a range of possible power levels and antenna height, including 1 watt or less, with antenna heights of just 50 feet; 1 to 50 watts, with antennas up to 150 feet HAAT; and 50 W to 3 kW, with a maximum HAAT of 328 feet.

Two petitions requested the FCC establish a temporary low-power license for special events, such as remotes.

At least one petitioner, Rodger Skinner, changed his original proposal to include amnesty for those operating illegal, unlicensed stations so that these people could be eligible to receive one of the new low-power licenses.

Skinner said he does not condone "bad pirates, who are technically lawbreakers," but he said he such activity should not be held against those seeking a new low-power license should the FCC

decide to lower the barriers to broadcast ownership.

Unlike many regulatory issues that the FCC puts out for comment, this issue has generated strong interest not only among owners, but among engineers, many of whom filed comments.

See LPFM, page 11 ▶

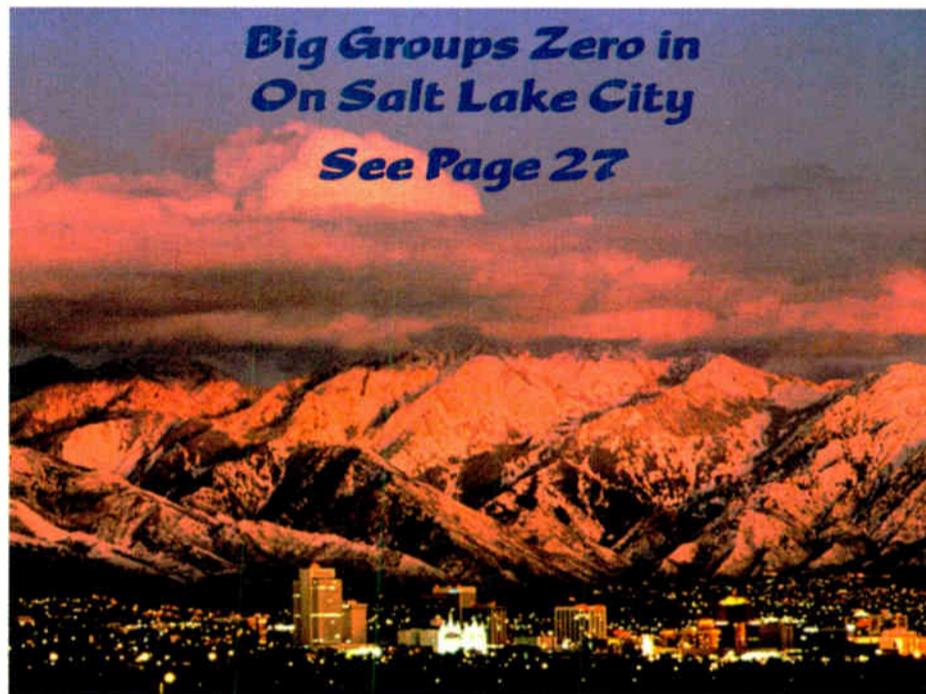


Photo Courtesy of Salt Lake Convention & Visitors Bureau

NPR's Lewis Reflects on His Term

by Joy Plaschko

WASHINGTON When Delano Lewis came to National Public Radio from the telephone business, he said he had a lot to learn about public radio. In the five years since, he has been a major force in the fight to maintain federal funding for public broadcasting, and feels his efforts to change the NPR organizational structure leave the network positioned for growth.

True to his initial commitment, Lewis has announced his retirement as president and chief executive officer of NPR, effective Aug. 1.

"I'd always said I'd stay three to five years," he said. "I began working at NPR unofficially in June of 1993, and officially in early 1994. For a while now, I've been thinking I'll finish 'just one more thing, one more

See LEWIS, page 8 ▶

Will New Standard Be A Boon to RDS Here?

by Lynn Meadows

WASHINGTON Radio Data System proponents hope the adoption of a new standard will spur global RDS receiver production, and in turn convince more United States broadcasters to use the technology.

After several years of work with its European counterparts and a meager voter response, the National Radio Systems Committee has adopted an upgraded Radio Broadcast Data System standard for North America.

RBDS is the name for the North American RDS standard. The technology is called RDS.

Broadcasters did not embrace RDS technology when the first RBDS standard was released in 1993, in part because there were not many receivers in the marketplace.

The earlier standard frustrated manufacturers because it was different enough from the European RDS standard to make the development of global RDS broadcast equipment difficult.

Because the new North American stan-



Advanced Data Systems Technologies markets the Cadet Data Radio PC Card.

ard incorporates the entire European RDS standard plus some new features, RDS supporters hope it will encourage

See RDS, page 12 ▶



It's the '90s: You have more to do with less time to do it. Days are hectic. You juggle so many tasks in the studio, you feel like you're a ringmaster in a circus—not a DJ on a live radio show. You wonder if the madness will ever end. Then you think, "There's gotta be a better way." Well, there is. Let Harris introduce you to the best assistant you can hire, AirTime™ by Orban.

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NEWSWATCH

Lucent, CD Radio Sign Chip Pact

ALLENTOWN, Pa. Lucent Technologies will develop and provide communications chips for CD Radio's 50-channel satellite digital audio radio service, set to launch late next year. CD is one of two FCC license holders to develop and market satellite DARS. Lucent said CD Radio will use digital signal processor and radio-frequency chips from the Lucent Technologies Microelectronics Group for CD Radio.

Lucent DSPs will be used in a card that consumers can insert into the cassette slot in car radios, allowing exist-

ing radios to receive the digital broadcasts from CD Radio. Lucent's RF chip will be used in a two-inch wireless antenna to be mounted on the motorist's rear windows.

Arbitron Buys Tapscan's Radio Business

NEW YORK The Arbitron Company has purchased the radio station, advertiser/agency and international assets of Tapscan Inc.

Tapscan is a Birmingham, Ala.-based software developer for broadcasters, agencies and advertisers. Revenue in 1997 for these portions of

Tapscan's business were about \$10 million. Terms of the deal were not disclosed.

Under the agreement, Arbitron acquires the software applications that Tapscan markets to radio stations, advertisers, ad agencies and overseas media (including software for overseas TV and cable).

Tapscan retains its software applications for TV and cable. Also not included in the deal is Tapscan's new MobilTRAK service to measure radio listening in cars.

Arbitron President Stephen Morris said combining the resources of both companies would allow Arbitron to

improve its services and expand overseas more quickly.

Top Engineer to Leave FCC

WASHINGTON Richard Smith will leave his position as chief of the FCC Office of Engineering and Technology at the end of next month to pursue other opportunities. Smith had been OET chief since 1994, and has been the senior engineer responsible for providing technical, engineering and scientific direction to the commission on a number of matters, including digital TV.

CEMA Audio Summit This Month

ARLINGTON, Va. In response to continued softness in the consumer audio equipment market, the Consumer Electronics Manufacturers Association will hold an "audio industry summit" in Chicago May 29-31.

Home audio sales have declined over the past two years. "People no longer listen to music like they used to. Lifestyles have changed," said CEMA President Gary Shapiro. "Audio is competing not only for consumers' dollars but their time. The audio industry needs new marketing strategies to re-ignite consumer interest."

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AUDIOARTS ENGINEERING

Will EAS Work in the Year 2000?

FCC Also Moves to Revoke Texas License in Three-Year AM Tower Dispute

by Leslie Stimson

WASHINGTON The FCC gets sort of overlooked when federal agency officials get together to describe what they are doing to solve the expected computer glitches when the year 2000 approaches. Big potential problems, like the Internal Revenue Service messing up everyone's tax information or the possible failure of the air traffic control system, usually get the press.

Many older computer systems were designed with a limited amount of memory, and are programmed only to store the last two digits in the year. For example, only "99" of "1999" would be stored. If not corrected, those systems will read 2000 as 1900.

But the FCC is the regulator of the nation's communications systems. How it handles the Year 2000 problem is critical for radio and TV stations. In its budget request for the next fiscal year, the FCC asked for more than \$8 million to upgrade or replace computer and communications equipment (RW, April 29). If the funds are approved by Congress, part of the money would be spent on upgrading the FCC's licensing database programs for the industries it regulates.

At a recent Senate hearing on the Year 2000 problem, FCC Chairman Bill Kennard said he hopes to complete that upgrade by the middle of next year. FCC employees have been working on upgrading the databases for five years.

Kennard realizes the FCC can't solve all of the glitches that may occur when computers have to make the change from 1999 to 2000, so he's concentrating on the most important issues. Commission officials are concerned in particular about the viability of the Emergency Alert System as of Jan. 1, 2000.

In an interview, Kennard told RW, "If

the telephone switch is talking to a microprocessor in the broadcast station to tell them to activate the EAS system, and there's a malfunction, we've got a Y2K problem and it may not activate the emergency alert."

The microprocessing chips in EAS boxes are part of software-driven systems. Frank Lucia, director of emergency communications for the FCC, said those chips recognize the date, including the year. If the chips are not Y2K-ready, he said, "The boxes would probably lock up

How the FCC handles the Year 2000 problem is critical for radio and TV stations.

and not work." If that happened, the stations wouldn't be able to receive incoming EAS messages, nor could they send any.

EAS encoders/decoders

The FCC has contacted the seven licensed manufacturers of EAS encoders and decoders. At press time, five companies had said their products were Y2K-ready: Sage, TFT, Multi-Technical Services, HollyAnne Corp. and Gorman Redlich.

The FCC has an internal team working on the Y2K problem; its members have been meeting for 10 months. The commission also has launched a Web site on the issue (www.fcc.gov/year2000).

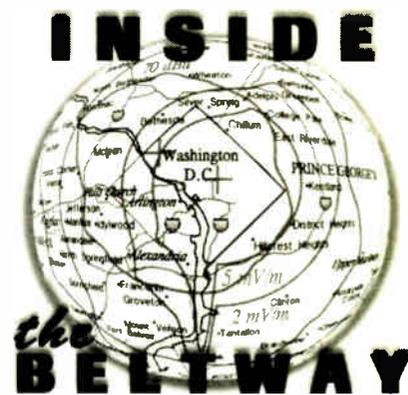
Also, Commissioner Michael Powell serves on the President's Council on the Year 2000 Conversion.

EAS isn't the only issue on regulators'

minds these days. The FCC has upheld a previous decision and moved to revoke the license of AM station KFCC in Bay City, Texas, over a tower dispute. If revoked, it would be the first time since the early 1980s a license was rescinded for what the commission calls "lack of candor."

In a case that began in 1995, station owner Chameleon Radio Corp. requested special temporary authority to move the transmitter so the station signal could better reach the Houston area.

The FCC said that after Chameleon bought the station, the company took it off the air, then filed the STA request "due to the loss of its currently licensed



A Roundup of News and Comment Affecting Radio From the Nation's Capital

sent it as an existing tower."

In 1997, an administrative law judge concluded that Chameleon misrepresented its intentions to the commission, and recommended the license be revoked.

Chameleon President and station GM Don Werlinger said, "We are not guilty of the things we have been accused of." He said the company, of which his mother is the majority stockholder, didn't try to deceive the commission.

"We filed engineering exhibits that showed them what we were doing."

Werlinger has appealed twice and, at press time, had not decided whether to appeal again.

He had until May 21 to file for an appeal. If he doesn't, he has until midnight of June 3 to take the station off the air, after which the license would be auctioned.

WHAT COMES AFTER DIGITAL?

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

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

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

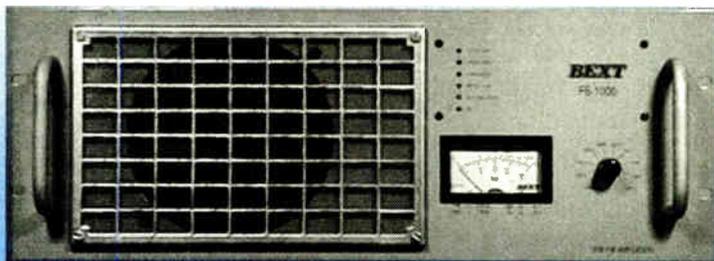
Want to know what comes after digital? Call (724) 772-2310 and ask for our white paper "Artificial Intelligence, It's What Comes After Digital". While you're at it, you could also ask for a no-obligation, 10-day demo of COBALT BLUE™, the world's first Neural Network audio processor.



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Just Tuning In to RW? Welcome!

The Best Writers and Features From Tuned In Magazine Move Into Our Pages

The best columnists and regular features from Tuned In magazine are now a part of **Radio World**. Starting in this edition, you will enjoy stories about the people, issues and decisions that make up the business, programming and sales sides of radio. We have covered these stories in the past; now you will find our coverage to be even stronger.

Here's the background. **RW** has been serving radio owners, managers and engineers for 23 years. Our *Running Radio* section, containing program, sales and business stories, was launched in the early 1990s and immediately became one of our most popular features. It was obvious to us then that our readers wanted to read even more about that side of radio.

Tuned In grew out of that section of the newspaper; in fact, it was first called Radio World Magazine. The magazine offered thought-provoking columns and plenty of stories about interesting radio markets, formats and trends. But after a few years, we came to a realization.

We had sensed correctly that readers and advertisers wanted more business/programming features. What we *didn't* expect was how strongly they wanted that content in **Radio World**. Further, we continue to publish a good management section in **RW**. That section was competing with Tuned In. This was inefficient, and confusing to clients, not to mention readers, many of whom continued to request **RW**.

Reader reply cards, conversations with radio managers, and comments from Tuned In advertisers all led us to the same conclusion: Keep the business, programming and sales stuff in Radio World.

"We like Radio World," these people told us. "We read Radio World, we know Radio World."

Why fight uphill? We've decided to give the readers and advertisers what

they want — our best and strongest publication, in a growing family of strong publications.

What does this mean to you, the reader? It means you will read regular Market Watch features, in which our editorial staff takes a close look at a particular radio market (in this issue, Salt Lake City). We will introduce you to popular national columnists like Frank Montero and Kim Komando. We'll ramp up our coverage of the business of radio, while retaining the best management features we already have.

RW is the most popular newspaper in radio because we paint the stories of radio on a broad canvas every two weeks, with technology news, regulation, product reviews and analysis of trends. Expect that to continue. We'll make a few small design changes in coming issues that will help guide you through the newspaper and point out the most important, interesting stories.

To our new readers and advertisers joining us from Tuned In, welcome. To our long-time readers and supporters, we promise to continue to provide the best industry coverage around.

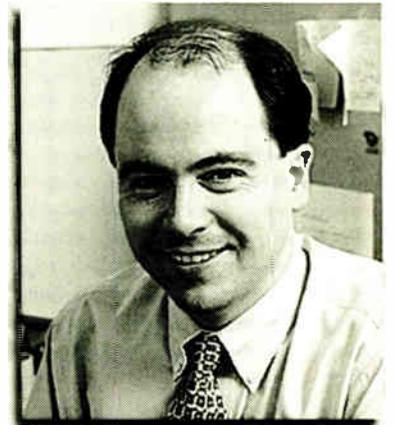
If you like what you see, let us know. Patronize the advertisers who support your newspaper. Drop me an e-mail at pmclane@imaspub.com and give me your ideas.

Our commitment to covering the world of radio won't change. It is stronger than ever.

★ ★ ★

Lucent Technologies is moving forward to compete in the IBOC digital audio broadcast arena, as **RW** reported last issue. To me, the presence of this large, nationally known company in the market just reinforces what we have argued for a long time: If DAB has a future in the United States, it lies in an in-band, on-channel solution.

From the Editor



Paul J. McLane

★ ★ ★

Are you a user of radio equipment? (Of course you are!) If you would like to tell your industry colleagues about your experiences with a new piece of radio gear, let us know. We will print your thoughts in our *Buyer's Guide* section. Upcoming equipment categories include audio consoles, remote audio equipment, codecs and FM transmitters. Interested? Drop an e-mail to Brian Galante at bgalante@imaspub.com

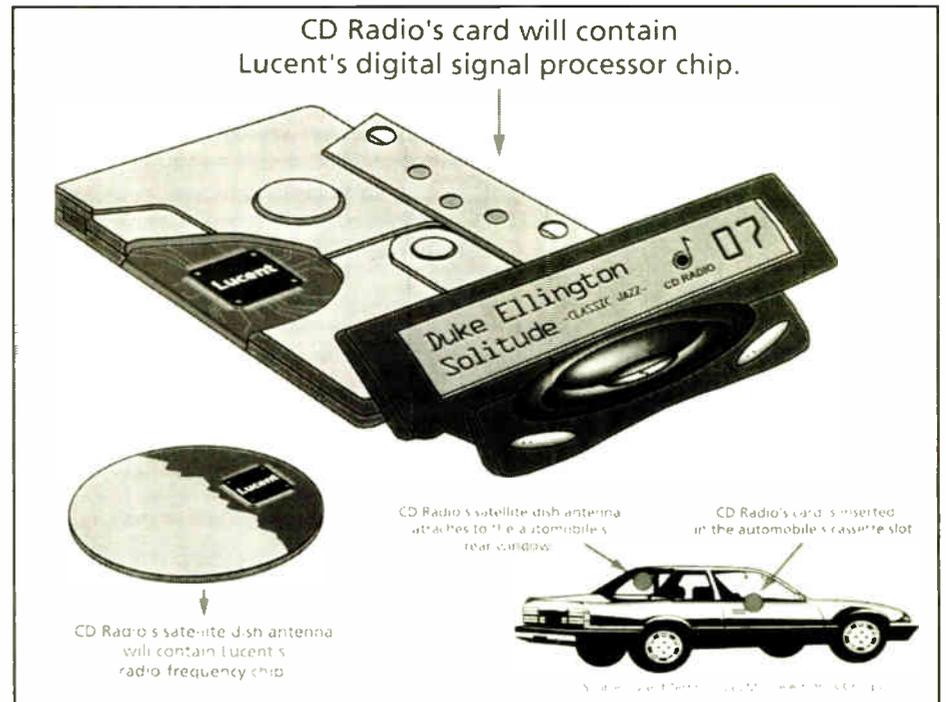
How will the IBOC race play out, now that the relationship between USA Digital Radio and Lucent has changed? Where does Digital Radio Express fit in? What will their various tests this year reveal? Watch and wait.

★ ★ ★

Meanwhile, as reported on page 2 of this issue, Lucent also is a player in the satellite-delivered digital radio arena — diversifying its investments, if you will. The company will develop and supply communications chips to CD Radio, which will launch its national satellite-to-car radio system next year.

"Lucent's DSPs will be used in a card that consumers can easily insert into the cassette slot in their car radio, enabling existing radios to receive CD Radio's broadcasts," according to the statement released by both firms. Lucent RF chips will be used in a wireless antenna that mounts to the car rear window.

The accompanying graphic illustrates how it will work.



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◆ READERS FORUM ◆

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

We need ARMA

Dear RW,

In his column "Will This Be a Muscular ARM?" (April 15), Paul McLane wrote that he felt that there was no need for another trade show. My company and three others, who founded ARMA, along with more than 50 manufacturers that have agreed to exhibit at our first show, strongly disagree.

ARMA was formed as a grassroots effort to provide a low-cost, low-hassle alternative for radio broadcasters to get together to discuss issues, learn about new technologies, and yes, sell and buy hardware and services to help pay the bills. We are expending considerable time and effort to ensure the success of our first East Coast show, scheduled for June 4 and 5.

Our show was conceived to provide an

alternative to the large, expensive and distant shows such as the NAB spring convention in Las Vegas. Our objective is not to denigrate other shows but to complement them. The NAB convention is a great show; but that's just the problem. It's so grand that it tends to dwarf smaller manufacturers, stations and even radio as an industry. The expense and time commitment of attending the NAB convention is becoming too great a burden for many broadcasters, especially those on the East Coast.

I doubt that you would ever use the pages of *Radio World* to advocate that other trade journals be closed down. Likewise, I would never expect to be able to rally my customers behind the notion that we should not allow another console manufacturer on the scene. Our clients could not petition the FCC to deny a new license in their market just because they were there first. The public has the right to decide.

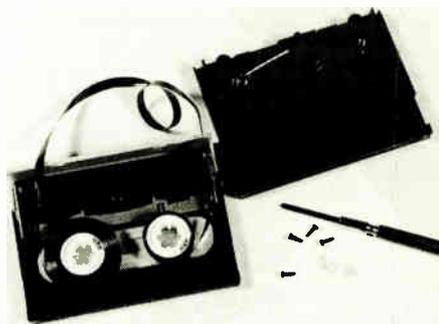
When one trade organization dominates so boldly in an industry, there is more than just a need for effective competition — there is a crying need for it. RW should champion our cause, not condemn it. Anyway, Paul, how could ARMA be bad for business? We're advertising in RW this month!

Daniel Braverman
President
Radio Systems Inc.
Bridgeport, N.J.

DAT discussion

Dear RW,

I read Jeff Johnson's article on servicing DAT decks (RW, March 18) and generally found it good, especially for those with no experience with helical scan tape transports.



Maybe things have changed, but when I went to Sony school for certification on U-matic and 8mm VCRs, they taught us that the foam swabs in the hands of the untrained were a damaged head waiting to happen. Their preferred cleaning material was chamois, either on sticks or a chamois cloth on a finger tip. The concern was bits of the foam breaking free and clogging the head gap or just getting snagged by the head. We also used Kimwipes or other lint-free tissues or cloths to wipe the non-moving parts.

They also preferred a flouorocarbon solvent or canned head cleaner as opposed to alcohol. The concern was that alcohol could leave a film on the head drum assembly.

I await the next installment.

Ben Bass
Owner, Bass Electronics
Buffalo, N.Y.

Are You Bored Yet?

It's time for a little chat, just between friends. We have a problem, you see.

Radio is boring.

This is not the kind of thing you want to read in *Radio World*. But drive around the country and you'll reach the same conclusion. The radio dial is becoming dominated by the same sound-alike songs, liners, personalities and formats.

The adult contemporary station in, say, Pittsburgh promises "The Best Hits of the '70s, '80s and Today." Drive to Indianapolis or Atlanta and you'll hear the same thing. Fly to Seattle, turn on your rental car radio, and — surprise — the same promises, the same songs, the same catch phrases, and now, thanks to the wonders of technology, the same voices. These stations sound almost *exactly* the same.

The trend cuts across formats. The news station in New York sounds like the news station in Philadelphia sounds like the news station in San Francisco, despite the presumed difference provided by local news content. Media critics lament the lack of interesting radio in their home towns. Late-night listeners flip around the dial hoping to catch an interesting distant program, and find themselves listening to the same network shows they can pick up in their own market.

As ownership deregulation progressed in the past few decades, as staffs were trimmed and more automation equipment installed, we promised ourselves that localism would not be lost, that we would continue to program our stations with innovation and care for local tastes. We promised ourselves we would not lose sight of our "franchise," our strong connections to our communities.

But the marketplace forces at work in radio are powerful and inexorable. Stockholders in public companies demand efficiencies and constant growth. To achieve that, managers at these companies, and the privately held firms that compete with them, *must* cut costs. The result: Pooled resources. Standardized "parts." Centralized operations.

Times are good now. A rising economy, strong ad sales and general good feelings prevail. But competitors are all around, looking for ways to serve our audience better — through multimedia on the Internet, with satellite radio or Internet service in our cars, with better delivery services we haven't even dreamed of yet. We won't have a built-in lock on office and car listening forever. Those competitors would be delighted to grab any bored listeners with more exciting, interactive fare.

Does the suggestion that radio is boring make you angry? Do you have a strong local radio story to tell? Please do. We know radio innovators exist. But those stories aren't reaching the public. To our ears, and apparently to the ears of the general population, the gourmet meal of radio is becoming a short menu of fast-food items.

— RW

Ham radio beefs

Dear RW,

There was a time when amateur radio provided a public service in training operators for military service and technicians for industry, fostered international goodwill and carried emergency communications. This rarely is true any longer. Today, amateur exams are so simple that children who can barely read can pass the test. All questions *and* the answers are published in multiple choice format. The examinee knows the actual questions and answers ahead of time.

Write to Us

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The average age of today's ham is well over 50, whereas when I was licensed the average age was 27. Hams are still communicating at 1,200 baud while Internet users fly along at 40 times that speed. As far as international goodwill, most hams rarely ask a foreign station anything more than what his equipment is — they do not care about culture, lifestyle or anything that really matters.

If you have a scanner, tune in frequencies between 145 MHz and 148 MHz and listen to the content of the conversation.

These are valuable frequencies that other public service and commercial interests could use *productively*. Cell phones have replaced the need for most emergency ham communications in this country. Hams use many other frequencies for little more than a discussion of personal medical ailments.

Hams are required to serve the public, but in fact they are serving themselves. Worse, they cause interference to other services (like your TV) and they erect large towers and, guess what, there is nothing you can do about it. The FCC is too underfunded to respond to citizen interference complaints, and the ham radio lobby (American Radio Relay League) has caused both state and federal governments to pass laws that prohibit towns from controlling these large antennas.

The frequencies that hams use are for the use of everyone, not for their personal fiefdom. It is time Congress conducted hearings and investigated whether ham radio has become the vast wasteland.

Burt Fisher
South Dennis, Mass.

Corrections

Our April 29 story about Harry Caray should have stated that he spent 11 years broadcasting Chicago White Sox games at AM stations WTAQ, WMAQ and WBBM. He was paired with Jimmy Piersall for four of those years. Also, Caray's son Skip currently covers the Atlanta Braves.

A story in the April 15 edition should have stated that the Sony SRF-42 Walkman is an AM stereo radio.

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June 10, 1998

BUSINESS DIGEST

RFS Broadcast Chases U.S. Market

Global RF Supplier Seeks Higher-Profile Role In United States Broadcasting Market

by Lauren Rooney

NORTH HAVEN, Conn. Expect to see the name RFS Broadcast more often in months to come.

A new business unit called RFS Broadcast USA, formed last summer, brings together the resources of two existing entities, Cablewave and RFS Australia.

Cablewave has been supplying broadcast antenna and feeder systems for three decades within the United States. Company officials say RFS Australia has been more involved in the world market, with a broader range of equipment and services, and has been involved in systems for digital TV and radio in Europe

Magris sees a large market for broadband antennas.

and the United Kingdom. The new entity combines resources from both and establishes an RFS Broadcast group within the United States. The company says the goal is to focus on broadcaster needs and provide them with more products and an approach to systems solutions.

Radio Frequency Systems, owned by Alcatel, also has groups in Germany, South America, England, France, Italy, Singapore and Jakarta. The groups in Germany (Kabelmetal) and America (Cablewave) are manufacturers of feeder systems, while Australia, France and now RFS Broadcast USA are manufacturers of antenna and RF systems within their regions and for other parts of the world as required. Other groups are sales offices to support their particular regions.

Cablewave employs about 300 people

in the United States. The new division employs 20 people with a personnel support group of 200 employees domestically and in Australia. Ernie Belanger, formerly of RF manufacturer Energy-Onix, joined RFS in a sales and marketing capacity in May.

Anthony Magris, general manager of RFS Broadcast, said, "We felt there was a need to have a more focused look at the broadcast market in America to give customers the sort of response that they deserve and require. We felt that a dedicated group just for the broadcast market would be worthwhile."

A new way to buy

Magris said the biggest goal for RFS Broadcast is getting broadcasters to rethink how they buy antennas and transmission lines. While Cablewave products will still be available from distributors, Magris said chief engineers also can call RFS Broadcast to buy directly from the company.

"The big thing we're driving towards is looking at everything as a system," he said. "In the past, customers had just been provided with components; now we're saying we can help you with your whole system."

Among its products, RFS Broadcast offers horizontally and vertically polarized high-power FM antennas, a circularly polarized antenna, medium-power antennas and multichannel circularly polarized directional antennas. Also offered are branched starpoint series combiners, the PD series of equal split dividers, directional couplers and a full line of Flexwell Cable transmission lines.

A broadband future

Magris is hoping the future of the company will lie in more use of broadband antennas. "We have a number of facilities in Canada that use broadband antennas, but it's still not something

and transmitting through one antenna. Broadband antennas are the only way to go if you want to have the same pattern coverage from each service."

With the experience RFS has had in Europe and Canada, where broadband antennas are more common, Magris feels his company will be on the cutting edge of this approach to RF design.

"RFS has been involved in telecommunications worldwide for more than 50 years," he said. "As in Europe, DAB is being considered in the U.S. and therefore, as with DTV, many broadcasters will require the types of systems we can provide."

that's done in this country. People tend to broadcast off a single antenna."

The advantage of broadband, Magris said, is that stations can broadcast more than one signal from their antenna.

"Many broadcasters are realizing that real estate and environmental impacts are key factors affecting the establishment of new towers to support multiple antennas," he said. "As time goes on people may look at combining their resources

Public Radio Confab Kicks Off May 29

SAN FRANCISCO How public radio will face technical and financial challenges in the new millennium is the theme of PRC 98, this year's public radio conference, which begins here May 29.

Conference organizers at National Public Radio are expecting more than 1,000 attendees — up from about 250 in the 1980s.

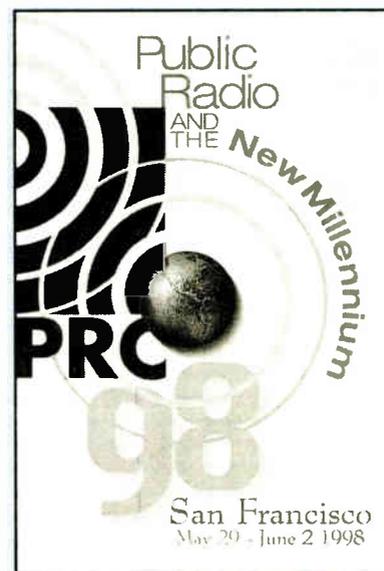
The exhibit floor will include a number of companies with a technical or product emphasis, including Apex Systems, Comrex Corp., CBSI, Crown International, Cutting Edge/Telos, Dalet Digital Media Systems, Datacount, Broadcast Electronics, Inovonics, Public Radio Satellite System and Radio Netherlands.

Technical panels at the PRC cover a

wide variety of topics including digital audio radio, automation systems, audio on the Internet and the MiniDisc format. Other sessions will include tips on localizing a repeater network and extending the life of station computers.

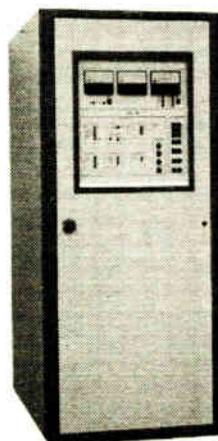
The PRC runs from May 29 through June 2 at the San Francisco Hilton & Towers. Conference registration is available on site. The three-day cost for public radio stations, independent producers and non-profit organizations is \$450 for the first registrant, \$400 for the second. For-profit organization personnel pay \$570 at the door. For more information call (415) 771-1400 and ask for the PRC office.

— Joy Plaschko

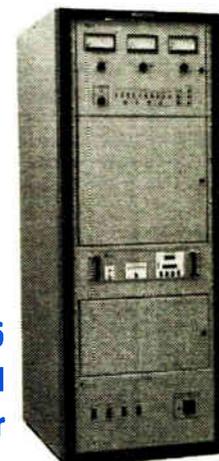


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Moving Your Station: A Primer

by Thomas R. McGinley

LAS VEGAS It seems that almost every station engineer has moved or consolidated stations, or is about to. The key to any successful move is to get organized, stay focused and maintain close communications with all the key players in the move.

That was the essence of the engaging presentation "Moving Your Radio Station" by Chancellor Media's Barry Thomas, engineering director of FM station KCMG in Los Angeles. Thomas was one of the speakers during the NAB '98 Radio Boot Camp, jointly sponsored by NAB and the Ennes Educational Foundation Trust, the educational arm of the SBE.

The most important relationships and dialogues to develop and maintain, Thomas said, are with station management, the real estate representative or landlord, the station attorneys, the station business manager and the construction manager. Defining and delivering on their expectations will require trust and mutual understanding.

Managers are results-oriented and engineers are process-oriented, so it is best to communicate with them using lots of bullet-points on one-page memos.

A little help from your friends

Studio site selection is crucial and involves studio-transmitter-link access, structural compatibility, security, proximity to business, listeners, and employees, access to telephone and necessary utility services, emergency power, room for expansion, adequate parking, and zoning clearance. Thomas recommended hiring others or reassigning other company engineers to oversee the existing station while you plan and execute the move.

He also advised hiring pros where necessary, for architectural design, acoustical design, and general construction contractor. Make the expense of assistants who help wire the new plant part of the overall cost of the project. Use other key staff like the program director or general sales manager to "sell" special needs to upper management.

Thomas said the scope of the project, meeting company or market standards, and expected life span will drive the overall project budget. A careful assessment of the assets to be reused and what must be purchased is vital.

The question of cash vs. trade also is crucial. "Do not compromise mission-critical items like traffic computer systems and telephone systems to trade deals," Thomas said. If management wants to use trade, reserve it for items such as office stereos and furniture. Build in a budget overrun of 5 to 10 percent to allow for change orders, which are almost unavoidable.

The design process demands that you keep good records. Use a spreadsheet program format, Thomas said, so you can change and move things easily. The physical design will consider current and projected employees, where they work and where they need access, so office locations and traffic flow can be optimized. Don't forget expansion options, along with the American Disabilities Act and legal issues such as zoning restrictions for tower or antenna placement.

Ergonomics and so-called "ego-nomics" also are critical in space planning. And don't forget adequate storage space. For studio design, carefully consider sightlines, traffic flow, seating room requirements, and "feel." The main air control room is the stage. Ideally, it should be "a room with a view." Jocks need to feel relaxed and good about their surroundings to do good shows. Don't forget acoustic considerations, especially for rooms adjacent to studios and other tenants.

Wise studio choices

Make equipment, layout, wiring access/routing, and studio furniture configuration choices early. Thomas



Engineering Area at KYLD(FM) San Francisco

also uses a spreadsheet to rough-in rack design and wiring layout. Understand staff needs and expectations when choosing new equipment, especially for morning shows. Those needs will drive the list and the budget. Thomas advised using professional, high-quality brands for telephone and computer systems. Service agreements should be included in the purchase, but keep your options open. You should "over-cable," to allow for future needs and expansion, especially category-5 wire to support computer networks and workstations. Add extra room to conduit and cable chase areas. Treat studio telephone systems as separate from the business phones to make

See MOVE, page 14

IS DELAY RUINING YOUR ISDN REMOTES?

ON AIR

Now, let's check in with Pete, the Party Animal at the FIJ! Block Party in sunny Ft. Lauderdale. Tell me Pete, are the beauties bathing?

Uh, Pete...are you there? I was wondering how the party is? Are you there?

...Uh, Yeah, I just asked how the party was.

...Oh! uh...the party's awesome... Huh? Did you say something?

Sorry Pete... Let's take a break. We'll try to check back with you a bit later!

I can't work like this! You have to do something about the delay!!!

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NPR, 'Getting There Together'

► LEWIS, continued from page 1 project.' And then I decided that there would *always* be one more thing."

His term has seen plenty of action. Critics can point to high-level staff departures, discrimination lawsuits, cozier business relationships and open-ended merger talks. Supporters can cite successful lobbying for funding, new senior-level staff, new internal systems, new programming and new collaboration with a rival network.

"It's been broadening, enlightening, for me. It's been rewarding," Lewis said. "It's been new culturally, and very challenging. I'd been on the boards of nonprofits, but I hadn't managed one full-time. Add in 500-plus member stations to the culture, and the culture of journalists."

Internal change

"This is a hands-on CEO job," Lewis said. During his 11-year run as president of C&P Telephone, just prior to NPR, he was less central to the decision-making process.

It has been hardest to get staff to think about change, Lewis said. "The culture is deeply resistant to change. I'm not singling NPR out here. It's true of most organizations."

Now, he said, "People are thinking differently and working in teams. We're breaking down fiefdoms, figuring out what the goals are and getting there together."

Joanne Wallace, general manager of NPR member station KQED-FM in San Francisco, praised Lewis for his efforts, particularly in 1995 and 1996 when members of Congress threatened to zero out the budget for the Corporation for Public Broadcasting.

"He led the fight for continued funding. He and his active national affairs staff mobilized and alerted member stations to the activities on the Hill and helped us make sense of what was happening," Wallace said.

"He's made some good hires. I am very impressed by Jeffrey Dvorkin," Wallace said. Dvorkin was hired as acting vice president of news and information in May 1997. Two months later, the NPR board removed "acting" from that title.

Dvorkin's recruitment from the Canadian Broadcasting Corp. followed the rocky departure of longtime News and Information Vice President Bill Buzenberg, who decided, with the help of Lewis, to resign in January of 1997.

The heat of three discrimination lawsuits brought forth by newsroom staffers during the latter part of Buzenberg's term was a highly visible item on Lewis' plate. Staffers who brought the lawsuits against NPR charged racial and gender discrimination, among other things. One case was settled; another was sent to arbitration, in which the outcome is confidential. The third case was lost by the plaintiff on appeal.

Programming

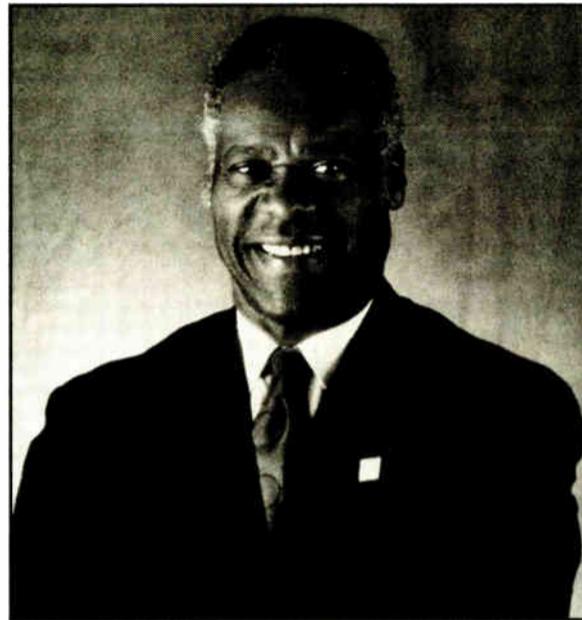
Lewis made contributions on the programming front.

Stations had been asking for years to have "All Things Considered" begin at 4 p.m. ET, Wallace said. "He had the energy and will to do that," in 1995.

The decision to start "Morning Edition" at 5 a.m. last summer also has

gone over well. Both changes are attractive because they provide an extra hour of mainstay programming in drive time.

But these also are seen as fairly easy changes to make, in programming against the Public Radio International program "The World" and filling in a gap left by the departure of the Christian Science Monitor from morning radio. New cultural program offerings under Lewis, "Anthem" and the radio game show "Wait, Wait...Don't Tell Me," have reportedly not experienced significant station carriage.



Delano Lewis

"Anthem" lost its popular host Bonnie Grice in March of this year when she decided to leave Washington for her home in New York.

Technical changes

Early in the Lewis years, NPR made another move, to new quarters. The network moved in February of 1994 to new headquarters at 635 Massachusetts Ave. in northwest Washington, D.C. Donald Lockett, NPR vice president and chief technology officer, helped supervise the move.

The biggest technical challenges of moving included "making sure we had an adequate frequency coordination and minimal amount of terrestrial interference at the new site," Lockett said, and "moving without a loss of air time — planning gradual removal of key equipment over a period of weeks, and the critical components over a weekend when production is somewhat reduced."

"Voice of America served as an interim production facility for us. A consultant was employed to assist with the move," Lockett said.

During the Lewis term, NPR has evolved digitally. "We've been somewhat limited by availability of equipment and have limited budgets. We are building a networked digital system rather than 'sneaker net,' discrete digital technology," Lockett said. He said the facility should be fully digital by the end of this year. (For more on this story, see *RW*, April 15.)

Another issue has been formal union

organization of the technical staff. In February, NPR engineers and technical employees voted for representation by the National Association of Broadcast Employees and Technicians. Citing irregularities in the balloting, NPR challenged the election, and the results were set aside by the National Labor Relations Board. A second vote was yet to be scheduled at press time.

Rewards

Lewis finds great reward in what he calls an "emphasis on people" that came about at NPR.

"We brought in a human resources specialist and made her an officer of the company. We took the personnel function and expanded upon it — making sure people are treated fairly," Lewis said.

Lewis said he is proud of the team in place at NPR, including Dvorkin; Chief Operating Officer Peter Jablow; Vice President of Human Resources Kathleen Jackson; and Vice President for Legal Affairs, General Counsel and Secretary Neal Jackson.

F. Kim Hodgson, chairman of the NPR board of directors and general manager of WAMU(FM) in Washington, said, "The senior management team is the best in the company's history, and is superbly organized to pursue ... NPR's mission. Del still has a lot of work to do for NPR, including helping the board to reach a ... conclusion to the strategic planning process ... now underway."

Partners

NPR's exploration of partnerships with corporate America has generated attention, and given a target to critics

We could become irrelevant to our customer ... We have to be competitive when that's important, and collaborative when that's important.

— Delano Lewis

who ask how NPR will preserve its mission to serve the public while it blends in a corporate mission to maximize shareholders' profits. NPR under Lewis has had some success with retail partners as well as NPR-related book and music products.

The issue of the NPR governance structure has been a difficult one for Lewis. According to one industry insider, "Everything led to governance for Del. He's raised some critical discussion, and governance will be an issue in the days to come." Ten of NPR's 15 board members are elected from member stations. Each station has a vote on substantial issues of the company. In comparison, Public Radio International has the flexibility of having a corporate-model private board and is not set up as a membership organization.

Merger talks with PRI are "still open," according to Lewis. "My successor will have to pick up on that. (PRI President) Steve Salyer and I had good chemistry. If both organizations can see value ... compelling reason," the process will continue, Lewis said. "We knew the idea would be a stretch. But there is no harm done. There is excitement in showing value — the value of doing things together rather than separately. It requires thinking outside the box. Good minds will come together to figure it out. It's about merging two entities of value to create greater value," said Lewis.

According to PRI President and Chief Executive Officer Steve Salyer, "There are no active merger talks underway. The discussions were useful and possible because we saw eye-to-eye on goals for the industry and how the industry could best be served. Whether or not discussions take place again, time will tell."

"I have enormous regard for him personally," Salyer said of Lewis. "I admire the vision he tried to bring to NPR during his tenure. It's better and stronger than he found it. His legacy includes his leadership during the funding crisis and his representing the industry on Capitol Hill. He's recruited some good people. He's good at asking big and important questions. That doesn't mean that the answers were easy — but that's as important a legacy as anything else," Salyer said.

The future

When asked about a possible future without federal support, Lewis said, "The NPR board is grappling with this scenario." Another funding crisis, he said, always is possible if the political scenery changes.

That grappling is being done as the NPR board shapes its strategic plan for the next three to five years.

"Kim Hodgson wanted help through the July NPR board meeting," Lewis said about the timing for his Aug. 1 departure. The network's final framework for that plan is expected to be approved at its board meeting in late July.

Of the big picture, Lewis said, "We could become irrelevant to our customer. Competition is whoever is fighting for eyes and ears — Internet, cable, etc. Technology is

changing so rapidly. We have to be competitive when that's important, and collaborative when that's important."

At NPR's April board meeting, board members approved NPR executive vice president and chief operating officer Peter Jablow as interim president, effective Aug. 1. "The search committee may engage an executive search firm," Lewis said, adding that the board hopes to have a new president chosen by November.

Post-NPR

Lewis' post-NPR plans include traveling, writing an autobiography, consulting, teaching, and lecturing. He was to find out soon whether he has been approved as a board member for Kodak. If approved, a board meeting in Japan follows, after which Lewis hopes to visit several countries in Africa.



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Comments On LPFM

▶ LPFM, continued from page 1

Allowing different types of people to get into broadcast ownership is at the heart of the low-power supporters arguments. In support of the new service, engineer Dave Allen from Gulfport, Miss., wrote, "Only those who have a radio station that can carry the purchase of a second station are contenders. The only way for me to be a station owner is to be a multimillionaire, or for the FCC to allocate a new LPFM."

Allen wrote, "There are several Class As on the band that are just a few kilometers of being fully spaced to other existing stations. I feel that another class, based on interference studies, is the way to go ... Currently, the rules won't allow me to put a new, slightly lower power Class A on the air. It has to be a fully spaced Class A."

Allen further said the commission should not allow anyone who lives outside a 50-mile radius of the community of license to own a frequency in the so-called new class.

Another engineer who filed comments, Duke Evans of KTOB(AM), Petaluma, Calif., told *RW* that he supports some form of new low-power service to solve terrain problems in his area.

NAB opposition

NAB strongly opposes creation of a new service. NAB officials consistently have pointed to interference concerns and the administrative burden on the FCC of regulating more broadcasters. In its comments filed with the commission, NAB also said that any change to the FCC allocation rules would be "detrimental" as analog stations make the transition to in-band, on-channel digital audio broadcasting.

"Existing channel allocation criteria used by the commission have played an integral role in the development of IBOC technology," said NAB. "In order to commence digital broadcasting in the

NAB said any change would be 'detrimental' as analog stations transition to IBOC DAB.

AM and FM bands, new digital signals will have to be squeezed into this already crowded spectrum."

The NAB maintains that "the introduction of hundreds, or perhaps thousands of new low-power stations would effectively preclude the adoption of IBOC technology."

The FCC continues to enforce laws against unlicensed operators. In May, FCC officials and representatives of the United States Marshals Services seized equipment they said was being used by an unlicensed broadcaster in Detroit. Edwin Raices admitted owning and operating illegal station "La Gigante" on 106.3 MHz, the FCC said.

BUSINESS DIGEST

Chancellor Media Names New CEO

IRVING, Texas Cable television executive Jeffrey Marcus is the new president and chief executive officer for Chancellor Media Corp. Marcus built three cable companies, beginning with Marcus Cable in 1990 with 15,000 customers. Marcus sold his company's limited partnership interests for \$2.7 billion in May.

Marcus begins his new position at Chancellor on June 1. He replaces Thomas Hicks of Hick, Muse, Tate & Furst, who served as Chancellor president and chief executive officer on an

interim basis. Hicks will continue to serve as chairman of Chancellor.

Marcus served as a director of Chancellor since last year, and joined the board of Chancellor Broadcasting, which merged with Evergreen Media to form Chancellor Media last year.

Chancellor has also reached a separation and consulting agreement with former president and CEO Scott Ginsburg, who resigned (*RW*, May 13). Under the accord, Ginsburg also will resign from the Chancellor board of directors.

Chancellor Media Corp. has formed a new division, Chancellor Marketing Group, to increase revenue from Chancellor sales promotion efforts. At the same time, Chancellor has acquired a consulting firm, Global Sales Development, to lead its marketing efforts.

Chancellor Media Corp. Chief Operating Officer James De Castro said promotion revenue represents untapped growth for Chancellor.

— Leslie Stimson

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New Standard, Old Questions

► RDS, continued from page 1
manufacturers to build global RDS receivers. And more receivers, they hope, will convince more broadcasters that the technology is worth their while.

RDS in cars

RDS receivers are available in Cadillacs, Ford Explorers, Ford Ranger Trucks and other high-end vehicles.

"Delco began shipping RDS receivers compatible to the new standards as early as the 1997 model year (fall '96). We are currently shipping a 'world' receiver in the Cadillac," said Scott Wright, project engineer for Delco Electronics.

Very popular in Europe, RDS continues to fight for notice in this country. The technology uses the 57 kHz FM subcarrier to transmit multiple groups of data at a rate of 1,187.5 bits per second.

In the United States, stations primarily use RDS to display text and call letters on RDS-equipped receivers. In Europe, many stations use RDS for the "alternate frequency" feature: When the station signal fades, the RDS receiver automatically switches to an alternate frequency provided. The alternate frequency is useful in areas where the same programming is carried on more than one station.

Consumers with RDS receivers will likely notice only the two new program type codes that were added to the standard. The PTY codes allow the listener to scan the radio for a particular format or program feature such as "Classic Rock" or "Top 40." The two new codes are "Weather" and "College."

The new standard also defines an Open Data Application feature. This is meant to allow any person or company with an innovative idea for using RDS to apply it without having to modify the standard. Nineteen of the 32 data groups transmitted can be used for ODAs.

For instance, an ODA could be developed that would allow those with special receivers to see the current weather forecast at the push of a button.

The standard includes an Emergency Alert System ODA Protocol for use in the United States. This ODA allows for the retransmission of emergency information sent by the EAS system. Both the current standard and the older standard include a PTY code for "Emergency." Specially designed receivers can monitor for an EAS alert even while turned off. When the receiver picks up the Emergency PTY code, it automatically turns itself on.

Anyone who wishes to develop an ODA must apply for an application identification code.

The new RBDS standard was adopted April 9, with 29 votes in favor and five abstentions. More than 100 ballots were issued to NRSC members.

Broadcasters who already use RDS will not be affected by the update unless they want to use some of the new features, said NAB Staff Engineer Dave Wilson.

Wilson said new receivers will be backward-compatible with older encoders. Whether existing encoders will be modified for the new standard depends on the manufacturer.

Circuit Research Labs manufactures the SC-100 encoder and plans to issue updated software that incorporates the protocols in the new standard. Bill Ammons, national sales manager, said the software update will be free for customers who have the encoder and should be available at the end of the third quarter.

Inovonics manufactures two basic RDS units. Both retail for less than \$1,000 and were developed to provide broadcasters with the basics of RDS at a low price. Because of that strategy, Ben Barber, senior development engineer of Inovonics, said the company had no

plans to update the 701 unit or its predecessor with features in the new standard.

For receivers, the ODA feature is likely to lead to the development of receivers that are specific to particular applications. Advanced Data Systems Technologies markets the Cadet Data Radio Card for the PC. The company plans to release software in the fourth quarter that will make the card compatible with the new standard.

Pump up interest

The Consumer Electronics Manufacturers Association has tried to increase broadcaster interest in RDS technology with limited success. CEMA ran a campaign three years ago to distribute an RDS encoder and receiver to FM stations in the top 25 markets. At least 300 stations accepted the offer. According to the association, around 700 stations currently broadcast RDS signals in the United States. Many use RDS for paging and global positioning services. Anecdotal evidence suggests, however, that some stations have not maintained RDS service after installing the equipment.

CRL sets up paging systems using RDS. Ammons said the monthly rental income

for a station that leases its RDS subcarrier ranges from \$300 in the smaller markets to \$1,500 in the larger markets.

In the field, station managers who use RDS have mixed opinions on its success to date.

KXXO(FM) in Olympia, Wash., was given RDS equipment in the fall of 1995 by CEMA. The station's tower collapsed before the equipment was installed. It took 18 months to rebuild, said General Manager David Rauh, and the equipment is still not installed.

Rauh said he has not received any calls from listeners wondering why KXXO does not use RDS.

WKAR(FM), East Lansing, Mich., was given an RE America 533 encoder and Denon receiver as part of a special National Public Radio deal with Denon. The station has used RDS on the air for several years, said Chief Engineer/Radio Harold Beer. The station uses it primarily for promoting its programming. During pledge drives, the station replaces the call letters displayed with the phone number. In the last pledge drive, Beer said one contributor was moved to donate after seeing the station's phone number on his RDS display.

Beer said he liked the RDS clock feature in his radio. Because the data is transmitted automatically via the RDS encoders, he never has to set the clock.

Differences Between RDS and RBDS:

- **Program Type Definitions (PTY)** — Due to different broadcast styles, the program type code definitions (i.e. Jazz, Rock, etc.) differ between RDS and RBDS.
- **Program Identification Coding (PI)** — North American PI codes differ in functionality in three ranges. This affects alternate frequency switching and regionalization.
- **"Dynamic" Program Service (PS) Name** — The RBDS Standard allows "non-distracting" changes to the PS, while the RDS Standard strictly forbids dynamic changes to the PS.
- **Phase-out of Fast Program Service (PS) Feature** — Group 15A of RBDS was previously defined for use as a Fast PS feature. This usage is being discontinued.
- **Mobile Broadcast Service (MBS) / Modified Mobile Broadcast Service (MMBS)** — MBS is the predecessor system to RDS in Europe. It is used as a commercial nationwide paging system in the United States. Because it shares the same modulation format as RDS, it may be time multiplexed with RDS.
- **ID Logic Feature (IDL) / RDS Updates to In Receiver Database (IRDS)** — A licensed feature that allows the receiver to identify the call sign and format of non-RDS FM and AM broadcast stations via a built-in database. This database may be updated via an Open Data Application.
- **Emergency Alert System (EAS) Open Data Application** — An Open Data Application has been developed to carry emergency information compatible with the U.S. Federal Communication Commissions EAS protocol. This public ODA also offers increased consumer receiver functionality with emergency messaging.
- **AMRDS** — The RBDS standard has a reserved section for an AM equivalent to RDS.

Courtesy Scott Wright of Delco Electronics Corp.

SBE Explores the Power of Databases

by Stephanie Muller

LAS VEGAS The SBE wants to help employers and prospective employees get connected.

During the Society of Broadcast Engineering Board of Directors meeting in Las Vegas last month, several new plans and proposals surfaced.

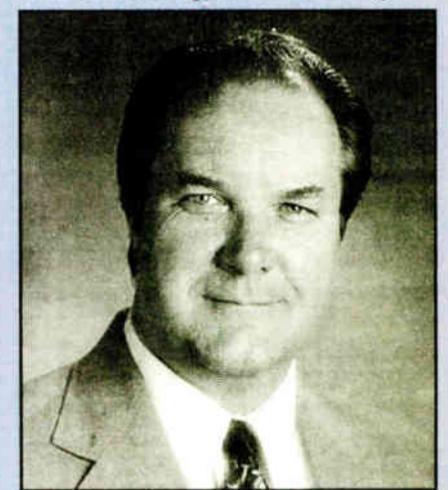
President Ed Miller said a proposed SBE résumé service would generate a database of interested parties, listing their qualifications and job interests. This new database is a way to cross-reference those who are searching for jobs with those who are in search of employees, match qualified applicants with vacancies and put parties in contact with one another. The proposal was discussed and put before a committee for more analysis. The proposal is expected to be reintroduced at the next meeting in Seattle in the fall.

The SBE also is proposing a national database of frequency coordinators. The organization has been involved with frequency coordination for 18 years.

The FCC maintains a database of frequencies that are available for simultaneous multiple users. Problems have occurred, particularly when several stations try to cover a single major event at the same time. SBE has submitted a proposal to the FCC to formalize a national database, to help users avoid problems. The proposed system could expedite the licensing process through new pre-screening and electronic filing options. Miller says the FCC is excited about the proposal, and he is optimistic that the plan will be put into action fairly soon.

SBE membership is at an all-time

high of 5,200 members. According to Miller, the SBE is experiencing its most rapid growth period. He attributed this success to industry support of the society certification program. Employers, he said, are offering higher salaries and other incentives for individuals who are certified by the SBE. Members are respected for their knowledge and education and have established a reputation for being able



Ed Miller

to get the job done, he said.

As reported earlier in *RW*, the SBE also established a youth program at the board meeting. Miller hopes that by targeting high-schoolers, the society can generate interest in the field, and recruit new, technically inclined young people into the broadcast engineering business. The program will allow participants to gain hands-on experience under the eyes of experienced engineers. The SBE will ask local chapters to sponsor their own student/youth nights for the purpose of educating these young people.

HE **DARED** TO GO THERE.



Peek Into the Telex/EVI Marriage

by Randy Stine

MINNEAPOLIS Employees of the new Telex Communications are manufacturing broadcast and professional audio products for radio, television and live performance applications. The new Telex was formed earlier this year when Telex and EV International combined to form Telex Communications Inc.

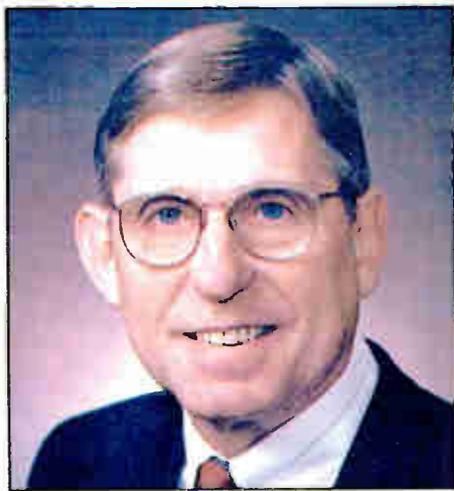
The company is led by John L. Hale, chairman, president and CEO, who served in the same position with Telex before the merger. He has put in place a new management structure based around a brand-management philosophy. The intent is to increase market penetration across the board for its 20 professional brand names such as Telex, Electro-Voice, Altec Lansing, DDA and Vega.

The new company retains several familiar managers. The president of the pro audio division is Dan Dantzler, who held a similar position with Telex prior to the merger. The vice president for marketing and sales/pro audio is Paul McGuire, the former president of EV International. The vice president of manufacturing is Roger Gaines. The remainder of the company is divided among several key business groups. Those include multimedia/communications and overseas operations.

The new Telex has 3,300 employees worldwide and combined gross sales of more than \$355 million. The company

has 22 sales offices and 16 production facilities. The nearly 14,000 dealers and distributors of Telex products have had a positive response to the merger, according to Telex management. Dealers have seen their product line increase with minimal overlap of products.

Telex headquarters will remain in Minneapolis. It was decided fewer employees would be displaced by keeping top man-



John L. Hale

agement there. The old EV International headquarters in Buchanon, Mich., remains open under the Telex banner.

Why merge?

Prior to the merger, Greenwich Street Capital Partners, Inc. of New York, a pri-

vate equity investment fund, owned 100 percent of EV International. Greenwich purchased the former Mark IV Audio in February of 1997. Three months later, Greenwich purchased 80 percent of Telex. Combined, the investment fund now owns 80 percent of the new company. The role of Greenwich is seen as that of an investor only; it currently has three seats on the Telex board of directors.

The prospect of a merger interested Greenwich investors immediately. "What they saw were two very distinct companies with a product line that complemented each other, and similar pursuits of technology through our R&D," Hale said. He said that after Greenwich purchased EV International, it seemed "a natural" to consider combining the two.

"I think everyone could see it would be a nice fit," he said.

Both Telex and EV International brought expertise and strengths to the

See TELEX page 16 ▶

Organization Critical To a Studio Move

▶ MOVE, continued from page 7

it easier to extract audio from the phone system for broadcast applications. Still popular for studio hybrid interfacing are IA2 systems, the old analog button phones. Choose your telephone system vendor and installer carefully.

Lay out the wiring infrastructure with good documentation. Thomas advised using a spreadsheet or database tool. Label each studio numerically and the type of circuits in each with letter identifiers, i.e. A for audio, C for DC control, T for telephone, D for data. If you are planning a conversion to an all-digital system, use AES3-compliant audio cable so that it can be used for either analog or digital. CAT-5 wire will support all computer-based LAN interconnections up to 100 Mbps as well as standard telephone circuits. Decide early on a termination system and central location for a terminal/rack room, using either a punch block or a connectorized scheme. Establish and stick with a standard color scheme for multipair wiring and pin-out protocol for connectors. Larger stations will need a master signal router and some patch bays.



New Air Studio at Chancellor's KYLD(FM)

move, have an orientation meeting to go over new procedures training. Distribute new keys, access codes, parking garage cards, and so forth. If you installed new hardware systems like telephones, voice mail or computerized studio functions, provide adequate staff training first to head off associated learning-curve problems after the move.

Do not try to do everything with only yourself and one assistant, Thomas said. Delegate to committee or department heads. Stay focused on the broadcast and studio issues first.

During construction, don't forget to take pictures to document the work as it progresses. They may come in handy later. After the new studios are complete, have a christening party to launch the new facilities and then take a well-deserved and extended vacation!

■ ■ ■

Tom McGinley is chief engineer of WPGC-FM/WARW(FM) in Washington and technical adviser to RW. Reach him via e-mail at k7qa@aol.com

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MP-2-4	4	2,000W	3.3	\$1,820
MP-3-5	5	3,000W	4.1	\$2,270
MP-3-6	6	3,000W	5.2	\$2,740

LOW POWER CIRCULAR SERIES

Model	Bays	Power	Gain	Price
GP-1	1	2,000W	-3.1	\$350
GP-2	2	4,000W	0	\$1,350
GP-3	3	6,000W	1.5	\$1,900
GP-4	4	6,000W	3.4	\$2,600
GP-5	5	6,000W	4.3	\$3,150
GP-6	6	6,000W	5.5	\$3,700

MEDIUM POWER CIRCULAR SERIES

Model	Bays	Power	Gain	Price
SGP-1	1	4,000W	-3.3	\$690
SGP-2	2	8,000W	0	\$2,690
SGP-3	3	10,000W	1.4	\$3,595
SGP-4	4	10,000W	3.3	\$4,500
SGP-5	5	10,000W	4.1	\$5,300
SGP-6	6	10,000W	5.2	\$6,100

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Circle (28) On Reader Service Card

Telex Extends Brand Equity

► TELEX, continued from page 14

merger. "You take the excellent acoustic transducer technology that is the hallmark of EVI, combined with the wireless communications capability, digital sound processing, active noise reduction, and software development that Telex brings and you have a winner," he said. "That experience can be parlayed into actual point products that no other company will be able to deliver."

Brand name and brand loyalty is the marketing philosophy embraced by the new company. "It's really brand equity. We have some of the strongest name recognition in the audio business with Telex and Electro-Voice. It's not any dif-

ferent if you're selling cereal or microphones; brand names help make the sale," said Hale. "We will position ourselves to take advantage of that."

Marketing departments from both EVI

TELEX®

and Telex have been consolidated since completion of the merger in early February and are based in Minneapolis. The marketing strategy for the combined companies is simple, according to McGuire.

"The main conduits to the broadcast engineer are our dealers and distributors.

As a supplier, we view ourselves as problem solvers," he said. "We need to go out and meet face-to-face with engineers and be very hands-on with them. We do this through the NAB show and other trade supply shows, both local and national. It's a year-round effort."

Can Electro-Voice strengthen its position in the market further? McGuire thinks so.

"The RE20 has become the industry standard for microphones. And you can't find a remote news gathering event without seeing RE50s and EV 635As around," he said.

Are there more niches to be filled in the mic field?

"We see some holes that EV can fill. We have a new shotgun mic we unveiled at the NAB in Las Vegas," McGuire said. Called the ENG618, it is a boom mic that can be used in news gathering on location. "We are looking at every avenue we can to improve the product," he said.

Engineers in this country can expect to see more of the series of DDA mixing consoles. They are produced in the United Kingdom. According to McGuire, the boards have a strong following throughout Europe. "The DDA CS8 and CM12 have done extremely well overseas and we feel they've been badly under-distributed here in the states. You can expect to see a very aggressive marketing plan," McGuire said.

Smooth transition?

The pro audio division includes all broadcast, touring sound and fixed installation equipment. In some cases, according to Dantzler, the company has been able to create a new product category by joining forces. "For example, Electro-Voice had a digital design group in Oklahoma City, while Telex had one in Minneapolis," he said. The two offices have since been combined.



Telex HR-1 Series Headset

"Both complemented each other very well. One was working on digital signal processing, while the other concentrated on the analog-to-digital switch in radio applications," Dantzler said.

Digital development is a top priority for Dantzler. "We think digital is more user-friendly and cost-effective for our customers," he said. The company is searching for digital applications for nearly all of its product line. "Where before you had individual units for analog, now we can consolidate things like mixing, routing, effects and processing."

Dantzler said, "Here's the trick. The human brain is an analog device. ... You start with an analog source, then translate it into a digital realm. You do whatever processing you'd like to do. Then you go back to the analog realm. The issue is limiting the amount of disruptions that occur during those transitions."

What does the merger mean for the thousands of engineers who order and use the company's products? Hale said the changeover will be of no consequence for those who purchase Telex products.

"Radio engineers should see absolutely no change when it comes to sales and technical support. They'll still find the brands they need through the same distributors," he said.

Telex customers can call technical support at (800) 234-6831.

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Workbench

Radio World, May 27, 1998

Sharp Edges Endanger Motor Wiring

John Bisset

Take a look at the wiring to your blower motor the next time you are inside your transmitter. Figure 1 shows motor wiring that was abraded by the constant vibration of the motor, resulting in a short. If the motor wiring bends around sharp corners, protect the wires using vinyl tubing or by wire-tying the wires away from the sharp edges. Thanks to John Diamantis, CE at WBQB(FM) in Fredericksburg, Va., for sharing this tip with us.

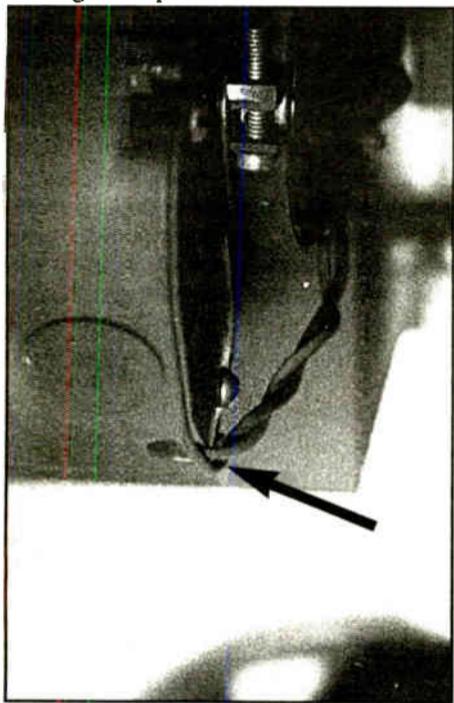


Figure 1. Sharp corners and motor vibrations do not mix when combined with motor wiring. Arrow shows a potential failure spot, unless the wires are protected with vinyl sleeving or electrical tape.

★ ★ ★

You can find good uses for existing cart machines. Joe Davis, former CE at WETA(FM) in Washington, D.C., designed a schematic that presses a Stereo ITC Premium machine into "beeper" service. The circuit ties into the transmitter site generator. When the generator turns on, the circuit takes a POTS line off hook and fires the ITC. The relay also switches between the left and right channel. Joe recorded a cart with touchtones that dialed his beeper, then entered a code to indicate the generator had switched on.

The touchtone stream for the generator "on" indication was recorded on the right channel of the ITC. A similar sequence of touchtones to dial Joe's pager was recorded on the left channel but included a different two-digit code to indicate normal transfer back to the power company.

Contact me if you want a copy of

Joe's schematic, and let me know if you have found other uses for your cart machines. We will share them with your fellow engineers.

★ ★ ★

Scott Christensen writes with a tip for owners of CCA FM20K transmitters. Scott experienced a bad tube socket, tracing his problem to arced mica insulators on the PA socket. The arc shorted a grid, and although the voltage supplies appeared correct, the tube just would not put out any power. Scott Christensen can be reached in Minnesota at (612) 481-9333.

★ ★ ★

A warning from some Internet friends about a telephone scam that involves a message on your answering machine asking you to call a number with an 809 area code. Sometimes the scam artist tells you they have important information regarding a family member who has taken ill, others may offer you a prize, or simply ask for information.

If you call, you may get a long recorded message or perhaps a real live human speaking broken English. The idea is to keep you on the line as long as possible. When your phone bill arrives, it includes a \$100 charge.

Crooks are using 809 numbers as "pay-per-calls" and to get around U.S. regulations and 900 call blocking. They receive a greatly inflated rebate from the foreign telephone company for each call. Since the calls originate from the Caribbean, they are not bound by the U.S. 900 number regulations, which require a warning of the impending charges.

Neither your local phone company nor your long-distance carrier will want to get involved (after all, you did make the call). And trying to argue the billing matter with a foreign telephone company will try anyone's patience.

Thanks to Shelly Baines at CON/SYD for passing on the warning.

★ ★ ★

Harry Bingaman (KC3QH) runs a contract business in Northeast Pennsylvania. He reminds readers not to forget the tube when output power problems develop in an FM transmitter. A friend of his had a 20 kW Collins that would easily do 21 kW. His TPO was 19.5 kW, and had to change his final due to low emissions. Even with the power control (screen) maxed out, the transmitter would only put out 19.3 kW. He peaked and tweaked, all to no avail.

Harry joined his friend and they

both checked everything. Nothing appeared out of the ordinary. They called and asked for another tube. What a difference! TPO and maximum power was no problem, the screen current was low and the screen voltage was near factory spec.

If you cannot get maximum power from your rig, check into the accuracy of the plate current and plate voltage meters. Also the Bird wattmeter.

We recently investigated a case where a transmitter was severely under power. After the usual detective work we pieced together the following scenario.

After a lightning storm, the RF wattmeter read high. Instead of calling an engineer, a jock "trimmed" the output power meter after lowering the power to the licensed value. All of a sudden there were coverage complaints, which was when we were called in. As you can imagine, nothing looked right.

Comparing the IPA stages with the transmitter test data sheet was the first hint of what was wrong. Ignoring the transmitter power meter and Bird wattmeter, we raised the power control until the meters read normal. The wattmeter showed nearly 7 kW out of a 3 kW transmitter, which was highly unlikely. This might have been noticed had an engineer been first on the scene.

A check of the transmitter power meter trim pot disclosed the telltale flaking of red Glipt, a nail polish-like coating used to "lock" the trimpot setting at the factory. Replacing the wattmeter confirmed our suspicion, and after talking to the GM, the jock finally admitted his "engineering faux pas."

■ ■ ■

John Bisset, a district sales manager with Harris Corp., can be reached at (703) 323-8011. Printed submissions qualify for SBE recertification credit. Fax submissions to (703) 323-8044, or send them via e-mail to wrwbench@aol.com



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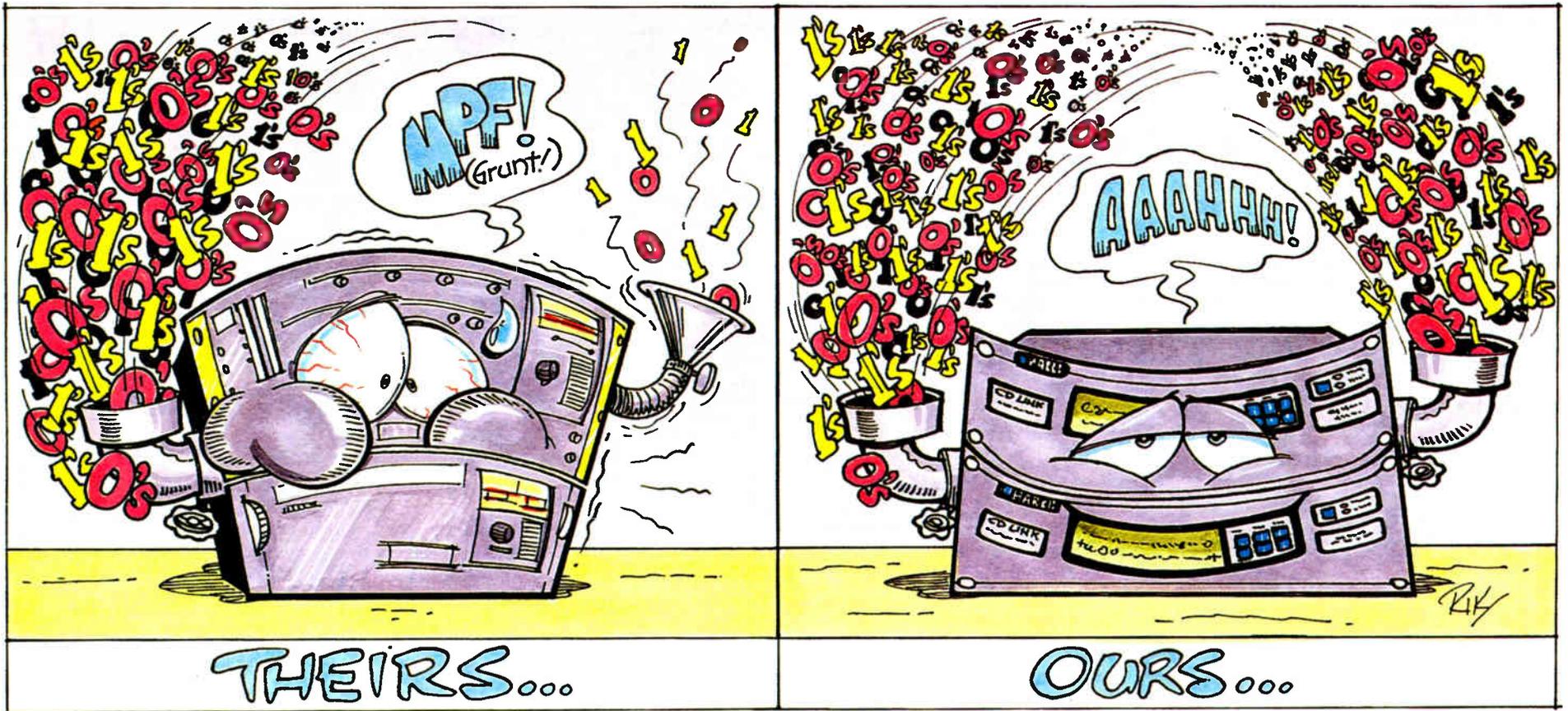

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A new world of broadcast solutions

Powerful System Documentation

Tom Vernon

This is the second of two parts. The first article appeared April 15.

Perhaps the most comprehensive program for documenting broadcast systems is VidCAD, from Video Design Pro. This program operates on a runtime version of AutoCAD that has been customized and simplified.

By automating the documentation process, VidCAD eliminates much of the repetitive typing and greatly reduces the time to complete drawings. The program automatically links the diagram and rack drawings to a database, placing information such as the equipment name, cable number, source, destination, cable type and connector type in a database. This linking takes about three seconds per record.

VidCAD also can use the database to print out patch panel designation strips and cable labels. The program enables users to create 3D views of rooms, complete with walkthrough animations. All of this automation saves time. VidCAD users claim reductions in design time of 80 to 90 percent.

The leading documentation programs all have loyal followers.

Followers of some of the CAD programs point out how quickly those programs can produce detailed diagrams

exactly the way they want. On the negative side, most CAD programs have a steep learning curve and tend to be expensive.

Visio Professional devotees will tell you how quickly you can get up to speed with the relatively inexpensive program.

A vast storehouse of technical templates also are available for Visio. On the other hand, some feel there is not as much flexibility with Visio drawings as there is with CAD drawings.

staff and contractor may have different ideas about how a system should be documented. A few contractors may think providing the client with a set of "as-built" drawings fulfills their obligations and is the last step in completing the job.

Just the beginning

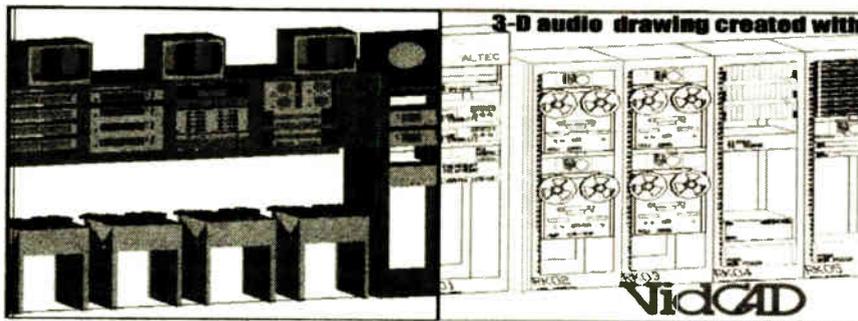
To station personnel, this documentation is the beginning of a system they will need to maintain. Being provided with a notebook full of papers

finished form before beginning construction. Few projects are built exactly as proposed, but it is usually much easier to go back and make a few corrections than to document a system that has been built.

Once a studio is constructed there is usually a lot of pressure to move on to the next project or catch up on the backlogged work. Too often the preliminary drawings get stuffed in a file folder and are forgotten until the studio requires major upgrades.

Be consistent with documentation standards. Symbols and abbreviations should be the same on all drawings. Things can get out of control easily if more than one person is doing the documentation on a project.

Make sure your drawings are clear, not mere shorthand. The creator of the drawings may or may not be around when the next upgrade happens. The drawings should be complete enough so that someone not familiar with the plant can understand what has been done.



Three-dimensional renderings of studio space are easily created with VidCAD. Courtesy CMBE, Inc.

The combination of lean engineering staffs and the need for frequent facility upgrades has led many stations to hire outside contractors or systems integrators to renovate facilities. This decision brings with it a different set of issues concerning documentation. In some cases, the station engineering

that soon will be obsolete is not satisfactory.

Engineering personnel must be clear with the contractor during negotiations about the meaning of "documentation." In increasing numbers, engineering staffs expect, and system integrators provide, some form of electronic documentation. This may take the form of information on a CD-ROM or Zip drive.

In some cases, the installer will set you up with a workstation complete with application software and your station data on a hard drive. At least one systems integrator offers ongoing maintenance of the documentation as an option to its clients.

While paper-based documentation is decreasing in importance, it is not without its place. For contractors, detailed drawings submitted with a proposal are a powerful selling tool and demonstrate to the client their attention to detail. When engineers are troubleshooting or upgrading, they also may want to have a hard copy of a part of the system to mark up as punch block wiring is changed or a new piece of equipment is installed in a rack.

Documentation is part of what systems integrators and contractors do for a living, so they have to be good at it. Here are some tips from the pros on how to lay out your next project.

The leading documentation programs all have loyal followers.

Be disciplined about documentation. Drawings need to be checked for accuracy when completed and regularly updated as the plant is modified.

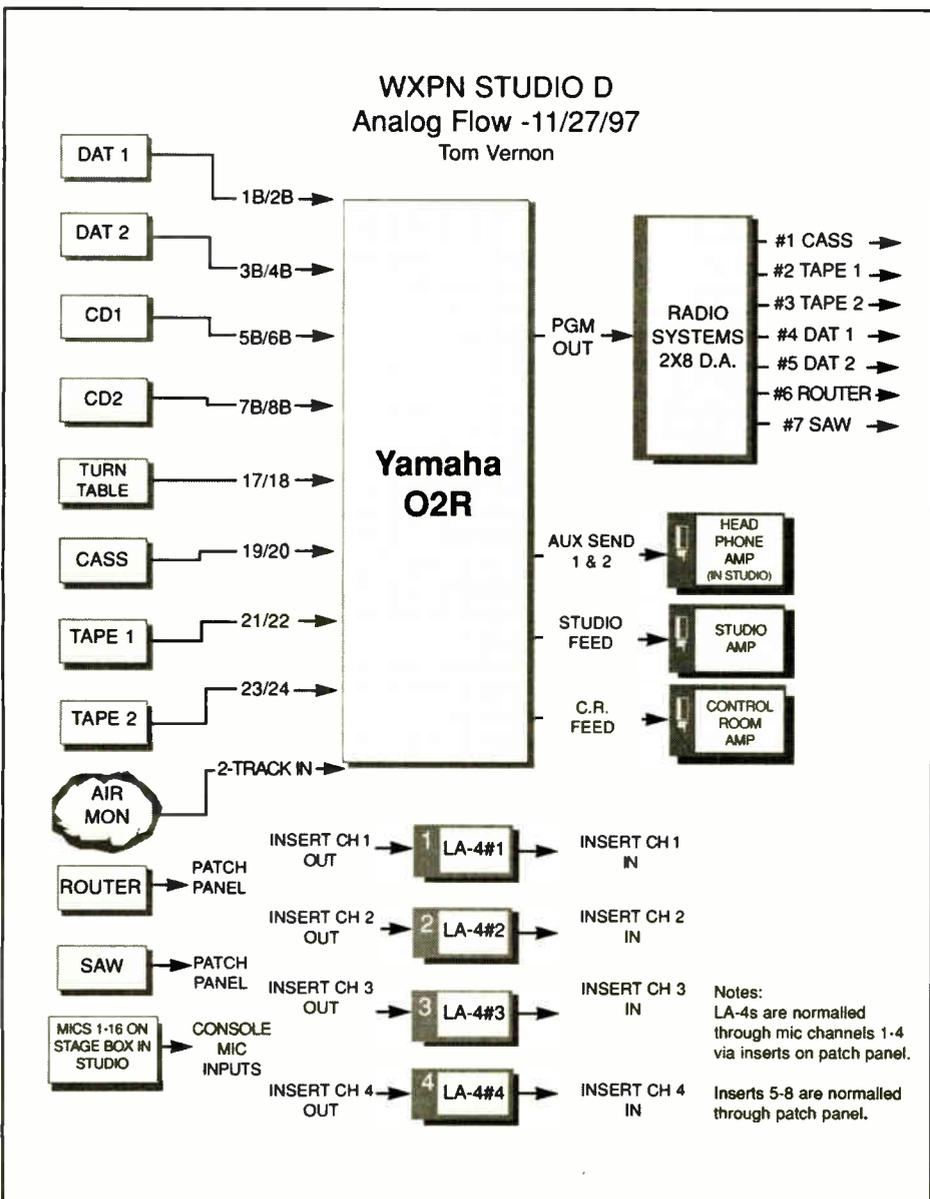
FileMaker Pro, Inspiration and Visio Professional are available through many popular software catalogues. PowerCADD is available through Mac Zone, via direct sales from Engineered Software or their dealers. VidCAD is available directly from Video Design Pro.

Special thanks to the following people for sharing information used in these articles: Dr. Walter Black, president of VidCAD Inc.; Chip Morgan, president, CMBE; John Wesley Nash, vice president of engineering, Communications Engineering Inc.; and Jim Pinkham of Multronics Inc.

Documentation Software

VidCAD
VDP Inc.
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Las Cruces, NM 88005
(800) 843-2236
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Try to get all the documentation in



Simple flow diagrams may be created with Inspiration, a program available for both Windows and Mac platforms. Technical difficulties prevented RW from printing detailed graphics for other programs mentioned in the first part of this article.

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The DAI-1 Dial-Up Audio Interface provides an array of features unparalleled in the industry. It combines an autocoder, a dial-out alarm, two AGCs, a DTMF operated equipment controller and an audio switcher into one affordably-priced device. Common applications are emergency broadcasts and "dial-up" remote broadcasts when the studios are unmanned.

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FEED LINE

Diplexing Into Existing Systems

W.C. Alexander

This is the 14th in a series of articles about constructing an expanded-band AM facility. The previous part appeared in RW May 13.

Although the information provided in this series of articles is targeted specifically at licensees and engineers constructing expanded-band facilities, it also applies to any new transmitter site construction or renovation.

For many AM station licensees holding expanded-band construction permits, diplexing into existing antenna systems makes more sense than purchasing land, obtaining FAA approval and zoning variances, and

low-pass/high-reject main filter is in series with the matching network, allowing the low-frequency RF to pass through to the antenna while sharply notching the high-frequency RF from



the other station. A high-pass/low-reject auxiliary filter routes any residual high-frequency RF to ground at the matching network output while pre-

senting a very high parallel impedance to the low-frequency RF.

On the high-frequency side of the diplexer, the RF passes through a matching network. A high-pass/low-reject main filter couples the high-frequency RF through to the antenna while notching out the low-frequency RF from the other station. A low-pass/high-reject auxiliary trap on the matching network output shunts any residual low-frequency RF from the other station while presenting a very high parallel impedance to the high-frequency RF.

In some diplexer designs, the aux-

iliary traps may not be needed. This is determined during the design process, when the design engineer determines whether the port-to-port isolation is adequate without auxiliary filters. When auxiliary filters are used, they tend to narrow the bandwidth on the side of the diplexer where they are used. This, along with the added cost, must be weighed against the additional isolation these filters provide.

Depending on the impedance of the antenna at the low and high carrier frequencies, we sometimes see pre-matching or pre-resonating components installed between the antenna and the main filter or from the antenna to ground. The purpose of these components is to lower reactances and present a more desirable impedance to the

See NEW, page 22 ▶

We diplexed a station into a three-tower array for \$30,000.

building a new tower from scratch. After all, these licensees are already operating a station in the regular band, and each station should have an antenna of sufficient length for use on the expanded-band frequencies.

Dollars and sense

Combined use of an existing site makes good economic sense in many cases. The cost of a combining system and the risks of having all of your eggs in one basket are often outweighed by the costs of developing and maintaining a new site.

The design, construction and tune-up process is fairly simple when the regular-band station antenna for diplexing is non-directional. If the antenna is directional, matters are somewhat complicated.

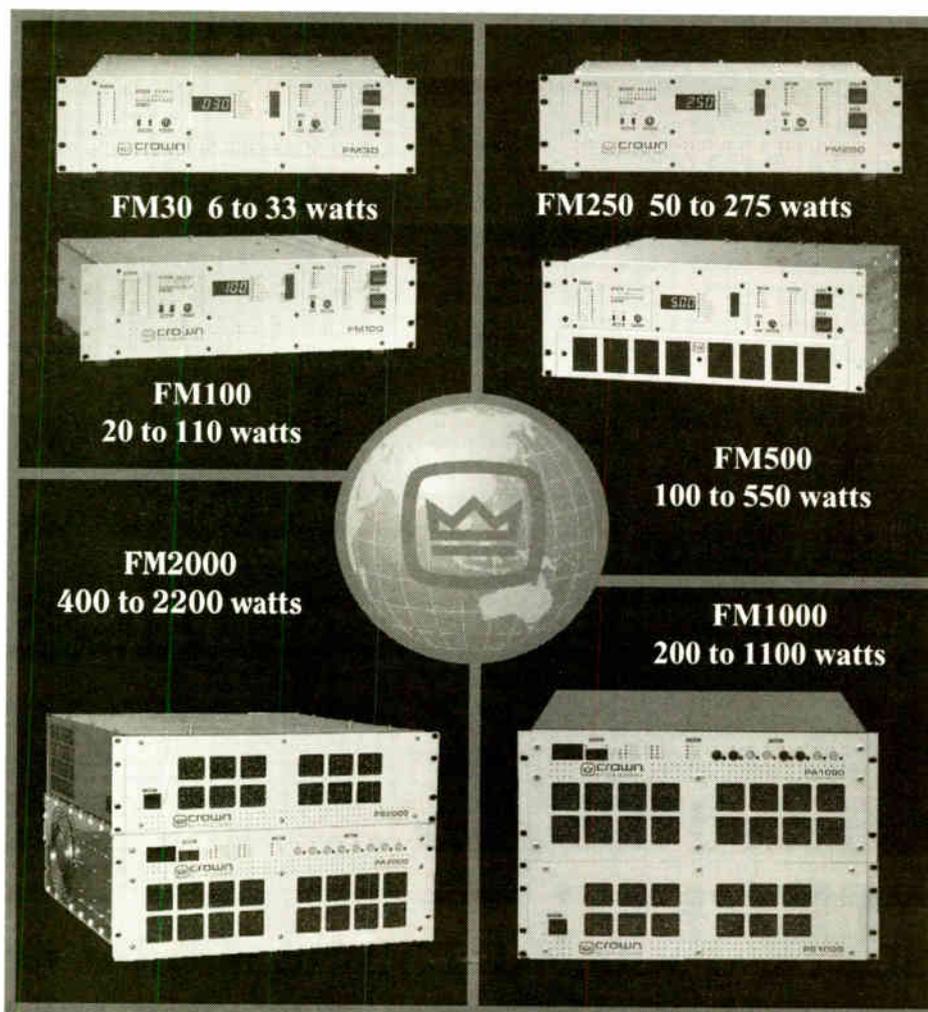
All the towers in the array except the driven element on the expanded-band frequency must be detuned. Also, traps must be installed at unused towers to prevent induced expanded-band RF from being coupled back into the transmitter.

Adding traps and a detuning apparatus at each of several towers runs up the cost of diplexing considerably, but this may not push the cost of site-sharing out of reach. We recently diplexed an expanded-band station into a three-tower 5 kW regular-band array for about \$30,000, which is much less than what it would have cost to purchase land, build a tower, put up a transmitter building and plow in a ground system. At our site, all these elements were already in place.

Let's begin by examining a typical diplexer scheme. Figure 1 is a schematic diagram of such a system.

Starting at the low-frequency transmitter input, the RF passes through a simple "tee" matching network. A

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ROOTS OF RADIO

Happy Birthday to Bob Hope

Bob Rusk

"Maybe there's something to this radio thing," Bob Hope said with a sly grin after a broadcast of "The Family Hour." The year was 1932 and the young comedian had just completed a guest spot on the Sunday morning variety show.

Hope was booked on the show to promote his stage engagement in New York at the Capitol Theatre, where "The

for his long-running "Original Amateur Hour," Hope did other guest spots, including a lucrative stint on crooner Rudy Vallee's program.

"That was the first time I appeared on the NBC network," Hope said. "I got \$750 a performance. I'd stuff the checks in my pocket and run! I had no idea that radio paid so well."

The next year, 1937, Hope signed a 26-week contract for "The Woodbury

voice and bulging eyes. One of the most popular bits on the show was Colonna's funny phone calls to Hope:

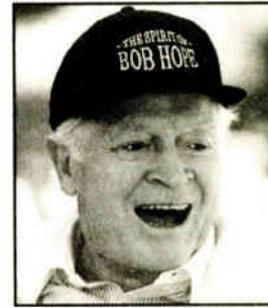
COLONNA: Hello, Hope? This is Colonna.

HOPE: Professor! Where are you?

COLONNA: I'm here in England building a bridge across the Atlantic.

HOPE: Nonsense, Professor. You can't build a bridge across the Atlantic.

COLONNA: I can't? (Pause) Okay, boys. Tear it down!!!



Bob Hope Today

imaginary Yehoodi. After a hilarious search, they concluded that Yehoodi was the little man who pushes up the next Kleenex tissue.

Hope had many other famous guests stop by his show. Among them was his best friend and co-star in the hugely popular "Road" movies, Bing Crosby. Hope and Crosby got big laughs when they teased each other on the air. Hope joked about Crosby's big ears, and Crosby took jabs at Hope's big nose, calling his buddy "good old trout snout."

"Bing and I met at the Friars Club in New York," Hope said. "That was several years before we starred in a movie

together. Bing was signed by Paramount before I was. When I arrived at the studio, we were already good friends.

"On the weekends, we enjoyed going down to Del Mar; that was the racetrack in California that Bing owned a piece of. Every Saturday night he put on a show down there. One Saturday both of us got up on stage and performed together. We sang, danced, told jokes, and were a big hit!"

See HOPE, page 23 ▶



Hope (left) and Bing Crosby

Family Hour" originated. Hope worked out a routine with plenty of jokes, but the laugh was on him. The host of the show, Major Edward J. Bowes, rearranged the script and took the punch lines, leaving a startled Hope to play the straight man.

"I got smart," Hope recently recalled in an interview with *RW*. "The next time I worked up a routine for the Major and me, I secretly prepared punch lines on top of punch lines, and ad-libbed a lot. We got great laughs, and the Major loved every minute of it."

Golden age

Hope, who turns 95 on May 29, went on to become one of the biggest stars in the Golden Age of radio. After appearing with the Major, who is best remembered

Soap Hour," appearing with Shep Fields & His Rippling Rhythm Orchestra on the New York-based program.

Hope quickly gained the attention of Hollywood and was invited to star in "The Big Broadcast of 1938" for Paramount Pictures. In that movie, Hope first sang "Thanks for the Memory," which soon would become his theme song.

The Pepsodent Company was the long-time sponsor of "Amos 'n' Andy," which had been declining in the ratings. Pepsodent was looking for another program on which to advertise its toothpaste. It picked "The Bob Hope Show," a new entry on NBC Radio. It became a huge Tuesday night hit, running for 12 years.

Hope's supporting cast included Jerry Colonna, the comedian with the bellowing

Like many radio stars of that time, Hope also enjoyed teasing his listeners with catch-phrases. His most popular was, "Who's Yehoodi?"

Hope and Crosby

On one broadcast, fellow NBC stars Basil Rathbone and Nigel Bruce appeared as Sherlock Holmes and Doctor Watson to assist Hope in finding his

Get Expanded Use From Existing Facility

▶ NEW, continued from page 21

filter and matching circuits. Voltages thus are lowered, reducing the component stresses and lowering costs.

In a typical situation where an expanded-band station is diplexed into an existing station's antenna, the existing station's antenna tuning

nents and connecting strap and tubing and ground, both within the filter cabinet and without, alters the impedance presented to the existing station's ATU.

Use care in constructing the filter cabinet and in the routing of the tubing. Generally speaking, when it comes to filter cabinets, bigger is

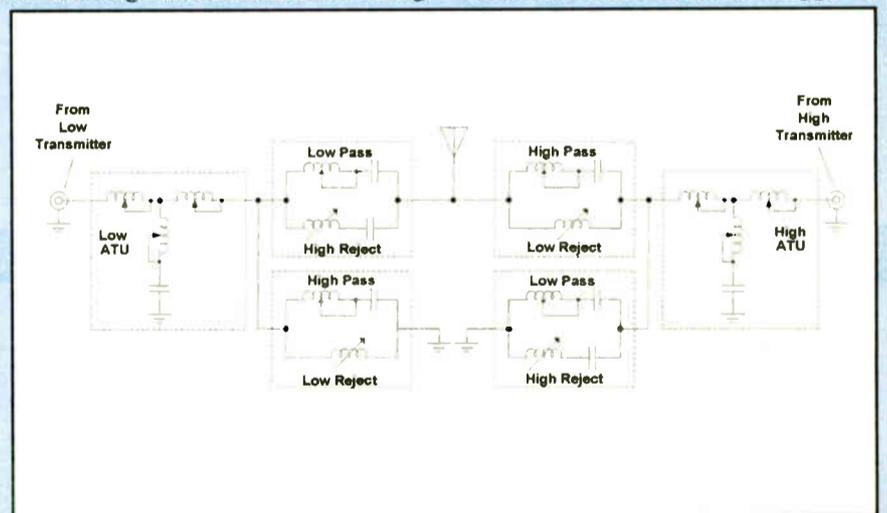


Figure 1: Typical Diplexer Schematic

unit would remain, thus cutting costs considerably. Only the main and auxiliary filters would be added on the low-frequency side. The input to the diplex filters from the low-frequency station would then be made via tubing, probably through bowl insulators. The existing tubing run from the ATU to the tower would be re-routed to the filter cabinet input, and the filter cabinet output would then be routed to the tower.

Distributed capacitance is the biggest enemy when adding a diplexer to an existing station. The capacitance between the compo-

unit would remain, thus cutting costs considerably. Only the main and auxiliary filters would be added on the low-frequency side. The input to the diplex filters from the low-frequency station would then be made via tubing, probably through bowl insulators. The existing tubing run from the ATU to the tower would be re-routed to the filter cabinet input, and the filter cabinet output would then be routed to the tower.

Cris Alexander is director of engineering for Crawford Broadcasting in Dallas. Contact him at (972) 445-1713 or via e-mail at cbceng@compuserve.com

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► HOPE, continued from page 22

Hope was an even bigger hit with servicemen and women. He was nicknamed "America's No. 1 Soldier in Greasepaint" when he took his radio show on the road to entertain the troops during World War II. Those remote broadcasts began in May 1941, when Hope did a show at March Field Army Air Force Base in California. He then entertained GIs stationed throughout Alaska and the Aleutian Islands, with a supporting cast that included Colonna and vocalist Frances Langford.

"We flew up, and it was almost a disaster," said Hope. "We had to make a forced landing in a storm, because the plane's radio went out. United Airlines had sent word we were coming and a general put some anti-aircraft lights in position. The pilot spotted one of them and brought the plane down safely. If it wasn't for that, I wouldn't be telling jokes today!"

During the war, Hope did his Pepsodent show from Army, Navy and Marine bases throughout the world. The biggest laughs came when he worked the name of the base into his monologue: "Well, here I am at Camp Hood in Texas. ... This is one of the biggest camps in America. I never saw so many soldiers. They got five buglers here just to wake up the buglers!"

"Boy, is this camp tremendous. ... To give you an idea how big Camp Hood is, it's the only camp in the world where a soldier can go AWOL for a month and still remain in camp. ... Some of the soldiers here took me for a ride in a tank. You know what a tank is? That's a jeep with hardening of the arteries.

"And these boys have to be experts at camouflage. They disguise themselves with leaves and branches until they look just like the bushes around here and nobody can tell where they are. It worked fine until one day the commanding officer happened to drive into Dallas and saw 2,000 tumbleweeds following a blonde down Main Street!"

Hope's first trip into a combat area was in 1943, when he and his small USO contingent visited U.S. military installations in England, Africa, Sicily and Iceland. When the war ended, Hope did not stop entertaining the troops. He continued to make frequent peacetime visits to military bases and hospitals.

A Christmas tradition began in 1948, when Hope traveled to Germany to entertain the troops involved in the Berlin Airlift. The tradition continued through the Vietnam conflict in the 1970s and Operation Desert Storm in 1990.

Thanks for the memory

Last year the U.S. Air Force honored Hope for bringing "cheer and moral support to men and women of the service for over 50 years," and unveiled the new C-17 Globemaster 3 aircraft, named "The Spirit of Bob Hope."

Not bad for a guy who started out as a tap-dancer in Cleveland. Hope, who was born in England in 1903, came to America when he was four. His father had accepted a job in the States as a stonemason. Hope's parents enrolled him in a tap-dancing class, and he was immediately bitten by the show business bug.

"Eventually I started doing comedy and played a lot of small theaters in Cleveland," Hope said. "That was quite an experience. If I had an early show at one theater, I'd book a late show at another theater. I had to make it across town by streetcar, but never missed connections."

By the late 1920s, the young Hope had joked and danced his way around the



Bob Hope

vaudeville circuit. When he finally made it to New York, the eager entertainer landed roles in Broadway shows such as "The Antics of 1931."

Shortly after that, Hope's radio career took off. He would soon sign with NBC. Between radio and TV, he remained with the Peacock network for an unprecedented 60 years.

Today Hope is taking life easy, making a few personal appearances and enjoying life

with his wife Dolores at their mountaintop mansion in Palm Springs. But Hope, ever quick with a one-liner, remains active in show business, overseeing the marketing of a line of merchandise that includes recordings of his World War II radio broadcasts.

Like the Energizer bunny, Bob Hope keeps on going and going — just not at the pace that earned him the nickname "Rapid Robert." At 95, Hope makes an occasional personal appearance and is still able to get in a couple of holes of his beloved golf each week.

Will he ever retire? "Never," the legendary star replied. "I'd rather wear out than rust out!"

■ ■ ■

Bob Rusk is a frequent contributor to RW.

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Skew Alignment of Tape Path

Jeff Johnson

This is the third part in a multipart primer on how to service your digital audio tape machines. The previous part appeared April 29.

We now take up the subject of DAT skew alignment.

The tape is guided past the head drum over rollers on the supply and the takeup sides of the drum. These are commonly called "post" rollers. The angle of the tracks across the width of the tape is the skew angle. It is a standardized angle. All machines must have the same skew angle to be compatible.

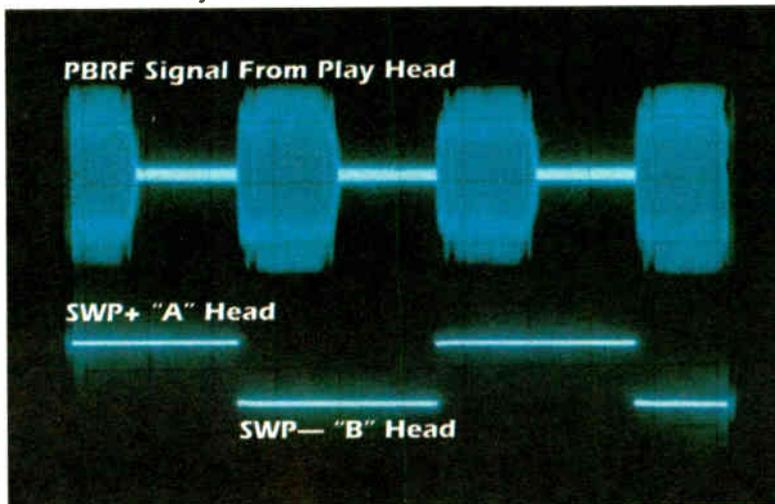
The post rollers can be adjusted up or down. Incorrect skew alignment is the major cause of tracking incompatibility from one machine to another.

Proper skew alignment requires a dual-trace scope and a test tape. The most affordable tape is the Sony TY-7252 for approximately \$150.

Affixing a scope to the machine requires a shop manual to find two test points. One is commonly called PBRF,

SWP is a square wave signal that switches between the two heads. The positive swing selects the A head and the negative swing selects the B head. Keep this in mind when troubleshooting.

Attach the scope Y1 trace to PBRF, and the Y2 trace to SWP. Trigger from the SWP signal. With 10x probes the scope settings should be Y1 = 20 mV, Y2 = 0.5 V, Sweep = 5 mS, Delayed Sweep = 0.2 mS.



Proper DAT Waveform on Dual-Trace Oscilloscope

for Play Back Radio Frequency. This is the amplified raw signal from the heads. The RF refers to the raw, undecoded digital data.

The other test point is commonly called SWP, for Switching Pulse. The

viewing the shape of the RF signals is your most important troubleshooting tool. Through this process you can display skew alignment trouble, tape dropouts, weak heads, missing head signals on record or playback, tracking fail-

ure, and the important phase relationship between the PBRF and SWP.

You know how many words a picture is worth. Becoming familiar with the look of the RF signal will allow you to troubleshoot your decks quickly.

The RF signal from each head should be essentially rectangular in overall waveform. Each waveform from the A head and the B head should be similar in amplitude. The headers will be delineated clearly from the digital data in the middle.

Either RF signal is sufficient for playback of the total decoded audio signal. Indeed, a machine with only one functional head will play perfectly well. Both heads must be functional on record, as the ATF compares the A and B RF signals on playback.

The test tape mentioned has only one RF signal present. The ATF cannot make its comparison, so tracking drifts. When the skew alignment is correct, the waveform raises and lowers evenly in amplitude at the leading and trailing edges. It "swims" in a sine wave manner when the skew alignment is incorrect.

Rotate the rollers

With the skew alignment correct and the ATF not functioning, the heads will "see" the tracks on the tape moving slowly past in a perfectly parallel manner. The resulting rectangular waveform will increase and decrease in amplitude evenly from beginning to end.

Becoming familiar with the look of the RF signal will allow you to troubleshoot your decks quickly.

Many machines will display a sag in the middle, but if each end rises and lowers together, the skew alignment, as stated, is correct.

If the skew alignment is incorrect, the heads will see the tracks passing by at an angle, causing the waveform to raise and lower in amplitude unevenly. The waveforms will appear to swim. It is reminiscent of a "lovely hula hands" motion. In fact, with the skew angle way off, the waveshape will form a bowtie figure.

Adjustment is accomplished by turning the post rollers, or screwing them up and down. Each of the two affects alignment. Turn one perhaps one-eighth of a turn and see if the waveform improves toward the goal of even rise and fall. Then turn the other. They are interdependent, and numerous iterations will be necessary.

With further consideration, the skew alignment can be correct, but the tape path can be altogether too high or too low. This condition will be seen in the scope trace with one end or the other of a full waveform truncated. In this case turn both one turn in the direction required and continue fine tuning.

To keep track of original or good settings, I mark half of the post roller screwheads with a black marker and keep notes of the original, interim and final settings. If a full turn is made (not likely), that is noted.

Jeff Johnson is network engineer at WVXU(FM) in Cincinnati and the eight-station WVXU Network. Send questions or suggestions to the author via e-mail to Jeff.Johnson@goodnews.net

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SBE NEWS

Don't Waste Youth on the Young!

Edward J. Miller, CPBE

The author is president of the Society of Broadcast Engineers. RW provides this regular space to SBE as a service to the industry.

Has the broadcast business been good to you? As a broadcast engineer or technician, you have the opportunities to expand your knowledge, acquire new skills and provide a needed service for which you get paid. Have you thought to yourself, "What a great business this is!"? Here we are on a daily basis, exposed to cutting-edge technology, exercising the freedom to design new facility support services and, at the same time, provide entertainment and public service to our listening and viewing audiences.

Have you considered how you got to where you are in your career? Did you receive support and encouragement from family and friends? Perhaps you are a self-motivating, self-taught individual. More likely than not, it was a combination of support, education and on-going camaraderie that contributed to your success.

Take a moment and look around at your fellow engineers and technicians. I suspect you too have noticed that none of us are getting any younger. We who toil in the technical broadcast field have done so for many years. While maturing with the business, we have not made any real attempt at replenishing our aging workforce with new, young broadcast engineers. Perhaps we are too busy, overworked or just not thinking about protecting the future of broadcast engineering. We need to begin a serious effort to improve this situation.

Lawyers generate new lawyers. Doctors generate new doctors. Clergy generate new clergy. What about us? Do we generate new broadcast engineers? I don't think we do a very good job of it. There are many schools teaching broadcast technique, but we are hard-pressed to single out schools that prepare the graduate for what is expected of a broadcast engineer. Expertise in broadcast engineering, in addition to a generous amount of book learning, is acquired by hands-on experience and sharing of one's knowledge with prospective candidates. If that's true, then the earlier we get started with this process of sharing, the better off we will be.

Board action

At the Society of Broadcast Engineers September 1997 Board meeting, a motion was introduced to develop a new way for encouraging younger people to select broadcast engineering as a career. At the most recent Board of Directors meeting during NAB '98, the concept of a youth membership classification was approved. It is the Society's hope that this youth membership category will create a flow of young people into the field of broadcast engineering. It will certainly encourage students involved with high school stations or amateur radio clubs to join a group of professionals who have dedicated their life career to broadcasting.

The youth membership classification will encourage participation in local SBE Chapter activities. Such activities should include an annual student night presentation of age-appropriate technical information and the opportunity to network with veteran broadcasters. The Society will publish a newsletter offering technical articles, college

and career information, scholarship awards programs (such as Ennes), stories about student-run stations and internship programs. The student member will be encouraged to access the SBE Web site for additional information. The Society of Broadcast Engineers is committed to establishing a path for attracting new talent to the broadcast engineering community.

As we retrace our beginnings in electronics and in broadcasting, we recall those individuals whose concern, dedication and support contributed substantially to the advancement of our career. Those of us truly fortunate may have had more than one person with whom we consulted. That

individual may have been a parent, your high school math teacher, a fellow worker or even your boss. It is not so important who, but rather the impact that person had on your life career, that is important.

Support through counsel, education, advising and sharing is really mentoring. Webster's definition of a mentor reads, "the loyal friend and wise advisor; teacher and guardian." How true it is!

My father was a significant influence and a great source of encouragement. Later on, a high school science teacher guided my interests in electronics. Now in my 38th year as a broadcast engineer, I still have a mentor. A corporate vice president

of engineering, only 10 years my senior, serves as my mentor and source of information and support. You are never too young or too old to mentor or be mentored.

Older engineers need to encourage and support the young to participate. The young engineer or prospective engineer needs to feel comfortable soliciting this support. All parties need to share their interest and desire for self-improvement. You are encouraged and are able to support this program because, as veteran engineers, you have a lot to offer. As a young engineer, you are encouraged because you have a lot to gain. Collectively, we have the obligation to share our knowledge and expertise with others, especially the young. Remember: Let's not waste youth on the young!

■ ■ ■

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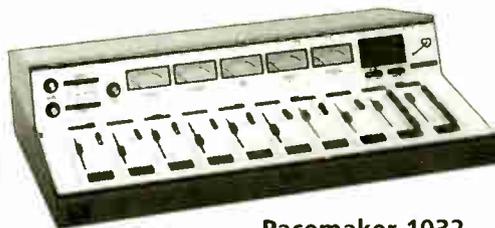
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Running Radio



RADIO
Mercury Awards

Page 31

Radio World

Resource for Business, Programming & Sales

May 27, 1998

Gay Radio Network Branches Out

Bob Rusk

"Guess who's gay?" Max Craig asked. To anyone who had listened to him for even a minute, the answer was obvious. "This network is gay and so am I!" he proudly proclaimed. So began another episode of "The Other Side," Craig's week-day talk show on the new Triangle Broadcasting Co. radio network.

Programming on the Triangle schedule includes "Good Morning, Gay America, with Blaine and Sue." Nicknamed B&S, the duo discuss news of the day, from the gay and lesbian perspective.



The Colorful Triangle Broadcasting Logo

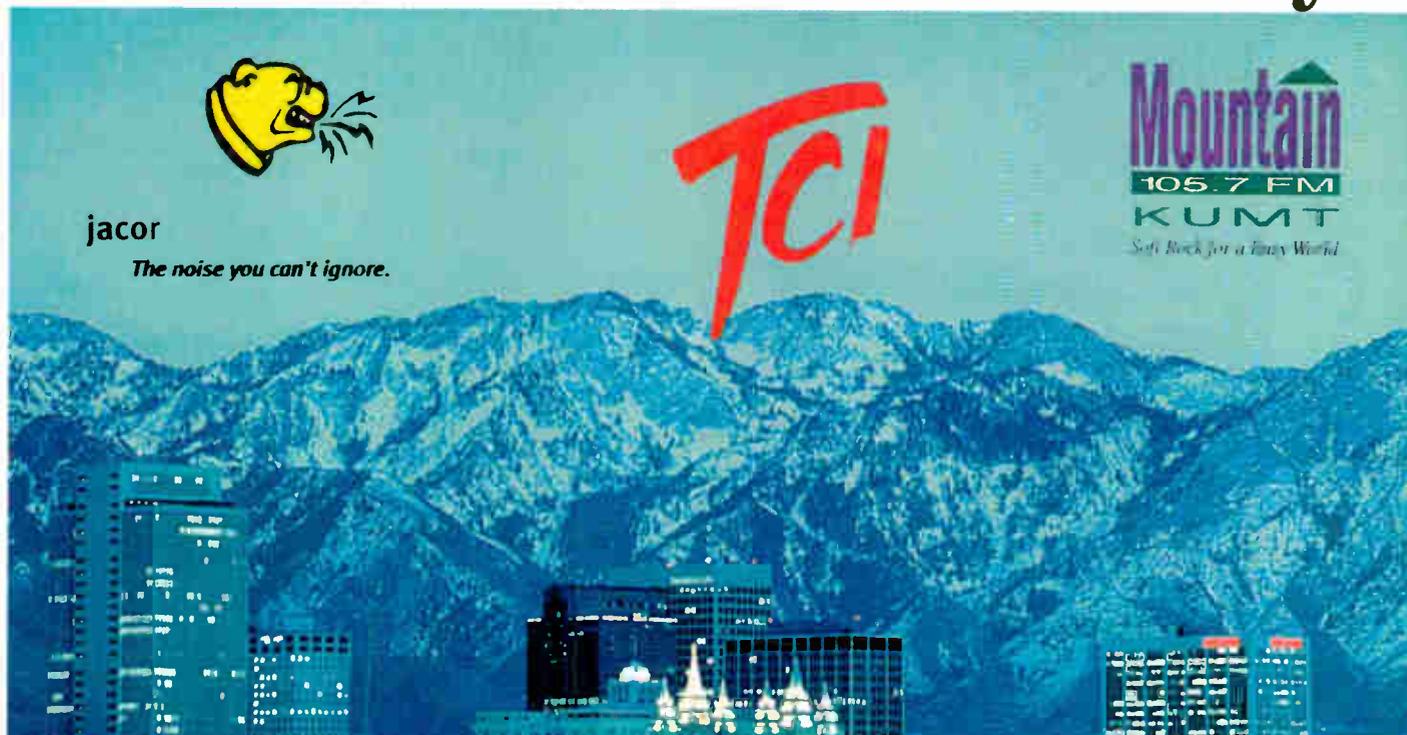
The lively John O'Neil is known as the "Queen of the Airwaves," who can switch from class to crass in a single breath. On a recent show, O'Neil, in his trademark effeminate tone, talked about seeing "these really hot guys" at the supermarket.

Triangle, which signed on last October, bills itself as "the first national broadcasting company that targets the interests of the gay and lesbian community." Triangle currently

See TRIANGLE, page 35 ▶

MARKET WATCH

Fortunes Rise in Salt Lake City



jacor

The noise you can't ignore.

Mountain
105.7 FM
KUMT
Soft Rock for a Busy World

Shan Fowler

There is a touch of sadness in Jim Facer's voice when he talks about the current state of the radio business along the Wasatch Front.

"It is not the same business," he said. "Radio has just changed so much between six years ago and today. A guy cannot own a radio station today because the price of admission has gone up so much. Now it's all big companies."

Half and half

And Facer should know. In February 1992, he founded KXRK(FM), X-96, acting as manager for the six years he

was with the station. Despite his hands-on management, he was only half-owner.

When Facer's partner, Jim MacNeil of United Concerts, decided he wanted to sell the station, MacNeil exercised a clause in his and Facer's ownership agreement which required one partner to either buy or sell his half to the other partner if that partner wanted out.

Facer made an offer to MacNeil; MacNeil declined and then made an offer to Facer that Facer was obliged to accept. Shortly thereafter the station was sold to the Utah-based

Tuning In to Radio World

Beginning with this issue, Radio World brings you the best writers and features from our sister publication, Tuned In. In this issue, we feature a Marketwatch story about the Salt Lake City radio market. Columnist Frank Montero provides his usual insights on finance and communications law. In future issues, you will enjoy similar tips and columns from other nationally known authors and industry experts.

These additions strengthen RW, and make this section of the paper an even stronger source of information for station managers, programmers and salespeople.

What are your thoughts about the *Running Radio* section? Send an e-mail to chamaker@maspub.com and let us know.

Simmons Radio Group.

Such is life in the booming radio business along the Wasatch Front, not

See UTAH, page 32 ▶

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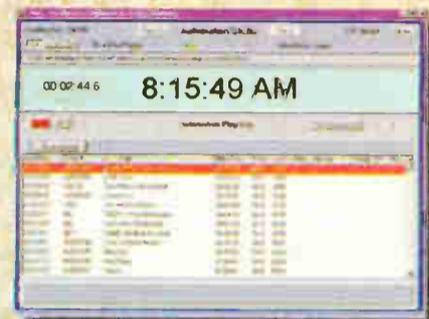
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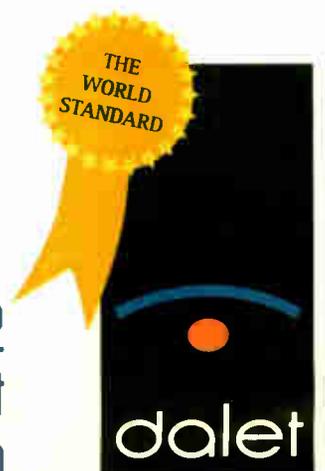
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PERSONALITY PROFILE

Keith Reinhard, Raised on Radio

Advertising Expert to Receive Lifetime Achievement Award; Reflects on Power of Radio

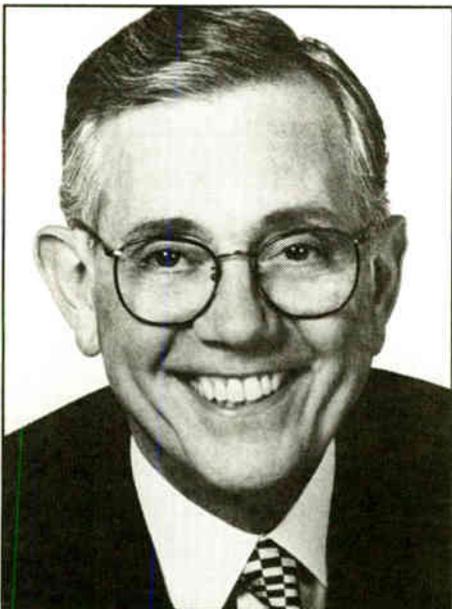
John Montone

Take a little old-fashioned hard work and determination, mix them with one of the most famous advertising concepts of the last 20 years and throw in a media-savvy outlook appropriate for the '90s. Then take a bow, as the accolades roll in.

Keith Reinhard, chairman and CEO of DDB Needham Worldwide Inc., will receive the Radio-Mercury Lifetime Achievement Award on June 4 in New York.

Reinhard grew up in a conservative Swiss Mennonite community where television was forbidden. Not so radio.

After school, Reinhard would tune into Jack Armstrong and "Terry and the Pirates." Gordon Hastings, president of the Radio-Mercury Awards, said, "Keith



Keith Reinhard

came up through the ranks."

But Reinhard told *RW* it took approximately 10 years just to break into the ranks.

Corporate ladder

In 1964, 10 years after high school, he was hired as the oldest beginning copywriter at Needham Louis and Brorby.

As we go forward we will be looking at reaching the consumer in a much more holistic way.

— Keith Reinhard

Gradually he worked his way up to copy group head, then head of the creative group. In 1980 he was named president of the company's Chicago agency. Through times of mergers and acquisitions, Reinhard has been a constant force in the company's fortunes.

Speaking from his Madison Avenue office, Reinhard talked about his earliest success.

He wrote State Farm Insurance commercials that ran on the NBC Radio Network. Radio greats Henry Morgan and Dave Garroway read his words.

Reinhard also did creative work for Pepsi, Mobil and Sony. But it was in

1970 that he wrote the spot for which he will always be remembered: "You deserve a break today," for McDonald's.

That spot, along with the total body of his work, "left an indelible mark on radio as an advertising medium," according to Hastings.

Reinhard is proof of the Ben Franklin adage that success is one percent inspiration and 99 percent perspiration.

"Nothing really pops into your head," Reinhard said. "Well, it pops," he said, reconsidering, "but only after a long, long time of investigation and getting facts and listening to a lot of consumers."

Reinhard recalled the cultural context of the McDonald's ad. "In 1970, housewives were still housewives, so what they were looking for was a break from meal planning. Kids were looking for a break from vegetables and table manners, and dads were looking for a break from high-priced restaurants. It all sort of added up."

True believer

The youngster who loved the after-school radio serials still believes in radio.

"(Radio) is the most visual of all the media," Reinhard said, adding that words and sounds broadcast on the radio create an immediate picture in the listener's mind. "On television there's a step in between," Reinhard said. "I have to cast people you will relate to and you will say, 'Yeah, that's sort of like me.'

"Radio used to do what television does, but when TV arrived, radio became much more vital in terms of being an immediate way to reach people. Then it became interactive with all the talk shows, and as we go forward we will be looking at reaching the consumer in a much more holistic way with every medium, including the new interactive technologies. ... So radio will be an important part of a larger orchestra."

It is an approach he calls "The Personal Media Network." Explaining the concept, Reinhard said, "We do not think in media-specific terms. The only network I care about is the trail of media behavior that you evidence in your own

personal life every day."

Reinhard said that trail can be tracked. "Let's say you get up in the morning and start your day with WQXR or Z-100. We can find out what you do next. You go to a newspaper, perhaps. Then we decide at which point along the path we can best appear in your vision or in your hearing. So radio is one of a series of points along the path we will use."

For example, he points out that if you put a McDonald's commercial on TV during the Super Bowl, "Who's going to get up in the fourth quarter and go to McDonald's? Nobody."

But when people hear another

McDonald's spot the next morning on the radio, they may decide they want an Egg McMuffin.

Reinhard has a recipe for success. "Talent, skill and determination, fire, passion. Talent is God-given," he said. "You either have a little or a lot.

"Skill you can acquire, but you can make up for almost anything with enough determination. I'm a great believer in the power of persistence, of pursuing a dream."

The winner of the second Lifetime Achievement Award noted that last year's award went to Paul Harvey. "I feel very unworthy, flattered and hon-



ored to be thought of in that company," Reinhard said.

John Montone is a radio reporter for 1010 WINS(AM), New York. Send him e-mail at jfmontone@worldnet.att.net

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Salt Lake's Crowded Radio Landscape

► UTAH, continued from page 27
 Unlike other radio markets. Where independently owned stations once were common, large corporations with deep pockets now exercise their visions of market dominance.

Attention

Salt Lake City-Ogden is one of the most crowded radio markets in the United States.

Indeed, for the past five years, this market, which will host the Winter Olympic Games in 2002, has grown financially at an average of 17 percent per year —

short years ago — more or less came out of thin air.

"I would say stations probably doubled, if not tripled, in value the minute the Telecom Act was signed into law," Facer said.

It is simple economics. Before 1996, even companies that wanted to expand were limited by ownership caps in each market. After the Telecom bill was signed, the supply of stations stayed the same, but the demand exploded as companies vied to increase their audience base through station acquisition.

itself by buying six stations and actively working to acquire the two more the company was allowed under the revised ownership rules.

Citadel, which already owned several stations, also acted fast in its acquisition efforts. Both companies say their goal is station (and audience) maximization in every market they enter.

Better value

"Our strategy is to be as dominant as possible," said Benedetti. "You reach more people, and that's more and more valuable. If you own six stations and you are looking to purchase two more, the value of those two stations is greater as part of the eight than they are on their own."

Hanson said. "How many stations that means is relative to the stations we own."

Market penetration also can be relative to how well a station's staff can generate revenue from sources other than radio advertisements — non-spot revenue, in other words.

Perhaps the biggest local non-spot revenue success story is Marketeer, a magazine started by Citadel and Cox TFI two years ago to reach a more targeted demographic. The publication is supposed to reach every business with two or more employees along the Wasatch Front, putting its circulation at roughly 27,000.

Diversity

Despite such market success, it is tough to ignore criticism that conglomeration leads to radio homogenization.

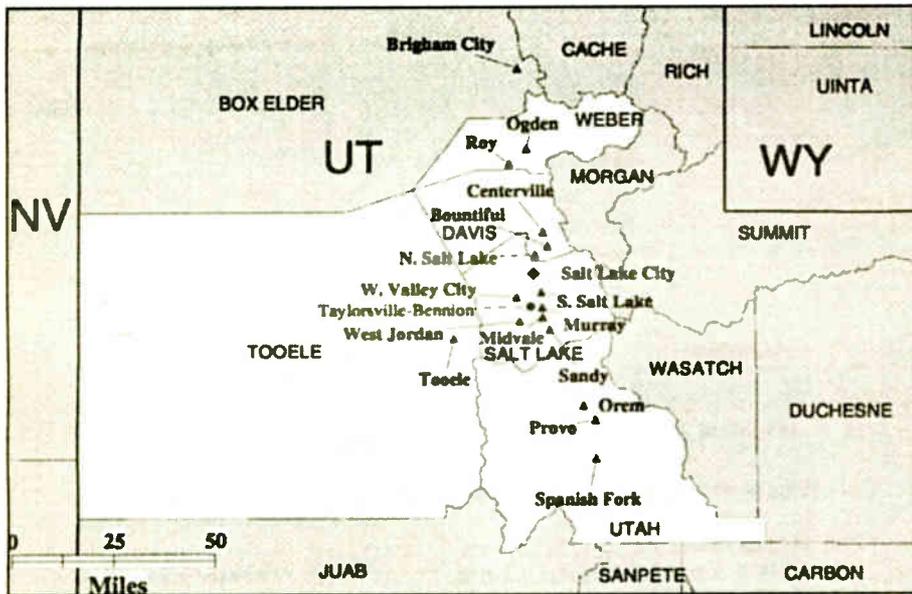
"I couldn't disagree with that argument more," Facer said. "The Telecom Act has brought on more deep-pocketed, sophisticated people who want to be successful, which means more niche marketing."

The niche marketing to which Facer referred is the proliferation of diversely formatted stations. Reedy offers Trumper's KSNU(FM), a "timeless classics" station, as an example. "A station like this could not survive on its own," he said. "But as part of Trumper, the costs can be spread out and the station can live."

In Salt Lake City, where corporate giants with deep pockets and visions of market dominance vie for position, living is the name of the game.

■ ■ ■

Shan Fowler is editor of The Event, a general interest magazine in Salt Lake City. This story appeared in different form in the May issue of Utah Business.



BIA Map: The Salt Lake City-Ogden Market

almost twice the national average, according to BIA Research. In 1993, total revenue in the market was \$31 million. By 1997 that number had almost doubled, to more than \$60 million.

Salt Lake City in the 1990s has been consistently among the top-10 growth markets in the nation, according to Miller Kaplan, a Los Angeles-based research group that tracks the radio industry in more than 100 markets.

"There is almost no question in my mind that this will be a \$100 million market by the time the Olympics arrive," said Pat Reedy, president of the Salt Lake Radio Broadcasters Association and vice president and general manager of Trumper Communications, Inc. TCI owns four stations in the market: KUMT(FM), KISN-FM, KOSY, KSNU.

Reedy's prediction is bold, but other members of SLRBA unanimously agree.

"It's a great time to be in the radio business in Utah," said Craig Hanson, chairman of Simmons Radio Group. Simmons owns six stations in the Salt Lake City market: KXRK(FM), KSFI(FM), KRSP-FM, KQMB(FM), KMGR(AM) and KDYL(AM).

Why all the activity, and where is the money coming from?

"I would say the Telecom (Act) is the single biggest thing that has ever happened to our industry," said Pete Benedetti of Citadel Communications, which owns six stations in Utah. "It's given companies the opportunity to operate more profitably."

Part of the money being poured into the Utah market — money which allows a station like X-96 to sell for more than 2,000 percent of its value six

Deregulation is not the only factor in the boom of the Salt Lake City market.

Reedy noted that radio industry growth almost mirrors growth in other segments of Utah business. Also, he said, the construction boom has increased the time that the average Utah resident spends in his or her car per day, increasing the amount of time he or she listens to the radio.

Perhaps it is simply a case of opportunity presenting itself. Jacor, which moved into the Salt Lake City market in January 1997, quickly established

Salt Lake City - Ogden Financial Snapshot

Market Rank: 35
 Revenue Rank: 33
 Number of FMs: 21
 Number of AMs: 22

Revenue 1994: \$43,400,000
 Revenue 1995: \$50,300,000
 Revenue 1996: \$57,700,000
 Revenue 1997: \$62,400,000
 Revenue 1998: \$67,100,000 est.

Revenue Growth:
 '91-'96: 12.1%
 '97-'01: 7.7%

Local Revenue: 80%
 National Revenue: 20%

1997 Population: 1,581,100
 Per Capita Income: \$13,057
 Median Income: \$35,249
 Avg. Household Income: \$41,748

Source: BIA Research

Salt Lake City - Ogden Radio Market Overview

Station	Freq.	Format	1997 Est. Rev. in \$ mil.	Owner	Arbitron 12+ Fall '97
KSFI(FM)	100.3	Soft AC	8.25	Simmons	7.6
KSL(AM)	1160	News/Talk	8.3	Bonneville Int'l	7.3
KBER(FM)	101.1	AOR	2.0	Citadel	5.4
KZHT(FM)	94.9	CHR/Dance	1.6	Jacor	5.3
KODJ(FM)	94.1	Oldies	4.0	Jacor	5.1
KALL(AM)	910	News/Talk/Sports	2.6	Jacor	4.7
KUBL(FM)	93.3	Country	3.0	Citadel	4.5
KXRK(FM)	96.3	Modern Rock	2.5	Simmons	4.4
KBEE-FM	98.7	AC	3.0	Citadel	4.8
KRSP-FM	103.5	'70s Oldies	4.2	Simmons	4.3
KSOP-FM	104.3	Country	3.0	KSOP	4.3
KISN-FM	97.1	Hot AC	4.3	Trumper	4.0
KENZ(FM)	107.5	Alternative	1.9	Citadel	3.9
KKAT(FM)	101.9	Country	3.5	Jacor	3.8
KDYL(AM)	1280	MOR	0.9	Simmons	3.4
KBZN(FM)	97.9	Smooth Jazz	1.4	John Webb	2.6
KFNZ(AM)	1320	Sports	1.0	Citadel	2.6
KURR(FM)	99.5	Rock	1.2	Jacor	2.4
KQMB(FM)	102.7	Alternative	0.85	Simmons	2.2
KUMT(FM)	105.7	AAA	1.5	Trumper	2.0

Stations are ranked in order of Arbitron Fall '97 12+ ratings. Copyright 1998 The Arbitron Company. May not be quoted or reproduced without the prior written permission of Arbitron. Other information provided by BIA Research through its MasterAccess Radio Analyzer Database software.



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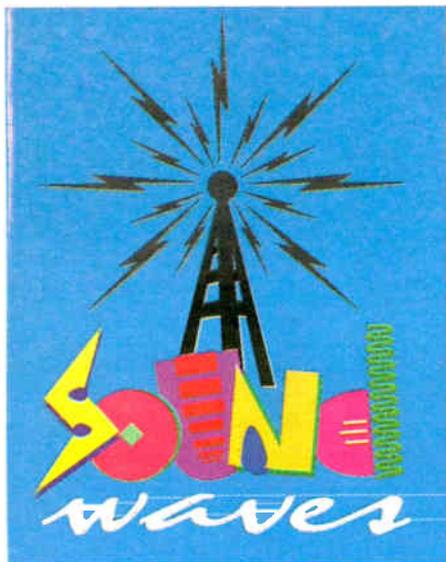
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World Radio History



Harris Joins PRI

Public Radio International has appointed Eleanor Harris to the position of senior vice president and director of marketing.



Eleanor Harris

Harris is slated to lead PRI's program marketing and sales activities, including services to an international roster of producers and more than 600 affiliated stations nationwide.

BE Adds Staff

Broadcast Electronics continues to



Blain Albright



Brian S. Eaves

grow. Blain Albright has joined the customer service integration team. He will be responsible for reviewing all assigned orders, handling pre-installation contacts with customers, managing the factory production of digital studio systems and overseeing in-house documentation of orders.

Brian S. Eaves is another new BE team member. Eaves joins the studio systems customer service department as a customer service engineer.

Roberts To Head BEDA

Philip H. Roberts, executive director of the New Jersey Broadcasters Association, has been elected president



Philip H. Roberts

of the Broadcast Executive Directors Association. BEDA serves as the trade association of all of the executive directors of state broadcast associations across the country, and including Alaska, Hawaii and Puerto Rico.

Roberts will serve a one-year term. He was elected president at the association's annual meeting in Washington, D.C.

Big Science Expands

There's some Big News at Big Science — Amy Garrison has joined the original music and sound design company as producer and director of sales.



Amy Garrison

Garrison is slated to lead the company's new business development efforts while continuing to produce the award-winning, sound design-driven public radio program "Everyday Science".

"Everyday Science" is going into its 4th season and is carried on over 100 stations nationwide.

Jones Promotes Duensing

Jones Radio Network has promoted Patti Duensing from her position as senior accountant to business manager.

Duensing's primary responsibilities include financial reporting, budgeting and general administrative oversight for the company.

SCBA Names Garber as President, Promotes Senior

The Southern California Broadcasters Association board of directors has appointed Mary Beth Garber to the position of president. Garber will serve as head of the organization following the departure of Gordon Mason June 30.

Carol Senior has been promoted to the post of executive director in charge of member services. Senior joined SCBA 11 years ago as vice president/marketing.

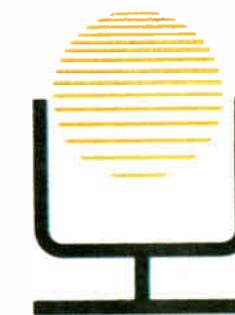
Crown Announces Key Appointments

Crown Audio has filled a pair of key positions with the appointment of Scott Robbins and Joe Wisler.

Robbins steps into his new position as director of domestic sales. Wisler is a new consultant/contractor liaison.

With the appointment of Robbins to sales, Mick Whelan will become vice president of product development, which encompasses marketing and engineering.

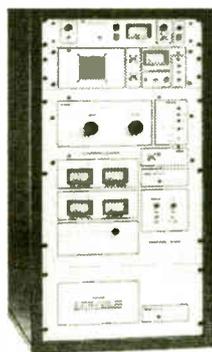
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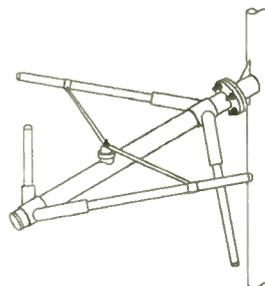
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Gay Network Seeks New Affiliates

► TRIANGLE, continued from page 27
 airs programming on the two stations it owns, KBRO(AM) and KNTB(AM) in the Seattle market.

Positive feedback

The format is a hit with a local chapter of PFLAG (Parents, Families and Friends of Lesbians and Gays), a national support organization. "We are happy to have a station that discusses gay, lesbian and transgendered issues in this area," said Carol Balasa, co-chair of PFLAG in Bellevue, Wash.

"Triangle Broadcasting unites our communities nationwide. In this area, it is a voice to counter the shrill nastiness of the extreme political-religious groups that air on several stations," Balasa said. "The witty and often camp dialog would appeal to 'straights' who just want to be entertained. For PFLAG, we hope this medium will serve as another means of dispelling stereotypes and fears."

Triangle programming is expected to begin airing this spring in San Francisco on KEST(AM), following the purchase of the station by the Multi-Cultural Broadcasting group. Triangle is negotiating to buy several hours of time each weeknight on KEST, which airs brokered programming.

Triangle, which takes its name from the pink triangle that serves as a symbol of the gay and lesbian movement, is aggressively marketing the network to stations in other cities. "We're in heavy

currently does not air any commercials for major national advertisers, according to Tighe. The network does air spots for per-inquiry advertisers such as Colonial Penn Life Insurance Co. and local sponsors such

buy products" from companies that advertise directly to them. The study also found that 40 percent of gays and lesbians have a total household income between \$45,000 and \$100,000; about 20 percent of gays and lesbians live in a household with an income greater than \$100,000.

Tighe said Triangle, which offers programming 24 hours a day, has not run into any resistance to its gay and lesbian programming from potential advertisers or radio stations. "When we talk to people, it's business," said Tighe. "They can see the potential of what we are doing."

By the end of the year, Tighe hopes Triangle will be heard in 30 markets. Washington, Houston and Miami are among the cities being targeted. "Then we will be in a strong position with national advertisers," he said. "We will be the only venue for advertisers and stations that want to target the gay and lesbian audience."

Bob Rusk is a frequent contributor to RW.



The Triangle family (left to right).
 Back row: Carlos Tynes, Max Craig, Roger Asquith, Melinda Tremaglio, John O'Neil, Michael Andrunas, Sue Velky, Jeff McCloskey.
 Middle Row: Kellett Tighe, Richard Weiner, Paul Seidler.
 Front Row: Chris Weber, Vivienne Furlong, Lori Miller, Mimi Gold.

The network name and logo serve as symbols of the gay and lesbian movement.

"The contract has not been finalized, but we anticipate that it will be very shortly," said Jaime Arbona, a consultant to Multi-Cultural Broadcasting. Arbona is impressed with Triangle's "very sophisticated operation," and added that gays and lesbians in the Bay area "will find that issues central to them are better served on Triangle" than on other media outlets. "The San Francisco market is home to a huge gay and lesbian community," he said. "It has a number of newspapers and magazines but has no radio. There is an under-served market."

negotiations in Atlanta," said Kellett Tighe, Triangle vice president, who declined to mention call letters.

Triangle had been broadcasting two hours a day on brokered outlet WNWR(AM) in Philadelphia. Station manager Sam Speiser declined to discuss why the network was taken off WNWR. Triangle President Frank Olsen, who has been in the radio business for about 30 years, said, "It was a mutual decision" by the network and station. Olsen wants to negotiate for additional hours in an earlier time slot on WNWR, which is a 50 kW daytimer.

"With a two-hour time slot, I can't put a salesman out on the street," Olsen said. "I want six hours, so my salesman can make a living."

Ad sales

Triangle is a public company listed on NASDAQ (symbol: TBCS), but the network

as the Pioneer Square Hotel in Seattle.

Tighe said the network is negotiating with national accounts that advertise in the gay and lesbian print media. Companies that have run such print ads include Bank of America, Starbucks Coffee and Tower Records.

As a sales tool, Tighe uses figures from Simmons Market Research Bureau, which published a Gay and Lesbian Market Study in 1997. Among the findings: 88 percent of gays and lesbians will "go out of their way to

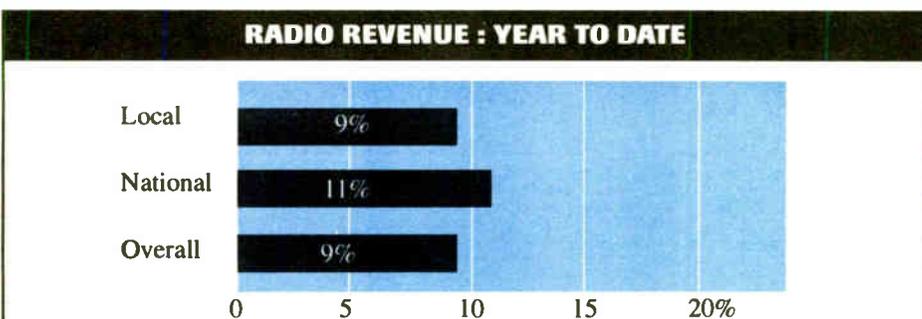
Technology at Triangle

Triangle Broadcasting, which programs talk shows during the day and the "Hot Tracks" dance music mix overnight, operates out of studios in Palm Springs, Calif.

Programming is fed via ISDN to satellite and uplinked on Satcom C5, Transponder 21, said director of engineering Gary A. Belzman.

A Wheatstone R-60 audio console is used in the main air studio, which also is equipped with Sennheiser microphones. For two programs that originate in New York and West Hollywood, Comrex frequency extenders are utilized. "That gives us a good 5 kHz bandwidth over telephone lines," said Belzman, who previously was a chief engineer for stations throughout southern California.

Triangle plans to have RealAudio samples of its programming on the network Web site: <http://www.trianglebroadcasting.com>



Strong Sales Keep on Rollin'

Revenue gains across all regions of the country propelled radio in March. As of the end of March, combined radio sales had jumped 9 percent over where they were at the same point last year.

The RAB reported that local revenue showed extraordinary growth during March, registering double-digit gains in all five measured regions of the country. The strong growth pushed up the year-to-date percentage of local revenue to 9 percent.

National revenue during March saw a respectable 6 percent increase in the East, but that figure was more than tripled in the Southeast, where revenue soared 21 percent.

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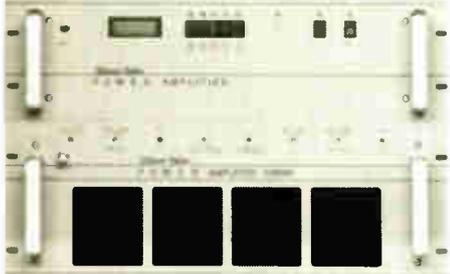
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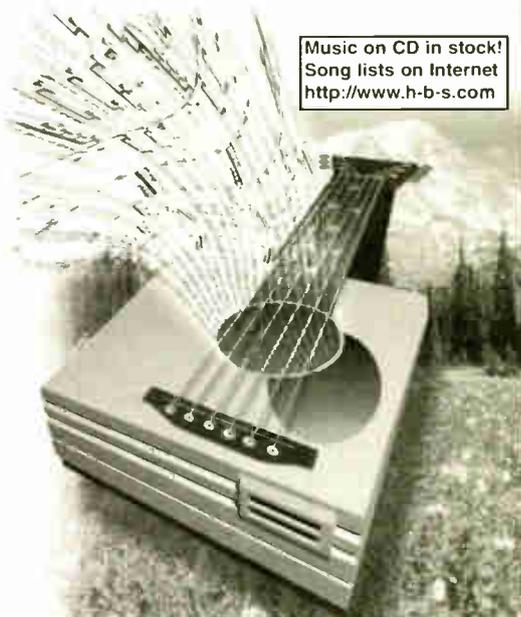
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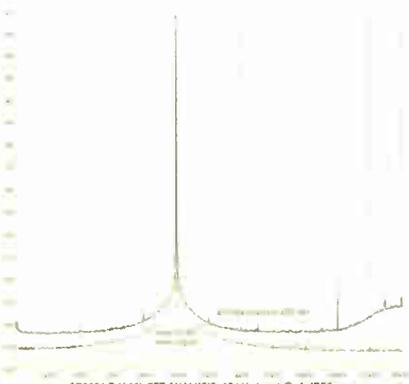
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THE BOTTOM LINE

Return of the Tax Certificate?

Frank Montero

The columnist is a partner with the Washington-based law firm Fisher Wayland Cooper Leader & Zaragoza L.L.P.

In recent months, the grapevine has been buzzing with talk of bringing back the FCC tax certificate. As you may recall, broadcasters and certain types of telecommunications companies, including those in the cable and wireless arenas, were given tax certificates that afforded them incentives if they sold their stations to qualified minorities.

The original policy was codified in Section 1071 of the Internal Revenue Code, which granted to the FCC the authority to issue such certificates to promote the public interest. Eventually, the FCC used that authority to adopt a policy of issuing certificates in order to encourage and assist minority ownership in the communications industry.

Keep the change

The way the tax certificate policy worked was relatively simple. If a broadcaster sold his or her station to a qualified minority-owned company, the seller could then apply to the FCC for a tax certificate. If the FCC certified the transaction as qualifying under the policy, the old owner could then use the certificate to defer any capital gains tax incurred as a result of the sale, provided the seller reinvested the proceeds within two years in a similar business.

The real benefit of a tax certificate was that it effectively enabled the qualified buyer

to bid less for a station than an unqualified bidder, while allowing the seller ultimately to walk away with more after-tax money.

Following several highly publicized transactions in 1994 involving the deferral of hundreds of millions of dollars worth of capital gains taxes, allegations emerged that the tax certificate policy was being mismanaged by the FCC and abused by large, non-minority owned enterprises that, critics claimed, were setting up minority-owned shell companies to qualify for tax certificates.

Adding to the criticism was the then-newly-elected Republican majority in Congress, which thought the policy was being abused. In the winter of 1995, the House Ways and Means Committee called for hearings on whether the policy was serving its intended purpose. Soon thereafter, Congress voted to repeal Section 1071 of the Internal Revenue Code and the FCC tax certificate policy disappeared.

Increasingly, industry analysts have begun to speculate over the possibility of reintroducing some form of tax certificate policy. Many point out that times have changed since 1995.

In the past three years there has been a softening in the relationship between the White House and Congress over budgetary issues. Moreover, the economy is strong and vibrant.

Recent years have also witnessed an alarming decline in the number of minority and small-business operators in the radio industry.

Last year the Commerce Department released its annual compilation of minority ownership in broadcasting. The results

showed that the percentage of minority-owned commercial broadcast stations had decreased to a mere 2.8 percent.

Many small, independent broadcasters have claimed that the FCC has been insensitive to their needs at a time of rapid market consolidation and deregulation. And let's not forget that there are four new FCC commissioners, three of whom, including the chairman, are ethnic minorities.

Hope for reinstatement

With these new dynamics in place, many of the original proponents of FCC tax certificates are hoping that the time is ripe to reconsider the policy. In fact, former NAB General Counsel Erwin Krasnow, who led a coalition to expand the tax certificate policy prior to its repeal, said, "The time has come for the broadcasting industry to lend its full support to legislation which reinstates a program that has been remarkably effective in helping minorities surmount the greatest obstacle to ownership, namely attracting the necessary capital." Many would say that the same applies to small-business radio broadcasters as well.

FCC Chairman William Kennard, who has expressed concern over the pace of consolidation in the radio industry, has suggested that he would support reintroduction of a tax certificate policy. In fact, it was Kennard who, as FCC general counsel, defended the FCC tax certificate policy in testimony before the House Ways and Means Committee.

The emperor's new certificate

How can a new tax certificate policy avoid the problems and alleged abuses associated with the original process? Many critics of the old tax certificate policy attack both the criteria that were used in determining eligibility for a certificate, as well as the lack of restrictions placed on the use of certificates by qualified recipients.

One consideration has been to change the criteria for eligibility from a race-

based standard to a financial standard, while narrowing the benefits associated with the certificate.

One of several proposals to reinstate the tax certificate would change the focus from minorities to qualified small businesses. This is not a new idea. In fact, shortly after the original tax certificate policy was repealed, Congressman Bob Matsui, D-Calif., reportedly promoted a draft bill that would have authorized deferral of capital gains tax on the sale of broadcast facilities to qualified small businesses.

Placing restrictions on the use of certificates also has been considered. For example, the original policy had no dollar limit. That is, any capital gains generated by a qualified transaction would be deferred regardless of the amount of the gain or the size of the transaction.

This potentially limitless deferral of capital gains tax liability under the original policy was a source of great criticism, especially when cable giants such as Viacom became involved in sheltered transactions worth hundreds of millions of dollars. One approach would be to limit the size of the transactions eligible for a tax certificate or limit the amount of the gain that could be sheltered.

No certainty

There is no certainty that the current fascination with tax certificates will lead to any real development. It may just be a passing fad. Still, it appears to be gathering momentum. Many believe that an incentive to encourage the growth of small businesses in the broadcasting industry is necessary — not so much to stem the tide of consolidation, but to provide small businesses a means to compete for available broadcast properties.

With station prices going ever higher in today's market, some believe small businesses — especially those that are minority owned — effectively are barred from entering or growing in the radio industry. Given the dramatic changes in the economy and at the FCC, the time may be right for change.

■ ■ ■

Reach Frank Montero at (202) 775-5662 or via e-mail at fmontero@fwclz.com

COLE'S LAW

Is It the End of the Road for EEO Rules?

Harry Cole

The FCC EEO rules, in place for some 30 years, went away in April at the hands of the U.S. Court of Appeals for the District of Columbia.

The court found the FCC rules unconstitutional. While the commission has not, as of this writing, formally stated what it plans to do in response to the court's decision, its options are limited and its prospects for success are bleak at best.

Black and white

The court's decision was issued in connection with an appeal filed by the Lutheran Church-Missouri Synod, which owns a couple of radio stations in Clayton, Mo. In 1989, the church's renewal applications had been the target of a petition to deny filed by the NAACP, which alleged that the church's EEO program was deficient and that the church had not hired enough blacks.

The matter escalated into a hearing. The FCC concluded in 1997 that the church hiring policies impermissibly

avored Lutherans or persons familiar with Lutheran doctrines, and did not adequately provide for recruitment of minorities. (The FCC also found that the church had engaged in a lack of candor on one point, but the court rejected the commission finding on that score.)

The church took the FCC to court, arguing, among other things, that the FCC EEO rules as a whole were unconstitutional. The argument, stripped to its nitty-gritty, said the EEO rules are a race-based governmental policy which, under the Supreme Court's 1995 Adarand decision, could be upheld only if that policy is absolutely essential to achievement of a compelling governmental interest.

The FCC responded by arguing that the EEO policies are essential to achieve "diversity" in broadcast programming, which the commission claimed was a compelling, or at least important, governmental interest sufficient to justify the rules.

The court disagreed. As the court saw it, the notion of "diversity" is just

See COURT, page 41 ►



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Jim Murphy, of 'Journey Into Jazz'

"Journey Into Jazz" does not cater to an exclusive audience. Many current

jazz programs narrow their audience by playing only contemporary jazz fusion, or focusing mostly on classic or mainstream jazz.



Each program hour of "Journey Into Jazz" is made up of roughly 11 sections, encompassing several different instruments, tempos and artists. The goal of the program is to expose listeners to the different sounds of jazz, old and new, in hopes of stimulating interest among those who do not consider themselves big jazz fans.

For information contact Jim Murphy in Baltimore at (410) 366-5118; or circle Reader Service 152.

Kids Find a Voice on Talk Radio

Motivational speaker and psychologist Dr. Alexandra Delis-Abrams is expanding the audience for talk radio

with her program, "Your Feelings Friend." The program targets children ages 9 through 15, focusing on their problems and issues.

"Your Feelings Friend" sets out to serve the needs of children, providing avenue on which they can voice their concerns and ask questions. Delis-Abrams is executive producer and host of the talk show. All issues and questions are raised by the children, and all



Dr. Alexandra Delis-Abrams and friend

"The Edge of Reality" has been picked up by about 75 stations.

For information from United Stations Radio Networks, contact Andy Denmark in New York at (212) 869-1111; or circle Reader Service 226.

Westwood One Announces Several Exclusive Broadcasts

Westwood One will kick off the summer with exclusive broadcasts of two important country music events in Nashville. The program provider also plans to release a series of live concert performances by R&B artists.

On June 15, Westwood One will simulcast the 32nd annual "TNN Music City News Country Awards" live from the Nashville Arena in Tennessee at 8 p.m. ET.

The "TNN Music City News Country Awards" is the only country awards show in which the fans cast the vote. Jeff Foxworthy, recipient of TNN's Comedian of the Year award for three consecutive years, will be hosting the awards show.

Westwood One's exclusive broadcast will mark the award show's broadcast debut on the radio. Nominees include Leann Rimes, Garth Brooks, Trisha Yearwood and Alan Jackson.

Westwood One also will have an exclusive broadcast of the annual "The New Faces of Country Music," taking place June 22 to 28.

"The New Faces of Country Music" features 10 of this year's hottest stars, including Matt King, the Lynns, Dixie Chicks, Lila McCann and Anita



Cochran, all of whom have visited Westwood One studios for interviews.

Some of the top R&B artists can be heard on the weekly 90-minute concert series "Superstars of R&B."

These live performances from Kool and the Gang, Smokey Robinson, Tina Turner and Luther Vandross among others are exclusive to Westwood One.

The new series will kick off May 11, with Aretha Franklin's 1981 performance at the Roxy in Hollywood.

For information from Westwood One, contact Peggy Panosh in New York at (212) 641-2052 or Sherry DeLeone at (212) 641-2057; or circle Reader Service 204.

Radio Makes Housecalls

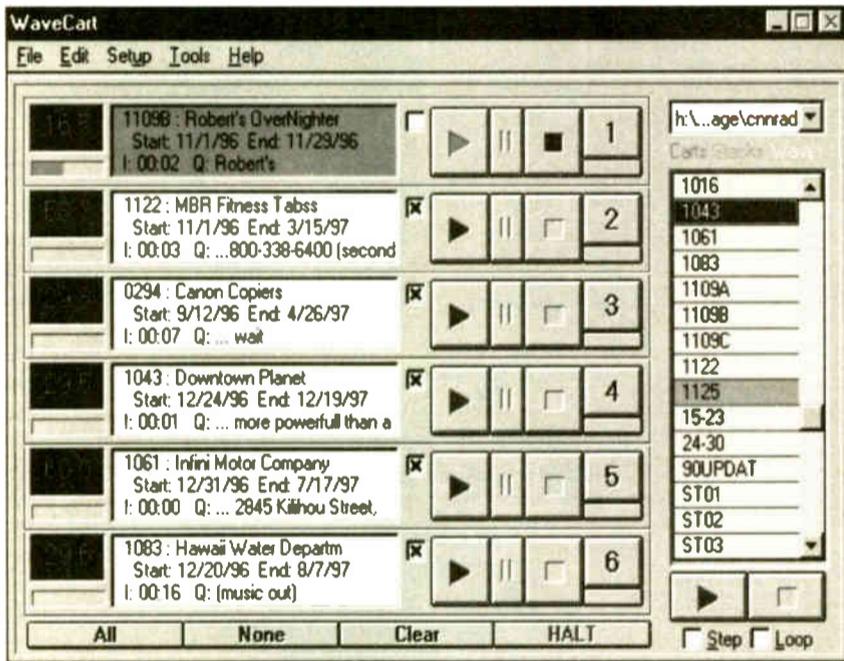
Dr. Bob Lanier will be making housecalls via radio with "60 Second Housecall."

The internationally syndicated television program has been adapted into a radio format, allowing listeners to soak up the latest trends and events in medical technology. The show also will feature daily medical tips from Dr. Lanier, who has been hosting the program for over thirteen years.

"60 Second Housecall" will make its radio debut on June 1, 1998.

For more information on the program contact Adele Broyles in Texas at (817) 731-9196; or circle Reader Service 72.

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are addressed by Delis-Abrams.

Although the target audience of this program is children, adults are encouraged to tune in. "I want to have adults as well as children tuned in, so they can hear what is going on inside their children," said Delis-Abrams.

"Your Feelings Friend" is available for immediate distribution from Abernat Broadcast Services. The program is set up to run for one hour, five days a week, after school.

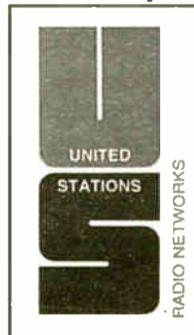
For information from Abernat Broadcast Services, contact Lowell Homburger in North Carolina at (704) 544-7615; or circle Reader Service 178.

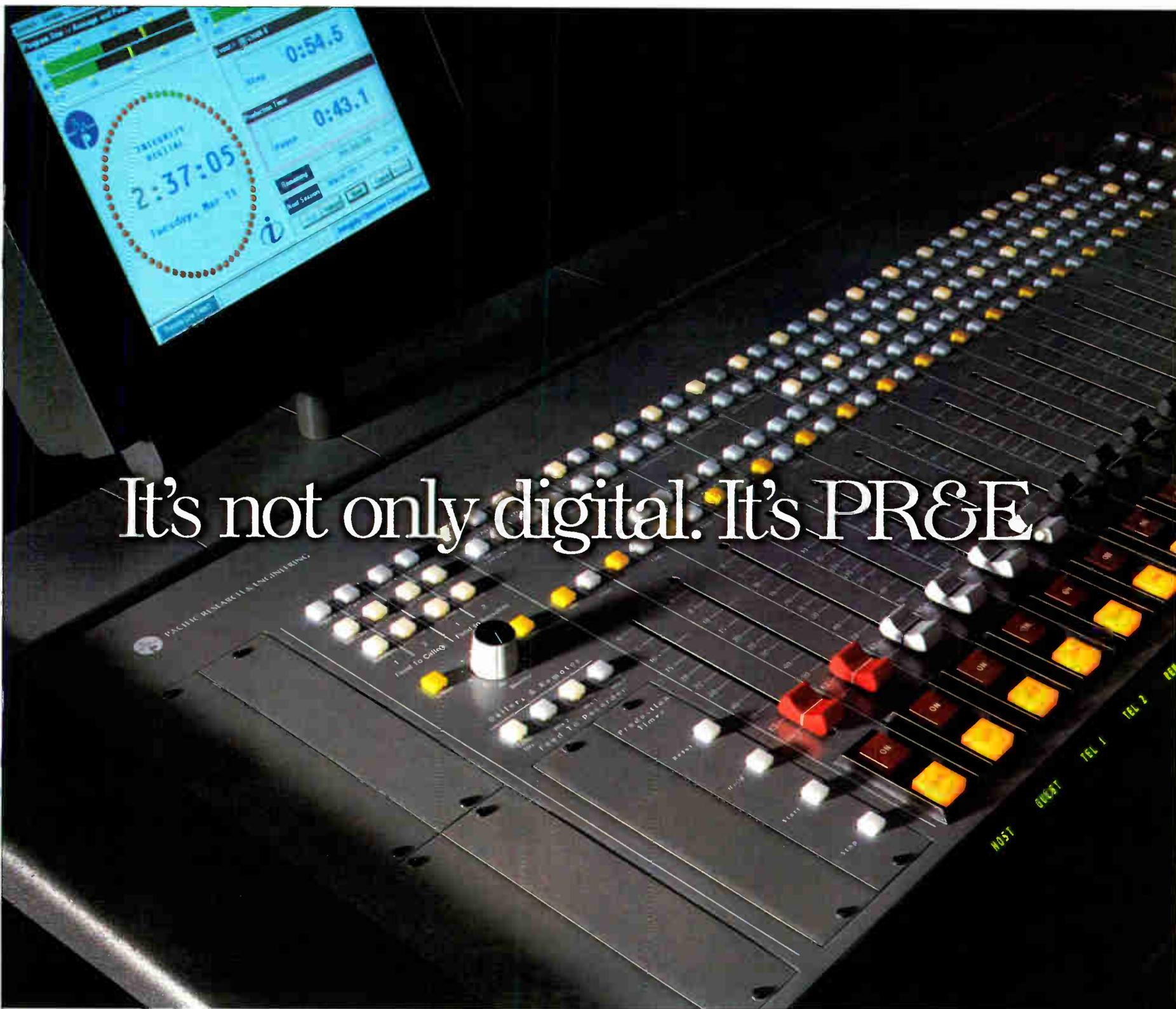
Science Fiction Enters Radio Realm

United Stations Talk Radio Network has opened up the airwaves to "The Edge of Reality," a three-hour program about unexplained phenomena ranging from UFOs and space travel to vampires and ghosts.

Past guests have included notable science fiction screen celebrities Leonard Nimoy and Mark Hamill, as well as witches and psychics.

United Stations President and CEO Nicholas Verbitsky said the program was adopted in response to the overall attraction that the American public has toward paranormal activities, particularly with the continued success of programs such as "The X Files."





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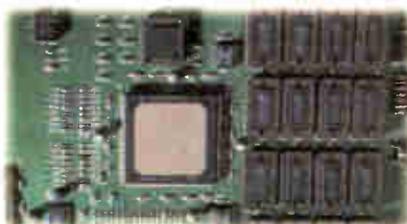
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PACIFIC RESEARCH & ENGINEERING

Circle (82) On Reader Service Card
World Radio History

CARL'S WEB

Imagine the Net Possibilities

Carl Lindemann

Recently, a certain radio personality was asked if his show was available on the Internet via RealAudio. "No," he said, "it's only available over real radio."

The laughs this gets show that it is still easy to sneer at Internet-only broadcasting. But who will have the last laugh?

"New media" gurus predict that such online communications will put radio, TV and newspapers out of business — eventually. For now, most "traditional" broadcasters see Internet broadcasting as a curious novelty. It may have a place as an adjunct to the airwaves and cable. But can it stand in its own right?

Low overhead

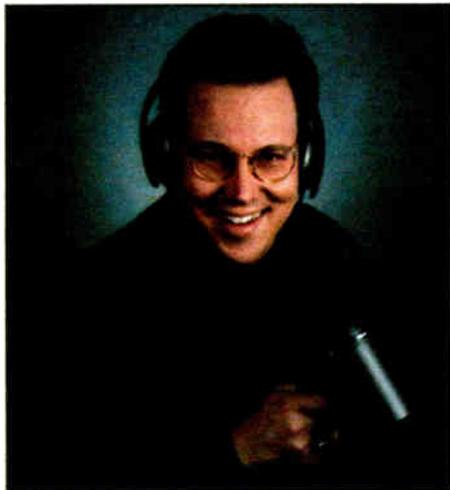
Imagine Radio (<http://www.imagine-radio.com>) is a start-up aiming to turn the prophetic vision into a profitable venture. It is an ambitious undertaking, akin to starting an entire network with a variety of different formats. The investment in programming its many "channels" is impressive, with much more content still to be tapped from parent company Imagine Media's several magazines.

The "stations" on Imagine are more like channels, providing specialized programming, such as a Led Zeppelin-only channel, and broader formats like jazz, country and talk.

They target specific tastes that might be too specific in any but the largest markets. But given a "metro area" of 60 million potential listeners online, narrow markets can get pretty wide. Imagine's approach could parallel the success achieved elsewhere by niche marketers, such as microbreweries in the beer business.

The investment in programming the many "channels" of Imagine is impres-

sive. But would it not be more profitable to develop such content for on-air rather than for online use only?



John Adams

"We're creating something new here," said John Adams, Imagine Radio program director. "Until it has been tried, it has yet to be proven one way or the other."

The potential for online profitability is helped by low overhead. "I have been able to set this up — 21 stations — for less than what it would cost to put together a single, live broadcast station. It is phenomenal what you can do with technology," Adams said.

Adams oversees a staff of programmers with impressive broadcast credentials. Kelly Crowe, executive producer for Imagine talk formats, comes out of programming powerhouse KGO(AM) in San Francisco.

Feedback

Imagine Radio's ability to serve a refined market is helped by the technology.

Broadcasting, as it is generally defined, is built around a point-to-multipoint architecture. A single source sends to many passive receivers.

Imagine Radio utilizes the Internet's point-to-point architecture to create a different relationship with listeners — and advertisers.

To appreciate the Imagine Radio concept, you have to understand the relationship listeners have with program content. Listeners always have had more options than just choosing between radio stations. Sometimes they tune out and opt for their own programming by putting on a CD. The Imagine Radio concept tries to create a hybrid that combines such "passive" and "active" approaches to programming.

Yes, the music formats are programmed. But the listeners have the opportunity to rate how much they like, or dislike, the selections. Such interaction customizes the format around the listener's individual taste.

"The more you interact with your channel, the more you will hear the music you like," said Adams. Of course, traditional broadcast stations do not have entirely fixed playlists either. But with Imagine, listeners hear their own preferred music, not that of innumerable others. That's the power of point-to-point media.

From an advertiser standpoint, this direct connection with the listener adds major value. Imagine Radio operates off the traditional broadcast revenue model: Create an audience, provide avails and sell them.

From an advertiser standpoint, this direct connection with the listener adds major value.

As yet, there is no standardized means to determine an online audience. Still, Adams said the Internet promises to deliver a more accurate audience assessment.

"There is something to be said about being able to verify an impression (on a Web site) versus whatever you want to call Arbitron. How verifiable are they, really?"

Purchase power

Being online also offers what Adams calls a "one click to buy" capability. "When you are driving in your car and hear an ad, you cannot really do anything about it. There are cell phones, and you can write the 800 number down, but that is nothing compared to what we can do to motivate you to look at your computer screen, click once, put in a credit card number and make a purchase."

Of course, you cannot tune into Imagine Radio in your car. Not yet, anyway. For now, Adams sees their biggest market as the workplace.

"The physics of radio has to contend with the cement and steel of buildings. Those are real limitations. The reality is that people are going to listen to Howard Stern on their local station on

the way to work. But if you want to keep listening in your office, you will click-in online," said Adams.

What about possible drawbacks? With radio, you have a standardized "interface." All broadcasters are sending to the same basic receivers.

To "click in" online, you first have to download a free "tuner." According to Peggy Miles, a member of the founding board of the International Webcasting Association, this presents a major challenge to creating a mass audience.

"It is a rather large program, and (that means) a long wait to get the software from their Internet site," she said. The download is 6.2 MB compressed.

Also, there is some debate as to whether these point-to-point systems can support the sizable audience needed to generate significant advertiser revenue.

Streaming limits

Audio streaming soaks up huge amounts of resources. Webcasters can find themselves swamped by only a few hun-



dred listeners. Tom Hale, Imagine Radio director of technology, understands the possible limits. "We built the system modularly so that when traffic rose to a certain level, we would be warned and could add another module."

Other methods for Webcasting sacrifice point-to-point architecture, which is the technical core of Imagine Radio's concept. While some might question whether any point-to-point communication system is really "broadcasting" (company literature states that the concept is more accurately described as "narrowcasting"), Hale questioned what counts as "mass media."

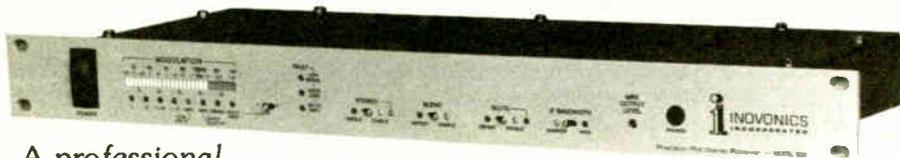
"How many viewers does local cable access have? Is that mass media? It certainly does not have the potential reach that Imagine Radio does," Hale said.

Imagine Radio is not the first outfit to test these waters. According to Miles, similar ambitious undertakings have already come and gone. Given the dynamics of the industry, what was not viable yesterday could work today. Or, perhaps, tomorrow.

It is too soon to judge Imagine Radio's timing. But the concept is sure to catch on eventually. Click in and see.

Carl Lindemann hosts "Cyberscene," a daily feature carried on public radio, and is the former production director for WCDQ(FM) and WSME(AM) in Maine. He can be reached at (207) 676-8525; e-mail carl@radioshow.net; or on the World Wide Web at www.cyberscene.com

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Court Strikes Down EEO Rules

► COURT, continued from page 37

too vague to support the rules. This is particularly so because, for example, the commission could not explain exactly why the racial and ethnic characteristics of low-level employees, whose hiring was subject to the EEO rules, would likely have any effect on program diversity.

Next step

Where do things go from here?

The commission has three options, none of them attractive. It could go back to the three-judge panel of the court and ask it to re-think its decision. Since the panel was unanimous in support of its first decision, which was strongly worded, the likelihood of success here essentially is zero.

Plan B would be for the commission to ask the entire 12-judge court of appeals, three of whom made up the panel which heard the case, to take a look at the decision. Such a re-hearing is rare, and could be obtained only if seven of the judges vote in favor of re-hearing the case. A quick, informal head count of the current members of the court indicates to us that the votes for this type of re-hearing are not there.

Plan C is to get the Supreme Court to hear the case. For the FCC, the trouble with that approach, according to some observers, is that the Supreme Court would be inclined to approve the lower court decision.

If the Supreme Court were to do so, it is at least possible that the decision would affect not only the FCC, but EEO policies at other federal regulatory agencies. In other words, the worst case scenario for EEO advocates before the Supreme Court would be not only having to live with the Court of Appeals decision, but possibly having the effects of that decision extended considerably.

Which leaves Plan D: Don't do anything, accept the decision and move on down the road. While the FCC might attempt to come up with some EEO rules that could survive constitutional review, the court's opinion makes it difficult to see how any such rules might be justified.

Supreme delay

These obviously are not attractive alternatives for EEO proponents.

We will have to wait and see what happens next. If the commission asks the Supreme Court to review the case, the court likely will not announce whether it will review the case until next fall.

What happens in the meantime?

The FCC has not, as of this writing, announced what broadcasters are supposed to do about EEO obligations in light of the court decision. But, as a practical matter, no FCC announcement is really necessary. The court ruled that the FCC broadcast EEO rules are unconstitutional. Unless the court stays the effectiveness of that ruling, which is unlikely, the rules are gone, pending some further contrary decision from either the Court of Appeals or the Supreme Court.

As a result, it seems to us that, as of April 14, 1998, broadcasters are no longer required to comply with the FCC EEO rules. Kiss 'em good-bye and color 'em gone.

Having offered that opinion, we hasten to emphasize what this

decision does *not* mean.

The FCC is not the only source of EEO rules. The EEOC, various state agencies and a variety of federal statutes prohibit employment discrimination on the basis of race, ethnicity and other such factors. In other words, it remains plainly unlawful to engage in discrimination.

In fact, the primary effect of the court ruling as we see it will *not* be to encourage rampant discrimination leading to the segregation of the airwaves, as a number of doom-and-gloomers have suggested. Rather, the primary effect simply will be to free broadcasters from a boatload of pointless pain-in-the-neck record-keeping obligations. After all, in enforcing its

own EEO rules, the FCC seldom, if ever, found that broadcasters had actually discriminated; instead, it tended to issue fines for failing to keep adequate records.

What now?

So for the time being, before you start filling out any FCC EEO forms, you should be sure to check with your counsel to get advice on whether you still really need to worry about FCC EEO rules.

Team Cole's Law tips its hat to the folks at Fisher Wayland Cooper Leader & Zaragoza, who represented the Lutheran Church, and in particular Kathy Schmeltzer, who tried the case, and Barry

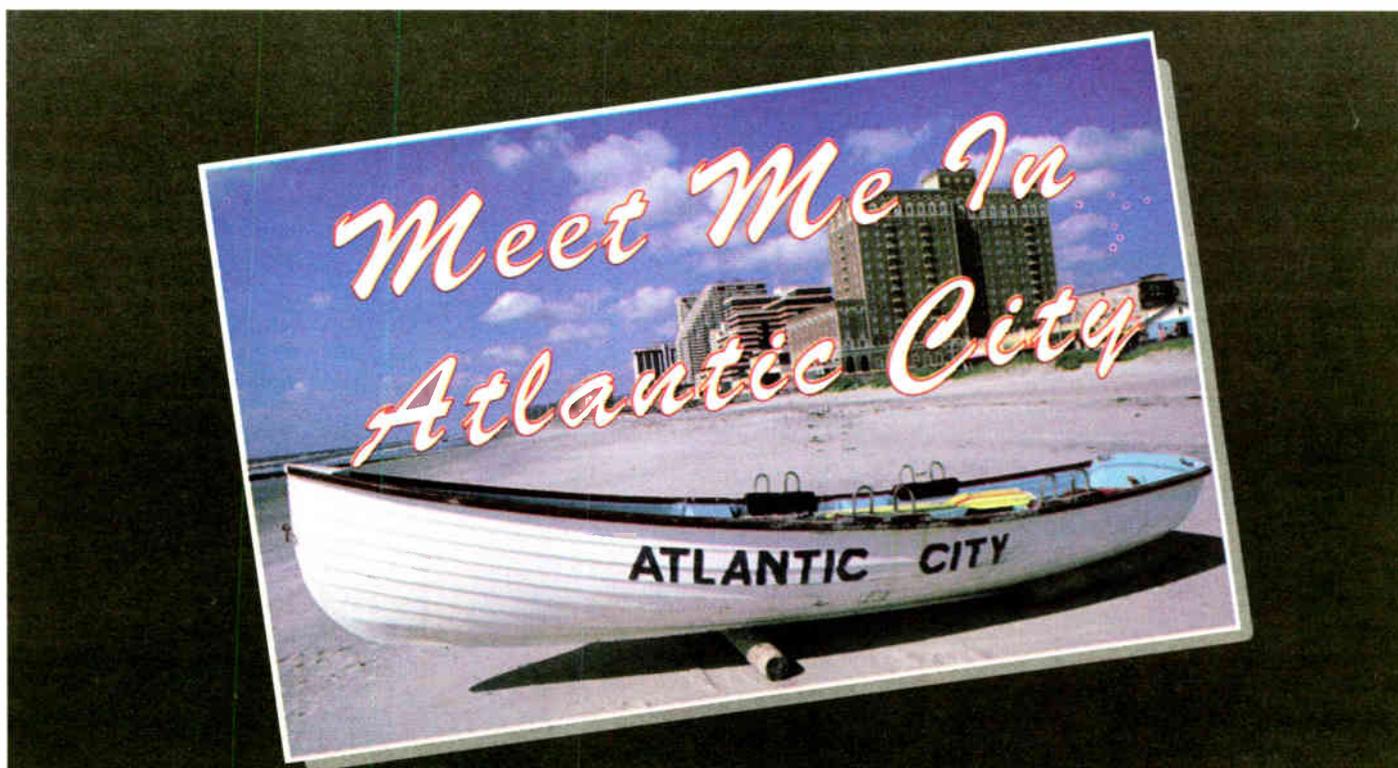
Gottfried, who argued it in the Court of Appeals. It is often difficult, both personally and professionally, to take on a sacred cow like EEO, and many law firms doubtless would not have touched this case with a 10-foot pole. Fisher, Wayland took it on and won.

By the way, we assume that the church (and who knows, maybe even Fisher, Wayland) drew encouragement from the *Cole's Law* columns which ran in mid-1995 and early 1997 noting the likely unconstitutionality of the FCC EEO rules.

■■■

Harry Cole is a principal in the Washington-based law firm of Bechtel & Cole, Chartered.

RW welcomes other points of view. Send e-mail to radioworld@imaspub.com or write to the address on page 5.



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May 27, 1998



**Plug Your PC
Into Your VCR
See Page 44**

PCs May Be Polluting Your Studio

Carl Lindemann

As stations trade up to newer and faster computers, specifications like processor speed, hard-drive capacity and memory usually are the focus. Many computers — especially if they come from “clone” manufacturers — tend to trim costs by skimping on less-obvious aspects: cases, power supplies, CPU fans and even motherboards.

This is because the market is incredibly competitive. The total savings from cutting corners may not add up to much beyond \$100, but that could constitute the entire profit margin. For most applications, this is not a problem. But when buying a computer bound for the radio studio, you must watch these details and expect to pay a bit extra to get it right.

Getting warm in here

Computers generate heat, noise and RF as they process data. In most environments, this is a minor concern. But in an on-air or production studio, stray RF and the high-speed whirl of noisy fans are problematic.

A station can spend thousands of dollars building a soundproof studio. Within the double-studded sealed walls and acoustic

foam surface treatment, a tremendous engineering effort and great expense went into quieting the HVAC system and sealing the openings around power outlets. Then, after all this care, PCs are placed inside the studio, negating most of the effort.

I have been in at least one state-of-the-art production studio that looked beautiful. But at the main microphone, the noise from computers was over 30 dB. When questioned about this, the production director shrugged and said, “It’s just white noise.”

Perhaps, but according to Doug Dodson, president of PC Power & Cooling Inc., “It’s noise, just the same.”

Dodson’s firm specializes in the design and manufacture of computer power supplies, cases and CPU fans that are quieter, both in terms of sound and RF. “Our equipment is popular anywhere the ambient noise needs to be under control, yet there is still the need to use computers,” he said.

These gains come on two fronts: fans in the power supply and on the CPU. According to Dodson, there are several key factors in generating, and reducing, this noise. Any such solution must be respectful of the reasons for the fans in the first place: to keep the electronics cool.

“Our ‘Silencer’ line takes the industry average for airflow and engineers around it to create the least possible noise while still generating that airflow,” said Dodson. As it turns out, the fan’s rpm figure is the defining factor in generating noise. The trick is to slow the fan without reducing airflow.

“You have to get the blade design right,” said Dodson. “They need to be pitched correctly so that they move air efficiently and make the best use of the rpm.”

Watch what is inside

He also pointed to another important element: the internal layout of the power supply. Placing a large component such as an electrolytic filter capacitor at the fan’s intake creates turbulence. “That can increase the noise level as much as 10 dB over designs without any obstruction,” Dodson said.

The advent of the 486 microprocessor opened up the digital audio market and also created a new application for PC Power & Cooling designs. These chips began channeling significant amounts of power, creating heat problems. Small fans mounted on or near the CPU became necessary to make practical these new hot-running processors.

See POLLUTE, page 46 ▶

SHORT TAKE

Audicy Now Networkable With PCs

When the original AKG DSE 7000 workstation landed in 1990, radio production took on a whole new look, sound and feel. The DSE’s successor — the Orban Audicy — turned one year old at NAB ’98 and turned a few heads with its latest software enhancement offering full networkability.



Orban Audicy Workstation

No longer a stand-alone editor, the Orban Audicy now can connect to, and communicate with, many popular network systems. File transfer and file interchange can take place between single or multiple Audicy workstation units and file server computers. The new Version 2.0 software also allows instant access to a range of remote resources such as personal computers, servers and storage systems, removable disk drives and CD-ROMs.

Users of the original DSE 7000 know well the routine of offloading a completed multitrack mix or single sound effect onto media such as reel, cart or DAT for archiving, storage and playback. The ability to network multiple Audicy units and integrate them within a station LAN (or even a WAN for transfer over great distances) allows a number of users to share productions and sound libraries.

This also means there is no longer an intermediate step to get a completed mix on the air. Finished production can be internally mixed, then routed over the network directly to the on-air servers for each station.

According to Orban, implementations for Novell server support are underway. Windows 95 and NT support exist now.

For information, contact Orban in California at (510) 351-3500 or circle **Reader Service 201**.

— Alan R. Peterson

PRODUCT EVALUATION

GX-440: One-Box Remote Solution

Paul Kaminski

Until the cost curves of POTS codecs, frequency extenders and plain dial-up connection equipment intersect, cost-conscious managers often will opt for simple dial-up remote broadcast equipment. These devices provide a dependable, no-brain audio link back to the radio station. Listeners generally are tolerant of a telephonic voice, even on FM.

The GX-440 telephone remote mixer was acquired by Marti from Telfax Communications last year and thus is sold under the Broadcast Electronics banner. (Marti is now a BE product line.) This \$1,295 unit is an investment for the short and long term — a one-box remote solution. The GX-440 combines a four-input mixer with a telephone interface and headphone connections in a single durable chassis and high-impact plastic carrying case.

Once around the panel

The mixer section allows four low-Z mics to be connected on XLR jacks, or two XLR mics and two line inputs on quarter-inch jacks. One of those inputs is switchable to a Cue channel, a feature valuable for accommodating a spotter, cueing up tapes or other audio, IFB or taking a

call on a second phone line. Much like the Cue button on a studio console, that switch keeps that input’s audio off the main mix.

inch jack and a DIN plug to feed an ISDN/POTS codec, frequency extender or other line-level input device.

There is tone/pulse dialing capability



Telfax GX-440, Now Under the Broadcast Electronics Banner

Color-coded pots and firm slide switches round out the top panel controls. A 10-segment LED bargraph VU meter displays audio level and when the built-in limiting circuit kicks in.

The GX-440 has telephone outputs available on two standard RJ-11 modular telephone jacks. You may use these to feed two lines or take calls on one while feeding another. Audio outputs are on both a quarter-

inch jack and a DIN plug to feed an ISDN/POTS codec, frequency extender or other line-level input device. There is tone/pulse dialing capability

on both lines; the keypad will send tones as long as you press the key. A 1 kHz tone generator is accessible via a DIP switch hidden under the front panel. A pair of hidden switches inside the unit perform other handy functions. One changes the Line Mix to a combination of Send and Receive audio, and the other switches the Send between mic and line level.

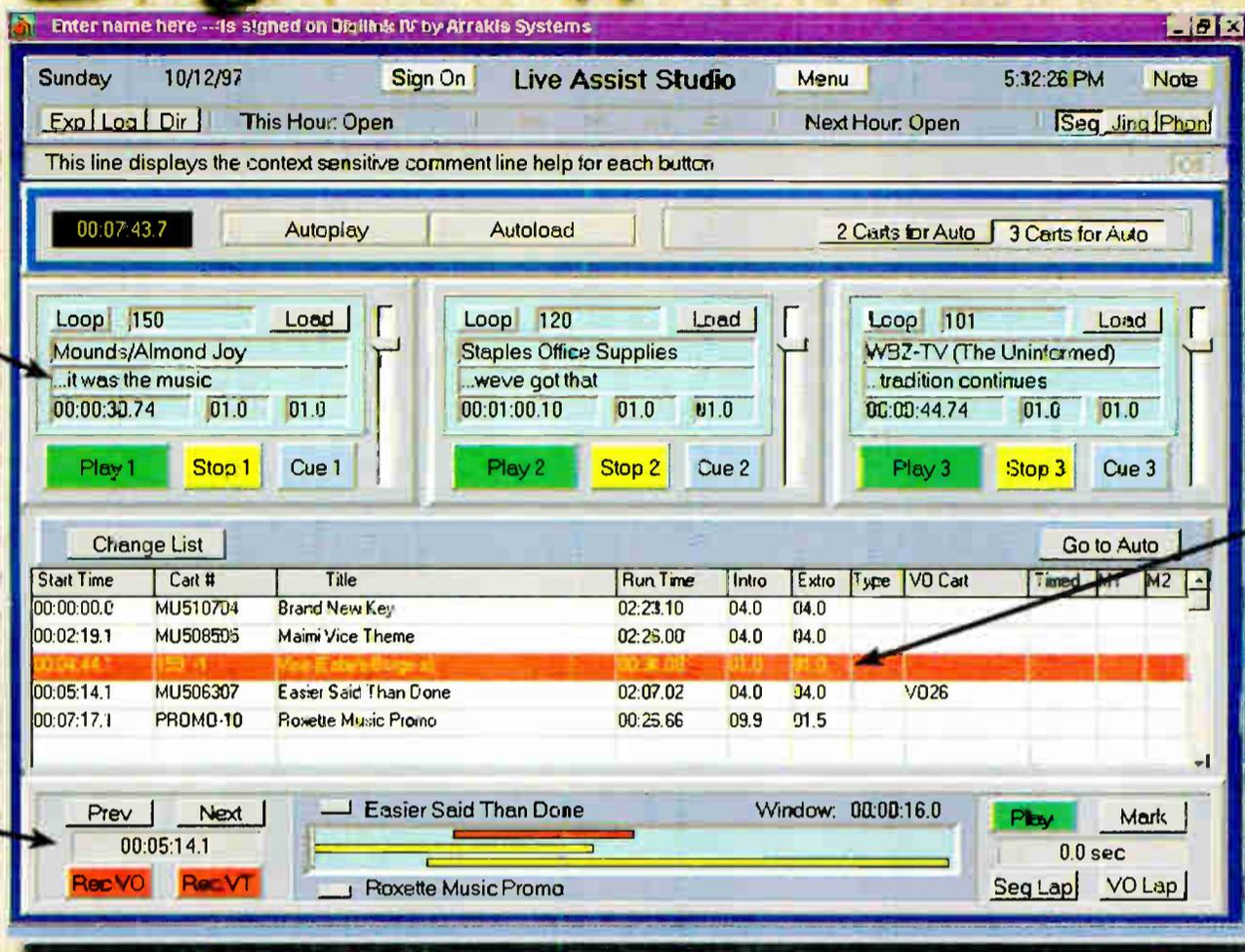
See REMOTE, page 49 ▶

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Back Up Computer With Your VCR

Read G. Burgan

When someone first mentioned a product that would back up a computer to a VHS cassette, I was intrigued by the thought: backing up a hard drive on a plain old \$2 videocassette. My 3.2 GB Traven TR-3 tape cartridges run close to \$30. That would be a \$28 savings.

Along came the Danmere Backer 32. The actual external unit is housed in a 4-by-7-inch black plastic box. Out of the box, a two-page sheet with the word "Important" fairly screamed at me, detailing a host of criteria that must be met for the unit to work.

That generally suggests a product that is difficult to install, or trying to do a task it was not designed for. The *readme* file contained a long list of potential problems, including conflicts with soundcards and SCSI controllers. I thought, "This is never going to work."

As it turned out, I was in for several pleasant surprises.

Off to the store

I tested the unit with a new General Electric VHS-HQ stereo VCR — about \$150 to \$200 at most discount stores — and a 13-inch White Westinghouse TV set. My test PC was a Pentium 166 with soundcard, SCSI controllers and two scanners, enough to provide plenty of potential hardware and software conflicts.

The Danmere Backer 32 external kit came with the necessary cables to connect the box to the parallel port and the VCR. Each VCR cable had tags noting the Backer I/O and VCR I/O. Too simple.

Once the unit was connected, the Backer 32 software was installed and the device driver manually loaded. Danmere Backer has software for Windows 3.1, 3.11 and 95 on supplied floppies.

Before doing any serious backing up, it was necessary to select a few MB of sample data and save it to the VCR. The drive was highlighted and the files I was to back up were saved as a template. The Backer software then indicated to start the VCR.

When finished, the Characterize command is run, which determines the rate of transfer and compression the computer can handle. The selected files must be typical of the ones to be backed up, as different file types will compress at different rates.

A word-processing file may have 2:1 compression or more, while a WAV will hardly compress at all. In backing up an entire drive, the estimate of the time needed to do so will be based on the original sample.

Because the VCR must be manually stopped and started, the computer cannot detect when or if the tape runs out. Should this happen during a transfer, the process must be repeated. The best way to deal with this problem is to err on the conservative side: a six-hour VHS cassette should only contain about five hours or so of data.

As the backup begins, the television screen — yes, I needed to monitor the process with a TV — will show a pattern of vertical bars as the header is written. As the files were transferred, a pattern of black and white dots resembling large snowflakes appeared on the

screen. When the backup was complete, the software instructed me to stop the VCR.

To my amazement, it worked fine. And restoring the files was equally easy: a comparative test found no problems.

Yes or no?

Should you use the Danmere Backer 32 to back up your computer? If economy is your goal, this might be the answer. The Danmere Backer 32 will back up to nearly any VCR or camcorder with an AV input/output. These include VHS, VHS-C and 8mm units.

In addition, the ubiquitous nature of the VCR is a plus. If yours breaks down, you probably have a second one in the den. The neighbor should have one. And for the next couple of years, at least, you should have little trouble finding one.

How much data can a VHS tape hold? Danmere says up to 3 GB is possible at Extended Play (EP) speed, but it depends on the type of files being

running out long before the backup is finished. One way to minimize the problem is to do the backup overnight when you are not tying up your computer on other tasks.

What's a TV doing here?

Another question relates to convenience: Do you normally keep a VCR and TV set next to your computer? If you have to purchase a TV and VCR for backup purposes, figure on \$150 for a VCR, another \$150 for a TV and \$89 for Backer. That is nearly \$400. For \$200 or less, a good parallel port tape backup drive will do the same job.

But if you are going to back up frequently, the difference in media cost soon will offset the difference. Twenty backup tapes can cost roughly \$600, while 20 VHS tapes will run about \$40. That is a savings of \$560. Then again, a dedicated tape backup device is controlled by the computer where Backer is not. A dedicated drive can fast-forward and rewind under computer control,



The Danmere Backer 32 turns your VCR into a tape drive.

backed up. Documents and similar files should compress enough to provide that kind of storage, but I could expect only half as much storage with WAV files: about 1.3 to 1.5 GB on a standard VHS tape. My experience with conventional tape backup units has been about the same.

One way to extend the storage capacity is by using a VHS-160 tape. These are only a buck or so more than a VHS-120 tape and still represent a savings over a tape backup cartridge.

If time or convenience are important to you, the Danmere Backer may not be your solution. To back up 1.5 GB of WAV files, an entire VHS cassette running at EP speed takes close to six hours — fairly comparable to other parallel port backup devices, but slow by SCSI standards. To verify the integrity of the transferred files, the cassette must be re-run for another six hours. In other words, 12 hours to back up and verify 1.5 GB of data.

Danmere says you can run the program in the background as you do other work. Technically true, but not practical — particularly if you use compression on the files. The backup program is CPU-intensive, and other programs will slow the transfer.

I started a backup and ran Backer in the background. The snowflakes on the TV screen slowed to a crawl. The lower transfer rate could result in the cassette

allowing verification of files at a fairly fast rate.

You won't be able to restore your hard drive after a major crash with Backer 32. The program operates under Windows, which means you would have to reinstall your operating system before any restoration. Most dedicated tape backup devices will reinstall everything, including your operating system.

Before the end of 1998, there may come another backup option. Several manufacturers are poised to deliver DVD recorders offering up to 5.2 GB of rewritable storage space on disks that are predicted to cost \$39.95. In the next year or so, units that can record up to 10.4 GB should be unveiled.

In the end, you have to weigh what is important for you. For now, the Danmere Backer 32, at \$69 for the internal version and \$89 external, represents a viable option for backing up your audio data or commercial copy.

■■■

For information, contact Danmere USA, 236 Santa Cruz Ave., Suite 204, Los Gatos, Calif., 95030; on the Internet at www.danmere.com or circle Reader Service 150.

Read Burgan is a free-lance writer and a former public radio station manager. He can be reached at (906) 296-0652, or through e-mail at rgb@up.net

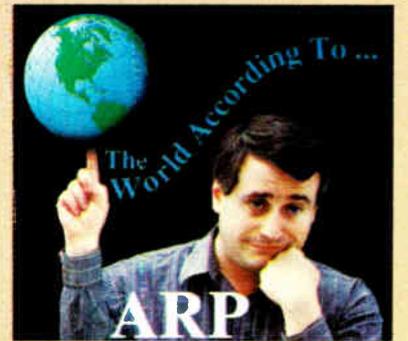
Any Studio Buildout Is a Juggling Act

Alan R. Peterson

I really must give a tip of the hat to those poor folks who are told, "We just bought three more stations. By Monday, I want you to find us a new building to move into and have a floor plan drafted and ready to roll by Tuesday. We begin moving out of here Wednesday night."

Okay, this is a slight embellishment of the truth. But with multiple installations and shortened construction timetables, it can almost feel that way.

I have never participated in any major buildouts or moves, but having



worked on smaller scale projects, I can sympathize. I have put my John Hancock on many "we need crew" volunteer sheets, and I have lost countless Saturdays squeezed under studio furniture or slinging twisted pairs inside suspended grid ceilings.

When a plan is in place, the move is hectic but controlled. It is those spur-of-the-moment decisions that can be like a rail disaster.

An engineer with whom I worked at an AM/FM combo ages ago picked up a used stereo Gates console. The purchase coincided with our FM station considering going stereo and the need to replace our solid-state mono mixer. This engineer pushed for an almost-immediate installation.

The board was tube-driven and generated buckets of BTUs and noise — the very reasons its previous owner got rid of it. Why on earth did we buy it and why would we want to put it in?

"Tubes have 60 years of proven performance behind them," I was told. "Transistors have — what? — 20, maybe 25?" The owner went along with this blunt logic and approved the installation.

To quote the Borg, resistance was futile. The mono board was to be cut free after sign-off and relegated to the production room, displacing the Collins board already in there.

As for how we fared after the shift: The studio cart machines were all still mono, so all taped audio remained unaffected. Music on vinyl was the only stereo source. The heat generated by the board forced the installation of an air conditioner and subsequent redesign of the studio layout. The production room was down for four days. All new commercials were read live. But hey, we were stereo!

See ARP, page 49 ▶

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The Harris DRC 2000 Digital Radio Console now includes linking and reverb. (optional)

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Noise, RF Concerns Inside Studio

► POLLUTE, continued from page 42

The original 486 was an 8 W design. Today's processor chips are nearing 50 W. The attendant increase in the heat load demands proper cooling. Without it, intermittent processing errors that can crash a system begin cropping up, and CPU life drops dramatically. In the studio, these requisite fans bring additional, unwelcome noise and often develop squeaks.

For Dodson, the cause is obvious.

"Most use sleeve bearings. That is not a good idea for this application because the heat dries up the lubricant," he said. Opting for ball bearing-driven fans instead is the solution. As an added benefit, the mean time between failures (MTBF) rises as well. Having personally fished out a few bad CPU fans from station systems, I can attest that a few extra bucks for a ball bearing fan to save a CPU is not a frivolous investment.

What is the upshot of the company's engineering efforts? A side-by-side comparison of a typical clone and a PC Power & Cooling "Silencer"-equipped system was remarkable. The company claims of up to 90 percent reduction in noise were supported.

RF interference

Less apparent but potentially as important is the RF generated by computer systems. According to Julius Knapp, chief of the FCC Policy and Rules Division in the Office of Engineering and Technology, "The standards set by the FCC are really designed to protect from interference between users. They never were intended to cover two pieces of equipment in the same room." A computer that is FCC- or CE-compliant still can leak enough RF energy to cause studio problems.

RF comes in two forms: radiated and conducted. Radiated emissions follow the frequency of the CPU clock speed. "We have blown past the FM broadcast band from 88 to 108 MHz. Computers now are in the range of 166, 233 MHz and up," said Knapp. For now, the problem is not a

major concern around shielded equipment. But as CPU speeds inevitably creep into the Gigahertz range, generated RF may threaten various emerging mobile satellite services and cellular communications.

"We will have to keep an eye on what the emission spectrum looks like from future computers," Knapp said.

Conducted RF poses other problems. It is carried over the power lines connected to computers and contaminates every piece of equipment on the same electrical circuit. This can cause trouble for gear that demands "clean" AC power to operate properly. Both kinds of RF can be reduced or contained if you pay attention to your choices in motherboards, power supplies and cases.

False frugality

Cheap motherboards tend to skimp on capacitors and line terminators. Power supplies may likewise lack sufficient filtration to keep RF to a minimum. Even with the best components, some RF is generated. A well-constructed case traps stray radiated RF and sends it back to ground.

Rick Rozalsky, hardware sales manager at motherboard manufacturer American Megatrends, pointed to the problem spots. "If a motherboard is not well designed and grounded, it will emit radiation around the keyboard connector, mouse connector and the card slots," he said. "Using a 'tight' case will help contain this."

Of course, an investment in a quality motherboard saves the need for such rear-guard actions. What are the rules of thumb when selecting a motherboard? Make sure it is designed for performance, not price. Rozalsky said that, unlike many imported boards dumped into the market, AMI designs their products with EMI compliance in mind.

Again, this issue will only become more critical as the technology advances. "Typically, the faster the bus speed becomes, more concern needs to be focused on the EMI characteristics of the

products," said Rozalsky.

More pressing problems exist inside the box. Excessive RF can generate background noise or whistling on even the most expensive soundcard. Some manufacturers are opting for outboard processing solutions to achieve the very best signal-to-noise ratio. Here, the soundcard is merely a connector to the external A/D-D/A converters.

This method may be appropriate for the highest high-end audio applications. For most broadcast studios, choosing a quality power supply and motherboard can tame the hostile environment inside the PC.

Not long ago, a computer capable of studio use was a specialized beast. These pricey systems were built with this specific application in mind. Now, common PCs are able to take on most tasks by just adding a few plug-in cards. Just the same, studio work should not be relegated to off-the-shelf products — especially for those who have already made a considerable investment in soundproofing. A few dollars spent on these details can make a major difference.

Carl Lindemann writes and produces the syndicated radio feature "Cyberscene" and contributes regularly to RW.

Contact Information

PC Power & Cooling is located at 5995 Avenida Encinas, Carlsbad, CA, 92008. Telephone (760) 931-5700 or (800)722-6555; visit the Web site www.pcpowercooling.com; or circle Reader Service 202.

American Megatrends is at 6145-F Northbelt Parkway, Norcross, GA, 30071-2976. Telephone (770)246-8600; visit the Web site www.ami.com; or circle Reader Service 176.

Hushkit Tames Loud Computer

One noise abatement product worth considering is the Hushkit from Silent Systems Inc., of Woburn, Mass.

The Hushkit consists of three basic components. First is the SilentDrive acoustical/thermal sleeve that fits over existing hard drives. Company literature claims a reduction of hard-drive motor whine to less than 30 dBA.

Next, SilentPower is a direct replacement for the PC power supply. It reduces fan noise generated from the existing power supply, again to 30 dBA. Two power supply versions are available: AT for the AT-style chassis form factor or ATX for the ATX-style chassis.

Finally, there is the Microprocessor Cooler replacement cooling fan, claimed to significantly reduce fan noise generated by the existing cooler. The Silent Systems socket 7 cooler emits 25 dBA of noise while the slot 1 cooler emits 30 to 32 dBA of noise.

The only current limitations to the Hushkit are its PC clone compatibility — no Mac models are available — and it can only be used on disk drives up to 5,400 rpm: faster drives run too hot for the SilentDrive sleeve.

Hushkit components range in price from \$38.40 to \$149.90. Full descriptions are posted on the company's Web page at www.silentsystems.com and information is available at the corporate headquarters: 20 Commerce Way, Woburn, Mass., 01801; telephone (781) 932-8444; fax (781) 932-7444 or circle Reader Service 124.

— Alan R. Peterson

Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No.(s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

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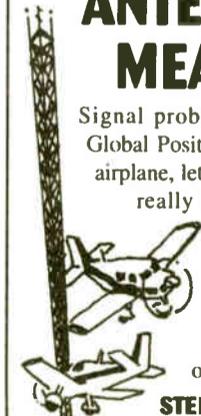
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READER SERVICE NO. 47

On the Voice-Over Audition Trail

Travis

The audition process is considered to be the most disliked aspect of performing. We all have to go to job interviews, but I cannot think of any other profession where the job interview is actually the job.

Performers out here in California say the "job" is looking for work: getting the work is the reward. Nobody likes auditions. Not the performers, not the directors nor the producers.

Recently, my agent set up a voice-over audition for me in Hollywood. It was to be held at a facility I had visited several times before — an old building which probably has its share of exciting Hollywood tales to tell. Taped to the wall at the front entrance was a sheet of paper declaring "Auditions Downstairs" in large laser Helvetica type. Two old solid white doors faced outward, with no indication as to where they lead. Upstairs? Downstairs? Who knows?

Trick question

I am certain there is some intelligence test at each audition facility, designed to make you feel dumb before the audition. After a while, you realize everyone else has to take and fail this test, but until you figure that out, it is especially troubling.



Travis

The first time at this particular facility, I took the right-hand door and walked down a rather long hall which ended in a stairway going upstairs. Wrong door. I backtracked outside to the "downstairs" door, which opened into a lobby area. Inside was a bulletin board with a list of auditions and corresponding room numbers. Naturally, my audition was not anywhere on the list.

Easily rattled

When I first started in the V/O business, these occurrences used to throw me seriously. Going through lots of wrong doors, being rejected for all sorts of commercials and other projects, casting directors telling me to my face that I should consider another career. Thank goodness I have the stomach of a pro today. I wasn't going to let a little thing like a missing list stop me.

I stomped outside and back through the upstairs door, down the hall and up the stairs to find an office with no sign or other indication as to its function.

"Uh, excuse me," I asked a rather large, bespectacled man inside. "I couldn't find the room for my audition. It has something to do with Oklahoma," which was all the information my agent provided.

The large man took off his glasses and said, "The bakery spot. Room Number 8." There was no mention of either a bakery spot or room number on the bulletin board, but I knew where I was headed.

As I headed that way, I passed a group of young men and women, all dressed nicely and rehearsing lines for some sort of on-camera part. That is when I detected The Smell of Fear.

I had always considered that expression no more than a euphemism to describe a general atmosphere, not an actual odor. But those poor kids were frightened. I remembered experiencing the same scent once when passing a minor traffic accident. The tension at the

voice-over audition would not be nearly that fearful.

On a table in front of Room No. 8 was a pile of scripts. This description was tacked to the wall: "We're looking for someone who doesn't sound like an announcer. Someone who sounds a lot like Tom Bodett."

You want what?

"If they want Bodett," I wondered to myself, "Why don't they just hire him for the job?" See, I don't "do Bodett," and if they had only let my agent know what they were looking for, they would have found the right people to fill the bill and maybe have saved about two hours of my

time. But, what the heck; I went in and gave it my best shot just the same.

Inside the room was a young lady, a desk and a cassette recorder. A microphone and a music stand made for one tight squeeze along the back wall. When I moved the music stand forward a few inches to accommodate my now-aging eyes, the young woman screamed, "Don't touch that!"

Evidently, the mic and music stand had been strategically placed to "ensure the best sound from the microphone." Whatever.

As I moved the stand back to its original position, she started the cassette machine and commanded, "State your name and agent, please." I did so, she yelled, "Take One," and pointed to me to begin my read. Halfway through, she

See TRAIL, page 48 ▶

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Beating the Bricks for Commercial Auditions

▶ TRAIL, continued from page 47

rewound the cassette and informed me she needed more of an "Oklahoma" sound, and that I should slow down.

Slow down? The spot contained too much copy to be a :30 and not enough to be a :60. There was nothing on the copy to indicate which it was. I asked her, "Is this a radio or TV spot, and is it a :30 or a :60?"

"I don't have the faintest idea," the woman responded.

I then asked her if this spot was intended for a genuine Oklahoma audience. "Don't know that, either," was her terse reply, seeming thoroughly bored with the entire process. So I treated it as if it were a 60-second radio spot, using my "general southern" accent.

Ah say there, sir ...

I'm not much of an accent-guy, but thanks to an early childhood in Kentucky, I can do a passable Kentucky Southern accent, so long as no actual Southerners are listening in. "That's much better," the woman responded.

At this point, the young woman and I both wanted me out of there. I did three more takes, then thanked the young woman as I headed toward the door. On my way out, I could hear the cassette being rewound.

Obviously my takes were about to be recorded over by the next hopeful auditioner.

This audition was not one of my best experiences, but it was by no means unusual in the business. Compared to audition tales I have heard from other talent, it was comparatively mild. Horrible audition

**I wondered,
if they wanted
Bodett, why didn't
they just hire him to
do the job?**

experiences are considered to be part of "paying your dues" in the voice-over biz.

One rather successful actor I know says he considers this an important part of the art of the entertainment business. "I pray that never changes," he tells me. And I am inclined to agree, maybe about half the time.

■ ■ ■

Travis is a California-based voice-over talent. Reach him at Ttravis@compuserve.com

SHORT TAKE

AEA Makes Classic Microphones Live Again

Do you love the classic looks of the old RCA 44 microphone? Or do you have a dented and bent 44 stuck back in the closet, "retired" because you cannot find parts for it?

Audio Engineering Associates of Pasadena, Calif., manufactures a line of

The photo shows a fully assembled 1998 AEA R44 shell, complete with the Cushion Mount mic stand isolator. The tip-off that the mic is a reproduction is the logo; note the AEA with lightning bolt on the mic body where the RCA logo would normally be found.

The shell lacks the ribbon transducer and heavy magnet found in the original 1936 microphone, but is internally spaced and shock-mounted to receive a Schoeps or other 19 mm diameter side-fire microphone. This way, modern mic technology can be used with an aesthetically pleasing design of an earlier time.

As shown, this mic shell (AEA R44/SM) is \$895 with the cushion mount. Minus the mount, the AEA R44 is \$695. The black and chrome shell also is available in the familiar RCA "umber" finish.

For any old banged-up 44s back in the station shop, AEA manufactures new parts to directly replace bent grills, split Y-yokes and lost swivel hardware. An assortment of parts for RCA 77 microphones is manufactured by AEA.

New ribbon transducer assemblies are extremely delicate and difficult to install as a DIY project, so AEA offers ribbon repair services as well. The company manufactures a comprehensive line of replica and replacement internal parts, and technicians can refurbish older mics in need of some overdue care.

AEA mics were shown at the Dorrough Electronics exhibit at NAB '98. A catalog and price list is available by contacting the company in California at (626) 798-9128; fax (626) 798-2378; e-mail stereoms@compuserve.com or circle Reader Service 98.

— Alan R. Peterson



Look again: It's not an RCA 44, but an AEA replica.

modern replica replacement parts for the "Bing Crosby" version of the historic microphone, as well as "visual replicas," empty 44-style housings that may be used as props or ready to mount your own mic inside.

A refurbished RCA 44-style mic would be an appropriate choice for nostalgia and adult standard stations, and would certainly create attention as a live microphone at oldies-related remote events.

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Off to the Races With the GX-440

► REMOTE, continued from page 42

The GX-440 has two headphone outputs and an input for a radio receiver to monitor the off-air signal. This switch must be thrown for studio talkback.

By using a special studio coupler, DTMF touch-tones from the keypad at the remote site can fire automation events back at the studio. The coupler must mute the DTMF tones and be programmed to select and activate the proper event. With a little careful planning, your remote broadcasts can sound as if you have an engineer on the board back at the studio.

The GX-440 can be powered with a wall transformer or by rechargeable DC Ni-Cad batteries. It has a switch for a fast charge or the standard trickle charge when the transformer is plugged into the wall.

The unit has no low battery indicator. The only time we knew the batteries were low was when the audio began to distort. Plugging into AC power brought back the clean sound.

The GX-440 weighs less than 3-1/2 pounds, measures 9.4 by 6.1 by 1.5 inches and fits nicely into its own Platt injection molded foam case. The wires and power transformer probably would have to be transported in a separate ditty bag. Still, it is compact.

The operating manual seems straightforward for an engineer or skilled operator. The first page of the manual is a condensed version of how to set up the unit. I suggest making several copies to accompany the mixer on remotes (you'll thank me for it). I

also suggest first-time users follow these short instructions to perform a dry run at the station before they actually hit the field with the GX-440.

Out there

We tested the GX-440 by sending reports from a temporary pressroom at the Indy Racing League opener at Walt Disney World in Orlando back to AP Network Sports and American Forces Radio (nee Armed Forces Radio). A Shure SM-63 mic and Marantz PMD-222 tape recorder also were part of our rig.

It was an easy plug-up to phone lines and proper cellular phone interfaces (fax/modem jacks) with the RJ-11 jacks. Most users of this device would have us plugged into AC power, except for this event. Again, for us, the only way we knew the battery was low was when we heard distortion in the audio.

We got the headphone output and line input quarter-inch jacks confused during set up. But even with that, we were set up, connected and ready to broadcast within five minutes of finding our seat and phone line.

If your station uses POTS/ISDN codecs or RPU's for its remote broadcasts, the GX-440 still can have a place in your arsenal. It will interface to cell-phones and regular dial-up lines, providing you with a hot backup. And as they say, *some* broadcast is better than *no* broadcast at all, especially when those remotes mean big bucks.

For backup when the unthinkable hits — perhaps a complete studio wipeout or some natural disaster — the GX-440 pro-

vides a backup by hooking directly into a transmitter input, thereby being able to take phone calls and put them on air, providing service to your listeners when they may need it most.

Users with a heavy remote schedule, who need a dialup backup for remotes or just want to be prepared for the unthinkable should take a look. The GX-440 could solve those problems in one small box.

■■■
Paul Kaminski is the news director for the Motor Sports Radio Network and contributes auto racing reports to the AP Network. E-mail him at motor.sportsradio@compuserve.com

Product Capsule:
Broadcast Electronics GX-440
Remote Telephone Mixer

Thumbs Up

- ✓ Multiple inputs
- ✓ Remote automation control possible via DTMF tones
- ✓ Twin phone lines to put calls on air

Thumbs Down

- ✓ Labeling on phone and channel input jacks confusing
- ✓ No low battery indicator

For more information contact Broadcast Electronics in Illinois at (217) 224-9600 or circle Reader Service 133

Time Again for the Big Studio Buildout

► ARP, continued from page 44

By the way, you do realize that a single-channel production board would mean our produced material would remain in mono, right? He didn't.

I departed about one month later for a new job, never really knowing how expensive his "bargain" board really was in the long run.

About six years ago, I documented the construction of a new air studio at WLAD(AM), Danbury, Conn., here in these pages. All jocks and board-ops were invited to help design a functional and comfortable room. Several of us helped punch cable onto Molex connectors, paint the walls and build acoustic panels to tweak the room's response.

When the big day came, there were no out-of-commission rooms or "whoops" moments. Friday we were on the air in the old studio. The following Monday we took to our new studio, built by us.

Here we go again

I tell you this because once again I am being asked to volunteer for a new buildout. A noncommercial station near me is relocating its air studio to a much larger room originally designed for other purposes. I don't get to do this often enough to be good at it, but one gets smarter with each lump taken along the way.

The obvious snags include long parallel walls (reinforcing resonant standing waves); electrical and HVAC concerns (both must be rerouted and dropped down to new walls and a false ceiling) and leakage from other studios.

Furniture will be built locally. My concern is that it not turn out like a school shop project. With so many companies out there making reasonably priced studio furniture, the cost will likely turn out the same, so why sweat it?

And what if the studio design philosophy is still based on the pre-digital model? Where does the monitor go? What goes where the cart machines once sat? Where can the CPU be placed to be out of the way of careless feet and sensitive microphones? To base new studio designs on "the old way" means another rebuild is coming down the road shortly.

So to all you folks who must juggle electrical codes, acoustic theory and fiber optics while simultaneously dealing with new landlords, new owners and the same old headaches, I'm with you. May the job go swiftly, safely and correctly the first time.

■■■
Send e-mail to Al Peterson at apeterson@imaspub.com



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AMPLIFIERS

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Amateur Radio BTI 3-1000 tube, roller coils, variable vacuum capacitors, air variables, tubes, sockets, meters, dial turns counters, chassis, panels, cabinets, racks, power supply parts. F. Yonker, 814-867-1400.

Harmon-Kardon Citation 12 pwr amp, \$200. C Collins, 414-327-4141.

McMartin 10-15 W(rms) pwr amp, 25 V & 70.7 V output, 4-16 ohm output, gd cond. Ron, 732-469-0991.

Altec-Lansing A323B pwr amp w/6L6 output tubes, custom built w/Altec transformers, BO. M Crosby, 408-363-1646.

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Cablewave HCC-78-50J-120 7/8" foam w/N-type connectors (4), 300' rolls w/N-type connectors on both ends, \$5/ft. M Seaver, 217-222-6200.

Dissipator 500 point stainless, \$350; rigid 3" 5' flanger transmission line, \$200; Magnum 18"x70' tower, \$800; Scala FMO 1 bay all

chnl 250 W, \$250; Potomac AM-19 antenna monitor remote meter panel, \$100. D Rose, 888-380-7423.

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Fisher-Pierce PE control; Deltrol 30A relay & mechanical flasher. B Zellmer, 970-353-6522.

Kintronic AM isocoupler, used w/5 kW, gd cond, \$250. C Jones, 803-854-6396.

Cetec 10 kW FM, 2 bay, tuned to 102.3, \$2500/BO. E Stokes, 802-728-4411.

Pirod tower 30", 468' + 30' pole, never used, 80mph wind, no ice, factory paint, \$28K FOB Raleigh NC; (2) 10.3-10.7 GHz 8' standard Andrews MW antennas w/radomes, \$3K ea; 6' 6 GHz high performance MW antenna w/Hypalon, \$2K; (2) 10' 6 GHz UHX Andrew MW w/Hypalon, \$3K ea; Rohn 130' medium duty SS tower sections 7N, 6N thru 1W, \$3K; Rohn 100' light duty tower, 5N-1, \$2.5K; (4) Andrews 8' 2 GHz grid dishes, \$1K ea. B Wall, 1-800-653-1171 or email at DuelBWall@Aol.Com.

Rohn 80 350' radio tower, guide, steel, no rust, \$16,000 at site, 209-477-2688.

AUDIO PRODUCTION

Want to Sell

dbx II mdl 142 (2) stereo bdct NR system, excel cond; (2) dbx 3116 NR units, gd cond; CRL SPP-800 stereo

preparation processor, gd cond; dbx 3/16 matrix, gd cond; Aphex 323A aural exciter, mono, excel cond, complete w/Orban plexiglass cover over controls; Technics SU-9070 stereo flat preamp with tape inputs, TT inputs, aux & tuner inputs, excel; RTS 424 audio dist amp, stereo, 19" rack mount, gd cond; RTS 416 audio dist amp, mono, 1 in & 6 out, gd cond. Ron, 732-469-0991.

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Modulation Sciences Sidekick SCA-186, 92 kHz gen, excel cond. Ron, 732-469-0991.

ART DR-1 digital reverb w/wired remote control, \$450. M Schackow, 605-374-3424.

ATI M-1000-2 precision dual mic pre, as new, \$200. M Shea, 212-989-2084.

Burwen Research DNF 1201 noise filter, \$125; MXR dbx type II NR unit, \$100; Aphex aural exciter w/Big Bottom, \$150. G Dunn, 925-516-0299.

Rane ME-15, 15 band/chnl stereo EQ, rack mountable, 2 yrs old, like new, \$175/BO. R Erak, 253-839-9414.

Shure M675 bdct prod master, 2 phono inputs, 2 line inputs, monitor speaker,

\$60; (3) female-to-female XLR adapters, \$5 ea; (2) 1/4" splice blocks, \$15 ea; cassette splice block, \$5; disc feet, 1 set of 4, \$10; (12) music DeWolfe LPs, gd cond, \$20; (75) Norelco cassette boxes, worn but serviceable, \$20. E Ribner, 314-771-2155.

Sonomag 350/450 8 Carousels in gd operating cond, BO. E Stokes, 802-728-4411.

AUTOMATION EQUIPMENT

Want to Sell

BE AudioVault AV100 w/twin servers & (4) 96B hard drives, 1 yr old, excel cond, \$20,000. M Litton, WLYR, 1 Campus View Dr, Columbus OH 43235.

SMC 3060, (2) racks, limiter, clock, 2 random select Carousels, remote control w/all documentation & spares, \$500 u-haul. C Jones, 803-854-6396.

Arrakis GEM-600 Gemini System w/1.2 Gig + network board & software, w/cart call; Arrakis TS-8C Trak Star workstation w/270 Meg w/network board & software, 1 yr old, both currently on air, \$7500/BO. L Zeve, 717-249-1717.

CART MACHINES

Want to Sell

BE 3000 mono R/P in vgc, \$375; mono PB in vgc, \$150. D Kiker, 850-477-8500.

ITC 3-D triple slot (6), stereo, 3-cue; (9) ITC SP Series stereo, 3-cue; (6) ITC SP Series stereo, 3-cue; (2)

ITC R/P, stereo, 3-cue; (2) ITC WRA stereo, 3-cue, cart record amps; (2) cart racks, 100 space, masonite dividers & walnut-grained laminate sides, excel cond; Henry Engineering audio message controller, operates cart machine into telephone line & counts incoming calls. Ron, 732-469-0991.

ITC ESL-IV splice finder, gd cond, \$185; Spotmaster cart rewriter, fair cond, \$95; Dynamax CTR 124 R/PB stereo cart machine w/splice finder & FFWD, excel cond, \$495; (2) Harris single play cart decks, working, \$350 ea or \$600/both; ITC cart deck, working, \$350; large assortment of cart hulls, cart racks (wall & floor). M Casey, 803-275-4444.

PR&E Tomcats (3) in rack mount w/spare set cards plus one rcdr w/o rack cage, all checked out & calibrated, \$1500 +shpg. M Shea, 212-989-2084.

CONSOLES

Want to Sell

Arrakis 12 pot, \$1500. J Arzuaga, 787-895-0000.

Cetec 2007 8 chnl stereo, \$900; Harris 80 8 chnl stereo, \$900. D Rose, 888-380-7423.

Gates Yard (tube); Collins F Series (2) tube type; Gatesway II (2) for parts; Russco 505 mono. B Zellmer, 970-353-6522.

McCurdy SS4370 control board, 8 chnl stereo rotary step attenuators, gd cond. Ron, 732-469-0991.

Pyramid PR 8800 stereo mixer, working, \$235. M Casey, 803-275-4444.

Quantum QM-168 + QM-120 16x8 audio board w/patch bay & console, \$1900; Gately 16x8 audio board w/quadr monitoring, XLR on all in and outs, custom console, \$400. A Baker, 317-925-7371.

Ramco DC-38-10S, 1-chnl stereo audio mixer console, gd cond, \$3500. M Seaver, 217-222-6200.

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Sparta AS-30 console stereo, (2) TT's, desk, (2) pre-amps, (2) monitor speakers, cue speaker, \$500 u-haul. C Jones, 803-854-6396.

AudioArts/Wheatstone power supply w/phantom & cable for 8x console, \$125. D Kocher, 610-776-1455.

MCI/Sony 618, 24x24, \$6.5K; Quantum 24x24, \$4.5K; Soundcraft 600, 32x16, \$5.5K, like new; Model 30, \$295; 512, \$950; 520, \$1450. W Gunn, POB 2902, Palm Springs CA 92263. 760-320-0728.

Want to Buy

Altec 1567A rackmount mono mixer. M Schackow, 605-374-3424.

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speakers, \$900. D Rose, 888-380-7423.

RCA automatic 5"x7" tape cassette, heavy duty giant cassette mechanism deck, (2) motors less control electr, 22 pounds. F Yonker, 814-867-1400.

280 mono limiter, \$100; Harris MSP 90 mono AGC-limiter, \$250; CRL SEP 400 mono processor 3 chassis, \$300. D Rose, 888-380-7423.

Orban 8100A ST studio chassis. J Arzuaga, 787-895-0000.

Optimod 9100A, stereo w/NRSC already in. R Hill, 850-478-6000.

Teletronix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST, 972-271-7625.

EV 645-TR noise-cancelling telephone handset mic, \$25; EV RE-50, worn case, \$70. E Ribner, 314-771-2155.

EV RE-16, \$125. T Wheeler, 970-223-6078.

RCA 77DX w/owners manual & original carrycase, excel cond, \$1300. M Schackow, 605-374-3424.

RCA 77-DX's, 44-BX's, WE KU-3A's On-Air lights, recording lights. Top price paid. Fast response. Bill Bryant Mgmt, 2601 Hillsboro Rd, G12, Nashville TN 37212. 615-269-6131, FAX: 615-292-3434.

Grundig S0290/US stereo console radio, w/o cabinet, Multisonic w/echo, 4 bands, TM45 r-r, GW-11 4 speed changer, (6) cabinet speakers, (2) heavy chassis, tube type. F Yonker, 814-867-1400.

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CRL PMC-450, 2 yrs old, \$800. M Williams, 417-781-1313.

JBL/UREI M712 stereo limiting comp w/owners manual, new cond, \$450. M Schackow, 605-374-3424.

Want to Buy

CBS Labs Volumax, mono, manual or schematic. P Galasso, 609-294-9796.

MICROPHONES

Want to Sell

Astatic, Shure, Turner bullet mics, \$50 ea. C Collins, 414-327-4141.

Peavey PVM 480 electret omni directional super cardioid mic, never used, \$215. M Casey, 803-275-4444.

Sony ECM 33-P electret condenser mic, like new, (2), \$110 ea or \$200/both. D Meyer, 805-962-8273.

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Want to Buy

RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 972-271-7625.

MISCELLANEOUS

Want to Sell

1929-1945 vintage radio collection, 8 piece, \$800; Henry Mix-Minus-Plus, \$100; Touchtone decoder-rack-mount CS100, \$150; Pioneer CTF1250 cassette rcd, \$75; 9" B/W monitors, \$50 ea. D Rose, 888-380-7423.

ATI DP100-1 stereo IHF to prof converter, \$75. D Kiker, 850-477-8500.

Auto Broadcast 2501S tone sensors (2); lots of new large 25, 50, 100 W resistors various values; used vacuum & ceramic capacitors of various values. B Zellmer, 970-353-6522.

Bogen TP 160 tuner, \$50; several single speakers, all working but not in pairs; ADC patch bay, excel cond, BO. M Casey, 803-275-4444.

Eimac 250th, 450th, 4-1000, (4) PR-1000 transmitting tubes, air variable capacitors, Barker-Williamson 850 pi-output coils, band switches, all kinds of transformers. F Yonker, 814-867-1400.

JBL D130F/D140F Signature Series speakers, mint cond, \$450/all; MDI 100 microfiche reader, 14" screen, \$50. C Collins, 414-327-4141.

Kintronics AM pwr cutback to 500/200 W or less, \$350. C Jones, 803-854-6396.

Misc equip: IGM/SMC 24 cart Carousel, \$250; Pioneer F-9 tuner & SX-7 stereo rcvr, not working, \$15 ea; Ampex 440, \$200; Sony TC-FX120, \$10; Ampro 10 chnl dual console, \$800; Otari ARS-100 r-r PB (3), \$150 ea; IGM Insta-Cart 48 tray (2) \$250 ea; 200 cart stand alone rack, \$20; Revox PR-99 (2), \$225 ea; Toshiba DCP-26 bookshelf speaker pr, \$25; 19" racks, 65" tall (3), \$50 ea; Star SR-15 printer, \$30; IGM Insta-Cart (48) for parts, \$100; IGM automation controller series 400 on rack w/wheels, \$300; Schafer 901 controller, \$100; IGM satellite controller, \$50; misc Insta-Cart parts, cart trays, circuit boards, \$50; Sansui S-350 bookshelf speaker pr, \$100; Pioneer SG-9 EQ, \$75; computer desk, woodgrain vinyl wrap, \$25; 72x30" bookcase, 3 shelves, woodgrain vinyl wrap, \$25; 4 drawer steel letter size file, \$30; 2 drawer steel letter size file, \$15, all as is, entire list \$2000/BO, quantity discount. R Hill, 850-478-6000.

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Rack cabinet, 28"h x 14-3/4" deep, 26-1/4" panel space, \$10 +UPS. E Lightman, 724-266-2802.

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ADC TT (Bantam) Patchbays, \$149; TT or 1/4" cords, \$10; new short MRL test tapes, \$229 for 2", 1/4", \$79; Gates dual stereo tube limiter, \$1200; Gates top level, \$595; Allen & Heath GL2

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rack mixer, mint, 14x4, \$795; CBS Labs Audimax, \$400 ea; tube preamps, \$300-400; MX10 mixers, \$795. W Gunn, POB 2902, Palm Springs CA 92263. 760-320-0728.

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Jazz record collections, 10" LP/12" LP be-bop, swing, dixie, highest prices paid. B Rose, Program Recdgs, 228 East 10th, NUNY 10003. 212-674-3060.

MONITORS**Want to Sell**

Moseley AMR1 modulation monitor. B Zellmer, 970-353-6522.

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Want to Buy

Harris, Motorola or BE C-QUAM AM stereo mod monitor on 980. R Hill, 850-478-6000.

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McMartin SDR-1 IF demod, SN 640-4389-001, gd cond. Ron, 732-469-0991.

Wegener 1806-24S sat rcvr/tone DecGTO/CD country; Wegener DR 180-244-100-002 rcvr. B Zellmer, 970-353-6522.

Zenith M505 AM portable radio, AC battery tube type, \$5 +UPS. E Lightman, 724-266-2802.

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RECORDERS**Want to Sell**

Akai GX 646 r-r, stereo, gd cond, \$500. M Casey, 803-275-4444.

Ampex AG-350 mono r-r, rackmount w/custom console & solid state electronics, \$250; Ampex 350 r-r mono w/Inovonics solid state electr rackmount, \$200; Ampex AG-440B 1/2" 4 trk r-r in custom console, \$1000. A Baker, 317-925-7371.

Inovonics 370 electr; MCI JH-110 (3) play electr, (1) R/P, (3) deskc, (3) pwr supplies, (2) remote controls; Revox A77 for parts; Akai GX1900D for parts. B Zellmer, 970-353-6522.

Otari MX-5050 2 trk r-r, mint cond w/remote control & shpg carton, \$725. D Meyer, 805-962-8273.

Radio Systems 1991 RS-700 DAT rcd (2), gd cond. Ron, 732-469-0991.

Scully 280-B mono r-r in custom console, 7.5 & 15 ips, \$400; Ampex AG-440 mono r-r in custom console, 7.5 & 15 ips, \$400; Ampex AG-440 mono r-r in Ampex console, 7.5 & 15 ips, \$400; Nagra 4.2 mono r-r, 7.5 ips only, \$1400. A Baker, 317-925-7371.

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Sony TC-880-2 pro tape deck, 1/4" 2 trk 7-15 ips, 10.5" reels, ferrite heads, \$795 +frt. D Peck, 916-375-2300.

Telex 1400, rack mount, new heads, new switches, rollers, belts, bulbs, lifters at Telex factory, recently removed from service, w/manual & schematics, \$500/BO. M Gerardi, 860-928-1350.

Ampex 440C 1/4" mono (2), 7.5 & 15 ips, no servo capstans, no cabinets, one in gd cond, \$550, other needs work, \$375. D Cherry, 615-385-2957.

Ampex separate pwr supply for 350 series, \$100; Ampex 601 tube-type mono rcd, case & unit very clean, \$250; Akai M-7 in portable case, crossfield heads, \$150; Ampex AL-500-3 rcd, \$100; Metrotech/Dictaphone slow-speed tape loggers, 1/4" tape, \$100 ea, 1/2" tape, \$150 ea; Schafer 2 chnl logger, 1/4" tape, \$75; used alignment tapes, cassettes & cartridges, many types, half price; Ampex control boxes for 350 & 440 series, complete w/relays, resistors & connectors, BO. M Crosby, 408-363-1646.

Telestor digital rcd for auto-record telco news feeds, 5.5 min, \$395. 650-355-1020.

Marantz PMD-430, 3 head stereo, Dolby & dbx, illuminated VU meter, bias fine adjust, mic, 4 line inputs, limiter, carrying case, handle, AC adapter, very low hrs, \$350. M Shea, 212-989-2084.

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MCI 110 rec & repro heads inserts, 1/4" 2 trk \$200/pr; 1/4" 4 trk, \$200/pr; 1" 8 trk, \$500/pr, all new. M Shea, 212-989-2084.

Otari MX-5050MKIII 1/2" 8 trk in console w/CB-116 remote, \$975. D Cherry, 615-385-2957.

Sony DTC 1000ES DAT rcd, needs alignment work, it eats tapes, heads are gd, rest of unit in gd cond, 44.1 & 48 kHz sampling, analog & SPDIF I/O, \$250. R Erak, 253-839-9414.

Sony TC-153SD portable cassette rcd, mic inputs, Dolby B, service manual, \$75. E Ribner, 314-771-2155.

Telex CD4 & CD4S stereo cassette duplicator, master w/3 slaves, needs work, \$850. 615-385-2957.

Yamaha MD-4 4 trk digital Mini Disc rcd, new in box, \$750; Sony MDS-JE 510 2 trk Mini Disc rcd, \$200. D Kocher, 610-776-1455.

Alesis ADAT 8 track digital recorders. Refurbished with 90 day warranty. \$950 to \$1150. Pro Digital Inc, 610-353-2400.

Ampex 4 trk tube deck, \$2500; stereo 351 (recond), \$1800; Akai Adam, new, digital 12 trk, \$3500; MM1000-16 w/new heads, \$4500; Otari MTR10-4, \$3500; Ampex ATR102s, search to cue, \$495; Ampex locator for ATR or 1200, \$895; MCI 110C-8, \$3.5K; Tascam 85-16 recond w/dbx, rc & loc, \$3K. W Gunn, POB 2902, Palm Springs CA 92263. 760-320-0728.

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Gentner 1000A digital freq extender, excel cond, \$850; Gentner EFT power supply, \$100. M Casey, 803-275-4444.

Marti STL-10 xmtr & rcvr; Marti STL-8 xmtr & rcvr; Modulation Sciences CP803 composite limiter. B Zellmer, 970-353-6522.

Marti ATS-15E STL switcher, as new, BO; Marti SCR-8H 39 kHz; Marti SCG-8H 39 kHz; (2) Racom STL data link Morse code identifiers, excel cond, BO. M Casey, 803-275-4444.

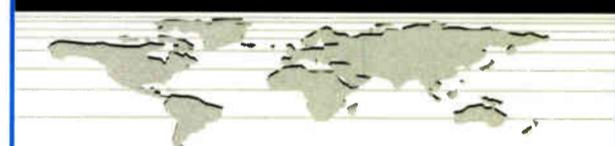
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Kintel 202B microvolt meter, tube type, 0 center, mirrors scale. F Yonker, 814-867-1400.

Fluke 87 true RMS 4.5 digit multimeter, \$250. M Shea, 212-989-2084.

General Radio 1685 digital impedance meter w/manual, BO. M Crosby, 408-363-1646.

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excel cond. Ron, 732-469-0991.

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ACTION-GRAM

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*Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.

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