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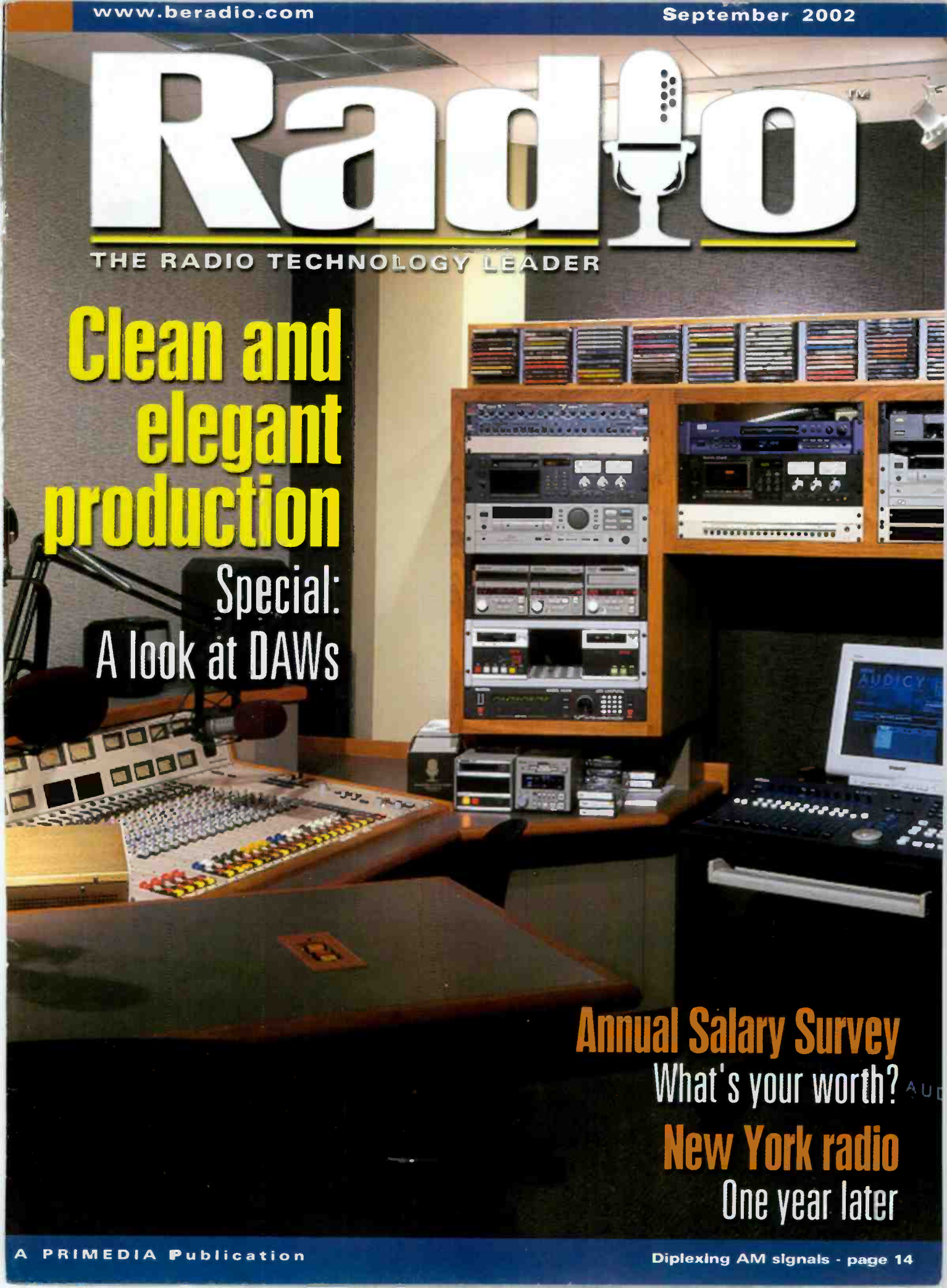

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Diplexing AM signals - page 14

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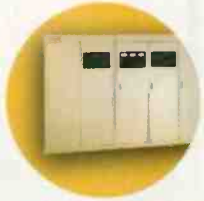

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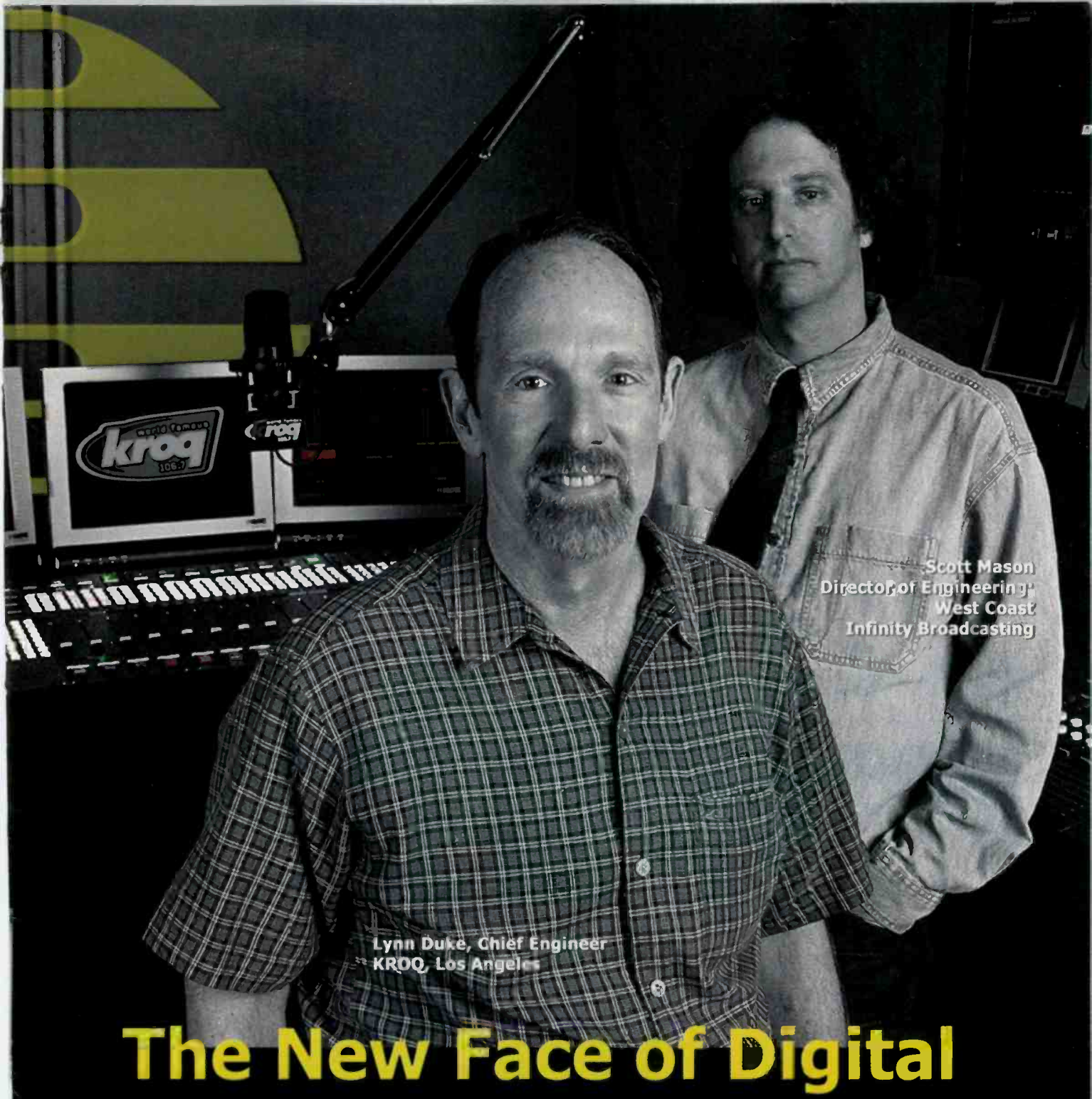

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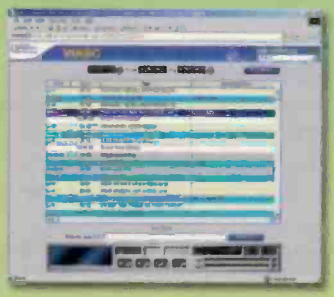

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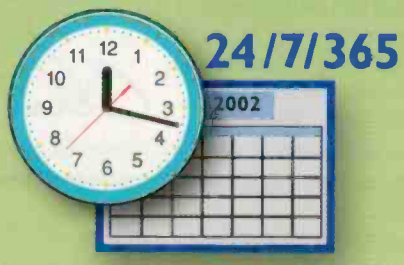

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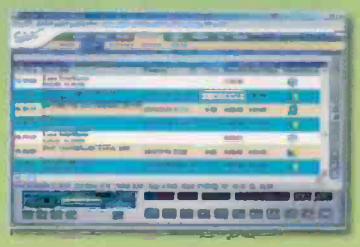

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Completed cycle

Because you're only on page 8 of this issue, you may not have noticed the change yet. I will admit that the final step was subtle. It has been seven months since we launched the redesign of this magazine, and in that time you have told us that you like the new look. After several years with the same layout and design, we felt it was time for a fresh look to bring you the great information you look forward to every month. We kicked the redesign off at the spring NAB convention, and now that the fall NAB Radio Show is here, we have completed our transition.

To give you the complete story, I will start from an earlier point in this magazine's history. In 1959, a publication called *Broadcast Engineering* was introduced to cover the technology behind radio and television. As these two sectors of broadcasting evolved, their common roots grew more disparate. In 1993 it was clear that one publication could not serve both sides of the industry to their fullest. In 1994, the radio content of *Broadcast Engineering* was taken out of that magazine and put into a new publication called *BE Radio*, while *Broadcast Engineering* continued to focus on television. The two magazines have stayed their courses, and today *Broadcast Engineering* even has two editions: the North American edition and the World edition.

Because of this magazine's history, I often tell people that we're a nine-year-old publication in a 44-year-old body. While our individual identity may be more recent, we have the longest continuous history of any radio technology publication.

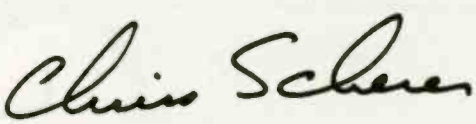
Going back to what I said at the beginning, I'm sure you're wondering what there was to complete. After nearly nine years of being called *BE Radio*, this publication has changed its name. What you are reading now is called *Radio* magazine. Don't panic; I said that this final step was subtle. We still cover the broadcast engineering and technology side of the radio industry, but now our name says what we are and what we do. We're not abandoning our heritage. Far from it. We embrace it every day. The new name just eliminates some confusion about the *BE* initials.

We chose the NAB Radio Show to complete the cycle to give you a chance to see the new layout and become comfortable with the new presentation. In March I said that the content hadn't changed, only the surroundings. Now you know that this is true. We decided to hold off on the name change until you had a chance to see what we were doing. Now that it is complete, I think you will see that we delivered on our promise to provide the best timely and useful radio technology information that you need.

While our name has changed, the URL for our website hasn't. We're continuing the legacy that the website address carries. Our online component, www.beradio.com, is still the radio technology website where you will continue to find a wealth of news, information and exclusive stories. If you haven't bookmarked it already, log on to www.beradio.com and bookmark it now.

Radio today uses technology from many allied fields including pro audio, computers, telecommunications, satellite and electronics. Many companies that cater directly to these outside market sectors are not familiar with the history of this publication. We have also learned that some of our readers do not accurately remember the history and the significance of the leading initials. Others who are completely outside the technology arena thought the initials were a verb, and they considered our name to be rather esoteric with a touch of Zen: Live radio; Know radio; Be radio.

Well, we *are* radio; *Radio* magazine.



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Archiving and storage

By Scott Hanley

When you've worked in radio for a while, cleaning the basement can be a different kind of chore.

For me, it has meant sorting through boxes and milk crates full of more than 20 years of reel-to-reel tapes of all sizes and formats, cassettes, carts, LPs, 45s, more than a few DATs and even a minidisc or two. Somewhere in there is precious stuff.

Much of what we do in radio is ephemeral—the traffic report, weather and other things that can be important at the moment. But why worry about keeping it forever?

A GM friend at a commercial station with a long legacy said that when you have station history that goes back 50 years or more, nobody really knows what they have. Many stations didn't save a lot of stuff. Still, some of these treasures have been found, and specials, soundbites and retail products have surfaced as stations and networks celebrate their history and bask in the glow of nostalgia.

Many stations have extensive archives on analog media that could be transferred to linear digital formats.

Sentiment aside, radio's intellectual property could be financially valuable in the future—let alone historically important. I would never want to repeat one of the greatest failures to keep tape I could imagine—the loss of nearly all of the tapes of *The Tonight Show with Johnny Carson* from 1962 to 1972. In the midst of some clearly forgettable sketches and interviews were some wonderful gems. Radio has also lost its share of gems.

Quality, quantity and recovery

On a day-to-day basis, the new world of radio is digital storage—on hard drive-based systems, mirrored for redundancy or routinely backed up.

Dolby AC2, MP3 and MP2 coding formats are data-reduced, taking out parts of the audio that can never be recovered. If you are going to use the audio more than once, better to have it sound as perfect as possible. With faster processors and cheaper storage via hard drives, the consensus opinion is to go linear if you can, if possible with 24-bits and 96kHz sampling. If you can't afford to go linear yet, keep the audio as high quality as you can.

The regularity of stations performing backups ranges from daily to weekly to whenever they please. I spoke with one individual who suggested that general managers stress the importance of backing up the digital treasure by having the operations staff exchange the backup tapes with bookkeeping to receive their paychecks.

Editing, editing, editing

As hard drive storage gets cheaper and cheaper, the bits get cheaper to store, but managing the content can get more complicated. Every day, stations, clusters, groups and networks are making decisions on their digital content management. How much hard drive space your producers, techs or hosts have to use has a direct relationship to with how much of your content they will keep on your system.

If they are squeezed for space, you may hear about it from what you don't hear, like an award-worthy commercial done for a hard-to-please client that got deleted because there just wasn't room anymore.

You will always seem to need more space, but sometimes it's because less-valuable content, work parts, duplicate files and plain junk are taking up space. File maintenance is an important bit of housecleaning to keep the system running well, but it's also important for the staff to remember what it was that they put there in the first place.

Eventually, you will need more digital storage space. The key is to make sure you and your staff know what is in the system that might be so valuable it shouldn't be erased.

Keeping the old stuff

Religious broadcasters, public radio outlets and some news/talk stations seem more interested in keeping and reusing archival content. Among the networks, news and talk archives seem to be of increasing interest.

The broadcast rules in Canada require compliance logging, mandating stations to keep 30 days of programming. There are computerized loggers that accept multiple

Computer-based logging systems ease the chores of storing, cataloging and retrieving audio files.

feeds. Stations that want to keep the audio longer can transfer the files to some other media type or increase their capacity. The same technology can be used to digitize analog content for the future.

Some networks are interested in archiving for host and actuality content for several years. This adds to the storage capacity requirements. Other legacy issues are a problem, not just for old audio formats, but for data backup systems. Some tape formats for tape backup systems are getting hard to support.

It is best to get everything of value on to some digital format, such as CD-R, at the highest digital resolution possible. While no format can be guaranteed to be timeless, making a periodic digital copy every couple of years will buy some time.

Using what you keep

For use on the air and the Web, there are commercial and non-commercial stations and networks that want to keep every word and program uttered. Keeping years worth of programming is more than a storage issue—it's a major challenge for finding and reusing the content.

When we turn audio into digital files, we can give it a user-friendly name so we can associate a database file to it. We can put it into categories. For pre-produced content, setting protocols and applying labels may work well but I have a feeling we're going to miss much of the value of our stored sounds with the need for so much manual intervention.

If we could search audio content the way we search text, the ability to find value in our stored archives could improve dramatically.

Speech recognition and speech-to-text solutions being developed for court reporting and captioning may hold an important solution. For example, Fast-Talk Communications is developing a high-speed audio search engine that has garnered the interest of security analysts and telephone and Internet customer service operations. If that kind of technology can be developed for use by broadcasters, it could turn radio into a searchable treasure trove.

Whatever you store, you must back up. Whatever hardware and software you purchase, it must be replaced. Hard drive space may be cheap, but you will always long for more.

Now, back to the basement. If I can get my hands on a DBX II decoder, I think I have a really valuable tape down there.

Hanley is director and general manager of WDUQ, Pittsburgh.

Thanks to Dave Scott of Scott Studios, Jay Hyrich of OMT Technologies/iMediaTouch and Don Backus of Enco Systems for their help in providing information in preparing this column.

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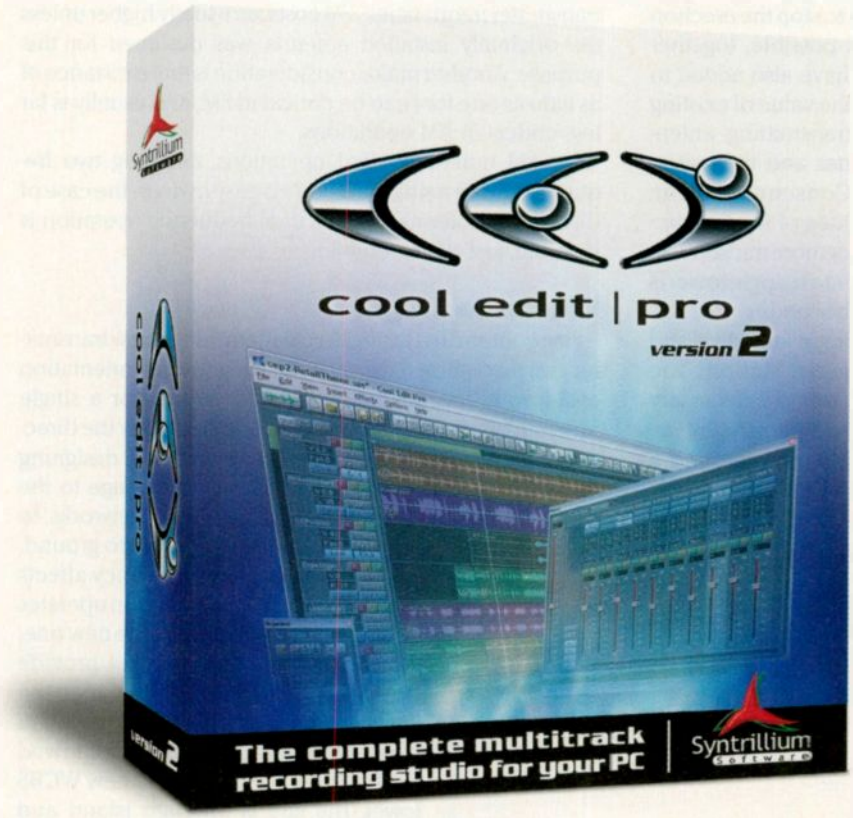

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Diplexing AM transmitters

By John Battison, P.E., technical editor, RF

Throughout the years that radio broadcasting has existed there has not been a strong need to operate more than one AM transmitter into a single antenna. However, during the past several years vertical real estate has become increasingly valuable due to economic factors affecting large tracts of open land. The frantic efforts of the anti-tower consortium to stop the erection of as many towers as possible, together with FAA restrictions, have also added to the value of existing transmitting antennas and their sites. Consequently, the idea of feeding two or more transmitters into a single tower is becoming increasingly attractive and more stations are finding it necessary to diplex to stay viable, or even find a suitable site.

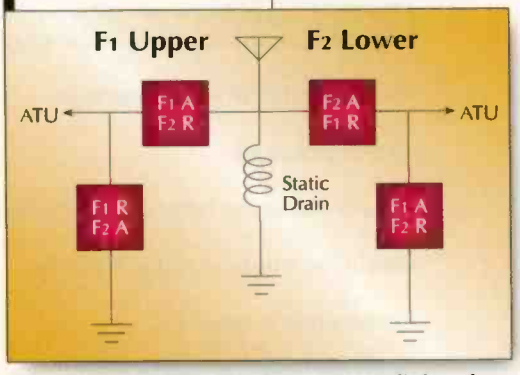

Figure 1. Block diagram of a common, diplexed non-directional installation.

The roadblocks put in the way of new tower construction seem to be increasing exponentially. Businesses that fall under the heading of public utilities can usually force acceptance of a new tower in places where they are banned. Unfortunately, despite the FCC's publicized "law" that is supposed to supersede local zoning regulations, the Commission has given little assistance to broadcasters coming up against zoning roadblocks. New permittees have to find a willing competitor who will rent radiating space on an existing tower.

Diplexing FM transmitters, or even triplexing is not unusual today. The same precautions have to be taken as for diplexing AM transmitters but to a greater extent. The major differences are that while almost any radiator will perform for AM, sometimes with minor modifications, FM antennas have to be specially broadbanded to cover all the desired transmitter frequencies. FM costs are usually higher unless the originally installed antenna was designed for this purpose. Another major consideration is that a distance of as little as one foot can be critical in FM, and usually is far less critical in AM operations.

For AM non-directional operations, radiating two frequencies from a single antenna is easy to do. In the case of directional antenna systems dual frequency operation is possible, just more complex.

Where to begin

First confirm that the desired pattern for the new transmitter can be obtained using the existing towers, orientation and layout. The next step is similar to that for a single antenna but considerably more complex. After the directional array is designed it becomes a matter of designing isolating filters that provide clean signal passage to the desired signals, and effective acceptance networks to bypass the undesired signals to ground.

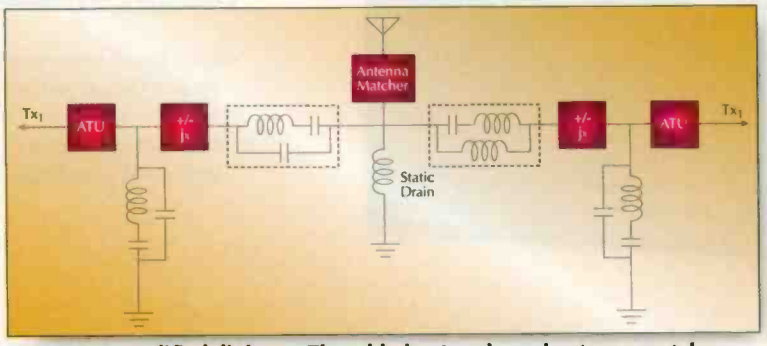

Figure 2. A modified diplexer. The added networks and antenna matcher overcome undesired electrical characteristics.

Sometimes antenna efficiency affects diplexing. If the existing station operates on a higher frequency than the new one, the existing antenna may not provide the required radiation efficiency on the lower frequency. This was a problem about 40 years ago when CBS allowed WNBC (now WFAN) on the new WCBS tower. The site is on High Island and surrounded by seawater, which gives excellent ground conductivity and coverage of New York City.

WCBS operates on 880kHz and WFAN is on 660kHz. Both are rated at 50kW. The shorter WCBS antenna did not provide the required FCC radiation efficiency on 660kHz. It took considerable work to bring the lower frequency efficiency up to the required level. In some cases, folded unipole techniques or some form of top loading may be required to increase the electrical length of the antenna for the lower frequency station, while not greatly increasing the radiation efficiency on the higher frequency unless such increased radiation can be approved with a new CP. Consider all the critical electrical length factors that are involved in constructing an antenna designed for multifrequency operation. The possibility of

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significant sum or difference frequencies being produced must be borne in mind in the planning stages.

Figure 1 diagrams diplexed nondirectional operation. The antenna circuit for each transmitter is similar. Between each ATU and the antenna is an accept/reject filter and an acceptance filter to bypass to ground the other transmitter's signal. This is the bare bones circuit and would probably work well but it does not provide the desired attenuation of the other station's signal. Audio quality may suffer from the effects of Hi Q circuits and bandwidth restrictions. A few modifications to the basic circuit will provide the best operating conditions. Sometimes it is possible to incorporate components of an ATU into various filters. However, this is not a good idea because it can make future adjustments difficult and can result in performance restrictions.

Figure 2 shows a diplex system modified to avoid problems of bandwidth restriction, impedance matching and excessive Q conditions. The higher-frequency side will be similar except that the frequencies of the accept/reject filters will be reversed.

The design of the main filter is important, but will be saved for a later column. The bandwidth of high and low frequencies will be affected by the design of this filter. Sometimes auxiliary filters are used and their presence affects the final main filter design.

Component stress has to be taken into account, especially 100 percent modulation current. Unsuspected high circulating currents can develop as well as unexpected high RF voltages.

Sometimes an antenna resonator is required when using an auxiliary trap. This resonator is actually a reactive device that may be positive or negative, depending on the impedance at the input to the main filter.

About 60dB attenuation between the transmitters is adequate. The amount of attenuation generally determines whether an auxiliary filter is required. If it's less than 60dB the auxiliary filter will be needed. Anything less than 15 percent frequency separation will require an auxiliary filter. With more than 25 percent frequency separation an auxiliary filter will not be required.

E-mail Battison at batcom@bright.net.

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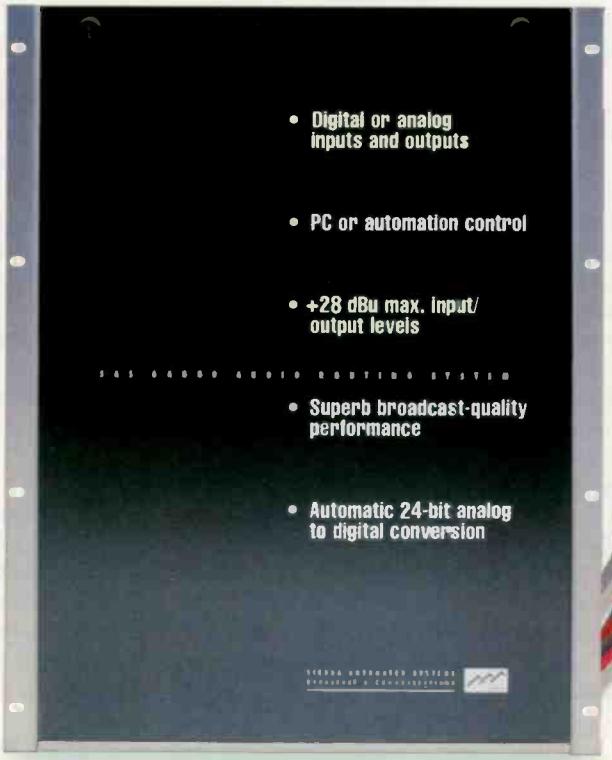

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Data backup systems

By Kevin McNamara, CNE

Last month we looked at a few methods for backing up data. This month we will discuss what types of data backup systems are currently available. While it is possible to backup data directly to flash-type memory devices, the more practical and safer method is to back up to disk- or tape-based media. Flash memory is a better solution for the temporary backup and transport of data between machines, primarily due to its small memory capacity and high cost compared to tape or disk-based media.

Tape-based systems

Tape-based backup systems fall into one of two types of technologies: helical-scan tape or linear tape. Engineers that have had some television experience may recognize these technologies as those used for traditional videotape recording and playback systems. You may remember seeing pictures of the early 9-track tape backup systems, used primarily by the government and large corporations. These 9-track systems used about 2,400 feet of ½-inch tape on 10½-inch reels. Nine-track backup devices used all nine tracks to record data in parallel. Eight tracks were used to store the data bits and the ninth was used to store parity information that ensured data integrity. In the mid-1980s IBM incorporated this format within a single ½-inch cassette subsystem for use with its 34XX series of mainframe computers. Strangely enough these systems are still in use, but are largely being replaced by newer tape technologies.

Digital Linear Tape is a popular and reliable data storage backup format.

Helical-based tape drives use a mechanism to physically pull the tape away from its case so that the tape can be placed against a rotating drum assembly that contains multiple heads. The drum rotates at speeds as fast as 7,000 RPM. Consumer and professional VHS video machines also use this technology. Helical-scan based backup devices can store a much higher density of data because the data is written diagonally across the tape and multiple channels of data can be simultaneously written and read. The reliability of helical-scan tape devices is questionable, because the tape can break from the high tension necessary to hold the tape against the spinning drum, but in practice, these systems have proven to be reliable.

Linear tape backup devices operate similar to the all-too-familiar audiotape formats, such as reel-to-reel and cassette, in which the magnetic tape media is drawn across one or more stationary heads. Linear backup devices are considered more reliable than those of helical-based systems because the tape is simply passed across the heads without the need for the complex tensioning mechanisms and the servo-control systems required to control the speed of the drum in helical systems. In linear tape backup devices, data is written from front-to-back in a serpentine method, which means that data is written on the first track in one direction, and then moves to the next track in the opposite direction. This process continues until it reaches the end of the bottom track. The number of tracks and the amount of data per tape offered in linear drives varies by manufacturer.

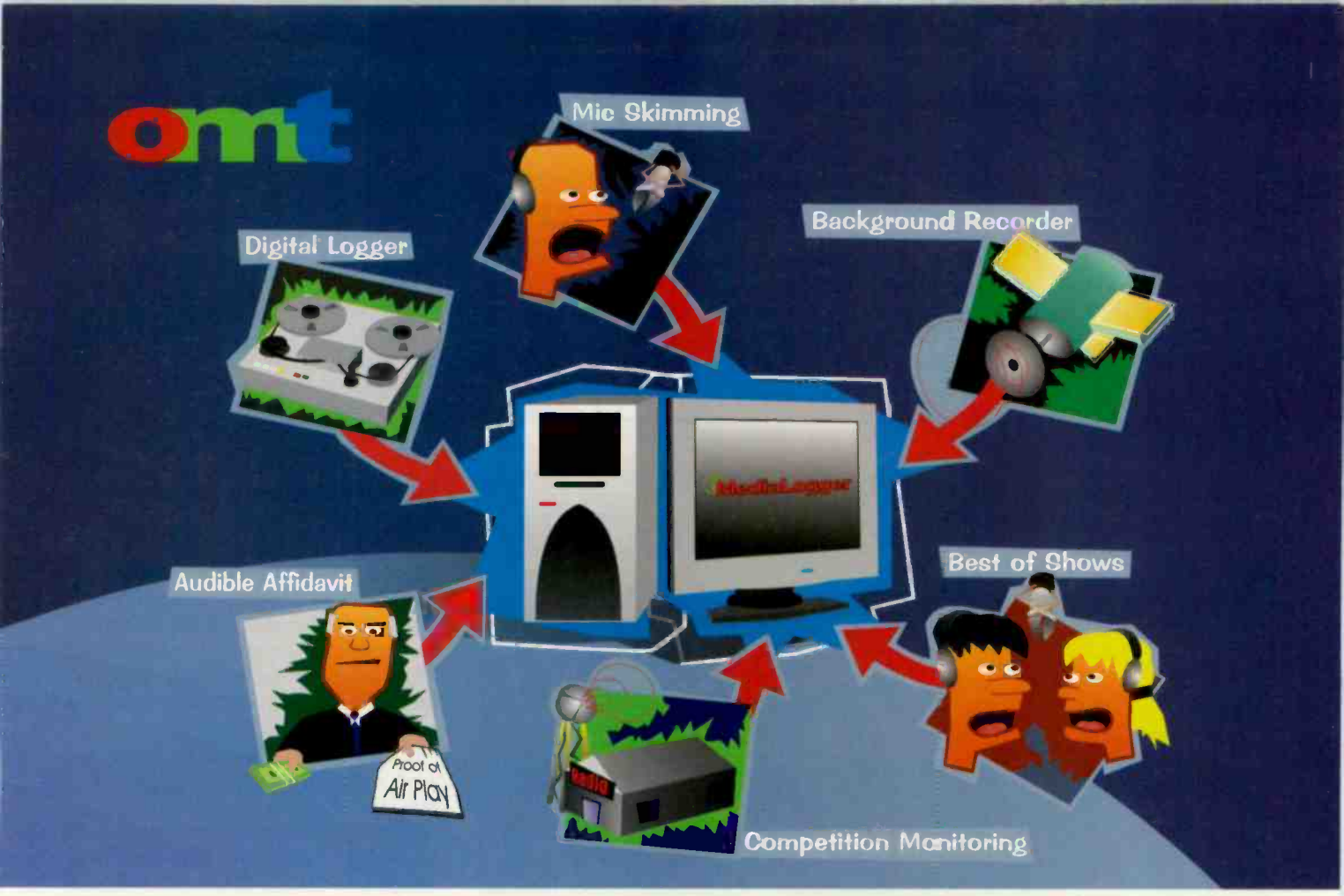
A more current variation uses a technology known as Digital Linear Tape (DLT). DLT was developed by Digital Equipment Corporation (DEC) in the early 1990s as a high-capacity alternative to the IBM ½-inch tape cartridge format. DLT drives use a four-channel read and write system, where four channels can read and write data simultaneously. Quantum, the primary manufacturer of DLT devices, has introduced Super DLT (SDLT) devices touting increased data storage density using a combination of magnetic and optical (laser) technologies within a single system.

Other backup technologies using linear tape include: Linear Tape Open (LTO), a direct competitor with SDLT that integrates a memory system within the tape cartridge, along with a tracking and identification system and Sony's Advanced Intelligent Tape (AIT) Drive, which uses smart card technology within the cassette.

Disk-based systems

For single workstation or small network applications where your backup needs do not include a large amount of storage, the simplest disk based backup system is still the floppy disk. However, the low cost of optical CD-ROM writers and disk media, combined with a relatively large storage capacity, makes backing up to CD a much more practical solution.

In larger networks, magneto-optical (M/O) or DVD-RW



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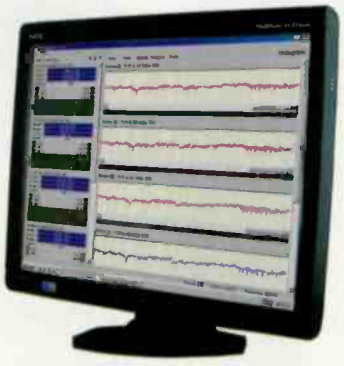

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drives may be used. The M/O drive uses a hybrid of electromagnetic and optical technologies. M/O technology uses a laser to heat specific parts of the disk to around 200 degrees centigrade. The direction of magnetic particles can be altered using a magnetic field generated by the read and write head. Because of this multistep process, M/O drives tend to be slower than other backup methods. A newer technology based on M/O, called Light Intensity Modulated Direct Overwrite (LIMDOW), uses magnets that are built into the disk rather than a separate head.

Magneto-optical formats work well in larger data installations.

The durability and relatively long shelf life of M/O media make it better suited for archival storage applications.

A lack of unified standards for DVD record products has been a stumbling block, however, the DVD manufacturers have announced an alliance to move ahead with standards for DVD+RW (DVD rewritable) and DVD+RW/+R (DVD rewritable+recordable). While DVD recorders are becoming widely available for storing and distributing video and audio information, the lack of standards has hindered its application as a viable data storage medium.

Some other optical storage technologies to look for include the Optical Super Density (OSD) that provides the benefits of M/O at speeds of current hard drives. Fluorescent Disc Technology promises the potential of enough capacity to store 20 hours of high definition TV programs.

When selecting a data backup system, decide what features are necessary for your application—reliability, speed or capacity. Other factors to consider are cost, ease of operation and the ability to grow into the future. There are several good alternatives available, but always remember that the backup system is only useful if proper backup procedures are adopted and followed.

McNamara, Radio's consultant on computer technology, is president of Applied Wireless, New Market, MD.

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MP-6	6	3000 W	$2,700

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GP-3	3	4500 W	$1,800
GP-4	4	6000 W	$2,500
GP-5	5	6000 W	$2,900
GP-6	6	8000 W	$3,500

FM Medium Power Circular Polarization antennas.

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SGP-2	2	6000 W	$2,450
SGP-3	3	8000 W	$3,500
SGP-4	4	8000 W	$4,300
SGP-5	5	8000 W	$5,100
SGP-6	6	8000 W	$5,900
SGP-6R	6	15000 W	$6,500

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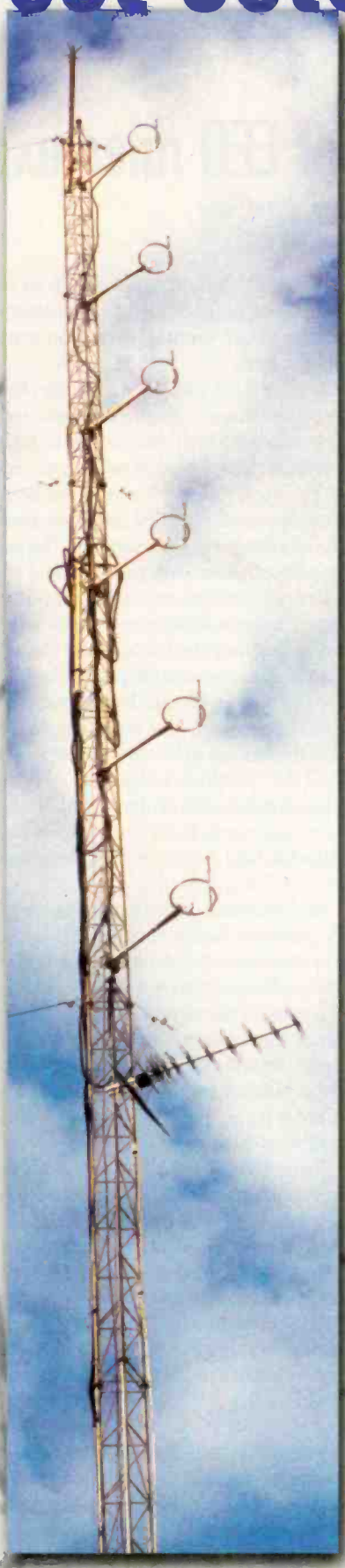

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TV & Radio antenna systems

Need for EEO rules explored

By Harry Martin

On June, the Commission held an *en banc* hearing on the need for new broadcast and cable equal employment opportunity (EEO) rules.

Former FCC Commissioner Henry Rivera provided a description of the history of the Commission's EEO rules and policies. The meeting then turned to two panel discussions, each followed by a question-and-answer period. The first panel focused on the challenges of EEO outreach. The panel was weighted toward minority and women's organizations, including the National Urban League, American Women in Radio and Television and the National Organization for Women and Hispanic Americans for Fairness in Media. These groups said there historically has been employment discrimination in the broadcast industry, that the previous broadcast EEO rules helped reduce the problem, but that more work still needs to be done. These panelists endorsed the return of EEO regulation by the Commission.

Also included on the panel were AFTRA, the Midwest Family Broadcast Group and the executive director of the Texas Association of Broadcasters Ann Arnold. Arnold questioned the need for new EEO regulations. She pointed out that for more than three years the broadcast industry has not been subject to any EEO rules, but that there is no evidence of any new discrimination in employment.

The second panel addressed methods of achieving broad and inclusive outreach. Included on the panel was Cathy Hughes, the founder of Radio One. These panelists recounted their experiences and described recruitment programs that they have found to be successful in attracting diverse applicant pools. Hughes remarked on the difficulty she has in recruiting Caucasian applicants for her minority-oriented stations.

Processing fees increased

Effective Sept. 10, the Commission amended its schedule of application filing fees to reflect changes in the Consumer Price Index – Urban ("CPI-U") as of Oct. 1, 2001. Copies of a Fee Filing Guide listing the new fees are available at the Commission's website (www.fcc.gov/formpage.html) or through its Forms Distribution Center at 1-800-418-FORM [3676]. For those keeping track, the CPI-U has undergone a net change of 40 percent since October 1989.

Anti-consolidation legislation

Sen. Russ Feingold (D-WI) has introduced the "Competition in Radio and Concert Industries Act of 2002" to prohibit anti-competitive practices in the radio and concert industries. The new legislation would authorize the FCC to revoke the licenses of entities that use their dominant power in the radio and concert industries to discriminate against musicians, concert promoters or other stations not affiliated with the licensee.

For example, under this legislation a radio station under common control with a concert venue or concert promoter would be prohibited from restricting the promotional giveaways offered by another station in the market. The station with the tie to the concert also would be prohibited from influencing the programming, or terms of sale of such programming, of a nonaffiliated musician or from restricting the ability of a nonaffiliated musician to receive promotional services from nonaffiliated entities. All licensees would be prohibited from extracting money or any other form of consideration from musicians or their representatives in exchange for airing their music.

Additionally, Sen. Feingold's legislation would require the FCC to designate for hearing any assignment or renewal application by an entity that reaches more than 60 percent of the national radio audience. In effect, this would institute a national ownership cap similar to the national television audience limit (35 percent) that was recently struck down by the Court of Appeals. In such hearings, the licensee would have to prove that it did not participate in these types of improper activities.

Further, the legislation would establish a cap in local radio markets limiting the control of any one entity, including those stations operating under LMAs, to 35 percent of the audience or 35 percent of the advertising revenue in a market. The legislation would also extend the attribution rules to include stations holding an option to purchase another station to just one year. It appears unlikely that this legislation will reach the Senate floor this legislative year.

Martin is an attorney with Fletcher, Heald & Hildreth, PLC., Arlington, VA. E-mail martin@fhhlaw.com.

Dateline:

Annual regulatory fees for 2002 are due no later than Sept. 25, 2002.

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Installation Profile

The Master Control Room/On-Air Room, has all necessary equipment placed within easy reach of the show host.

The On-Air Room uses a Harris Impulse-20 console.

WMKY-FM 90.3

Harris Helps Morehead Grow

WMKY-FM 90.3 is one of two stations that make up Morehead State Public Radio. As a 50,000-watt station, WMKY blankets several counties in Kentucky, Ohio and West Virginia. Housed on the campus of Morehead State University, the radio station was experiencing growing pains and needed to move to a new facility across campus.

When it came time to design and build the new facility, Dan Conti, the general manager of WMKY, who has had a long history with Harris, knew that Harris as a leading systems integrator would have the expertise to design and install their new studios. Because Conti had observed the quality and efficiency of Harris' work at three other stations, he wasn't surprised the corporation was able to create new, top-of-the-line studios from scratch and do so on a strict budget and tight deadline.

Chris Karb of Harris worked with WMKY over an extended period of time to get to know them and design a facility around the station's specific needs. The result of this year-long project was a brand-new facility with four specific studios: an on-air room, a production room, a talk studio and a news room. The station also includes a roof and antenna assembly with a roof sled and an inter-room wiring and audio router wiring package. And, best of all, the project came in on time and within budget.

The on-air room features a Harris Impulse 20 on-air console, which the station had purchased prior to the move, and was able to reuse for the new facility. CD players, minidiscs and all necessary broadcast equipment are placed in the on-air room within easy reach of the operator. The room also contains four metal racks loaded with air chain equipment, routers, emergency broadcast gear and ancillary recording gear.

The production room is designed to mirror the on-air room as much as possible. This was done so that operators could use the production room as an emergency on-air room. The mirroring of the rooms allows operators to easily move from one room to the other if necessary. Another recent-

Facility Specifications

Roof & Transmission:
- SCA Paraflector antenna
- Andrew Heliax cable
- Baird roof sled

Tech Core:
- Harris 44RU racks
- Sierra Automated System 6000 router
- Sierra Automated System expansion chassis (32×32)
- Krone blocks

Studio:
- Harris PR&E Impulse-20 consoles
- Harris custom cabinetry
- Electro-Voice RE20 mics
- Symetrix 506 headphone amplifiers
- Sony MDR7506 headphones
- Denon DJ151 digital turntable
- Tascam 122 MKIII cassette
- Tascam CDRW 700 CD recorder
- Sony CDPD11 CD player
- Mackie HR824 powered monitors
- Centner SPH10 analog telephone hybrid
- Sony MDS-E12 minidisc

News Room:
- Dixon Systems NM-250 Newsmixer

The Talk Room has flat desktop furniture which hides headphone amps and microphone preamps in racks under the table surface.

The Production Room mirrors the On-Air Room so that operators can use that room as an On-Air Room in case of emergency.

The News Production Room uses a Dixon News Mixer to free up needed desk space.

ly purchased Impulse console is incorporated into the design of the production room.

Connecting the on-air and production rooms is the talk studio. This room is designed so that a show host can interview up to five guests at one time. The furniture, when you first see it, is deceivingly simple with a straightforward flat desktop, but it hides a wealth of gear. Headphone amps and microphone preamps are in hidden racks under the table surface, and SAS Audio Router Heads (controllers) are neatly fitted into the surface. This table, designed by David Schlegel of Harris, uses screw-on legs that allow for the disassembly and removal of the table during pledge drives. Also, all the equipment in this room is able to "switch" from the on-air room to the production room if there was ever an emergency.

Systems designer Mark Colacito integrated a multi-pin audio snake cable into the table (as one might find in use on theater equipment) that runs back to a Sierra Automated Systems Audio Router. By programming in a series of "salvos" or "macros," multiple connections can be made instantly by the push of a single button. This button is integrated directly into the Host cabinet. So, with the push of a button, the host can now route all headphones, microphones, speaker feeds and talkbacks to the desired studio. Simple solutions like matching colored pop screens on the microphones to corresponding, colored fader knobs on the console, allow operators to easily track which fader controls match up with each microphone.

The newsroom presented a series of challenges during the construction process. This room has more gear assigned to it than one typically finds in a news studio. A simple yet readily available mixer was an elegant solution to maximize newscaster operation. The mixer also needs several balanced inputs to integrate with router feeds from the tech center. A Dixon News Mixer expanded with a 6x1 switcher was chosen because it integrated smoothly and allows for one-button mixing, and as a rack mount unit, it frees up precious desk space for the newscasters in this small room. Amazingly, the cabinet design fits all of the equipment WMKY requested into this small space without feeling cramped.

Shannon Halladay, Order Administrator at Harris, kept a close eye on the budget, which allowed WMKY to scale back or expand portions of the job depending on the daily expenditures. When savings were found, they immediately could be used in other areas in the facility. This allowed for WMKY to get everything that they needed in the studio as well as a few extras that they wanted. Today, WMKY has a state-of-the-art facility that has the flexibility to meet the communications demands of today and tomorrow. ■

Clean & Elegant Production

Let creativity thrive by providing the proper tools and a comfortable work space for the idea factory behind the station.

By Chriss Scherer, editor

Photo of KCBS by Sharon Risedorph of Sharon Risedorph Photography and courtesy of CIC Associates, Oakland, CA.

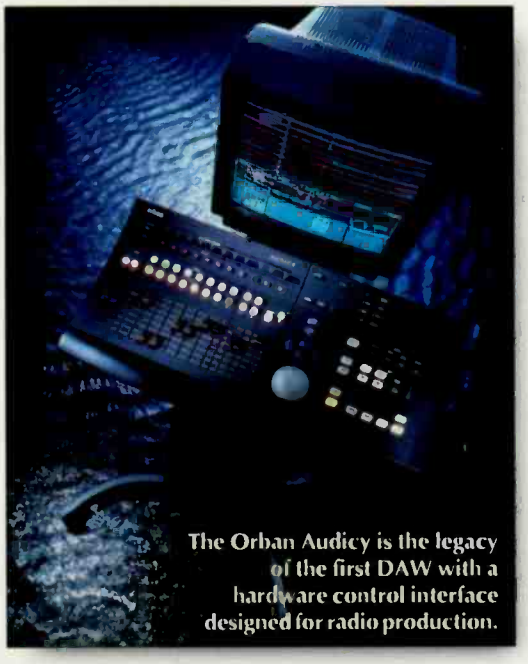
Because of its routine nature, it is easy to overlook the critical role that production plays in the daily operations of a radio station. What happens behind the scenes is just as important, if not more so, as what happens live on the air. Whether designing a new studio from scratch, enhancing what you already have or seeking to increase the role that production plays, some small steps can go a long way in getting you there.

The first step is to look at the studio's physical space. The production studio should first and foremost be just that—a production studio. It is common practice to design the production studio to serve as a backup air studio. This is a wise move, but the effort often places too high a priority on the on-air aspect. This should be the other way around. The studio is used for production 99 percent of

Continued on page 30

TRENDS IN TECHNOLOGY

Digital Audio Workstations


The Orban Audicy is the legacy of the first DAW with a hardware control interface designed for radio production.

DAWs are a critical part of the production process and buyers should choose one carefully.

By Mitch Todd

When I began my broadcasting career as a disc jockey, I quickly realized doing production was really the part that interested me. I could hide in my little room and manipulate the audio, refine it, polish it and have as many takes as I wanted, unlike live radio.

I have worked with several workstations since I gave up my one-inch eight-track sometime in the 90s. I, as many of my contemporaries did at the time, lusted for the Holy Grail of radio workstations, the AKG (and later, Orban) DSE 7000. It certainly freed up the creative process and was a big step up in functionality from my old trusty one-inch machine.

While I loved the functional aspects of my new hiss-free DSE, I

Continued on page 34

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Clean & Elegant Production

Continued from page 26

the time so design it for that purpose. While the on-air product is important, don't sacrifice an ideal room layout simply for the rare circumstance of using the studio on air. This is a creative space. The form should not stifle that creativity.

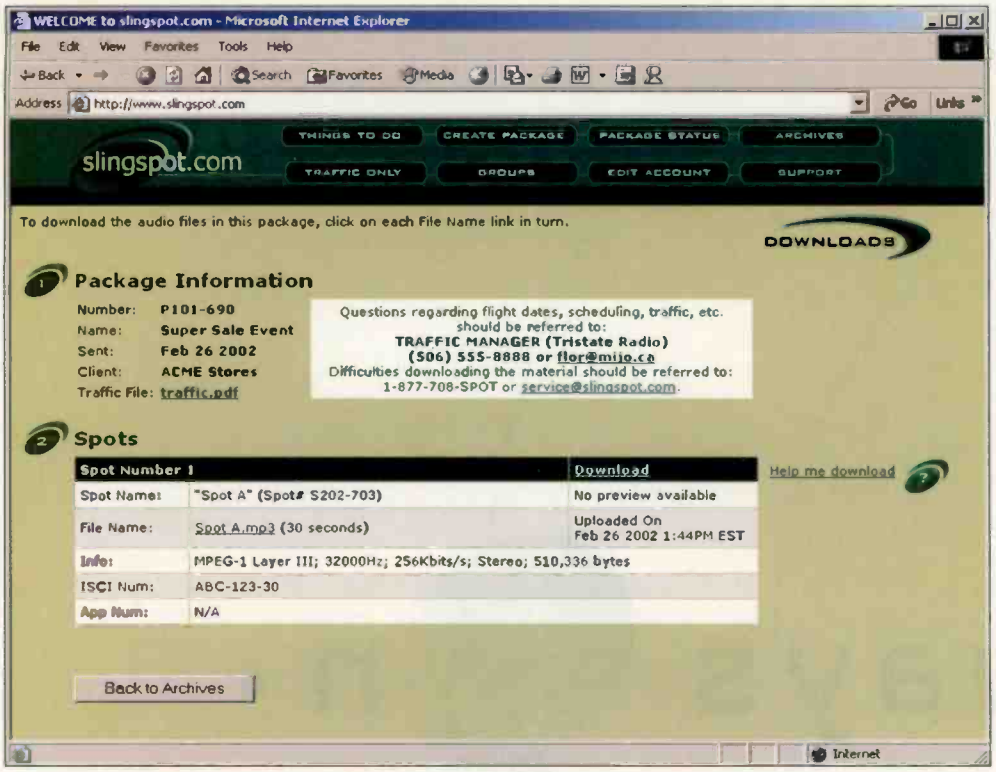
There are trade-offs in this design process. If the facility only has two studios (production and on-air), there may be less flexibility in focusing the design to a specific use. For example, the same audio console in both studios makes it easier for operators to move between rooms, and the second console can serve as a source of spare modules. In many cases, the facility would likely be better served by installing a console that fits the exact production needs and purchasing a few spare modules for the on-air console.

A common design approach is to fashion the production studio to function as a backup air studio, which is a good idea as long as the production focus is not lost.

Supplemental equipment, such as CD players and cassette decks, can be duplicated between rooms to provide the familiarity and backup security without sacrificing the production function.

The tools used in production have evolved, and so has the creative method. Look at the focus of the studio. Center the layout on this focal point. Until recently, the focus was almost always the audio console. Today it is most likely the digital audio workstation (DAW). Base the room design on this central appliance and the studio's functionality will thrive on it; not fight against it.

When DAWs first appeared in production studios, many were installed in a location



Internet-based audio delivery services speed delivery of material. The electronic package can also contain traffic information.

that replaced a reel-to-reel recorder. When the DAW's pivotal role was realized, it became common to place a set of nearfield monitors around the DAW to supplement the monitors for the room that were placed around the console. This helps place the DAW in a better listening environment. Because of the power in DAWs today, producers spend more time in front of the DAW, which can handle most of the mixing and effects processing needed. A good monitoring position should exist where the final mix is created.

When designing a new studio, consider shifting the room's center to be around the DAW and not the console, if the DAW sees the bulk of attention in regular use.

Studio integration has made the separation between the DAW, audio console and some outboard equipment almost invisible. This equipment evolution is investigated further in *Trends in Technology* on page 26.

Inner space

Because producers don't always voice everything themselves, establish a fixed space for guests and talent. Whether it's tracking the on-air staff during a commercial read, a client voicing his own spot or the superstar recording a few drops, there needs to be a place that the guest can call his own. A more comfortable surrounding puts guests at ease and will yield a better presentation. At the minimum, the furniture design can accomplish this, as can the overall room layout. Be sure that the space created for guests stays as a space for guests. It is tempting to use the extra corner to store materials and supplies. Keep the area clean and clear so when the unexpected guest arrives, he can move right in and not have to wait for someone to move all that junk out of the way.

If the facility space allows, a voice-over booth offers the best isolation and personal space. Isolation allows the producer to do his job without worrying about unintended noise being heard in the background. Musicians and performers will feel comfortable in a setting such as this.

Other equipment options

So far we have looked at the physical side of the production space. The equipment side has benefited from the advances in DAWs, but there are other equipment areas that can add some sparkle to a station's productions.

Sometimes a complete overhaul is not needed. There are likely some elements in a studio that work well, but it is felt that something more is needed. Ask the production and operations staff to tell you what items should be upgraded or added to the studio to improve its function. Don't just accept the first answer and move forward. The first answer will likely be less critical than it was perceived to be. Ask what else could be done and make a list. Once a list has been made, ask the staff to pick the one item that will make the biggest difference.

It may be that a new microphone, mic processor or multi-effects processor will make all the difference. The answer might even be more mundane, such as a new or better microphone boom or stand, or a new windscreen.

If a new mic or new mic processor is to be added, take care that the change will not be so dramatic that it makes the on-air mic setup lose its luster. If the comparative sound between live and produced is too great, the on-air announcers' voices will seem flat and thin.

The Internet has made file sharing and exchange an everyday function. This now simple task can be applied to production. At the minimum, audio files can be sent via e-mail or through an FTP server, eliminating the need to create and ship dubs. This saves time on both ends. If delivered in the proper format, the audio files can be directly imported into the station's on-air playback system.

While transferring files in this way works, the system was not designed explicitly for that purpose. File retrieval by the recipient and inclusion of any pertinent traffic information must also be included. To simplify this task, several services are available that handle the file distribution and

Clean & Elegant Production

record keeping. These services have a cost involved that can usually be offset by the savings in dub materials and shipping if it is not picked up by the client.

Some production projects require multiple access before the final product is completed. Projects in progress can be shared between producers in different locations. It is possible to have the voice talent in one city, the music composer/creator in another and the project chief in yet another share the audio file and provide his respective part of the completed piece. Individual portions can be forwarded to a single person, or a networked environment can be created so that each remote producer can access the project as if it were stored on a local hard drive. Many DAWs support remote networking, allowing files to be downloaded, modified and uploaded in a natural step.

Depending on the license terms of a production music library, it is possible to store the audio centrally for other stations and facilities to access as needed through the same network.

There are many ways to break out of the traditional mold when it comes to production. Sometimes the creative process can be invigorated by a touch of new technology or a change in room layout. Either way, the behind-the-scenes effort can step forward and make your stations shine.

Digital Audio Workstations

Continued from page 26

didn't like the sound of it. The station engineers kept everything locked at a 32kHz sampling rate due to limited disc space. The result was plastic-sounding audio. In time the station installed larger drives, moved up to 44.1kHz and eventually accepted digital as the way to go. One of the features that made it so

A DAW control surface creates a familiar work space for users and can be quicker than navigation with a mouse.

successful to broadcasters was its ability to emulate many aspects of an analog multitrack. The machine was designed to act like an analog eight-track with some new capabilities. The biggest advantage was the short learning curve and ease of use for people who hate manuals and aren't PC specialists. This is why the DSE was so popular in the radio environment, despite its initial price of around $40,000. This user interface established a new way looking at DAWs.

There are a lot of computer-based and stand-alone workstations on the market today. The current Orban workstation, called Audicy, is still a viable workstation operating on the original DSE principles but with more tracks and features. It is useful for broadcast applications without complex needs.

However, when I began using Protools I realized how many features I had been missing using the Audicy. The most important features were additional tracks and being able to automate mixing.

About the time I wanted to add computer editing at my home studio and was dreading the cost, along came Sytrillium's Cool Edit Pro. Cool Edit was intuitive, precise and inexpensive. I realized it had some limitations for professional use, mainly the quality of the built-in effects, but it was a lot of bang for the buck. It also worked on a wide range of PCs with various hardware configurations. I thought the editor offered some great features and good visual resolution of the waveforms, and the multitrack screen was functional and easy to use.

Things began to shift among the more advanced producers who wanted more flexible, functional, software that could quickly create more complex production. As budgets began to shift in the industry expensive, stand-alone, proprietary hardware/software workstations began looking less attractive. Cool Edit has become a popular, flexible, cost effective editor in many professional broadcast applications, and if a budget is your main concern it's a decent choice for production rooms. Meanwhile, other software manufacturers were responding to the pro and semi-pro users of studio recording equipment.

Continued evolution

While Syntrillium products evolved from the consumer world, many companies that looked to the professional and prosumer market were making some good, cost effective products. Sonic Foundry is one notable mention. Vegas Video (formerly just an audio multitrack application called Vegas) is a powerful audio and video multitrack application with some decent effects. The audio-editing application Sound Forge and loop mixing software Acid Pro are a powerful set of tools that coexist well for less than $1,000 if you shop around.

I know by now some Macintosh users are

There are a lot of computer-based and stand-alone workstations on the market today.

Digital Audio Workstations

feeling left out, but with the exception of Protools, most broadcasters prefer PCs. Protools was originally a Mac-based hardware and software package and grew from a multitrack system to a powerful swiss army knife for any audio application: recording and mixing music, mixing and sweetening audio for film and television, and other pro-audio post production. Protools has made strong inroads in larger market radio-production rooms. As plug-ins have advanced, saving rack space and dollars and adding a lot of features, it is now a universally accepted application for a wide range of professional uses. It has come to be that most high-end audio professionals and production directors know at least the basics of Protools. If a producer is going to actually use and learn all the tools at his disposal, then a Protools rig loaded with plug-ins is a great way to go. Adding the controller control surface makes it a versatile, ergonomic package.

Because the skill level of a radio station DAW user can vary, basic operation should be easy for anyone to grasp. More powerful functions can used by more experienced users.

The evolution has continued with several control surfaces now available from Digidesign. Some third-party hardware manufacturers also build control units that interface with Protools and other DAWs. If the unit works well with the software,then a control surface is a worthwhile investment. Orban realized the importance of a good control surface and that radio producers would make the transition from analog to digital much easier if their new machine emulated what they already knew. Reliance on hardware-based user interfaces will fade over time as more of the younger generation, who were born with a mouse in their hand, move into our industry and mouse and trackball technology evolves ergonomically.

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Digital Audio Workstations

So many choices

When deciding which workstation configuration to use in your facility, first define several parameters and needs. Decide what can be spent. This will reduce the available choices. Key features to consider are networking, session compatibility with outside studios, flexibility for future expansion and MIDI capabilities. Keep in mind the ability of the users that will use the system.

As computer hardware, operating systems and new methods of storage and connectivity evolve for PCs and Macs, the combinations of hardware, software and user interfaces for DAW use are evolving equally fast. On top of that, many new proprietary, self-contained units are on the market. This makes the choices in the current state-of-the-art workstations much larger and more flexible than just a couple years ago. It also makes it easier to create higher quality work than ever before with an inexpensive set up. But there is also something to be said for a system design that has been around a while and proven in the field and proven over time.

By now you probably realize that it's not easy to make an apples-to-apples comparison of various workstations...

By now you probably realize that it's not easy to make an apples-to-apples comparison of various workstations because of all the different features and considerations.

There are many products being used in radio applications such as Cakewalk's Home Studio and Sonar software, Emagic's Logic Platinum software/hardware combo, Mark of the Unicorn's Digital Performer software, Sadie software and workstations, SAW studio software, Steinberg's Cuebase series of software and others. There are also stand-alone hard disk recording systems/workstations from Fostex, Mackie, Roland, Tascam, Yamaha and others that have a lot of powerful functions. Two reasonably priced, self-contained solutions are the Yamaha Pro Audio AW4416CDHD and the Roland VS-2480CD. Both have balanced ins and outs, 24-bit resolution and built-in CD-RWs. Another workstation that has found acceptance in the world of radio is the Sadie Radia that comes as software with a PCI card or a turnkey system. A step up from that in the Sadie line would be the 24-96 offered only as a turnkey modular system, scalable from eight to 32 channels of I/O.

There are myriad choices in DAWs: Mac, PC based and stand-alone units. They all have their good and bad qualities. In the past, radio has favored tried-and-true equipment that is specifically designed for broadcast. While broadcast engineers enjoy staying in familiar territory, cost considerations and other factors may induce breaking some old habits. An established budget and end-user input will tailor the decision process.

Todd is production manager for Sirius Satellite Radio, New York.

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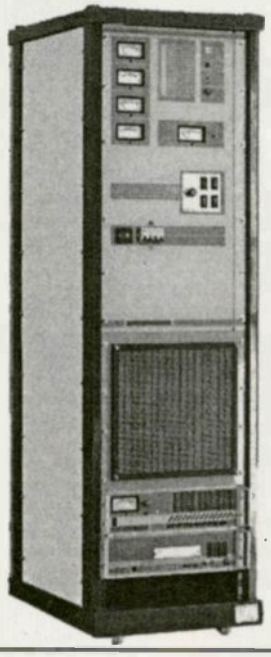

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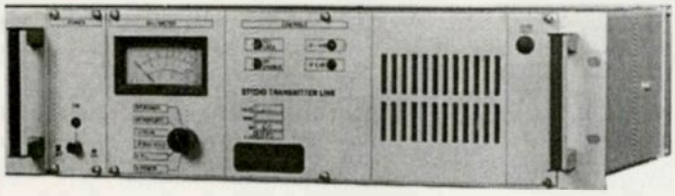

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Rebuilding *despite the rubble*

By Stephanie P. Snyder

One year later the World Trade Center radio stations are still recovering.

With tremendous height and clear coverage of Manhattan, the World Trade Center towers were home to four FM radio transmitters. On Sept. 11, 2001, WKCR, WKTU, WNYC and WPAT were not only faced with the difficulties inherent in covering news from a city under attack, but also they lost their transmission capabilities and equipment, just when they were most needed. Twelve months after the World Trade Center collapse, none of the stations have fully recovered.

Backup plans

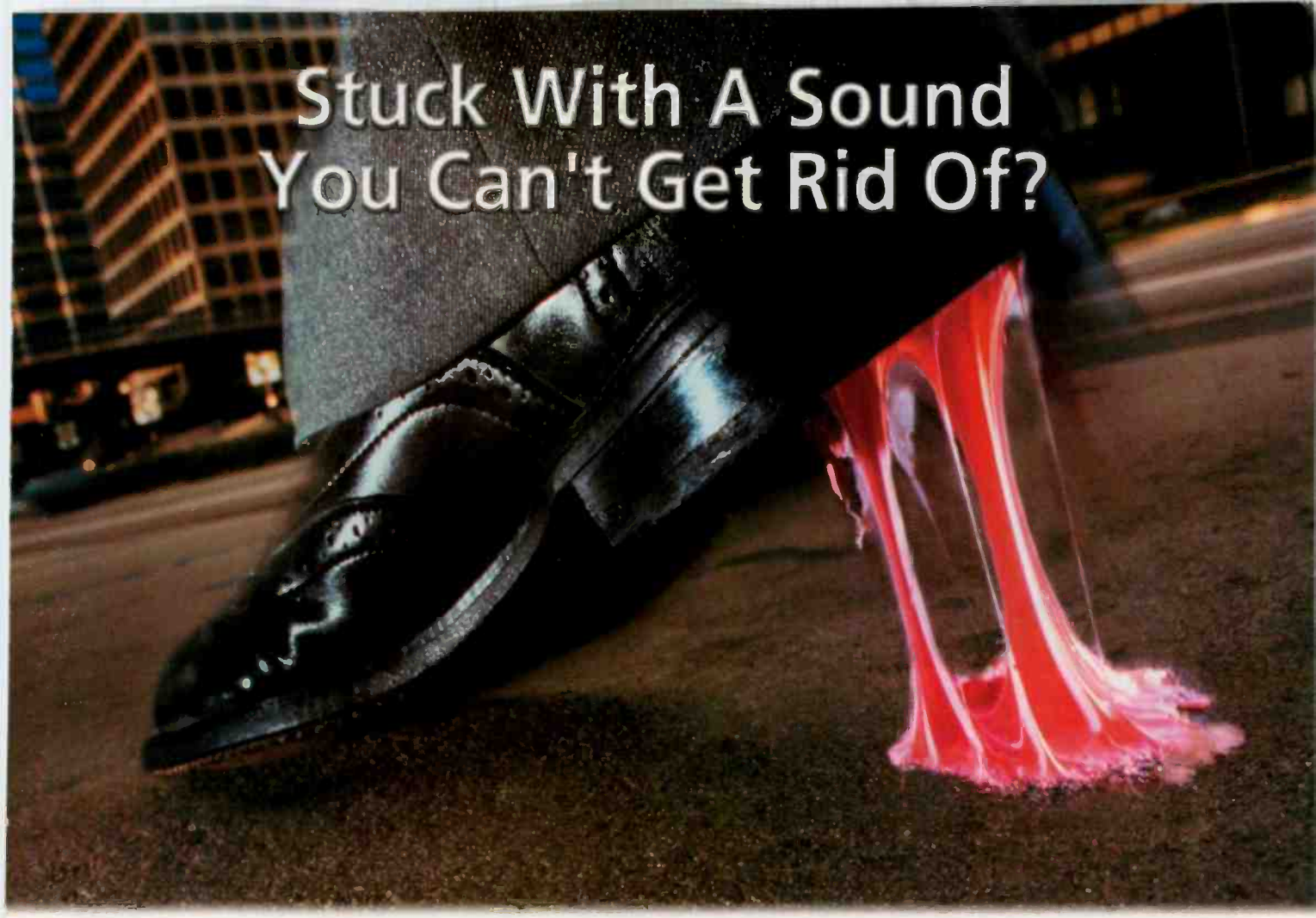
The terrorist attacks have forced New York stations to re-examine their emergency plans. There is now more variety in the mix of New York City backup locations and fully redundant transmission systems. For the four World Trade Center FM stations, emergency plans no longer mean simply a low-power transmitter for equipment failures. Backup systems were not considered of high importance before September, but "now you're criminally negligent if you don't have backup systems in place," said WPAT Chief Engineer Mike Toko.

When WNYC constructed its original transmission systems, the cost of a full-power backup system was considered excessive for its needs. "Who thought that the World Trade Center was going to collapse? That tells you anything can happen and you have to weigh the 'what if' scenarios against real world costs," WNYC Chief Engineer Steve Shultis said. For some stations, the cost of an extended outage may weigh more than the initial outlay on a backup location. "You spend a million dollars to build a backup system but what's the ROI? For us the site has more than paid for itself," said Josh Hadden, Clear Channel's New York director of engineering.

The full economic consequences of the damage from Sept. 11 may never be known, but New York broadcasters lost significant revenue while they were off the air, in addition to transmission equipment. Long-term solutions may be years in the making, but a review of station emergency preparedness plans should be something every station undertakes regularly.

WKTU, 103.5 FM

Clear Channel's WKTU was the first of the affected stations to return to the air. It also was the only one of the four stations with a backup system located elsewhere. The World Trade Center was the site of numerous television transmissions. Between 1999 and 2001, construction and testing of the DTV antenna system on the towers meant regular disruptions for radio broadcasters. To cope with the ongoing outages, Clear Channel built a backup transmission system in Times Square. "When the TV stations at



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Rebuilding

despite the rubble

the World Trade Center were upgrading their DTV projects, we used Times Square every night," said Josh Hadden, director of engineering, Clear Channel, New York. "That meant we were best positioned of all the FMs, of the stations on the World Trade Center, in that we already had a backup site in Manhattan." Within minutes of the collapse, WKTU was able to switch to the backup site, covering 80 percent of ERP at 8kW.

Photo by John Lyons

The site at 4 Times Square was built as Clear Channel's backup facility. It is now the main site for WKTU.

Within the week, WKTU requested and received an STA from the FCC for upgraded power from its backup site. The station now operates at 17kW at Times Square. While WKTU plans to keep the Times Square site as a backup,

it has filed an application with the FCC for a master antenna license at the Empire State Building. Hadden hopes to receive the license this year but spacing issues with a class A station on Long Island could delay the approval. The FCC is requiring all the stations from the World Trade Center to follow normal application procedures.

WKCR, 89.9 FM

Next to return to the air was Columbia University's WKCR. When the towers collapsed, WKCR lost its primary and backup systems. Shortly after the disaster, Station Engineer Rich Koziol ordered an emergency package from Harris for WKCR and arranged similar orders for WPAT and WNYC. The 1kW Quest transmitter was installed on

Photo by Wayne Cignac

Harris supplied the temporary transmitter that WKCR used from the roof of a campus dorm.

the roof of a campus dorm by Sept. 13. Unfortunately, the station now reaches only 9 percent of its original audience.

For five years, WKCR had operated out of nearby Riverside Church. In September 2001, the station planned to move back to the Columbia University campus into a brand new digital studio. "We spent a half million dollars [on the studios] and had planned fund raising for Sept. 28 but with 9 percent power couldn't do it, so now we owe the university," said Koziol.

WKCR received insurance funding and a government grant to build a new transmitter site, but it is still trying to negotiate an alternative location for the station. "The best site right now is Empire, but everyone is trying to get there," said Koziol, "there is no electrical, no room and the mast is full, so we chose not to do Empire, as we were such a small player."

There is a mast on the tower of Riverside Church, where WKCR formerly had its studios. Originally used by WRVR, the church antenna was abandoned many years ago and Koziol is hopeful the FCC will grant temporary authority for WKCR to transmit from the site. "With 26 stations we could interfere with in the educational band, any move requires a major review of short spacing," said Koziol. A study of the impact of the move to Riverside has been sent to the FCC and WKCR is waiting on the results. After FCC approvals are received, the station expects to be running from the church mast within 40 days.

Rebuilding
despite the rubble

Timeline

Sept. 11, 2001
WKCR, WPAT, WNYC and WKTU lose transmitters and backup systems on World Trade Center.
WKTU returns to air from backup transmitter in Times Square.
Harris ships three transmitters and ERI ships three antennas to WKCR, WPAT and WNYC.
WNYC-FM simulcasts on AM transmitter in New Jersey and on WNYE-FM.

Sept. 13, 2001
Transmitters arrive from Harris.
WKCR returns to air using 1kW antenna on roof of dorm at Columbia University.

Sept. 14, 2001
WPAT returns to air with 1kW antenna on Empire State Building.

Sept. 16, 2001
WNYC returns to air on 1kW antenna on Empire State Building.

WPAT 93.1 FM

Spanish-language broadcaster WPAT erected a 1kW transmitter at the Empire State Building after losing its primary and backup equipment at the World Trade Center. "We were down for 59 hours and 48 minutes, not that I was counting," said Chief Engineer Mike Toko. Though lower in height, and with less power at the Empire State Building, WPAT was still able to reach 75 percent of its audience.

Once emergency transmissions had been established at the Empire State

Photo by John Lyons

The WPAT installation at Times Square is also used by sister station WSKQ.

Building, WPAT began constructing an alternate site in Times Square. "At Times Square we have 90 percent coverage, we've only been on a couple of months but it's looking good and sounding good," said Toko. During the next six months, the station plans to construct a full-power main site at the Empire State Building and use Times Square as a backup.

WNYC 93.9 FM

The last of the four FMs to return to the air was WNYC. Immediately after the collapse of the World Trade Center, WNYC worked to maintain transmission on its AM facility in New Jersey. Once the AM signal was stabilized, WNYC began restoring its FM signal, placing a 1kW signal at the Empire State Building. "Empire was a shock," said Chief Engineer Steve Shultis. "With low power at Empire we got the whole east side back, which we had lost 15 years ago when we moved to the World Trade Center. We had so much shadow [from the World Trade Center site] that even the 1kW [on the Empire State Building] was an improvement."

Photo courtesy of WNYC

WNYC installed a full-power facility at Times Square.

WNYC spent the next six months building a full-power facility in Times Square. "Times Square was quicker for full power because the combiner system was plug and play, it just took a couple overnights to install," Shultis said. Now in the process of building a full-power facility at the Empire State Building, the station soon expects to have a full-power main facility at the Empire State Building and a full-power backup at Times Square. Shultis said, "my goal is 9/11 this year, as that would be a fitting ending to that calendar cycle."

Snyder is an independent streaming media consultant.

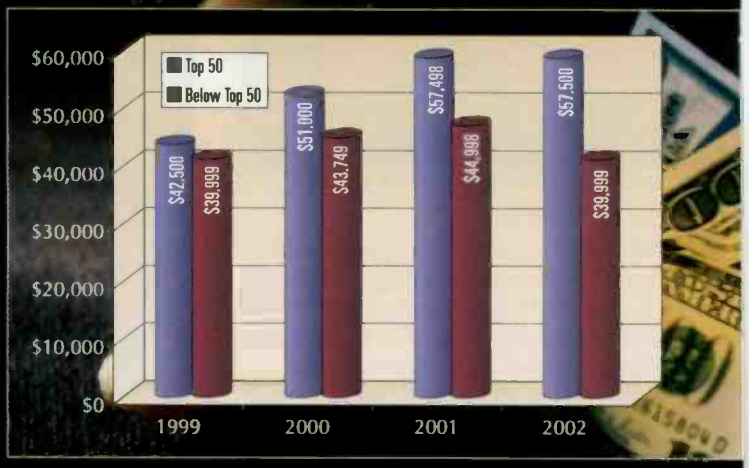
What does your money say to you?

By Kari Taylor, associate editor

Even though the economy has fallen into a recession, and many investors have had to say "goodbye" to large amounts of money, there is good news for radio industry professionals. This year's Salary Survey revealed that people in the radio industry have had the good fortune of maintaining their current salaries and even say "hello" to an increase in some cases.

In June, a *Radio* magazine-sponsored salary survey was e-mailed to a random group of more than 4,000 subscribers who were selected on an *n*th name basis. The results of this study are presented by job title group and market rank (top 50 and below top 50). The survey's objectives were to determine salary levels among *Radio* magazine readers for select title groups and to examine salary trends over time.

The information gathered in the survey is intended to illustrate broad trends in the industry. Treat the data as a starting point for salary ranges. Factors such as cost of living and the demand for a particular job are important in determining salary range.



Estimated median salaries for station management.

The respondents

Most of the respondents said they work at radio stations. Eighty-four percent of the station managers, 80 percent of the staff engineers and 67 percent of the contract engineers work for a radio station or multiple stations.

The station formats these respondents work within varied. The majority of respondents (41 percent) work within a news/talk radio format. Thirty percent work for a rock station, and there was a tie for third at 29 percent between the adult contemporary and country formats.

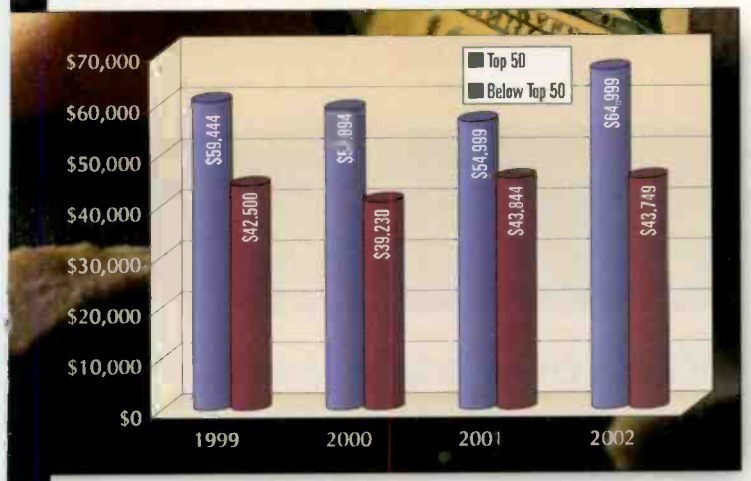
The survey also divulged that the number of engineers surveyed who are SBE certified has increased in 2002. This year, 37 percent of engineers are SBE certified, as opposed to only 32 percent in 2001. In 2002 the median annual salary for an SBE-certified engineer was $61,666 compared to $47,916, which was the median annual salary for non-SBE-certified engineers.

The average age of the respondents was 47, with the majority falling between the ages of 35 and 54. This is a slight increase from 2000 and 2001 when the average age of respondents was 44.5. Does an average age of 47 indicate less new blood and more tenure?

Listen to the money talk

For the fourth consecutive year, staff engineer salaries remained stable. Last year the median salary for this position in the Top 50 markets was $54,999 but in 2002 the median salary for a Top-50 market staff engineer jumped to $64,999. In 2001 staff engineers in markets below the Top 50 received a median salary of $43,844 and received a median salary of $43,749 in 2002.

This year's salary survey results showed that station management



Estimated median salaries for staff engineers.

salaries in the Top 50 markets remained steady at $57,500, compared to last year when the median salary was $57,498. However, the survey's results also showed a decrease in the median salary for station management in the Below Top 50 markets category. In 2001, the median salary for station management in these small markets was $44,998, and in 2002 the median salary for the same group was only $39,999.

"I believe the decrease in under Top 50 management salaries may be due to the 'clustering' of stations under common ownership in most markets," said Milford Smith, vice president of radio engineering at Greater Media, East Brunswick, NJ. "Typically these clusters have a well-paid 'cluster manager,' but rather than having individual GMs at each station (as in years past and each of which earned a good salary) individual stations now have an operations or station manager who is typically paid less."

John Caracciolo, general manager of Jarad Broadcasting in Garden City, NJ, believes the decrease in station management salaries in the Below Top 50 markets is because most management salary structures include commissions that are tied to overall billing. With the tough economy and budget tightening, revenue projections have slipped and therefore have bled out of management's salaries.

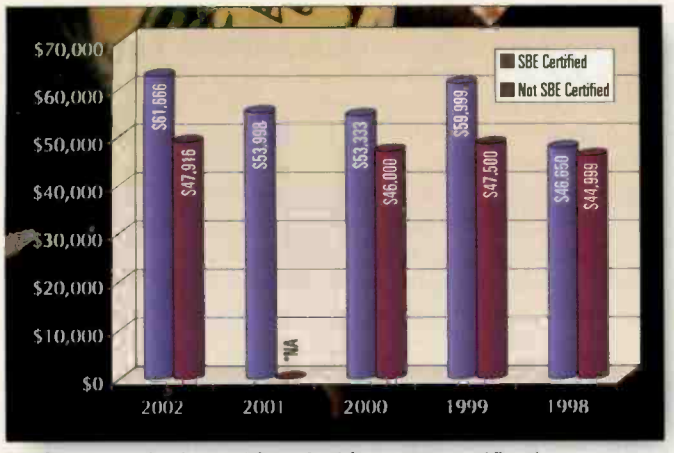
The estimated median salaries for staff engineers in the Below Top 50 market segments remained stable at $43,844 last year and $43,749 this year. Staff engineers in the Top 50 markets saw an increase in their salaries from $54,999 in 2001 to $64,999 in 2002. Competition for experienced engineers is seen as the driver behind this 18 percent jump in Top 50-market staff engineering salaries.

Smith said he attributes this increase to the fact that a highly trained electronics/computer technician or engineer now has many opportunities for employment outside of broadcasting. These outside opportunities generally offer more money and the hours are more predictable. It is taking more money to keep the quality engineers in the broadcasting business.

Caracciolo offered a similar sentiment: "This is definitely more of a competitive nature rather than a shortage of qualified trained workers," he said. "We are competing with cell phone companies, pager companies, cable TV, satellite radio, etc. Our industry has always underpaid the engineering department. Now we need to pay market value for qualified technical help."

Survey results showed that 61 percent of station management respondents in large markets (Top 50) received salary increases

What does your money say to you?



Median annual salary with and without SBE certification.

this year. Only 52 percent of station management in small markets (Below Top 50) received raises this year. Fifty-eight percent of staff engineers in large markets received salary increases, compared to 67 percent of staff engineers in small markets who received salary increases. Forty percent of contract engineers in large markets increased their salaries this year, while 50 percent of contract engineers in small markets received a salary increase.

Overall, the median salary increase for station management was 4.2 percent and the median increase for staff engineers was 4.5 percent. Average the two together and the median salary increase for all respondents was 4.4 percent in 2002.

In addition to the Salary Survey, Radio magazine has posted a survey that looks at some of the benefits associated with a radio engineering profession. The link is under Site Features at www.beradio.com

Will terrestrial radio say goodbye?

The Salary Survey also asked a non-salary-related question: How do Internet radio and satellite radio compare to terrestrial radio in terms of financial competition and audience segmentation? While most respondents believe they have not seen an impact on terrestrial radio by either type of radio, they do think satellite radio has the potential to increase competition for listeners.

"I don't see Internet radio as much of any financial competition, especially in light of the recent copyright ruling," one respondent said. "At this point, satellite radio is also not much of a financial competitor, since most of it is (at present) commercial-free. However, both Internet and satellite will continue to pry away listeners from terrestrial radio because traditional radio has become too cluttered (too many non-music) elements and too homogenized. With the advent of large groups, terrestrial radio has become like McDonalds, there's one in every town and you get the exact same product at each."

Another respondent said, "I handle the computer IT work and most of the studio satellite work. We do no Internet radio. I am finding that in the short run, the financial gains and audience pickup were great. We are three years into this, and I am seeing a long-term down side financially and with the audience. We are looking at going back to a mix of satellite and terrestrial. Terrestrial sure was easier."

"Other, primarily music, stations with cookie-cutter formats are going to get creamed by satellite radio," another respondent said. "Listeners with the wherewithal to do so will flee terrestrial radio in those markets at an increasing pace ... the devastation will be widespread for terrestrial radio. It's the programming, stupid!"

New Products

By Kari Taylor, associate editor

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Contributor Pro-file

Meet the professionals who write for BE Radio. This month: Trends in Technology, page 26.

Mitch Todd
Production Manager, music division
Sirius Satellite Radio
New York

From 1976 to 1985 Todd was an on-air personality/producer in Roanoke, VA, and Atlanta, all the while keeping his hand in music production. In 1986 Mitch transitioned from air personality to production director in Atlanta. From 1987 to 2000 he worked in San Antonio, San Jose, Boston, Philadelphia, Cleveland and Detroit.

He has been with Sirius Satellite Radio in New York since 2000. Todd is a member of AFTRA and still does voiceovers for radio and television.

Radio
THE RADIO TECHNOLOGY LEADER

Written by radio professionals
Written for radio professionals

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Shaping radio today and tomorrow

By Kari Taylor, associate editor

Do you remember?

In 1977 the Centurion I and II consoles from Cetec Broadcast Group advertised that they were able to handle 12 mixers with extender panels to accommodate 24 mixers. Each mixer offered push-button selectivity from three audio sources. Mono or stereo mixer modules were interchangeable.

The console included remote machine start and stop, and modules could also be turned on and off remotely. Noiseless, optically isolated switching helped provide reliability and a motherboard and ground plane printed-circuit techniques helped to eliminate cross talk.

At the time, Cetec offered twelve consoles and as many as 24 mixers.

That was then

Virtually all radio programs in radio's early days were performed live. Reference recordings were occasionally made, but the materials used were regularly recycled for later recording. During the metal shortage of World War II, shows were transcribed onto fragile glass-based discs, many of which are now unplayable if they can be found at all.

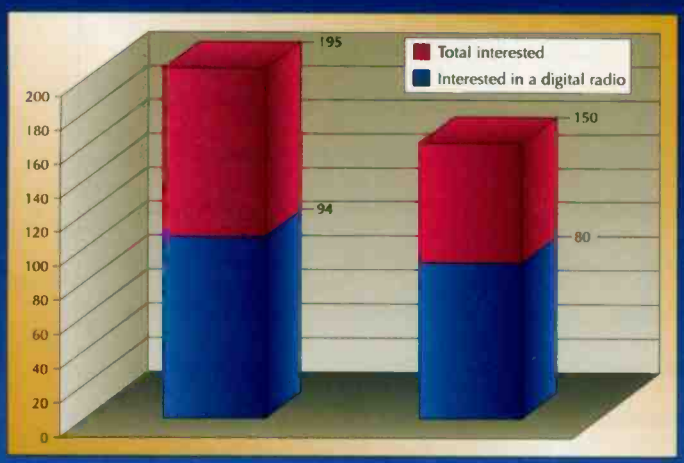
This photo is of a lathe used by WLW, Cincinnati, for archiving live programming. The lacquer masters were still fragile and susceptible to damage from heat and humidity.

The first lathe was introduced in 1917 by Scully. Radio stations continued to use lathes through the first half of the 20th century. In time, magnetic tape replaced the lathe as the preferred method of recording and storing audio.

Sample and Hold

A look at the technology shaping radio

Consumer intent to buy a stereo within the next year



Total survey: 1,500 consumers

Source: The Yankee Group Digital Radio Survey, 2001
www.yankeegroup.com

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- **CHOICE OF MASTER CLOCK RATES:** 32, 44.1, 48KHz or external reference

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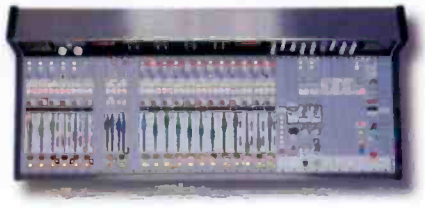

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THE WHEATSTONE BRIDGE DIGITAL AUDIO NETWORK ROUTER can start small with a single cage and only a few cards, or fully populated units can be stacked to form larger systems. Wheatstone's STAR TOPOLOGY ARCHITECTURE lets you connect multiple locations to your central rack room, providing shared resources for all yet still permitting independently functioning studios, each with its own combination of plug-in modules specifically suited for a select set of gear.

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