Radio Guide

Radio Technology for Engineers and Managers

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March 2004

Volume 12 Issue 3

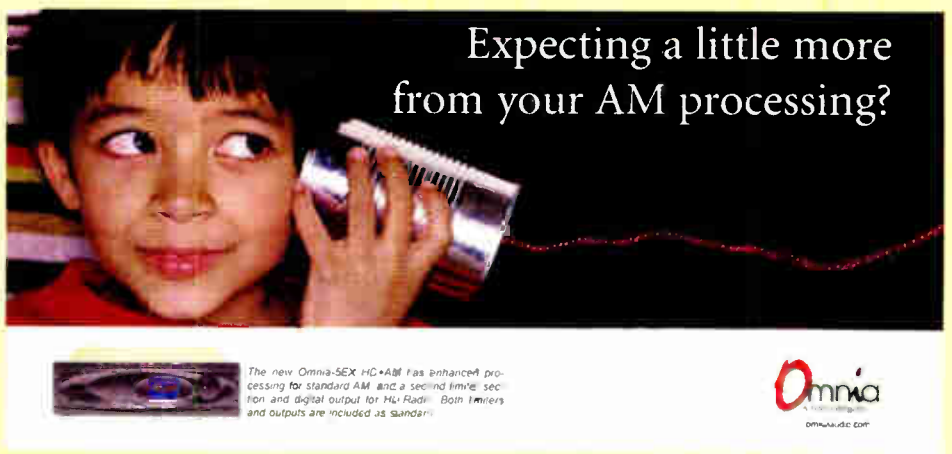
LPFM – On the Air and Growing

Is LPFM Delivering on the Promise?

Page-4 – The first LPFM station went on the air in mid-2001. There are now well over 300 LPFM stations on the air in the US (and some 200 more in Canada), with more coming on line each month. As we look at these stations, what has LPFM delivered on the expectations?

12th Annual Lunch Gathering at NAB2004

The 12th Annual Lunch Gathering at NAB will be held on Tuesday, April 20th. at 12 noon, at the Riviera Hotel Buffet. We are planning to share a meal, conversation, and some super door prizes – at least one will make your morning team drool! So, come to Las Vegas, see the show, get educated on the key issues affecting your profession, and associate with us at lunch on Tuesday. You'll be glad you made the effort!



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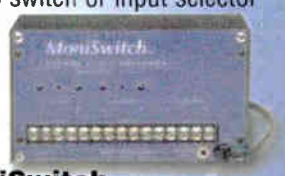

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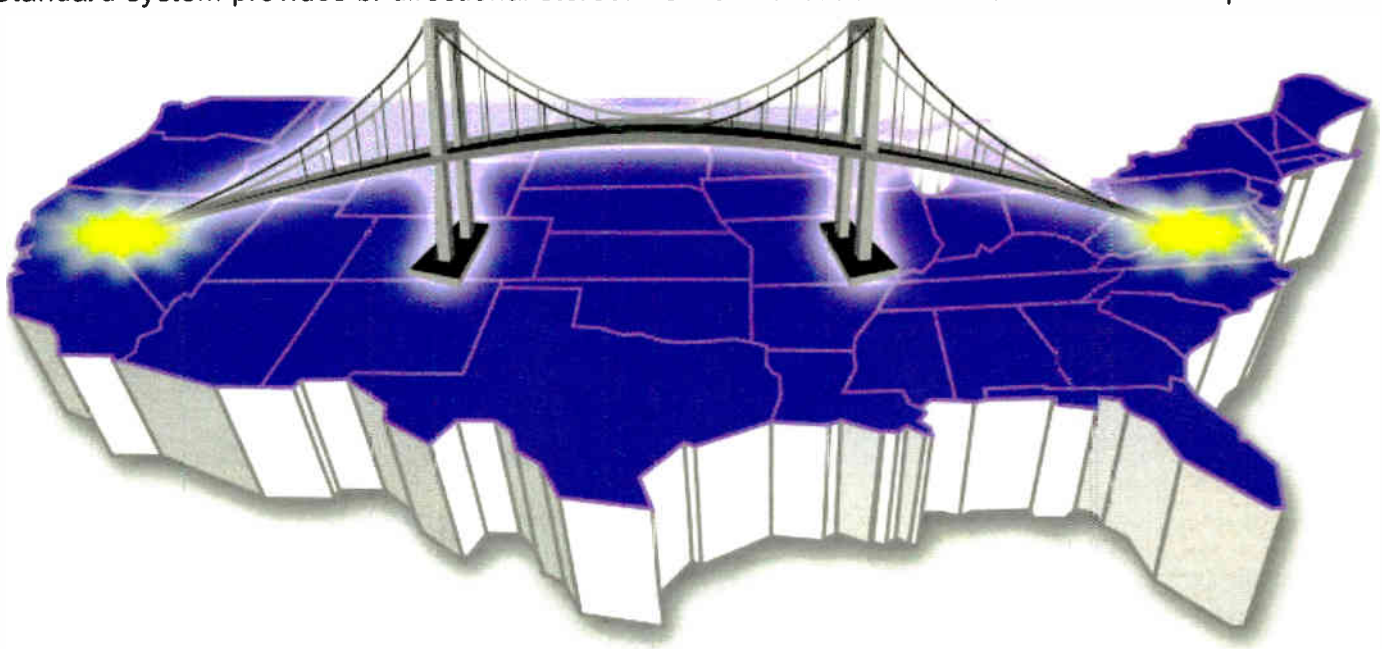

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Columns & Articles

Radio Guide

Volume 12 Issue 3
March 2004

LPFM – Is it Delivering on the Promise?

Page 4 – The first LPFM station went on the air in mid-2001. There are now well over 300 LPFM stations on the air, with new ones popping up on a regular basis. So, as we look at these stations, what has LPFM delivered on the expectations?

Audio Processing – Part 14

Page 10 – Getting the audio into the processor is almost as important as what goes on inside the processing chain itself. Continuing with the "front end," we need to discuss the concept of the "gates" used in broadcast processors.

NRB Looks Toward Expansion

Page 24 – The Charlotte Convention Center was the scene in mid-February for the annual national convention of the National Religious Broadcasters. The gathering of religious broadcasters from around the world was an eventful several days.

An EAS Case History

Page 26 – Every time the EAS is activated, the potential exists for broadcasters to provide either a real community service or a confusing alarm that brings program directors down the hall screaming for an end to EAS activations altogether.

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Serving the Needs

Every broadcaster is, at least on paper, committed to serving the Public Interest, Convenience and Necessity – or PICAN – a term many recall from "the good ol' days." The FCC, which 70 years ago began regulating 600 radio stations, is now overwhelmed with oversight of 13,000 AM/FM/TV stations and 10,000 cable systems, not to mention cell phones and a whole lot more.

Sometimes it seems the only "interest" of concern in the broadcast business is measured in financial terms. A frenzy of stories about program indecency fill the media. Corporate executives run to Capitol Hill to issue contrite statements that they "got religion" – completely unconnected to Mel Gibson's movie. The issue has to affect the NAB convention in April.

With some voices in and out of Congress demanding the FCC significantly raise the indecency fines, will companies making audio delay products see a huge increase in sales as the business of ... ahem ... business takes over? This is a national election year; it means "big bucks" for broadcasters.

Program content will be discussed, analyzed, and tested during and after the NAB show, with many other issues put on the back burner for a while. However, the engineering community also has important issues to meet over and discuss: IBOC and frequency coordination issues, among them. You really should be there.

Finally, I can't resist the chance to remind you about our **12th Annual Lunch Gathering** at NAB: **Tuesday, April 20th, 12 NOON at the Riviera Hotel Buffet.** We plan to share a meal, conversation, and some super door prizes – at least one will make your morning team drool! So, come to Las Vegas, see the show, get educated on the key issues affecting your profession, and associate with us at lunch on Tuesday. You'll be glad you made the effort!

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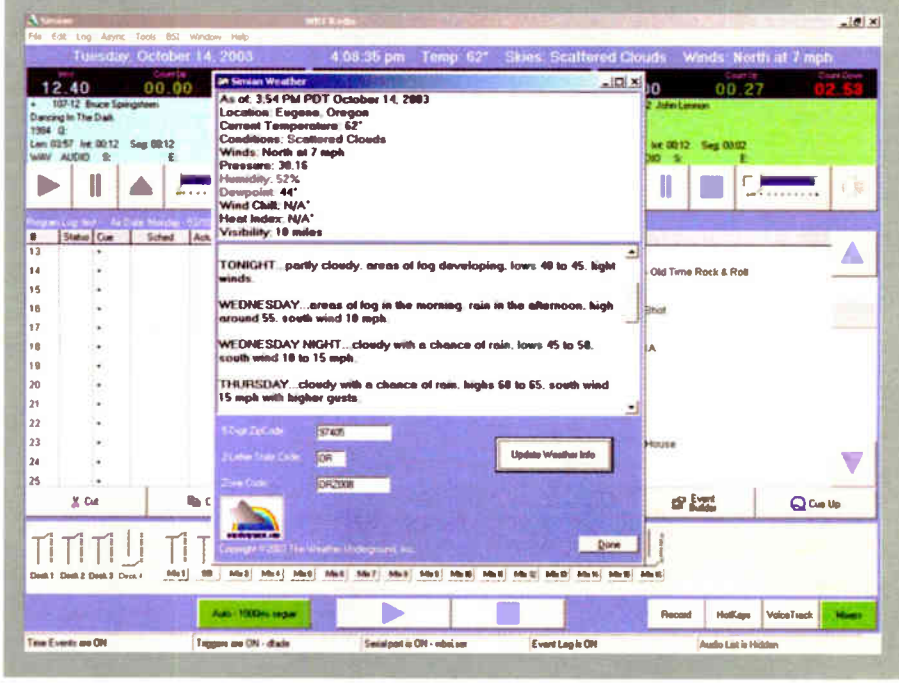

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LPFM – Is it Delivering on the Promise?

by Barry Mishkind

[TUCSON, Arizona – March 2004] In the early 1920s, the pioneer stations were usually low powered – five, ten, fifty watts. Transmitters were expensive, tubes not entirely reliable, and income to pay for the stations was very iffy. Still, many towns and cities sprouted small stations so the local car and radio dealers, newspapers and department stores could deliver their message to the local population.

However, starting in the larger cities and leading outward, the pressure was to raise power, both for "staking out the territory" and for allowing cheaper radios to be sold to the public. In many place, the concept of a community station was all but dropped in the US, although educational stations did pick up some of the "slack." The goal was, and continues to be "move as close to the big city as possible."

There was an initiative, the FCC 80-90 Docket, which was supposed to herald the return of "local" radio stations. But, the FCC had barely finished awarding these facilities with their misguided "minority preference" procedures (often resulting in almost immediate sale of stations to the large companies) when they appeared to give up on the concept of community of license. Stations were allowed to move toward – and focus their programming on – the nearby large markets. It was good for business. It was very bad for those hoping to get localism.

MOVEMENT TOWARD LOW POWER

Around the same time as 80-90 was "shaking out," some hoped that translators would be permitted to originate programming, and between local individuals and community groups, as well as a number of religious organizations, a sort of "land rush" occurred, and new translators started popping up all over the place.

On this one issue, the FCC did hold to its word, and did not allow translators to upgrade. Instead, the FCC proposed an LPFM service, which was met with great interest. Unfortunately, under great pressure from lobbyists and Congress, the new service was loaded with restrictions in terms of programming, coverage area, and ownership. Worse, it presented most communities with no more than one or two potential allocations. In many East Coast markets, the truth was that no frequencies were open at all.

WUPC-LP, Arrowhead Village, NJ
Courtesy: Neal Newman

This is quite a contrast to the Canadian model. As Barry Rueger of Community-Media.com points out, the Canadian authorities encouraged community and college stations, by allowing them on the air at five watts with minimal regulation and paperwork, as long as they upgraded in three to five years to fifty watts. These stations are based on the idea of serving their community. They are even allowed to sell some advertisements.

THE WINDOW OPENS

When the FCC announced the first "window" for filing applications for LPFM in early 2000, a large number of groups applied, including some who filed multiple applications. The deluge of LPFM applications also contained quite a few from religious organizations, who along with their large translator networks, wanted to expand into the LPFM area. Up to this time, over 3,300 applications have been filed, and approximately 600 CPs have been issued.

The first LPFM station went on the air in mid-2001. Among the early stations, several were focused on helping youths. Others were connected to several religious ministries. In Alexandria, LA. KCJM-LP was set up to teach young people, ages 12-24, the business of broadcasting. There are now well over 300 LPFM stations on the air, with new ones popping up on a regular basis. So, as we look at these stations, what has LPFM delivered on the expectations?

THE LEDGER

Of course, the report depends upon whom you ask. Those with licenses are often pleased, and there have been some LPFM stations that already made inroads into serving their community. And, predictably, those groups that did not get a license were less pleased with the whole process.

But, LPFM as a whole is still considered a problematic service. Some of it relates to operator disappointment at coverage, some to programming considered "non-local" or "imported" by religious groups, and some to the actual equipment put into service. A major complaint is "local" programming done merely by using computers to delay programs received via satellite.

Ernie Belanger, at Armstrong Transmitters (www.armstrongtx.com) related some of the complaints he hears when speaking with stations. "For many, the LPFM dream has been tainted by an inability to participate. There could have been extreme microbroadcasting, able to meet the needs of niche communities. But this did not come to fruition in this country." According to Belanger, too many LPFMs actually were built for "outside" interests who have spent time trying to "find a way around the Rules, splitting hairs and bypassing the original intent."

Armstrong FMX-30B

And then there is an important RF issue. Belanger notes, "The FCC backed away from its commitment to require equipment type-certified for broadcast." He says a lack of enforcement has prompted some LPFM operators to purchase cheap amateur transmitters, which can produce significant spurious emissions. "The FCC did not do its job technically."

Although some applaud the recently issued FCC finding that may lead to the relaxation of the third adjacent separation Rules, the continued existence of "dirty" transmitters represents "a major failure of the LPFM promise." Belanger says the FCC is "welcoming disaster" in relaxing the Rules without enforcing the transmitter standards. Other manufacturers also see a correlation between cheap, non-pro installations and "dirty" transmissions.

DOING IT CORRECTLY

Sylvain Couture of Decade Transmitters in Canada (www.decade.ca) noted that because the industry in Canada requires the use of certified transmitters, many problems, including interference with aviation, are avoided.

Bernie Wise of Energy-Onix (www.energy-onix.com) agreed, saying that it is a false economy to install amateur equipment purchased by price alone. Not only is the signal often "dirty," but the gear doesn't hold up over time, and users discover there is no real support.

Each of the manufacturers strongly advise spending a few extra dollars up front, in order to allow LPFM stations to focus their attention less on technical problems and more on operations. Couture sees this potential of LPFM as a medium "to give small towns the opportunity to get a local news voice."

Equipping properly allows the listeners to hear the signal more clearly. Using the newer adjustable transmitters, like the Decade 800 and 850 series, a small station can go on with as little as one watt, and turn the power up later, without having to purchase a second transmitter.

Decade 850

Such transmitter packages are not outrageously expensive. For $5,000 to $6,000, a complete package of audio processor, transmitter, coax, antenna, and hardware can be assembled, with only a tower needed. Studio packages can be put together from $4,000 to $10,000, depending upon the type of console necessary to produce the desired programming.

Sometimes stations install the right gear but still find themselves disappointed by the coverage achieved. Wise tells potential LPFM stations (and posts the information on the Energy-Onix web site) to get as much RF out, as high as possible. Using the Energy-Onix SST-300C transmitter and FM 1-2 antenna, Wise reports many stations get seven to ten miles of coverage.

While it is true that 100 watts at 100 feet is not going to cover a major metropolitan area, an antenna properly mounted on a tower of appropriate height can transmit well over the three mile radius the FCC considers "average." Some stations do get a bit "creative" on towers; WJTW-LP's "tower" in Jupiter, Florida is reported to be a 70-foot palm tree. Over time, one might expect the center of radiation to rise. Filing for a modified license could become a regular task – and that assumes there is plenty of "slack" in the feedline!

LESS IS MORE

Another recommendation from the manufacturers is to utilize mono transmission with LPFM. Wise says stations get 30% more coverage in mono, one station achieving coverage over a 10-20 mile radius. Couture points out that receivers need as little as 1 μV for full quieting in mono, compared to perhaps 30-40 μV in stereo. There is also a slight modulation gain, without a stereo pilot.

Energy-Onix SST-300C

Of course, because each installation has its own special aspects, putting any LPFM station on the air is best accomplished by a qualified engineer. If you are seeking to bring a local voice to your area, LPFM may the solution. More windows will be opening, with information on the FCC web site, as well as several others devoted to LPFM.

Overall, careful planning will result in both a technically sound, serviceable facility as well as a reliable one. Watch for future issues of ***Radio Guide***, where we will continue to present information to help you plan, build and operate your facility, whether it is one watt or 100,000 watts. – *Radio Guide* –

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The Canadian View

Community Radio, Canadian Style

by Barry Rueger

[HAMILTON, Ontario - Canada - March 2004]

If the two hundred plus community radio stations in Canada have anything in common, it has to be the name "McCurdy." It is difficult to walk into a community radio studio and not find at least one thing painted in McCurdy blue – either the "classic" light blue, or the newer dark blue.

Why McCurdy? Usually it comes down to two factors: The old McCurdy products were built like Mack trucks and were able to withstand years of volunteer use and sometimes sketchy maintenance. More importantly though, at the time that community radio in Canada was growing rapidly – throughout the eighties – a lot of large broadcasters were upgrading their studios, and McCurdy consoles, pedestals, and racks could be had for very little money.

Community radio in Canada exists in an environment quite different from that in the U.S. During the decades when the FCC made it impossible for community broadcasters to license a lower power station, the Canadian Radio-television and Telecommunications Commission (CRTC) was actively encouraging new and different forms of non-commercial broadcasting. Since the time when the first community radio broadcasters were licensed in the seventies, the CRTC has consistently considered community radio to be an essential part of the broadcast system, offering a distinct alternative to both commercial radio and the government funded Canadian Broadcasting Corporation (CBC).

DEVELOPING STATIONS

More recently, at the time when the FCC was struggling with the idea of LPFM and third channel adjacencies, the CRTC was (at the urging of community broadcasters) bringing in "Developmental FM" Licenses. These licenses required a bare minimum of paperwork and equipment, and were designed to allow small communities to launch a community radio station as easily as possible.

Developmental FM stations are limited to five watts, but are free of most regulation. The aim is to get new stations established easily and cheaply, and allow them to concentrate on building community support over the first few years.

Garry Clark calls the numbers for CFBI's monthly on-air Bingo. CFBI is in Cambridge Bay, Nunuvut, far above the Arctic Circle.

Five watts does not sound like much, but it is an inexpensive way to get started and will typically cover a small town well enough to build an audience where none existed. At the end of the developmental period – typically four years – the new station is expected to apply for a full community radio license and move up to a higher power level, such as 50 watts.

Community radio in Canada actually encompasses a number of different kinds of licenses. A standalone station, not affiliated with an educational institution, will be licensed as a "Community" radio station. A station located on a University campus will typically be licensed as "Campus-based Community." "Developmental" licenses can come in either of these flavors.

Native broadcasters have another category of license to suit the specific needs of their communities, and there is yet another license type for "Instructional" stations attached to broadcast schools.

NON-COMM COMMERCIALS

The differences between "Community" and "Campus-based Community" radio stations are less than would be imagined. The primary difference is that "Community" stations are allowed to broadcast more advertising than "Campus-based Community" stations. Yes, non-commercial radio stations in Canada are allowed to sell and broadcast advertising, although the number of minutes per hour is limited. Stations did face the same sort of underwriting restrictions as American non-commercial broadcasters during the seventies and eighties, but those were eventually dropped.

Unlike the U.S., where "College" radio is distinctly different from "Community" radio, all non-commercial radio stations in Canada have a similar philosophy and style. Both "Community" and "Campus-based Community" stations are required to open their doors to their local community. It is not considered good form to only allow students access to the airwaves, and in fact the regulations governing Campus-based stations are explicit that they serve the entire listening community, not just the campus. "Campus-based" radio stations are required to have a separate Board of Directors which includes both campus and non-campus representatives.

Film Maker Heather Ritchie and co-host Susan Johnston at CKCU-FM in Ottawa. They arrived at 6:30 AM on a minus 40 degree morning to host the "Special Blend".

The other distinct feature of almost every "Community" or "Campus-based Community" station is a heavy multicultural component. It is normal for established stations to broadcast in ten or twenty languages to as many cultural or ethnic groups. CKCU Radio in Ottawa for instance has weekly programs for the Jewish, Indian, Filipino, Afghani, Somali, Haitian, African, Persian, and Vietnamese communities. Many of these programs date from the early days of the station and play a critical role in their local communities.

OTHER FUNDING

Multicultural programs also play a critical role in the funding of community radio in Canada. Because community radio often offers the only media source in their mother tongue, multicultural communities are often major financial supporters of their local station. Unlike the U.S., where many community broadcasters can access funding from the Corporation for Public Broadcasting (CPB) or the PTFP program, there is virtually no funding available to community broadcasters in Canada. The only broadcaster funded by the Canadian government is the CBC.

As a result, community broadcasters rely most heavily on two income sources – student levies (for Campus-based stations) and listener donations. Despite being allowed to sell advertising, the reality is that ad sales seldom bring in enough income to cover the costs associated with selling and producing spots.

The annual levy that students pay to support Campus-based stations ranges from a low of forty cents to a high that approaches thirty dollars. Even though these are a fraction of the amounts that students pay for athletic fees or other "services," there is always a fear that an incoming student government may choose to turn off the tap.

Jazz Host Les Szabo at Vancouver Co-op Radio in the late seventies. CFRO is unique in being cooperatively owned by several thousand community shareholders. The big things behind him are called "tape decks".

Although stations like CKCU or Vancouver Co-op Radio have been conducting annual funding drives for a couple of decades, station fund raising is still relatively unsophisticated. There is no equivalent to the Development Exchange Inc. (DEI) in Canada, and there is very little use of direct mail by community broadcasters. Consequently the most successful funding drives in Canada seldom exceed $100,000 annually, even in large cities.

BUDGET CRUNCH

Budgets at Canadian community radio stations are quite a bit smaller than in the U.S., with most stations operating on less than $200,000 a year, and only a couple of stations exceeding $300,000. Capital budgets tend to be very tight, and maintenance of equipment can be less rigorous than anyone would prefer. Equipment is invariably used until it is well past its prime. CD players for instance will typically spend two years in On-Air, then move to the Production studios, then to the music library.

The small budgets also are reflected in the low staffing levels. Many stations have only one or two full time staff, and it is unusual to see stations with the four or five FTE staffing that CPB would require in order to qualify for a Community Service Grant. This, coupled with traditionally low salaries, tends to lead to burnout and a high turnover. The tendency is for community radio staff to be young and inexperienced. Once employees gain skills and knowledge they almost always leave the sector for "real" jobs.

ENGINEERING CHALLENGES

From an engineering standpoint community radio in Canada presents some interesting challenges. The people starting new stations are invariably beginners who are more concerned with serving their community than learning the ins and outs of frequency searches and HAAT. A good deal of our time (and a good deal of the content on our website http://www.community-

(Continued on Page 8)

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The Canadian View

Continued From Page 6

media.com) is spent explaining basic concepts to community groups and individuals, helping them to understand what equipment they *need* (as opposed to what the salesman wants to sell them), and helping them to learn enough of the jargon to understand what is happening around them.

We consider ourselves lucky to have a few suppliers who understand that volunteer programmed community radio is not the same as commercial radio, and who will try to suggest suitable equipment and products. That means no automation system, no fancy "studio furniture," and a focus on ease of use and durability.

We also keep close track of consulting Engineers who will work with community broadcasters on ten and fifty watt engineering briefs, and who understand the meager budgets of these stations.

As part of our work we also produce and distribute radio series to these community broadcasters. Once again the lack of a CPB or PTFP means that station facilities are quite limited. Outside of the francophone sector there are no satellite down links, so programming is almost universally distributed on compact disc. Thankfully the use of cassette tape for program distribution is almost dead.

Internet distribution is starting to become more common, but many stations are hampered by old computer equipment, poor Internet connections, or simply a lack of the skills and organizational support to take programming from the 'Net to the Control Room. Again, most of these problems are a refection of low budgets.

COMMUNITY RADIO IS LOCAL

Some will argue that the low budgets help to keep community radio stations focused exclusively on community service. Big egos are discouraged, as are the opportunists who only want to make a buck. The result is an ever growing network of stations that – without exception – place community service before profit.

Even the major commercial broadcasters seem to understand the role of community radio in Canada. Instead of considering them a threat, companies like Rogers and Standard Broadcasting seem to understand that community broadcasters serve a lot of marginal communities (in dollar terms) that the big guys would rather not deal with.

Instead of fighting the community radio sector, the major – and many not-so-major – broadcasters actively support community radio. Standard Broadcasting for instance has for many years financed the annual Standard Radio Awards of Excellence in community radio broadcasting, and CORUS Entertainment, owner of more than fifty radio stations, as well as cable television properties, has underwritten the Dig Your Roots project, which discovers new bands in Canada and presents live concerts broadcast via the 'Net. Both of these projects are coordinated by the National Campus and Community Radio Association (NCRA).

Even though stations may struggle with poor funding and aging equipment, it is still fair to say that community radio in Canada plays a vital role, and will continue to see steady growth for many years to come.

Barry Rueger has been working in community radio for more than twenty years. His company Community-Media.com offers training and consultation to broadcasters in Canada, the U.S., and abroad. His web site is as http://www.community-media.com, and he can be reached at rueger@community-media.com

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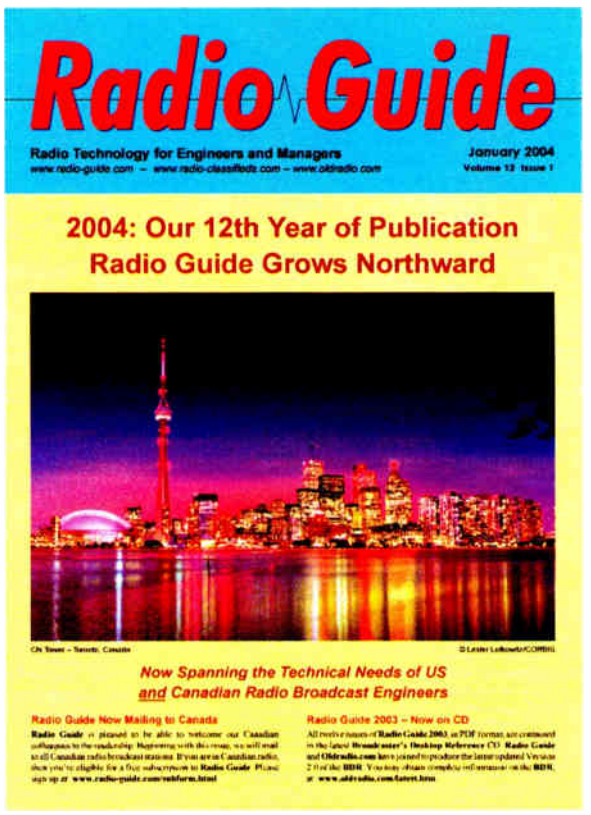

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World Radio History

Full Duplex

Identifying Important Things

by George Nicholas

The last Full Duplex discussed setting priorities and assigning a task's relative value. The trick, of course, is to know what is important ...

[CEDAR RAPIDS, Iowa - March 2004] "I've got so much work, I don't know where to begin," Murph the Engineer moaned to his manager. "I know what needs to be done, but I can't seem to engage today."

Mark, the GM, replied, "One of the reasons I hired you, Murph, is your ability to juggle three or four high priority projects successfully. That's what makes you a better Engineer." Murph looked a little dazed at first, then realized Mark was probably right. "You may be on to something. I seem to have a lot of work, yet my calendar seems pretty empty." Mark gave the obligatory wink and "finger shooter" gesture and strolled down the hall.

PRIORITY PARALYSIS

Clearly, Murph suffers from a disease I like to call "Priority Paralysis," that defeated feeling one gets when faced with a desk full of papers, a person standing in the office and the phone ringing simultaneously with the pager! The good news is: there is a cure. However, it may take time, and it will take change.

Murph sat at his desk and started a list of every thing he needed to do. After reviewing his list, it became clear there were a lot of tasks that really were not important, or less important than others. For example, he was two weeks behind on reviewing the logs, yet "sweep out the dog-house" was one of the first things on the list.

Murph's priorities were contaminated with *minutiae*, the fine points of everything unimportant. This is not to say details are not important; it is how they affect the process that matters. Many times priorities are not black and white, but various tones of gray. Hint: Setting the first priority is always the most difficult, so do not start there. Start lower, and work your way up.

Meanwhile, never be too quick to blame yourself! Some problems in priority ranking may be the result of your organization. John Maxwell, in "Leadership 101," suggests three common problems in most organizations:

- **Abuse:** Too few employees are doing too much.
- **Disuse:** Too many employees are doing too little.
- **Misuse:** Too many employees are doing the wrong things.

Sound familiar? While you may not be able to change your organization single-handedly, you can recognize these problems and make adjustments.

QUALITATIVE ANALYSIS

What is *really* important, and what is not? Answering that question requires perspective. Perspective requires experience; and experience allows judgment. Here is a way to get to the heart of the issue: What if you had only one day left to do your job?

That sounds dramatic, but it is an excellent thought-starter. Suppose you are leaving for vacation in a week (which some studies suggest is your most productive week of the year), or you may be leaving for another position and want the engineering department to be in good shape for your successor. Or, worse, it may be your last day of good health.

For example, Craig Hospital in Colorado specializes in spinal cord injuries. A spinal cord injury is about as serious an injury as one can sustain and remain alive. They have done research on the effect of spinal cord injuries and how it relates to quality of life decisions of their patients.

Based on a British study that spanned several years, 195 men with back injuries were asked to consider 15 categories that contribute to quality of life, including health and personal safety; material comforts; relationships with family; relationship with spouse; raising children; having close friends; helping others; work; learning; understanding oneself; expressing oneself; socializing with others; entertainment, such as reading or listening to music; participating in active recreation, and participating in local government.

WHAT IS IMPORTANT

Interestingly, both injured and non-injured men ranked health and personal safety first. But from that point on, the results were much different. The injured men cited relationships with family and spouse as second and third, followed by understanding yourself, followed by learning.

The non-injured men listed relationship with spouse as second, followed by work and material comforts; having and raising children was fifth. This correlates with experiences I have seen in others; usually a life or career threatening issue makes someone re-evaluate what really is important.

You might be asking yourself, "That's all fine and good; how does it affect me?" The point is that when determining what is truly important, you must look beyond the immediate tasks and try to imagine the "big picture," even taking yourself out of the picture.

To apply the principle, let us start with a list of categories (in no particular order) for you to consider, followed by a suggestion as to importance.

- FCC Compliance – Important.
- Being on the air – Important.
- Modulating at 100% – Not as important.
- Being competitively loud – Important.
- Being loudest in the market – Not as important.
- Helping the boss fix his/her computer at home – Important.
- Going to the bar with "the gang" after work – Not as important.

You get the picture. The importance of any matter is relative to the other issues at hand.

Finally, when prioritizing, make sure you include some "PTO" (personal time off) to relax – even briefly – between projects. No matter what anybody may tell you, taking time off to recharge your batteries is important!

George Nicholas operates George Nicholas Communications, specializing in technical and communication consulting throughout the US. If you have an experience to share, or an idea you would like to explore, email him at: georgenicholas@csi.com

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	2.5 kW	1978	Collins 831D2
	3.5 kW	1988	BE FM3.5A
	3.5 kW	1992	Harris HT3.5
	5 kW	1983	Harris FM5K
	10 kW	1980	Harris FM 10K
	10 kW	2000	Harris ZD10CD
	20 kW	1978	Collins 831G2
	20 kW	1982	Harris FM20K
	20 kW	2000	Harris Z20CD
	25 kW	1980	CSI T-25-FA *(amplifier only)*
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	50 kW	1982	Harris Combiner*(w/auto exciter-transmitter switcher)*

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World Radio History

Audio Processing From the Ground Up

Part 14 – Audio Gates and Phase Rotation

by Cornelius Gould

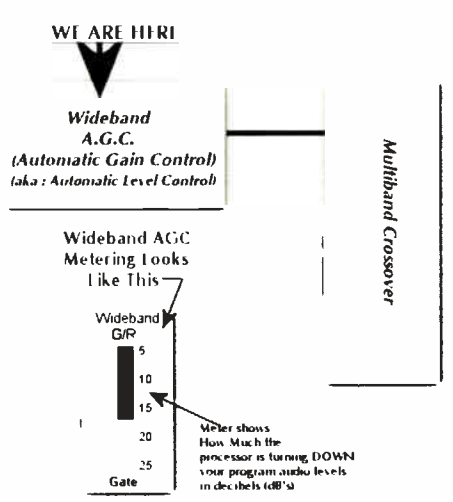
[CLEVELAND, Ohio - March 2004] Getting the audio into the processor is almost as important as what goes on inside the processing chain itself. As we discovered last time, the Attack and Release settings are vital to presenting the right levels to the processor. Continuing with the "front end," we need to discuss the concept of the "gates" used in broadcast processors.

Actually, there are usually two different kinds of "gates" on an audio processor. In recording studio type processors, "gate" most often refers to a "noise gate" where the output of the compressor is muted whenever audio levels fall below a certain user pre-determined threshold level. In broadcast audio processing, the "gate" refers to a process where the recovery time of the audio processor is "frozen" whenever the input audio levels fall below a certain user pre-determined threshold level. Why?

FOLLOW THE BOUNCING BALL

By default, an audio compressor will sort of act like a ball that is thrown up in the air. The harder you throw it corresponds to how much the compressor is turning down program audio levels. The default reaction of the ball is to return to the ground. For a compressor, this means returning to its previous gain-state. How fast it returns to its gain state (as you may remember from last time) is called "recovery time."

The problem with letting this happen with your audio is that every time there is silence, there would be a "rush" of background noise as the processor recovers from gain reduction. This can get quite annoying after a short time. The solution comes in the form of a system that watches for moments of silence, and shuts down the recovery function of the processor. This causes the system to freeze the recovery process at the level of gain reduction that happened just before the silence. There it will stay until some sounds are detected. At this point, the recovery functions will continue.



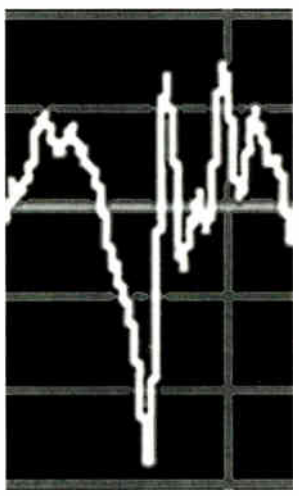
Getting back to our bouncing ball example, what this means is that you would have the ability to cause the ball to freeze in mid "drop" until you are ready to either let it fall, or hit it to make it jump even higher – and then freeze it there if need be.

This system is called the "gate." It requires the user to adjust a "gate control" which basically tells the system that any audio levels below the reference level you choose should be considered noise, and the processor should freeze its gain control systems to avoid bringing up this "noise." The proper setting for the gate depends on your format, and should be adjusted to allow for reasonable level control without bringing up too much of the objectionable background noise.

It is usually in this stage (or just before the wideband AGC stage) that you find this "mysterious" function called "Phase Rotator." So, what the heck is a phase rotator?

PHASE ROTATORS

Phase Rotators are designed with one purpose in mind – dealing with the peculiarities of the human voice. To understand the purpose and function of a phase rotator, we must first learn something quite interesting about the human voice: Human voices tend to be asymmetrical. What this means is if you could see your voice, you would notice that it looks odd compared to most sounds around; your voice has more information on "top" or "bottom." Which way changes from person to person, as some people's voices are more asymmetrical than others. Take a look at my voice for a moment:



Cornelius' Voice

As you can see, my voice has more information on the bottom than on the top. Either that, or my microphone wiring is wired with its polarity upside down!

Actually, this is a good time to bring that up. As you can see in the picture, my voice has a "negative" polarity. Another person's voice might have a "positive" polarity (which means that spike going downwards on my voice would be going upwards on someone else's). A friend of mine, Ryan, has one of the most unusual voices I have ever seen. His voice polarity is *totally* positive, with very little information in the negative area of the waveform!

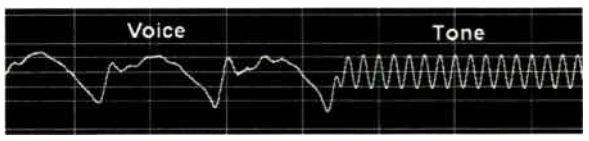
Polarity became important during the early loudness wars on AM radio. As you may or may not know, AM radio works by varying the power level on the AM transmitter with the audio information from the studio. Varying the Amplitude (power level) of the radio wave with the program signal is referred to as Amplitude Modulation, which is simply known by most folks as AM.

Positive-going waveforms cause the audio and power levels to go up. Negative-going waveforms cause the power level to go down. 100% negative modulation basically means the transmitter shuts off. So, it is important to keep tight control over that negative modulation, as shutting the transmitter off and on at an audio rate creates nasty "RF hash" on neighboring stations. This can also lead to a not so nice fine from the FCC!

People with voices such as mine causes a problem for AM radio. My voice, if left untreated by some magical process, would cause the transmitter to be closer to "off" than "on." This means the station would sound less powerful when I am talking than when the music is playing.

ROTATING CORNY

Since the voices like mine tend to "turn the transmitter off" at an audio rate, the processing has to work harder to prevent this from happening. Modulation control of a transmitter ultimately comes down to a clipping limiter; more clipping of average audio levels causes more loudness, but it also causes more distortion (like what happens when you turn your car stereo up too loud). When voices like mine hit the negative modulation control clippers, they have to work harder, causing my voice to sound quite distorted when compared to the music. Ryan, on the other hand, would probably have one of the loudest voices on the radio – assuming the microphone was not wired to flip his voice the other way!



In this picture, the tone represents music (which tends to be symmetrical). Notice how "asymmetrical" my voice looks compared to the tone!

Early solutions to asymmetrical voices that went negative involved a "polarity switcher" which would electrically switch in a circuit to flip a voice such as mine the other way, suddenly allowing it to have "boom," as it was now causing the power level of the signal to increase significantly (transmitter is more "on – with additional power output" than "off"). That is a good thing in loudness wars. The bad thing is that the switching process causes an audible change on-air in the form of a "pop," something very distracting to most DJ's listening to the air signal for their cues. Something better was needed.

The first successful solution that most of us have heard of was the infamous "Kahn Symetra Peak," which was a device now known as a "Phase Rotator." What a phase rotator does is to "roll" the polarity of the audio signals by frequency. This causes the various frequency components of audio signals to "not line up" in polarity with each other. When voices pass through this process, the asymmetrical qualities tend to either go away, or are greatly minimized. This causes voices to have more average "power" on AM than before, less audible distortion, and without annoying pops on the air – all without causing much of a distraction to the DJ's listening over the air for cues.

ROTATING AUDIO ON FM

Since FM has the same power output level no matter how you modulate it, the polarity of voices has no particular meaning. Still, the peak modulation of FM is ultimately controlled by clipping limiters just as with AM, and the more you use the peak clippers, the louder you sound on the dial – but with a price. As the apparent loudness from turning up the clipper increases, so does audible distortion. If you can keep the audio waveforms symmetrical, you can gain additional loudness before the distortion becomes objectionable.

This is because the human ear notices asymmetrical clipping more than when it is done symmetrically. Since human voices are asymmetrical, the clipping of the voice waveforms (refer to the comparison picture of my voice vs. a tone) becomes extreme on one side of the waveform compared to the other. In that picture, you may notice the negative component of my voice is about 9 dB higher than the negative-going waveform on the tone.

Asymmetrical voices (such as mine) also cause some processors to behave radically different than they would with music. So a DJ using a processor that does not compensate for this can cause excessive on-air distortion on voice, which in turn can be troublesome to the DJ while listening through the processing, as the music vs. voice balance could become "weird."

Most processors today come with a defeatable phase rotator system on the input. It is made defeatable since some users may not want to run their music through the phase rotator (since music tends to be symmetrical by virtue of the way it is produced at the recording studio, the rotator alters it for no particular reason). In this instance, the user can mount phase rotators to the output of the microphone processing (or on the outputs of the microphone preamps) so that only the voices are altered, and not the music.

Next time out, we will continue picking apart and discussing the various controls of your audio processor!

Even though he has proven himself to be "out of phase" Cornelius Gould enjoys playing with audio processors and sharing his knowledge. Corny is the technical advisor and weekend announcer for WAPS 91.3 FM, Akron, Ohio. You can reach him at: cg@radiocleveland.com

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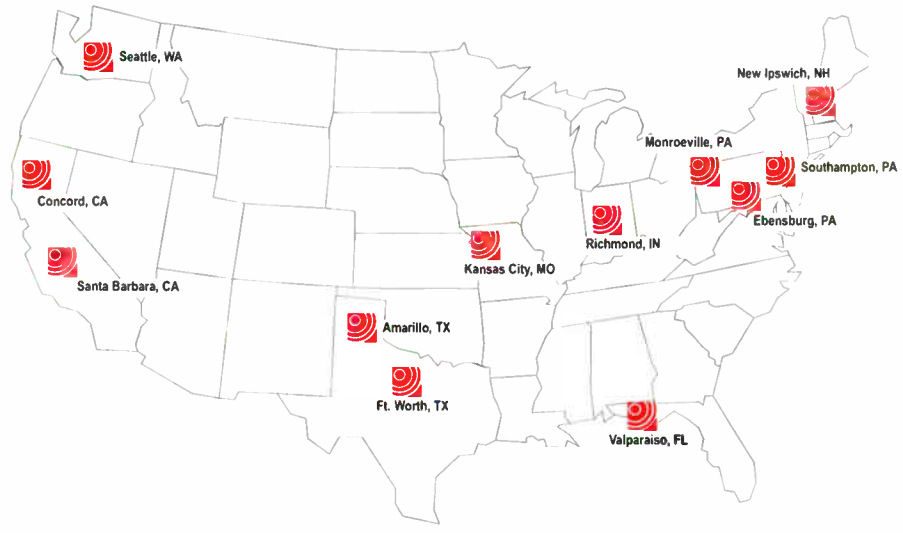

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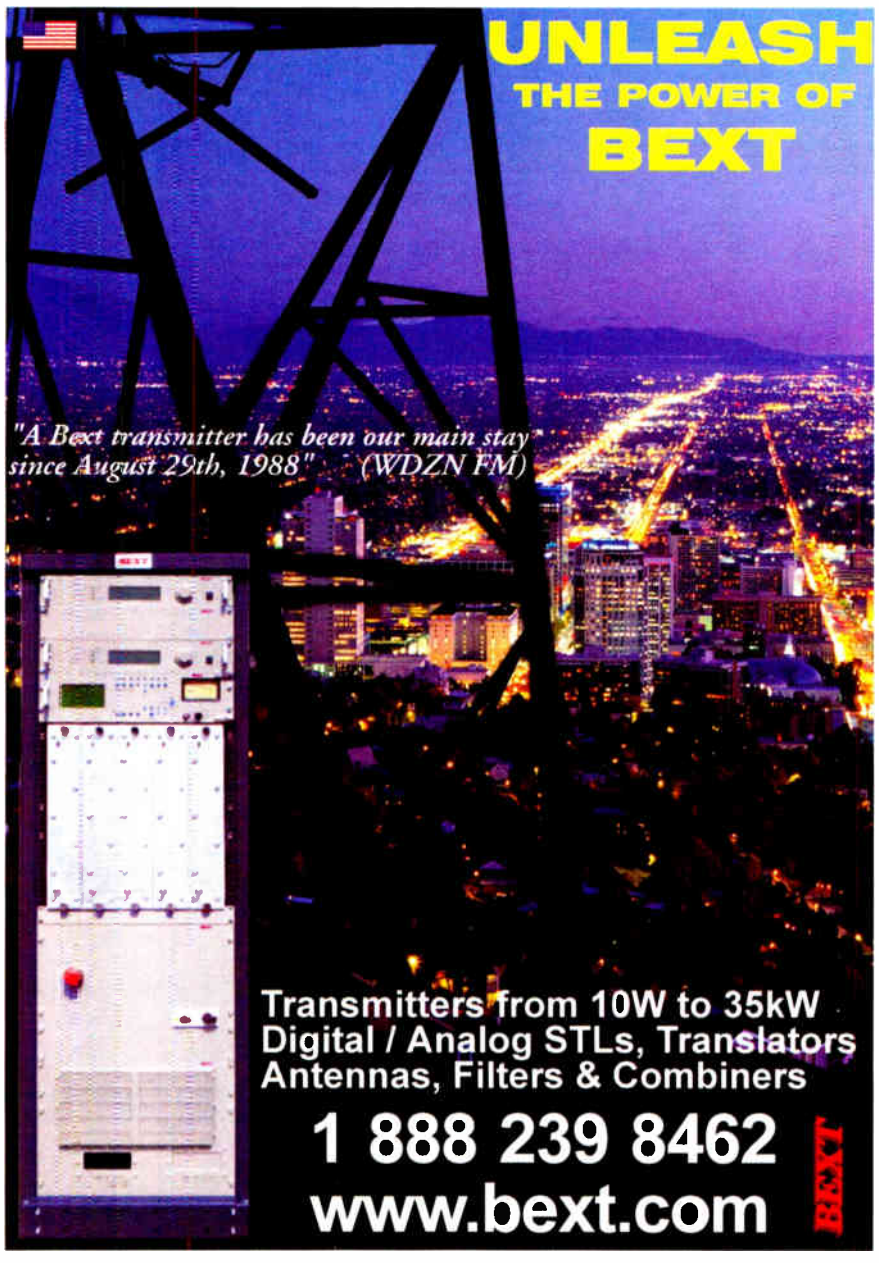

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World Radio History

FCC Focus

The Politically Correct Public File

By Ken Benner, NCE

[TUCSON, Arizona - March 2004] A very common question, asked repeatedly during inspections under the Alternative Inspection Program, is "How do we know the Political File folder in our station's Public File meets the FCC requirements?"

Many stations err on the side of caution with their Public File. But some things go way past caution: One station saved a copy of a letter to the FCC, complaining the station "illegally" prohibited the writer from airing his political view opposing his "rotten, no-good, lying, %#*@!" opponent, and insisting the station be fined and its license revoked. And then there was the Political File folder containing actual checks for political ads, some dated back for over a year. Obviously, they should have been deposited in the bank.

QUELLING DOUBTS

Broadcasters worry: What is needed? How long does it remain? And what makes a good political disclosure statement? Remember, I have no lawyer's shingle; the following is only a humble, good faith effort to de-complexify common legal gobbledygook.

All that is required for each candidate's inquiry to purchase political ads is a copy of NAB form PB-16. This identifies the party requesting such ads, whom he represents, party affiliation, office sought, and the date for the election. After entering this information, and providing a station rate card, complete the NAB form (if you use a standard station order form, note "Please see attached standard station order form" on the PB-16.)

Once the spots hit the air, either complete the PB-16's reverse side or note: "Please see attached statement of performance." This is simply a printout of when the spots ran, make-goods, time of day, days run, etc. – exactly the same printout as you would provide any co-op advertiser, minus the usual affidavit.

Get a copy of the NAB Political Catechism and a pack or two of PB-16s from the NAB (1771 N Street N.W., Washington, D.C 20036, Tele.: 202-429-5300) and you will have all you need. Remember to save all political public file material for two years after the last spot is aired.

DISCLOSURE STATEMENT

Here is a typical political disclosure statement provided to candidates or their representatives.

"The rates provided are this station's lowest unit rates for pre-emptable and guaranteed commercials for political "uses" (spot announcements which feature the candidate's voice and are sponsored by the candidate's authorized campaign committee). Such spots will be offered to qualified candidates 45 days prior to a Primary and 60 days prior to a General Election. All other political advertisements, including those spots sponsored by independent political action committees or for non-candidate "issue" advertising, are sold at regular prevailing commercial rates.

"In addition to fixed, non-pre-emptable time, the stations offers a variety of lower, pre-emptable rates. While non-fixed spot announcements are, by definition, pre-emptable, based on our experience we can advise you of the probability of clearance of the various pre-emptable spot options if you wish.

"Any class of time designated as "pre-emptable" may be preempted by any spot sold at a higher rate, and no "make goods" are provided. Once any other class of spots is scheduled, they are not pre-emptable by announcements of the same class. However, any spot may be pre-empted by a class of spot with a higher pre-emption priority.

"Under the station's policies, unless otherwise specifically noted herein, spots not run because of the scheduling of a spot with a higher pre-emption priority will be rescheduled as a "make good" if time is available, or a credit will be given, after consultation with the sponsor. The station cannot guarantee the time placement of "make goods" but will use its best efforts to accommodate the needs of the candidate. The station will apply the same policy regarding time-sensitive make goods provided to our best clients.

"In the event that the station sells advertising time for a particular amount and class of time in a particular time period, at a rate which is lower that the rate charged a candidate for "use" (as defined above) of the same amount and class of time in the same period, the station will afford the candidate the benefit of the lower rate by means of a rebate or credit against future purchases, as determined by the candidate.

"Spot time is available in :30 or :60 second announcements for the price indicated for each specified class of time. All spots are scheduled at the discretion of the station, within the day and time parameters listed. Political announcements will not air in newscasts or news sponsorships or on Election Day.

"All legally qualified federal candidates are entitled to reasonable access to the station's facilities for the purchase of time during an election campaign. While the station retains the ultimate discretion to determine the amount and location of time sold to meet the needs of federal candidates, the station will consider any such requests for time and will be available to make reasonable accommodations with respect to such requests in light of all relevant circumstances applicable to the candidate and the station.

"Unless the candidate's campaign committee or the candidate's advertising agency has established an acceptable credit history with the station, and will accept full responsibility for all air time and production charges pertaining to the candidate, net cash payments must be received seven (7) days in advance of the broadcast of the first announcement schedule in any contract. Announcements for independent political action committees or issue advertising must be paid in advance at the time that an order is placed.

"Announcements must comply with all sponsorship identification requirements of federal law. If proper identification is not incorporated in the spot, the station reserves the right to supply appropriate announcements within the scheduled time for the spot. All spots require a minimum of seven (7) days' cancellation notice."

Now that was not all so bad, was it!

Ken Benner, an active inspector in the AIP, resides in Tucson, Arizona. Ken can be reached at bennerassociates@aol.com.

World Radio History

Tech Tips

Dead Air Tracking in Pueblo

By Tony Lopez

[PUEBLO, Colorado - March 2004] Just as is the case with many automated operations today, the Clear Channel Pueblo cluster (KDZA, KCSJ, and KGHF) has had its share of dead air. To get a better handle on this issue, the Pueblo Engineering Team has designed an extremely sophisticated system for monitoring dead air.

This system includes a dedicated computer that monitors dead air by date and time, along with a central monitoring system in the building, which alerts everyone when there is any dead air. The computer program was written in-house and works in conjunction with commercially available monitoring equipment. A dedicated computer, receivers and antennas are used for this monitoring system.

The central dead air system lets the receptionist know which station has the dead air and whether it is a transmitter or studio problem. She is then able to make a "dead air announcement," if needed. Engineering is also notified automatically by cell phone when an off-air condition occurs.

This system has worked well during the evenings and with the weekend DJ's. A ceiling light – visible during the day and night – goes off when triggered. A monitor display panel at the front desk tells which station has the problem (transmitter or studio). If a DJ is out of the studio, in another part of the building, visual and audio alarms go off, along with a lighted display in Engineering, which provides the same information.

Since the Engineering department installed this central dead air system, our dead air time has been reduced significantly to minutes per week.

ANALYZING THE DATA

The raw computer data is exported to Excel and compared to the music computer event logs so Engineering can determine the cause of dead air. The number of dead air hits per station is also plotted. The graphs show a Pareto analysis of both scheduled and unscheduled downtime. At the end of the quarter, Engineering and the General Manager can see at a glance which stations had the most dead air.

The dead air data shown on these tables depicts typical dead air issues that occur in our operation.

Key Benefits:

- Dead air time reduced significantly.
- Dead air issues can be resolved immediately.
- Engineering can pinpoint exact cause of problem.
- Increased operator awareness.
- Graphic display summarizing issues by station.

In summary, using real time computer data from the most sophisticated dead air monitoring system in the CCU Western region, the Pueblo Engineering Department has been able to determine dead air more accurately for trouble-shooting and quarterly reporting.

Tony Lopez is the Chief Engineer for Clear Channel Radio's cluster in Pueblo, CO. He can be reached at tonylopez@clearchannel.com

1st Quarter Unscheduled Downtime

	KDZA	KJQY	KGHF	KCSJ	Total
Music Computer	0.28		0.5	0.3	**1.08**
Operator				0.59	**0.59**
Engineering				0.42	**0.42**
Transmitter	0.2				**0.2**
City Power			0.15		**0.15**
Console					**0**
Weather Related				0.08	**0.08**
Antenna					**0**
Total Hours Down	**0.48**	**0**	**0.65**	**1.39**	**2.52**

1st Quarter Scheduled Downtime

	KDZA	KJQY	KGHF	KCSJ	Total
Transmitter			2.0		**2.0**
Tower Lights			1.0		**1.0**
Antenna			0.65		**0.65**
City Power				0.45	**.045**
Music Computer	0.31				**0.31**
Engineering	0.28				**0.28**
Weather Related					**0**
Console					**0**
Total Hours Down	**0.59**	**0**	**3.65**	**0.45**	**4.69**

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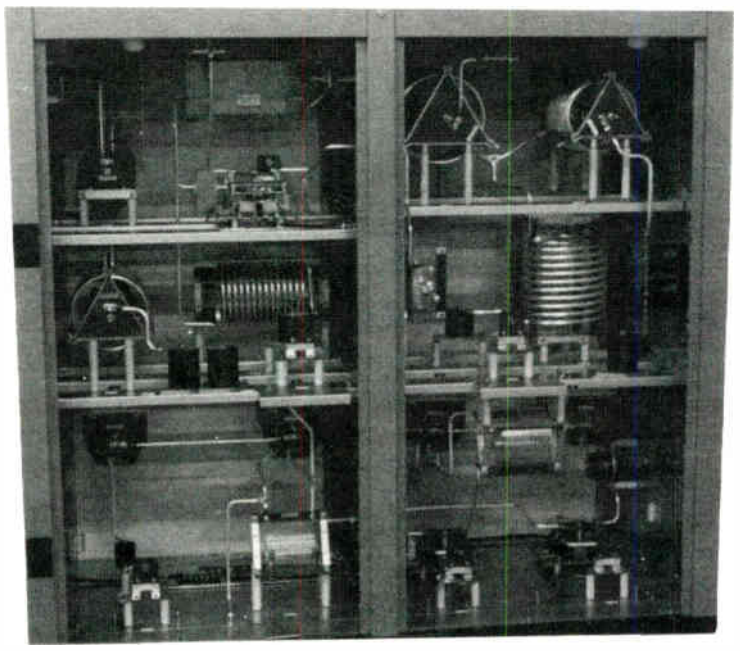

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World Radio History

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College Broadcasters are Our Future

by John Devecka

[BALTIMORE, Maryland - January 2004] The college radio world is one filled with a mix of fun and decisions. Do the students really want to do this for a job? I know I hear some of you screaming, "*NO*!" But you know what? Many of them really do. It is our job as educators and professionals to recruit for our own ranks.

One of the best ways to do that is to get involved with local college and high school stations. An even better way is to get involved with national college organizations and conferences. It is not hard, and it can be incredibly rewarding for you and the students.

NSMC 2003

With an attendance of about 3,000 students and faculty, the most recent National Student Media Convention in Dallas was deemed a huge success by organizers, exhibitors and attendees. As an attendee and panelist I must support their conclusion. A combination of print, radio and television organizations, the conference brought together representatives from all over the country for seminars, tours and exhibits. The conference included a live radio studio (with rotating student DJs and some live acts) streaming via the internet to stations worldwide, for local rebroadcast.

Nicole Scariano broadcasting from Dallas in the NSMC "studio."

I have been attending various college broadcasting conferences for a long time, first as a student, then as an exhibitor, and now as the WLOY faculty advisor. I remember the impact of meeting peers from other stations and being able to ask questions of people in "real" broadcast positions, and I always hope to see the same thing in the eyes of the students at any conference.

STUDENTS MEET THE PROS

Held at the Hyatt at Reunion in Dallas, participation in the broadcast side of the media conference was mixed between faculty advisors, students, and professionals from both commercial and educational broadcasters (licensed and unlicensed). The conference is unique among college gatherings as it really embraces and illustrates the convergence of media in the digital age.

Here they were able to talk to members of various companies, real radio DJs, staff, musicians, promoters, engineers, lawyers and even FCC staff. It was both overwhelming and an epiphany for many of the students. My own WLOY crew came back really energized; just ask our Chief Announcer. "During one of the nights, in some eclectic coffeehouse in downtown Dallas ... [we] started brainstorming," Nicole Scariano said. "Show ideas and promotional ideas flew, resulting in one really, really caffeinated night and some great plans for next semester!"

Increasingly, commercial print and broadcast media are cross-owned, share newsrooms, cross-pollinate web space and need many of the same talents. Conference sessions allowed students from other media to sit in and gain new views on our responsibility and program content. Students with no radio background learned how to start their own campus stations, while broadcast students dove into the First Amendment and censorship print sessions with gusto.

Many of the sessions covered discussions and critiques to help graduating students find that elusive radio job. The students really came prepared, with questions, ideas and hopes. Panelists from various media backgrounds were willing to help with private discussions, and their tips and secrets really hit home.

"We got some excellent questions in the panel discussion on voice-tracking," said Chuck Finney, 94.9 KLTY Director of Programming. "Clearly, this group really knew what's going on in the radio business. I was blown away at how well attended the whole conference was and by the diversity of places the attendees called home."

CBI CONVENTION BUILDS BRIDGES

I spoke with Will Robedee, the current Chairman for Collegiate Broadcasters, Inc. about the conference (CBI was one of the three media groups presenting the NSMC). "It was a breakthrough year for the CBI conference in terms of attendance, the number and quality of sessions and presenters and the number of vendors. We couldn't be more pleased with the responses we have received from those who participated."

CBI is a relatively new organization, serving educational radio and TV, but their actions belie that status. Having actively negotiated webstreaming fees for non-commercial and educational stations, testified before Congress, run a very successful and active list server, and pulling together quite a collection of panelists and vendors for a show – in only their fifth year of existence – is certainly something about which they should brag.

One of the most important things about this conference was the participation – and national support – of the Society of Broadcast Engineers. There is a trend of students away from broadcast engineering, often discussed in SBE circles. Here was a chance for SBE to put engineering folks in front of the proverbial next generation and help them. It was great for SBE Chapter Chairman from Dallas and Nashville, as well as other local chapter members, to be seen and heard on many important panels. SBE member session topics included issues for remote broadcasts, new and future technology, starting a radio station, and many more.

David Stewart, Chairman of the Dallas SBE Chapter 67, participated in the panels on remote broadcasting, new technology and starting a new station. He was pleased with both the participation from attendees and panelists, and took something important back with him. "I talked to management about how we probably should do more of this kind of hard contact [with] the larval next generation of people." Stewart typifies those interested in steering more students into an understanding of new technologies, both to fill future engineering ranks and to find new and different uses for media and technology.

Live365.com was present as an exhibitor, served the radio web stream for the live studio and Chief Operating Officer Raghav Gupta served as a panelist. He expressed great support for CBI for "putting on quite the show in Dallas. The enthusiasm of CBI members, especially the students, for radio, webcasting and new technologies was apparent and heartening." Live365.com has already committed to support the November 2004 NSMC in Nashville.

Dozens of well-attended sessions ran concurrently on a wide variety of issues.

NPR participated in the conference with its Next Generation newscaster program. This included training, mixing, newsgathering and production of a news piece for the conference – during the conference. Working on a real, short deadline, these students put together excellent pieces in time for the final closing ceremonies.

Next Generation Program Director, Doug Mitchell, was beaming with enthusiasm over the work these students produced. "We had students [do] an excellent job with the work and the tight deadline, yet tell a story with some depth. One of our project students is graduating in May and I know has applied for an internship at NPR for this coming summer. This is what I want students to do – get interested in the way we report and tell stories enough to where they want to join us."

SOLID SESSIONS

Warren Kozeriski, faculty advisor for SUNY Brockport noted, "Many of the broadcast sessions were standing room only with attendees spilling out into the hall. I think it was one of the best college broadcasting conferences in terms of variety of topics and interaction with students and professionals that I've attended in at least seven years."

Four of my students from Loyola College in Maryland attended and brought back notebooks full of ideas. They really do listen when I talk to them, but *peers* make such an important impression. I could tell them something over and over, but five minutes with other students from other stations and it all sinks in. Their biggest hassle was picking among all the options for sessions. Scariano said, "Each of us was faced with an entire booklet of classes to choose from, similar to our scheduling course packets, except no class was for a semester. However, for many I wish they could have been."

The CBI organization has long embraced educational television with radio and had a number of panels featuring television-oriented topics. Patti Smith, VP/GM of KVUE-TV Austin, said, "Both the panelists and attendees benefited from the ability to exchange ideas on a face to face basis. These students are the future of the industry and I believe that one of our responsibilities as working members of the media is to "give back" by addressing issues of interest to these students and by providing them a window into the real world of broadcasting."

REACHING OUT

More professional people are starting to see the value in working with educational radio. Not only is there a chance for gear to change hands, there is a chance to find just the right person to train for your assistant, or to clue you in to what the current crop of students thinks about the broadcasting world. Rumor has it that the Audio Engineering Society will probably participate along with SBE at the next big conference

This year's panelists and demonstrators came in from Apple, Belo, Broadcasters General Store, Comrex, FCC, NPR, Prophet Systems, Scott Studios, and many other well-known names. Students and faculty members got a sort of mini-NAB with good exhibitors, good after-session gatherings, and many chances to interact with their peers in and out of sessions.

Perhaps most importantly, these educational broadcasting folks were the real focus of the conference, unlike at an NAB, where it is sometimes hard for a student to be taken seriously, or given real time in a booth. They were able to learn a lot directly from the vendors, ask serious questions and get serious help, something difficult to do at a conference of the NAB's scale. Oh, and they *buy* stuff too.

Students View Exhibit at NSMC

I hope more of our broadcasting brethren discover this conference in Nashville (www.collegebroadcasters.org) so the students can continue to get the benefit of their experience without being third or fourth class citizens at NAB. You would be astonished at just how important your help is to a student. Try it some time. I think you will find the rewards far outweigh the effort required.

John Devecka is Operations Manager for WLOY Radio at Loyola College in Maryland. He continues to envision a world with an NAB-scale college media conference and lobbying power. Some share his vision, most think he's a whacko. Both are right. Let him know your thoughts: wloy@loyola.edu

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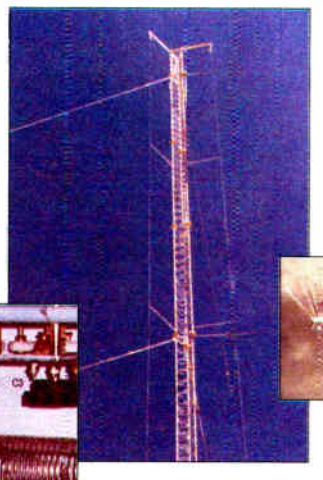

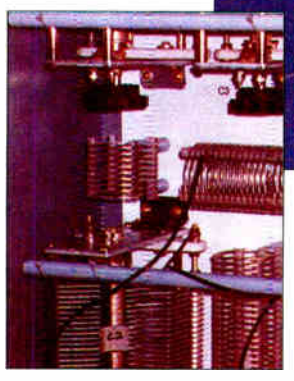

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Alex Lakey, Chief Engineer, Virgin Radio

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Michael Black, GM, WEOS, Geneva, New York

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World Radio History

What is This Thing Called Broadcasting?

Eddie Benson, St. Louis Inventor

by Frank Absher

[ST. LOUIS, Missouri - March 2004] It was the night of the Harding-Cox presidential election, November 6, 1920. At the very same moment KDKA "made history" by broadcasting the results, a 20 year-old kid was doing the same thing over 500 miles away on a transmitter he built in the basement of his home in St. Louis. He was said to have been playing with radio gear since 1914, which was the year in which he operated an amateur spark station.

Lester Arthur "Eddie" Benson did not have the public relations machine that Westinghouse did, and there are factual holes in published accounts, but if those press reports are to be believed, he may well be considered the father of St. Louis radio. For example, an article in the June 15, 1934, issue of *Broadcasting* magazine credits Benson with the building of the first transmitters for KSD and KFVE.

On the other hand, there was only one local article referring to his supposed technical achievements. That article also says he attended Washington University in St. Louis, but a school spokeswoman said no records could be found listing Benson as a student

Lester "Eddie" Benson, Late 1920s

there. His obituary, published in the *St. Louis Globe-Democrat* December 18, 1972 says "He made the first police radio broadcast on WIL in 1921 from a moving car, with the police chief along supervising the broadcast." Yet, WIL did not exist as such in 1921.

BUILDING KSD

KSD was owned by the *St. Louis Post-Dispatch*, and the paper vigorously promoted that station's experimental broadcasts. Through supposition, one can assume these were the broadcasts made on Benson's transmitter, and they led up to KSD's obtaining the first Class B license issued in the United States in March of 1922. Benson's name never appears in any of these articles, but there are brief descriptions of the "transmitting device:" "Technically, the small transmitter ... makes use of six five-watt power tubes, or 30 watts in all ... The small transmitter panel and its apparatus could be picked up by a boy and carried away under one arm."

The *Broadcasting* article says Eddie Benson had been commissioned in 1920 to build an experimental transmitter at the *Post-Dispatch* plant in downtown St. Louis and indicates this transmitter was used when KSD went on the air experimentally in 1922.

The experimental broadcasts were described in the paper on February 14, 1922: "Amateur radio stations in and around St. Louis are notified that a 'QST' signal will be sounded at 7:45 this evening for the purpose of a test demonstration of the wireless station installed in the Post-Dispatch building. Shortly afterward, the entire first act of the musical play now appearing at the American Theater, 'Two Little Girls in Blue,' will be sent broadcast by wireless – overture, songs, dialogue, everything presented on the stage during the first act will go out instantaneously through the Post-Dispatch radio apparatus. Wave length, 360 meters."

It appears Benson's device also was put into operation when KSD officially signed on March 11, 1922, but arrangements had already been made to replace it with a new Western Electric transmitter in June of that year.

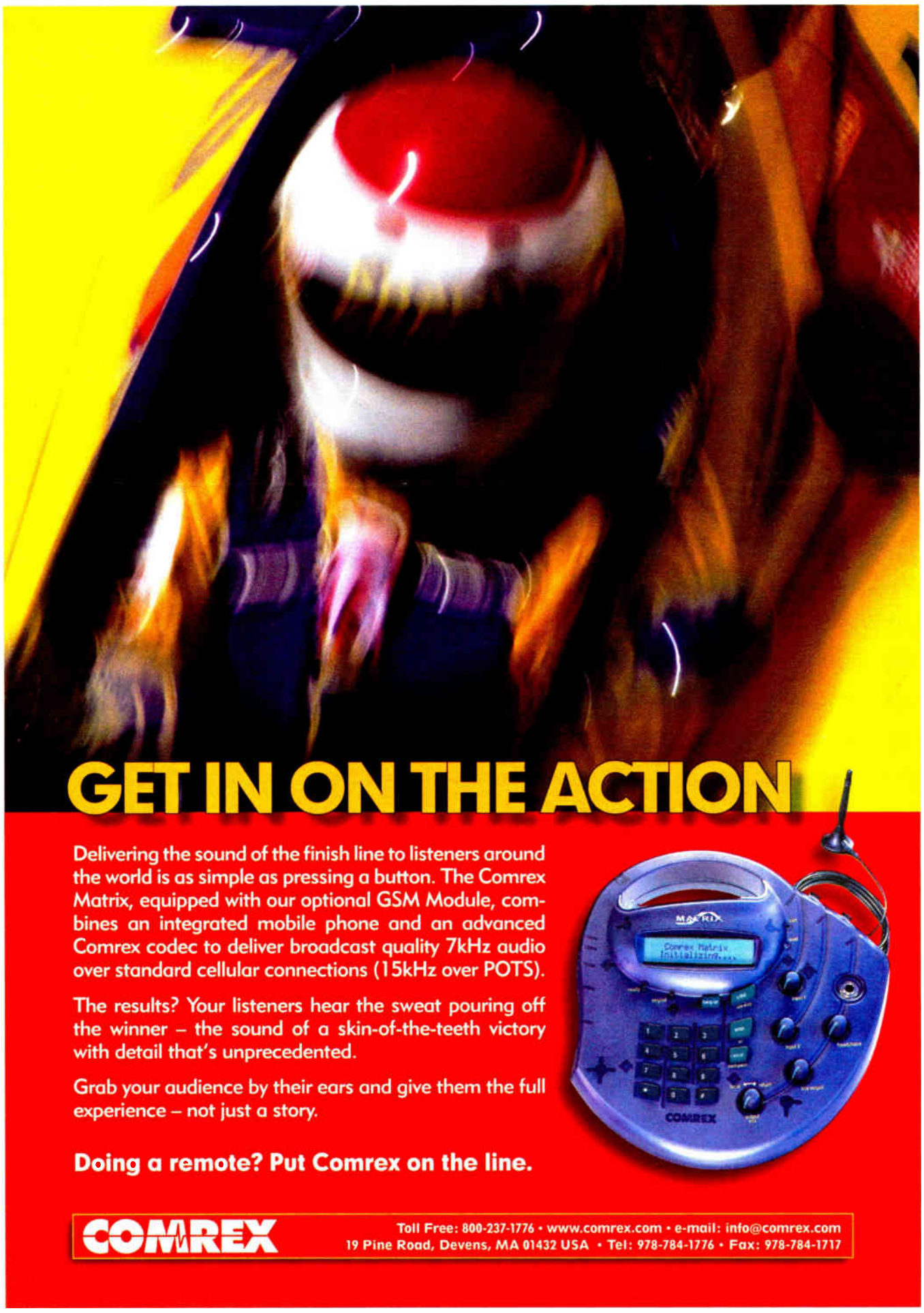
BENWOOD RADIO, KSD AND WEB

One reference in a KSD article tells how they had to run down the street to an electronics shop after transmitter failure during an experimental broadcast. Less than half a block away from the KSD studios in downtown St. Louis was Benwood Radio Company, the parts and service store founded by Eddie Benson.

By now things had been humming at Benwood for some time. Land station 9ZB was established there in 1920, and Benson was building a transmitter and filling out the necessary papers to put WEB on the air. Experimental broadcasts for WEB had begun February 9, 1922, at 375 meters. In what appears to have been a status race of sorts, the *St. Louis Star* had hitched its wagon to Benson's station and wrote in its February 8, 1922 issue, "The first program to be given by wireless under the auspices of a St. Louis newspaper will be presented tomorrow night, commencing at 7:45 o'clock from the offices of the Benwood Company, Inc., 1110 Olive Street, pioneers in the development of wireless apparatus in St. Louis."

The *Star* had no ownership position with WEB, but that did not stop the paper from milking their "cooperating relationship" with Benson, although his profile in all the hoopla was fairly low. There is one mention on February 10: "...a young man with a set of telephone receivers strapped on his head was talking into a transmitter. Every now and then he would adjust some numbered discs on a

(Continued on Page 20)



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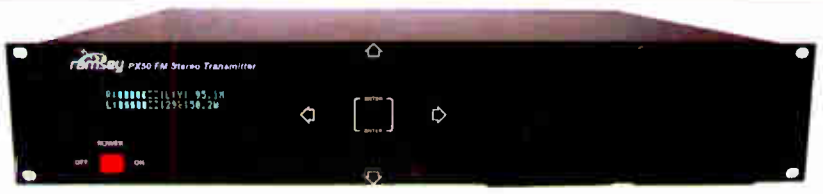

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World Radio History

What is This Thing Called Broadcasting?

Continued From Page 18

strange wood box and listen to what was being said on the other end of a wire that wasn't there. In addition there were a few peculiarly fashioned boxes and coils and a few electric lights on a black board. That was all, but it seemed an unexplainable mess until the young man took the apparatus off his head and gave a three-minute lecture that took all the mystery away. He was L.A. Benson, vice president of the Benwood Company, who was in charge of the sending."

Although the *St. Louis Dispatch* got their own transmitter and severed their relationship with him, Benson had the last laugh. After a couple years of the relationship with the *Star*, his company took full control of WEB, and changed the call letters to WIL. In later years it was said WIL was the market's first station to sell commercial time.

The Benson Broadcasting Company also reportedly figured in the history of KFVE, licensed to University City in suburban St. Louis. The original license holder was the Film Corporation of America and a published report indicates Benson built the transmitter for the station's sign-on in 1924, and he later bought the station.

ROCKY ROAD IN LIFE

That same year, Eddie took the big step down the aisle, marrying on July 24. He and wife Doris would weather marital storms, but the marriage itself would eventually dissolve in acrimony. Things went better at the station: In the 1930s, at a time when the country was in the throes of the Depression, Eddie Benson threw annual picnics for his radio staff, bringing in substitute engineers and announcers for the day. One newspaper account stated, "There is never a dull moment ... he is acknowledged a genial host."

In 1933 he completely remodeled the WIL studios and added a roof garden for the staff. Eddie Benson was also a ham radio operator and served as Midwest manager of the American Radio Relay League. He claimed to have been the first person in St. Louis to do baseball play-by-play in 1926, and he was actively involved in the operation of WIL until it was sold to Balaban in 1957.

The marriage situation, however, worsened. After repeated attempts at reconciliation, Doris and Eddie separated in 1939; eventually she claimed he deserted her and their daughter Leslyanne on December 28, 1941. Two months later he informed his wife he would not be returning to their home in South St. Louis, having taken up residence in the tony suburb of University City. He filed for divorce, alleging "general indignities, mental cruelty, nagging, violent temper and habitual suspicion," but the filing was later dropped. Doris Benson counter-filed for divorce in 1951, testifying she had made repeated attempted to persuade him to return. The judge awarded her a substantial settlement.

His active involvement in the family-owned radio station also was not without controversy. Eddie's own brother Clarence sued him in 1934 in an effort to prevent what Clarence called a usurping of rights in the company. Clarence also showed his distrust for his brother's management style by requesting an audit, alleging Eddie had overdrawn his banking account in what was then known as Missouri Broadcasting Company. A later judicial decree ended the family battle, and Eddie bought out his brother's interest in the station in 1948.

Lester Arthur "Eddie" Benson died December 16, 1972 at the age of 72. Although mentioned by name in relatively few newspaper accounts, he clearly built transmitters, owned stations, and was a local "figure." Hence, we can remember Eddie Benson as the man who got broadcasting started in St. Louis.

Frank Absher is a St. Louis Broadcast Journalist and owner of the St. Louis Broadcast History site, www.stlradio.com. He can be reached at fabsher@stlradio.com

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World Radio History

SBE National View

Broadcast Operations Focus on IT

By Fred Baumgartner

[DENVER, Colorado - March 2004] The National Association of Broadcasters (NAB) annual show in Las Vegas is a curious gathering of people from all aspects of broadcasting. For broadcast engineers, it is the world's largest toy show, and an opportunity to learn, see and touch what is new and useful for keeping broadcast stations on the air and productive. It can be overwhelming. Las Vegas remains the most popular destination for NAB, in no small part because of the low cost of airfare, rooms, meals and entertainment.

But there is much more than the show floor. One of the reasons broadcast engineers head to Las Vegas early is the Ennes program. Even before the floor opens, the Society of Broadcast Engineers, through its educational affiliate the Ennes Educational Foundation Trust, presents a day-long tutorial designed to bring broadcast engineers up to speed with advances in the technology and operations of broadcasting. In years past, the well-attended seminars have covered networking for broadcast engineers, centralization, digital radio and more.

MORE THAN THE EXHIBITS

This year, the Ennes/SBE program is slated for April 17, 2004, the Saturday preceding the opening of the floor. The session theme is "Converting Broadcast Operations to an Information Technology Platform." The full program is outlined on both the NAB website (www.nab.org) and the SBE site (www.sbe.org).

Clearly, the craft of broadcasting is changing from the mechanical (tape recorders, turntables and cart machines) to computer-based playback, distribution and storage systems. While turntables gather dust, and cart machines are curiosities to explain to the youngsters, broadcasting is fast becoming an *application*. It is more than servers taking the place of mechanical storage; hardware platforms are now – or fast becoming – interchangeable, and seldom does hardware limit what we can do with our broadcast applications running on them.

We now have options as to workflow. At one time, most every station operated like every other station. Odds were, whatever their specific skill, an employee could move across the country to another station and plug into a very familiar world. Today, the workflow can be very different, as many of the tasks from traffic to on-air talent are more highly integrated and automated. Any task can be done by any number of people, and in any number of different ways.

Therefore, the selection, setting up and modification of software – and even more importantly the architecture of the data and storage networks and organization of content – have a critical place in the usefulness and success of the broadcast station.

2004 PROGRAM

As a working broadcast engineer, you either are now, or probably soon will be, called upon to guide or help your organization through a conversion to IT-based broadcasting. There are a series of decisions to be made concerning the architecture and implementation to best fit your facility needs.

This year, Ennes has invited inventors, broadcast engineers and manufacturers who are driving the IT conversion to talk about their successes and failures. Moderators are Andrea Cummis (CBT, CTO, Senior Vice President of Engineering for the Oxygen network, SBE Board Member and Chair of the SBE Publications Committee), and William Hayes of Iowa Public Television. They present a day of sessions that include both the consultant's and manufacturer's side.

Pinnacle, EMC, Isilon, IBM, One World Technologies, BBC and Firwood Consulting are represented. From the real-world experience side, we have Clyde Smith from Turner, Mike DeClue of Clear Channel and BBC's IT conversion project with ESPN. In each case, these are the CTOs, project managers and directors of engineering that have designed and overseen the Information Technology (IT) conversion of their operations.

Andrea Cummis

With this year's Ennes program targeting your changing role, this is a good year to come to Las Vegas early and take advantage of the Ennes program, and many of the offerings of the NAB's Broadcast Engineering Conference. Broadcast engineers who are members of SBE receive a $200 discount off of the NAB non-member, full conference registration fee (the form is available at www.sbe.org), saving roughly the cost of a well-bought plane fare to the show.

William Hayes

Fred Baumgartner of Broadcast Technology Services in Denver, Colorado is an SBE Board Member and Trustee of the Ennes Educational Foundation Trust. He can be reached at fbaumgartner@sbe.org

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World Radio History

Antenna Topics

Antenna Resonance

by Ron Nott, K5YNR

[FARMINGTON, New Mexico – March 2004] Hams often speak of an antenna as being resonant. They sometimes take great pains in pruning a dipole to attain resonance, indicated by minimum VSWR. However, where antennas are concerned, there are two kinds of resonance. This article will attempt to clear up some misunderstandings about them.

DEFINITION

The mathematical definition of resonance is when inductive reactance is equal to capacitive reactance. Is that all there is to it? Mathematically, yes. However, in its application to antennas there is much more. Every length of wire or rod has inductance, and it also has capacitance to the space surrounding it. In studying electronics, we are led to believe that every capacitor must have two plates, but even a one plate capacitor, when suspended in space has capacitance to space. To help grasp this difficult concept, we will use an illustration.

Several years ago, I attended an International Lightning and Ground Conference at which we were told of various lightning experiments using aircraft. One research plane was a Korean War vintage jet fighter and the other was a Convair 580 loaded with instruments. The person doing the presentation said that the jet fighter had a capacitance of about 300 pF and the Convair had about 1500 pF. I immediately thought to myself, "To what? How can a capacitor have only one plate?" After I pondered on this a bit, I concluded that the metal skin of a flying aircraft must have a value of capacitance to everything else in the entire universe.

Now, a Convair has a lot of skin, but only has a capacitance of about 1500 pF implying a really big distance to the other plate. (How this value was computed or estimated, I do not know, but there were a lot of very smart people at this conference, all of whom accepted these values – so who was I to question them?) To help confirm this, recall that many years ago the experts said it was impossible for lightning to strike an airplane because, while flying, it is not grounded. The experts were proved wrong because lightning does strike aircraft, unloading its charge into the capacitance of the metal skin.

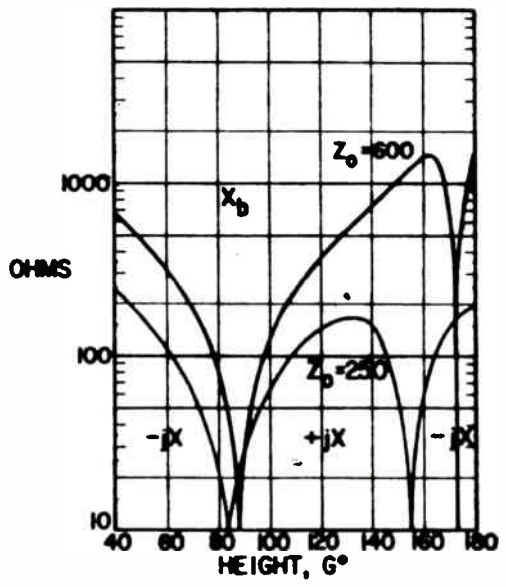
So it follows that when we stick a wire or length of tubing up into space and call it an antenna, it has capacitance as well as inductance. Old antenna textbooks show virtual capacitance from the antenna to ground, but the capacitance is actually to space as well as everything in the environment including ground.

TWO KINDS OF RESONANCE

The first kind is self-resonance, which is attained by adjusting antenna length until zero reactance is seen at the antenna input. There is then a pure resistance at the antenna terminals and if the resistance is exactly 50 ohms (assuming the transmitter output and transmission line both have impedances of 50 ohms) the VSWR will be 1.0:1. If it is not 50 ohms, the resistance can be matched using a tuner and you will still get a 1.0:1 VSWR.

This leads us to *Definition 1:* Self-resonance occurs when the electrical dimensions of an antenna cause the input reactance to appear to be zero without the need for resonating components.

Every antenna may have many self-resonant frequencies although there may be wide variations of resistance at the different resonant frequencies. If you look into the input of an antenna with an instrument such as an AEA Vector Impedance Analyzer attached to a laptop and sweep through a wide spectrum, you will see the reactance swing positive and negative repeatedly. Each time the sweep goes through zero, the antenna is resonant. Between the excursions through zero reactance the antenna is off resonance.



A graph of resistance and reactance as a function of tower height.

Self-resonance does seem to be a tedious term, so most amateurs just use the term resonance. But while this is correct, we know that it is also possible to resonate an antenna by using reactance.

ADJUSTED RESONANCE

An example is the use of an inductor (coil) in an HF mobile antenna. Without the series inductor, the input impedance will contain both resistance and capacitive reactance. The inductor may be adjusted until its inductive reactance is the same value as the capacitive reactance, at which time the antenna is resonated and has a pure value of resistance at the input.

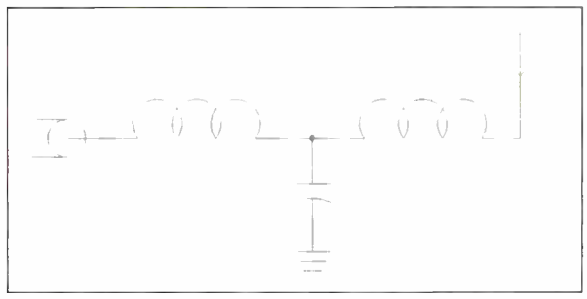
Definition 2: An antenna that has been resonated by a lumped reactance with a sign opposite that of the reactance of the un-resonated antenna is still resonant at its input. It is just not self-resonant.

Concerning these reactances, we often say that the one cancels the other, but is this really correct? The antenna still has inductance and it still has capacitance, but we have manipulated them until they are equal in value – the resulting addition technically yields "zero reactance." But neither of the two reactances actually went to zero; they are both still there, just now being equal in value and opposite in sign. So even though it appears that they went away, they are still there, i.e. they were not really cancelled.

Depending on the dimensions and geometry of the antenna, the reactance values can vary greatly. For example, after resonating both the antenna and the "canceling" components, they might both be 30 ohms (one "+," one "–"), or they might both be 300 ohms or most any other value of reactance as long as they are equal in value. This gets us into the "Q" of an antenna, which is directly related to bandwidth. But the important thing to realize is that to attain resonance, each reactance value must be equal to the other. That is the definition of resonance mentioned at the beginning of this article.

MATCHING NETWORKS

When designing a matching network (L, Tee or pi), it simplifies things to first resonate the antenna input, and then match the two different resistance values that remain. Even though there may be only three components in the network, it is important to remember that they perform two separate functions; the first is to resonate the antenna input, and the second is to transform the resistance differences between the transmission line and the antenna input (or transmitter output and transmission line input in the case of conjugate matching).



A typical antenna matching network.

To simplify the concept: every antenna input contains three components:

1. Resistance, which is the sum of radiation resistance and loss resistance.
2. Inductive reactance.
3. Capacitive reactance.

Even though the input may appear to be purely resistive, both kinds of reactance are still there, but because one has a "+" sign and the other a "–" sign, if they are equal in value, the reactance appears to be zero. Remember that every length of a conductor has inductance and it also has capacitance to space. They do not go to zero, they simply mathematically add up to zero.

RESONANCE CONSIDERATIONS

Is there an advantage, or does an antenna perform better, if it is carefully pruned to resonate at a certain frequency, or if it is resonated with an antenna tuner? If the tuner components are very low loss, there is no real difference. Granted, you can manipulate pattern shape by antenna dimensions, but as far as antenna radiation efficiency, one is as good as the other. As an example, look at the two-meter 5/8 wave vertical antenna so popular with mobile users. It is not a self-resonant antenna, but has a tapped inductor in the base in order to compensate for the capacitive reactance that would otherwise be present at the antenna input.

Finally, never forget that a VSWR meter does not measure the quality or performance of an antenna. It merely measures the quality of the impedance match. To really understand and evaluate antenna impedance, you need an RF impedance bridge, which measures both resistance and reactance, bearing in mind that none of them (including the VSWR meter) can tell radiation resistance from loss resistance. Fortunately, they are available at reasonable prices from manufacturers such as AEA and MFJ.

The input impedance of all antennas includes radiation resistance, loss resistance and reactance. In broadcast applications, antennas usually perform best when the loss resistance is minimized and the resulting total antenna network resistance is matched to near 50 ohms.

And for your antenna to accept RF power to radiate your signal efficiently, it must be resonant – whether self-resonant or resonated with a reactive component. Remember, reactance is always present, but if you cause the positive reactance and the negative reactance to be equal in value, they will balance out to zero at which point the antenna will be resonant.

Ron Nott is the owner of Nott Ltd., an engineering firm in Farmington, NM specializing in antenna products. You can contact Ron at ron@nottltd.com

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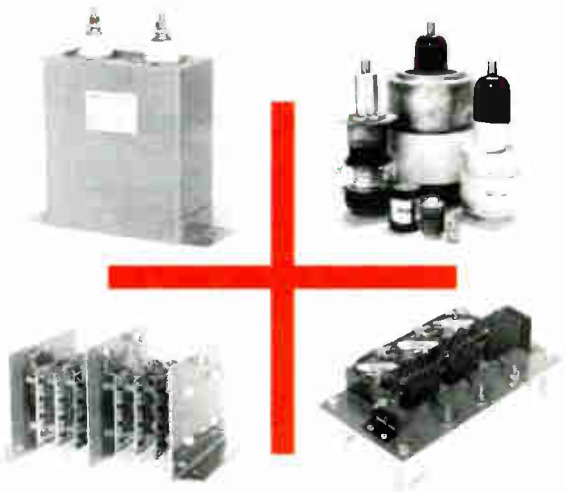

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NRB Looks Toward Expansion at Charlotte Convention

by Don Kimberlin

[CHARLOTTE, North Carolina - March 2004] The Charlotte Convention Center was the scene in mid-February for the annual national convention of the National Religious Broadcasters. The gathering of religious broadcasters from around the world was an eventful several days that included a number of announcements by the sixty-two-year-old organization.

Announcements during the convention told of expansion in the establishment of a subgroup for Spanish language religious broadcasters named the Hispanic National Religious Broadcasters (HNRB) and a collegiate group named the Intercollegiate National Religious Broadcasters (INRB). In addition, a series of regional conventions are planned leading up to the next NRB national convention slated for Anaheim, CA on February 11-16, 2005.

NRB GROWTH NOTED

Named one of the 50 fastest growing expositions by *Tradeshow Week Magazine*, this NRB was the largest in its history, with a record 6,049 registered attendees, including more than 500 international registrants from 37 nations around the globe. More than 200 members of the media attended to report on the convention, which included about 150 college broadcasters. The exposition had a record 300 exhibitors, in a record 148,000 square feet of space.

TECH SESSIONS WELL ATTENDED

As to matters technical, NRB had a satisfying turnout for its several "boot camps" that included sessions on not only radio and television broadcasting, but also computer and Internet use. All had a "standing room only" crowd attending.

This year's innovation of a "Technology Exchange Breakfast" produced about 400 attendees at some 20 tables set up by topic. The purpose is for members to discuss what works, what does not work and what is needed by broadcasters to optimize their operations. The organizers forecast a doubling in size of the information exchange at Anaheim next year.

SPECIAL EVENTS

Celebrities of religious broadcasting like Chuck Swindoll, Franklin Graham, George Foreman and others were featured at events across the several days of the convention, in addition to an advance private showing of the much-discussed Mel Gibson film of "The Passion of the Christ." (The film viewers were prohibited from discussing the film prior to its public release.)

In keeping with its long-established practices, the NRB membership made resolutions during the convention - largely stemming from recent widespread reaction to the Super Bowl halftime broadcast show. These resolutions directed the NRB officers to lobby for FCC enforcement of indecency fines to be multiplied by the number of cited acts and the number of stations broadcasting the acts. Doing so is intended to drive FCC fines for indecency into to multimillion-dollar range.

In addition, the officers were directed to lobby Congress to codify clearly what constitutes indecency in broadcasting. This is intended to remove the often-used defenses of speech freedom and artistic expression by defenders of such program material.

Regional NRB meetings prior to next February's Anaheim national convention are planned for:

June 13-15 at St. Paul, MN, July 22-24 at Dallas, TX, August 29-31 at San Diego, CA, September 23-25 at Philadelphia and October 27-29 at Asheville, NC. More information is available at their website: www.nrb.org

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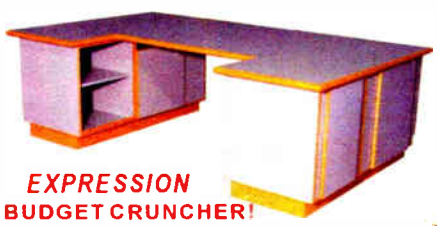

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World Radio History

The Story Behind:

120 Radials

By Don Kimberlin

[LANDIS, North Carolina - March 2004]

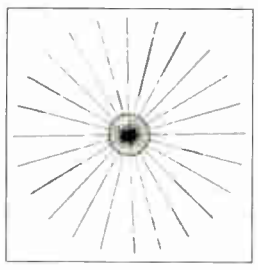
Most of us who have read station authorizations have seen the words at one time or another, specifying a ground system of 120 evenly spaced radials, each one-quarter wavelength. But why 120? From where did that number come? And why does it often seem that losing even a fair number of radials seems to make no difference in a monitoring point?

ORIGINAL RESEARCH

The source rather clearly appears to be the pioneering research of RCA's Dr. George H. Brown in the 1930s. Brown's work was documented in many papers, and some of them were directed toward finding the best economics for vertical radiators. In particular, Brown was seeking to find ways to make short towers into the most effective possible radiators. He found that launching the field from a short tower that had a very low earth resistance in the near field launched the strongest far fields.

Brown guessed 120 would be the theoretical minimum to be used over any soil conductivity – the main purpose being to couple the near fields into the earth. In his recollections, he mentioned he used a tower with only 113 radials simply because the team ran out of wire. They increased the recommended number to 120 in order to publish a convenient number that also resulted in the convenience of three degree spacing. Curiously, Brown remarked he had seen station applications later on for 113 radials, indicating that some engineers really had read his papers.

Since there is a wide variation of conductivity around the country, it is entirely possible that a fairly significant percentage of the radials could be lost due to erosion, vandalism or other factors, and the radiated signal only have minimal degradation. Of course, what may work acceptably in one location can result in poor radiation at another. Hence the minimum of 120 radials.



MAKING IT STANDARD

The staff at the FCC recognized this as a convenient, simple norm to apply to all station licenses, with the result that unless a station's designer raises the point and proves differently by actual measurement that the station will operate to forecasted values with a different sort of launching platform, a "normal" ground system of 120 radials a quarter wavelength long will be specified.

So, as the saying goes, now that you know the 120 radial norm was really meant to overcome difficulties with short towers – you now know the *rest* of the story. (Aren't you glad you read ***Radio Guide***?)

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World Radio History

An EAS Case History

by Clay Freinwald

Sometimes the easiest way to see what works (and what does not!) with EAS is to analyze what happens when the system is used, with a view toward improving the weak areas. This month, Clay takes a look at an event that could have ended local cooperation, and shows how to turn it into a "positive."

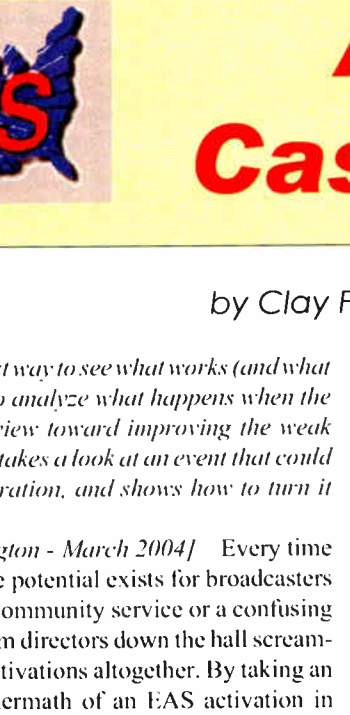
[SEATTLE, Washington - March 2004] Every time the EAS is activated, the potential exists for broadcasters to provide either a real community service or a confusing alarm that brings program directors down the hall screaming for an end to EAS activations altogether. By taking an in-depth look at the aftermath of an EAS activation in Washington State, you can benefit from our experience. After all, this involves some issues that, if they have not already impacted your area, likely will in the future.

This incident has provided some opportunities for us to make some immediate improvements to the EAS here. It is also a call to give some serious thought about what can be done, in terms of additional changes, to enhance the viability of EAS as a public warning system.

THE "SNO COUNTY" ALERT

Unlike many local EAS areas, the seven counties that comprise what is known as the Central Puget Local EAS Area do not use LP stations for relaying information from government entities but rather use what we call a Local Relay Network (LRN). This is a background channel system that links the 15 to 20 EAS entry points to the area's electronic media as well as NOAA Weather Radio. The system enables any of these entry points to automatically distribute an EAS message.

In the fall of 2003, the Seattle area EAS LRN experienced its first EVI (Evacuation Immediate message). It came from an EAS entry point in Snohomish County (north of Seattle). The problem was a gas main had ruptured, the extent of the damage was roughly known, the area of concern was identified, and a call was made to evacuate the impacted area.



The Entry Point folks did exactly as they were supposed to do, programming their EAS Encoder for the transmission of an EVI for Snohomish County. They gave specific details in the aural message (using known streets as boundaries, etc.) as to where the evacuation was applicable, and they pushed the button sending this out to everyone for distribution to the public.

Most radio operations did very well. Depending on their format, the predictable took place. Music stations ran the message and that was it. News operations or full service stations jumped all over the situation giving it great attention, with lots of repeats. Unattended Radio stations did their thing, passing on the message – one time.

TV is where the situation got very messy, really quickly. Usually, TV stations automatically take the header code information and use this to create a screen "crawl." In this case the crawl read "Civil Authorities have issued an Evacuation Notice for *Snohomish County*..." Viewers all over Snohomish County were alarmed, thinking the whole county was to be evacuated! While the voice portion of the message clearly stated the evacuation was only for several city blocks, the TV stations not only did not transcribe that to the screen, but rather continued to run the Evacuation Notice for the entire county for some time. It was a situation certain to cause friction.

To fully understand the problem, a little EAS background may be helpful.

QUICK BACKGROUND

The EAS is a nifty system designed to replace the old Emergency Broadcast System (EBS). One of the primary reasons for moving from EBS to EAS was the need to have a system that would facilitate Broadcast Stations wishing to operate unattended. EAS gave us what we needed.

We could install an EAS "box" in our radio station's program line, connect it to some sources of EAS messages, program it appropriately and, whenever we want to run our radio stations unattended, just walk away. The new EAS gizmo would do its thing, automatically relaying important messages to the public, as well as those pesky tests the FCC tracks. This way, it would keep us "legal."

Indeed, the EAS is great at distributing emergency information on a "one-time-only" basis. What I mean is that the EAS, properly operated, will deliver emergency messages to your listeners *once*.

EAS HAS LIMITATIONS

If your station is attended (i.e., you have live operators), the EAS message can be repeated as often as necessary to inform your listeners about an emergency situation as it develops. In live operations, the first EAS message can be carried live, or the content can be used as the basis for a locally produced informational or news piece. This means live operations have a real advantage over the automated stations.

If your station is not attended, listeners will not receive any additional information beyond the first EAS message, unless the "source" sends a subsequent message related to the first. This is not to say that automated stations cannot repeat the message, but I currently do not know of any off-the-shelf devices that will perform the task. Perhaps a creative engineer has come up with a method of repeating the voice portion of the message using their computer driven program system. If this is the case, I would certainly like to hear about it.

One of the major problems with the EAS is that too many folks involved in the planning and execution of the system use "live radio" as their basis of understanding of how EAS messages are distributed to the public. This shortsightedness creates a number of problems. In order to have an effective EAS system those that create and distribute EAS messages must fully understand the differences between "live" and "unattended" radio and how this impacts the overall mission.

IT TAKES TWO

For EAS to work properly, both portions of the message must work together. The EAS message starts with what is called the "Header-Codes." These are the "buzzzaps" or data bursts that contain the basic information of the message: Who sent it, the Type of Event, the Location impacted, the Duration, etc. The second part is the "Voice Portion." This contains the specific details about the event. In general, it is supposed to expand upon the information contained in the Header Codes.

For example, a Header Code may read "Civil Authorities have issued a Civil Emergency Message for Acme County for the next 4 hours." The Voice Portion then handles the details: "... Acme County Emergency Management is advising all citizens of an emergency situation involving a hazardous material spill that involves the central part of the county in the vicinity of 4th and Main Street and that residents should avoid the area for the next 4 hours." *Together*, the two components of the EAS message comprise the total notification.

At radio stations, the header codes print out the general information on the paper tape/printer. If your station is properly equipped, it also can generate the information on a local EAS display sign. (It is doubtful many listeners have such decoders that can deal with them, although there are a few out there.) What your listeners react to is the voice portion of the message. This is why it is important to repeat this information for the benefit of those that tune in just after the transmission of the first message.

TV CONSIDERATIONS

On the other hand, unlike radio, television has two means of conveying information – aural *and* visual.

Aurally, TV generally treats the initial EAS message much the same way radio does. The audio output of their EAS decoder transmits to their viewers the aural portion of the EAS message. As with radio, this is generally run only once. If the station has a news department, they may use this information as part of a follow up for their next newscast.

It is on the Visual Side, where the problems began. This is where TV takes advantage of EAS's ability to transmit "generalized" EAS information in the Header Codes by transforming this information into a crawl that appears on the screen. Add to this, the normal practice where a TV station might run the voice message only once, the information in the crawl may run for some time. You can imagine the effect on a person who turns on their TV set just after the initial transmission of the EAS message (with the aural message), only to see the Civil Authorities have issued a message for their county *without any additional information*. They are left to wonder what is going on and whether it applies to them or not.

Furthermore, even if the voice portion of the message was carried or repeated, deaf persons (or those with the TV sound turned down) would only see the crawl telling about the evacuation of the county. This gap in information transmission impacts TV stations and their viewers rather severely, and could cause unnecessary panic. The only solution, at this time, is to have someone *manually transcribe* the voice message and enter the information into the stations character generator so the crawl contains *all* the necessary information to make the message complete.

The "fall-out" and "post-mortems" started fairly quickly.

EAS REMAILER HEATS UP

Here in Washington State we are blessed with having a very active and often used remailer dedicated to EAS. This provides an on-going "virtual meeting" dealing with EAS issues, in addition to giving us the ability to pass on information, plan updates, meeting notices etc.

Immediately after the incident, the volume of postings shot up. The primary sources were the TV stations, each of which were very displeased with what took place. As luck would have it, we were only a few weeks away from our regularly scheduled SECC meeting. In the meantime, the remailer enabled a lot background information and facts to be collected, and a great deal of "steam" vented.

THE SECC MEETING

From the comments on the remailer I knew that this was going to be a most interesting meeting. As the meeting was about to start, there were a lot of new faces at the table – representatives from all the major TV stations in the area. These TV stations were calling for major changes that they hoped would eliminate what they viewed as misleading information being distributed. Also at the table were representatives from the government entity that had initiated the EVI message. The stage was set for a bunch of finger pointing.

How this meeting turned out, and the positive response from area broadcasters and governmental agencies will be the topic of part two of this "case history."

Clay Freinwald, Senior Facilities Engineer for Entercom in Seattle, is Chairman of the SBE's EAS Committee as well as chair of the Washington State SECC. He welcomes your questions about EAS at k7cr@wolfenet.com

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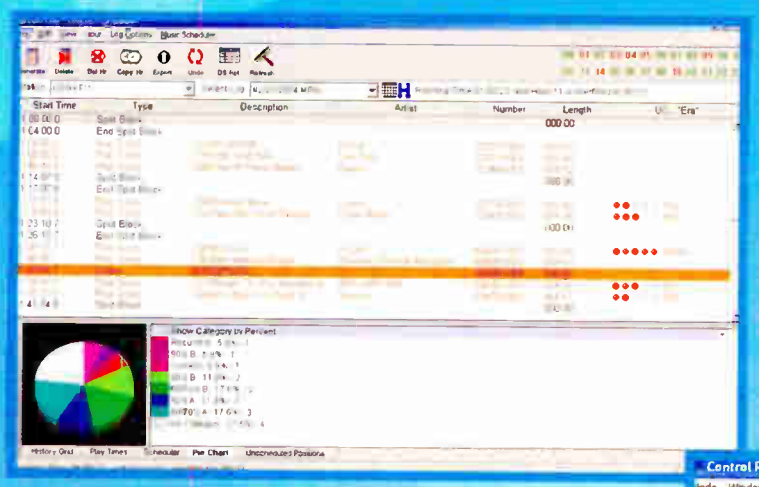

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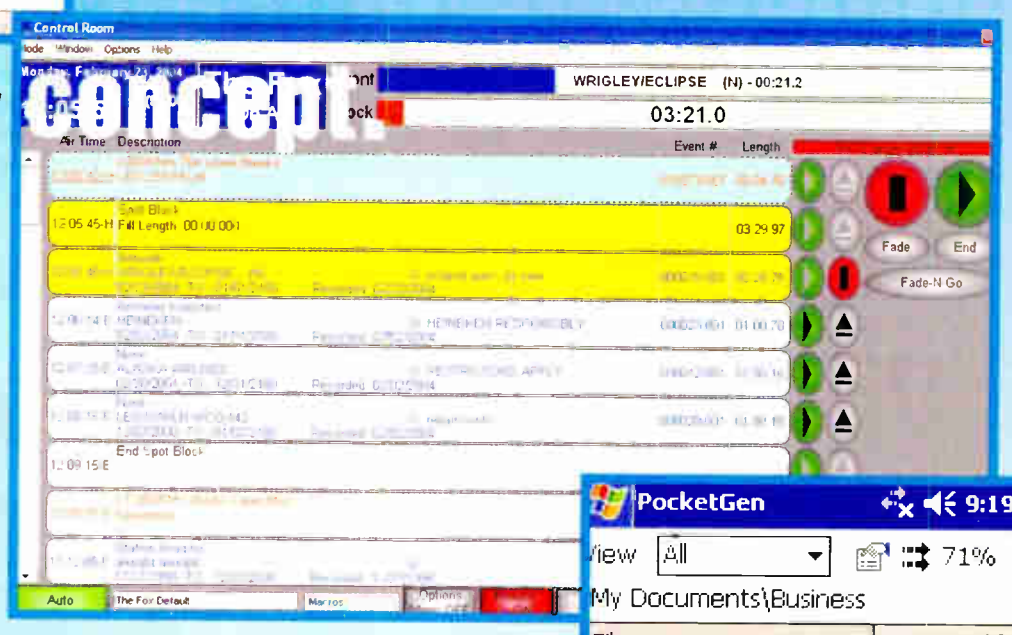

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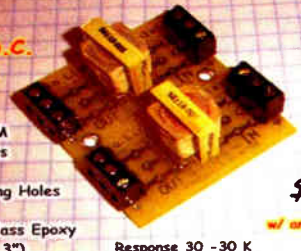

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Letters From Our Readers

Has the Email System Become Completely Broken?

I don't know about you, but it's been a tough week for me and my broadcast colleagues with respect to e-mail. The signal-to-noise ratio is bad and getting worse. For every useful message, I receive about 10 ads or messages containing notices about viruses cleaned. (I had to look up these statistics in my relatively effective but maintenance-needy SpamPal software because I simply never see most email. It gets marked as high-probability spam and is dutifully and permanently deleted!)

Many messages sent to friends and colleagues from home or work simply don't get through any more. Have you found that, too? Follow along: I tried to send a reminder to myself at home the other day and found that my own cable broadband Internet provider had blacklisted my employer's server – likely because of high traffic from the popular daily newsletter, or perhaps viruses. We don't know why; they won't tell us!

At the same time, a message from my home broadband account to a friend in Seattle didn't go through because my cable provider had been blacklisted. And as if to complete some mystic circle, my employer's server won't accept mail from the SBE server!

Sadly, the SBE e-mail lately has been rife with attempted virus mailings. It appears as though someone used the chapter address to spoof a FROM address, so we receive "undeliverable..." warnings from ISPs of people who were never sent messages. However, "undeliverable" mail is another trick of virus writers now, so it's difficult to know for sure.

I never open un-requested attachments (and they're all wiped clean anyway), but they still take a finite amount of time to analyze and discard. These virus warning messages, really ads for virus checking software, are their own form of spam, and are coming from so many sources that it appears impossible to set up a set of effective filters for them.

Many of the very important SBE bulletins are being dumped because they look like spam to some filters, or our address is not whitelisted by either our addressee's server or the end-user's mail program.

The situation has gotten bad enough that Bob Gonsett decided not to send out his CGC Communicator for a while, and that's particularly disturbing. I have some confidence that we'll eventually come up with a replacement communication protocol that will quiet the noise. But when a whole system of communication breaks down due to the abuse of so few, I have to wonder what the future holds for life as a whole for my children.

Gary Stigall, Chairman, San Diego Chapter 36
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Broadcast Software Intl. - 3	www.bsiusa.com
Broadcast Tools - 20	www.broadcasttools.com
Broadcast Warehouse - 12	www.broadcastwarehouse.com
Conex Electro Systems - 9	www.conex-electro.com
Comrex - 18	www.comrex.com
D&H Antennas - 8	www.dhsatellite.com
Decade Transmitters - 21	www.decade.ca
Econco Tubes - 8 & 28	www.econco.com
CKE - 15	www.rectifiers.com
Energy Onix - 2	www.energy-onix.com
ERI - 5	www.eriinc.com
Harris - 32	www.broadcast.harris.com
Henry Engineering - 2	www.henryeng.com
Inovonics - 5	www.inovon.com
JK Audio - 7	www.jkaudio.com
Kahn Communications - 19	none
Larcan - 7	www.larcan.com
Lightner Electronics - 7	www.lightnerelectronics.com
Micro Communications - 19	www.mcibroadcast.com
NAB - 31	www.nab.org/conventions
Nott Ltd. - 15	www.nottltd.com
OMB America - 20	www.omb.com
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Phasetek - 13	www.phasetekinc.com
Prophet Systems - 27	www.prophetsys.com
Ramsey - 19	www.ramseyelectronics.com
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SCMS Inc. - 23	www.scmsinc.com
Sine Systems - 15	www.sinesystems.com
Spacewise - 24	www.spacewise.com
Telos - 16/17	www.telos-systems.com
TFT - 25	www.tftinc.com
Tieline - 5	www.tieline.com
Transcom - 9	www.fmamtv.com

Date Book

Radio Conference Guide

List your Convention or Gathering Here
Email: radio@broadcast.net

IBS College Radio Conf. – Mar 12-14 – New York
www.ibsradio.org

Collegiate Broadcasters – Mar 18-20 – New York
www.collegebroadcasters.org/convention.shtml

Oklahoma Association of Broadcasters (OAB)
April 2-3 – Oklahoma City, OK
www.oabok.org

Black College Radio – April 16-17 – Atlanta, GA
www.blackcollegeradio.com

NAB Spring 2004 – April 17-22 – Las Vegas, NV
www.nab.org

NAB Radio Show – October 6-8 – San Diego, CA
www.nab.org

2004 Broadcaster's Clinic – October 12-14
Marriot-Madison West Hotel, Madison, WI
www.wi-broadcasters.org

Canadian Assoc. of Broadcasters (CAB)
November 27-29 – Ottawa, Ontario, Canada
www.cab-acr.ca/welcome.htm

Industry Updates

Marti Cellcast Remote GSM Unit Showing at NAB2004

MARTI Electronics will be showing, at booth N1902 during NAB2004, its GSM compatible Digital Cellcast all-in-one digital mixer and cellular remote unit. The GSM upgrade completes the remote unit's local compatibility with major cellular providers such as AT&T, T-Mobile, Cingular and others.

Broadcast Electronics, Inc. [Marti]
PO Box 3606, Quincy, IL 62305-3606
217-224-9600 Fax: 217-224-9607
Website: www.bdcast.com

Henry Introduces Studiodrive PC Mixer at NAB2004

StudioDrive makes any PC with a soundcard into a complete "studio-in-a-box." StudioDrive is a stereo audio mixer that fits in the drive bay area of any PC, and is designed specifically for broadcast and audio production applications.

It features 6 inputs (1 mic + 5 line), and has On-Air and Soundcard outputs. Sources can be mixed for a live broadcast or recorded and edited on the PC.

There is also a built-in telephone coupler, a Mix-Minus output, and provision for remote Mic control. The Monitor system features automatic muting when the mic is on, plus control of On The Air warning lights.

StudioDrive adds control, mixing, and monitoring functions to any soundcard, creating an integrated studio that's ideal for PC-based radio automation, newsrooms, and PC production studios.

StudioDrive will be on display at Henry Engineering's NAB booth N1100.

Henry Engineering
503 Key Vista Dr, Sierra Madre, CA 91024
Phone: 626-355-3656 Fax: 626-355-0077
Website: www.henryeng.com

Comrex Debuts STAC at NAB2004

At NAB2004, Comrex debuts the Studio Telephone Access Center (STAC) for listener lines, talk shows and call-in segments. STAC incorporates two digital telephone hybrids handling up to four callers. STAC is offered in six and twelve phone line versions with the ability to upgrade in the field.

The accompanying control surface supports unique producer and screener configurations. IP-based call screening and control are embedded, enabling operation from virtually anywhere. Other innovative features include auto-attendant and support of up to four control surfaces.

STAC joins a full line of Comrex broadcast products, including the DH20, DH22, and DH30 digital hybrids. Comrex also produces codecs for plain telephone (POTS/PSTN), ISDN, and GSM wireless networks. They will all be on display at the Comrex booth N2722.

Comrex
19 Pine Road, Devens, MA 01432
Phone: 800-237-1776 Fax: 978-784-1717
Website: www.comrex.com

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