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ON THE COVER

We all have have busy jobs, but some small organizational tools can make life a little easier. Cover design by Michael J. Knust.

Wireless Broadband Internet Remotes

"The first time out with the Tieline was a brilliantly simple experience for everyone involved. For lack of a better phrase, the codec just worked."

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  Mackay Communications

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CONTENTS ONLINE

Currents Online

Selected headlines from the past month.

FCC Clarifies Dual Antenna Hybrid Operation Notification Procedures

In response to several inquiries from the public, the FCC issued a public notice to clarify the notification procedures for stations currently operating with dual antenna systems under special temporary authorization (STA).

SBE Organizes Next-generation EAS Meeting

The Washington, DC, meeting was to discuss the next generation of public alerting. Attendees included the SBE, the FCC, FEMA, NOAA, the NAB and NASBA.

HD Digital Radio Alliance Renews Charter

The group's charter has been renewed for a third year. The new charter also revises the method that partner stations use to select multicast formats.

Broadcast Electronics Recognizes Larry Cervon

At the Oct. 26 recognition, Broadcast Electronics dedicated a commemorative plaque to Cervon to mark the 30-year anniversary of BE's move to Quincy.

Gepco Adds New York Warehouse

The 5,000-square-foot space is located in Chestnut Ridge, NY, and will stock all of Gepco's current cabling and connectivity systems.

APT Announces Licensing Agreement with SAS

In addition to SAS licensing Apt-x, the deal involves joint development to ensure interoperability of routing, console and codec equipment worldwide.

Ibiquity Updates Retail Training Website

The retail sales training website hdradiouniversity.com has been relaunched to educate retail sales people selling HD Radio products across the United States.

Site Features

We Have Podcasts

Each week we upload the Currents Podcast. You can also access other podcasts with industry interviews and in-depth information from *Radio* magazine.

Popular Downloads

A new feature, we have included links to the most popular articles and sections of the *Radio* magazine website.

Digital Radio Update Twice a Month

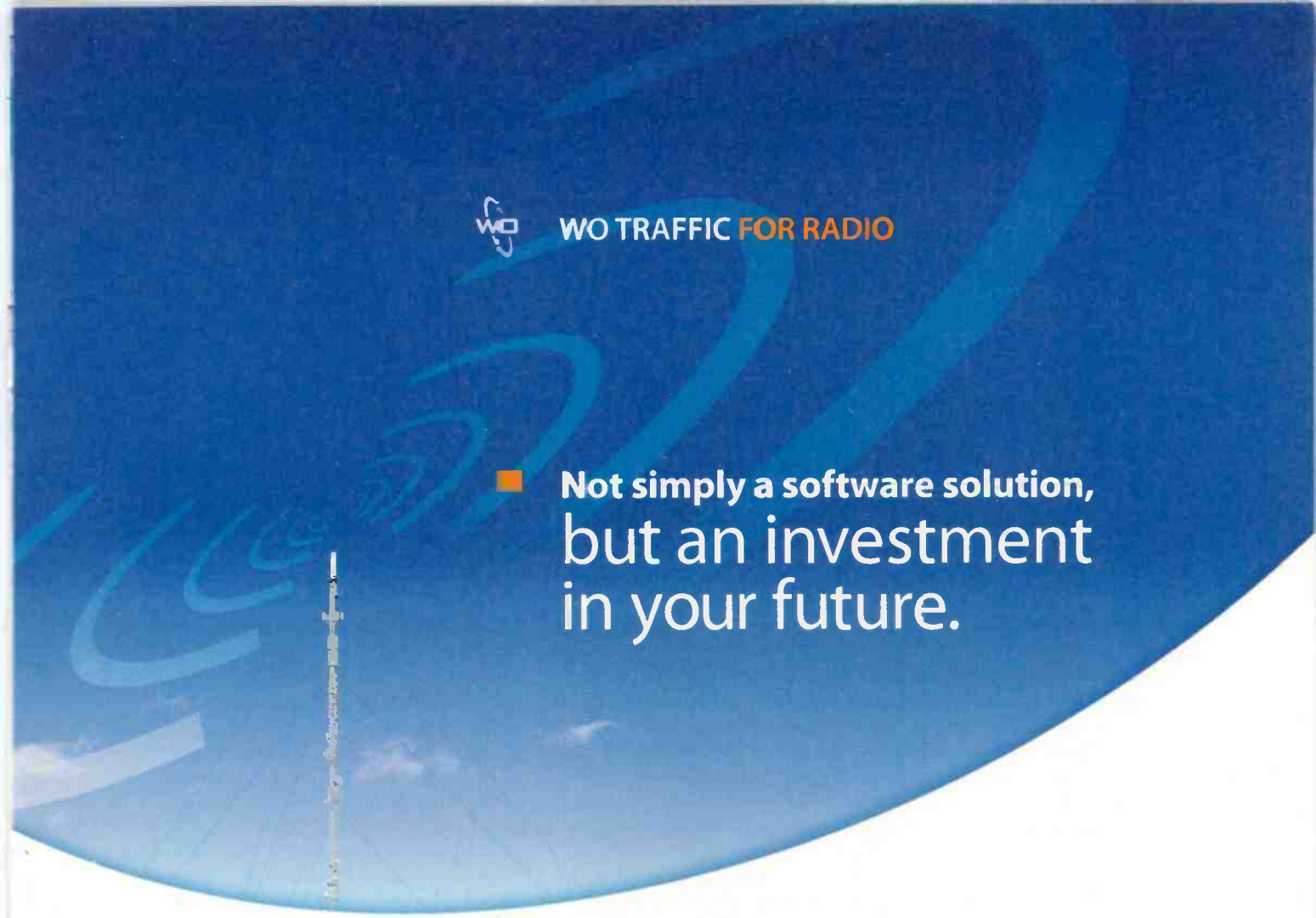
Stay up-to-date with the source of digital audio broadcasting news and information. The coverage extends to DRM, satellite radio and more. Subscribe today.

Advertiser Links

Access Web links to the advertisers in this and every issue.

Industry Events

The *Radio* magazine Industry Events section lists upcoming conventions and conferences. Update your calendar from ours, and tell us about events that should be included.



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— Jason Mann, Vice-President
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Out of mind, but not out of sight

As the year winds down, we start looking ahead and wondering what we might expect. In keeping with this, in October, the Consumer Electronics Association released the 2008 version of its annual report titled *Five Technologies to Watch*. The title is somewhat misleading because it doesn't focus on five defined technologies, but rather broader strokes. Otherwise, it's an interesting overview of consumer interest and intent. In addition to radio, the report also looks at GPS and software as technologies to watch.

The section on radio begins with an overview of the state of radio broadcasting and includes terrestrial, Internet and satellite in its coverage. The report touches on music download services in this section, but does not count them as forms of radio because they require the listener to pull the content rather than the content being pushed to the listener. That's a valid point, and one that I have made before, but while media players may not be considered forms of radio, they obviously take a portion of the potential listening audience away from the radio services.

Digging into the meat of the section, the report provides various statistics about listening habits and advertising trends. Overall, the CEA offers a fair assessment of radio in general, but there were two questions that really stood out.

Twice consumers were asked, "Why do you listen to radio?" The first time it was asked, the question was unaided. Respondents could reply with any answer. The second time the question was asked, possible responses were given. Any researcher will tell you that the way a question is asked is as important as the goal of the question, and this scenario follows that. The same question provided very different results in these two instances.

In the second case, by providing possible answers, the survey question did not actually answer the question why someone listens to the radio, but rather, the aided-response question really defines the features that listeners would miss if those features were taken away.

Two responses have a huge disparity between the results. In the aided response question, the top two answers were that consumers listen to the radio because it is always available and it is free. This is a pat on the back for radio, and the NAB has been touting these features of terrestrial radio for some time.

What's embarrassing is that when the question is asked with unaided response, these two answers fall to the bottom of the list. Convenience only scored 3 percent, and being free only scored 1 percent. What does that tell us?

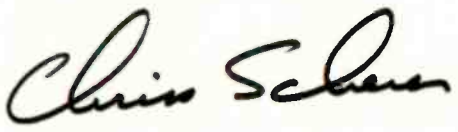
The common top reason for listening in both surveys deals with content. Unaided says content specifically, while aided falls into the local info and likely the live/current response. We already know that content is king, and this obviously confirms that belief.

Out of curiosity, I read the 2007 edition (published in 2006) of this report to see if similar information was available. It was not, but I found another survey that was truly alarming.

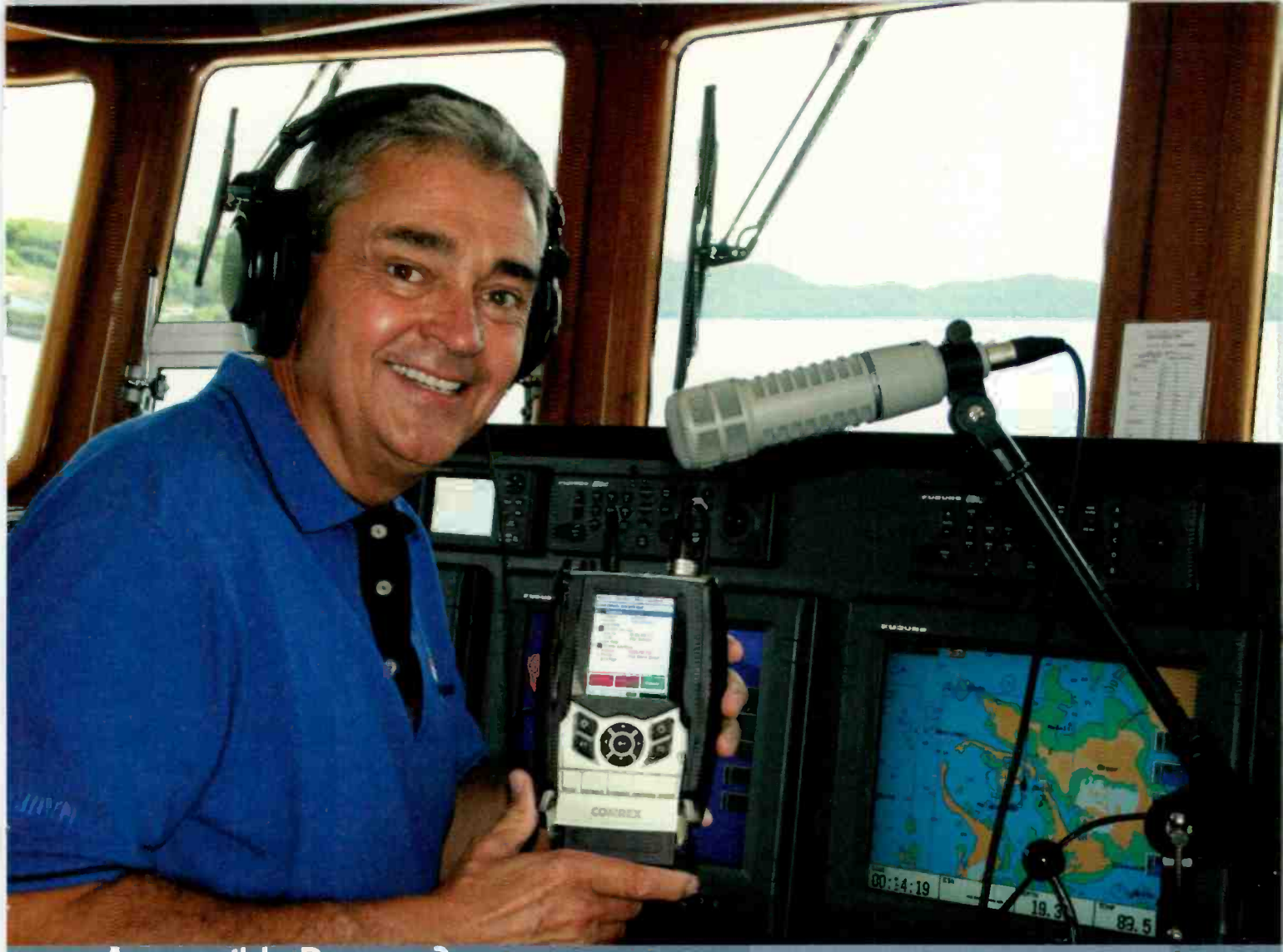
Another survey asked consumers to rank the most important technology today and in five years. Computers scored well, as did cell phones and TV. Radio, however, has a problem. Radio only scored 1 percent for importance in 2006, and the predicted importance in 2011 was zero. Media players at least held their 1 percent ranking for 2006 and 2011.

So what is radio's future? It has survived nearly 100 years so far. It will likely survive in some form for many years to come. While radio has a certain importance to consumers, it appears that it is not top-of-mind in importance anymore. Radio continues to be overshadowed by other technologies, but it's still holding a subliminal space.

Read the entire CEA report at radiomagonline.com/media/2007/1107/5trends2008.pdf



What's your opinion? Send it to radio@RadioMagOnline.com



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Keith DeGreen says: "Whether I'm a thousand miles out to sea, visiting unusual ports of call or exploring remote inland places, my Comrex ACCESS Portable empowers me to project a broadcast-quality signal back home at any time from virtually anywhere."

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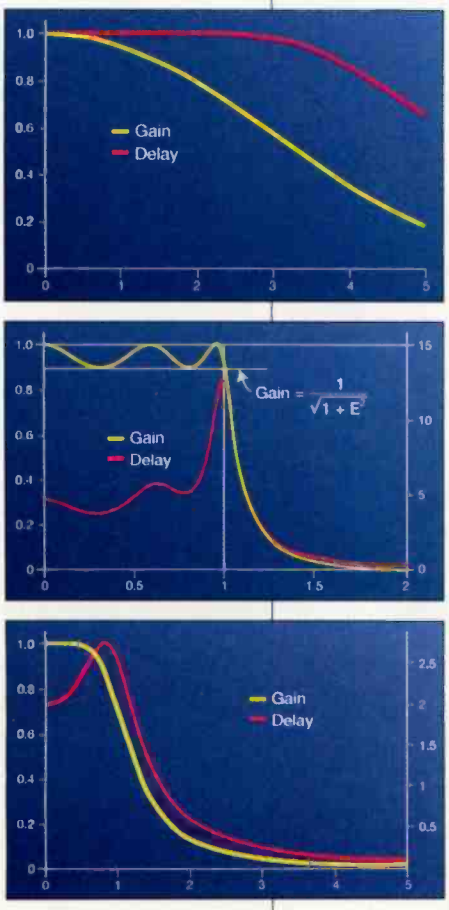
RF filters

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

Sometimes it seems as though radio-engineering work is very involved with filters of one kind or another. Actually this is not so far-fetched. When you think about our radio equipment, the widespread use of filters is easily understood. The science of broadcasting depends on the correct passage of various frequencies through differing pieces of equipment. Some frequencies are in the audio range and others are in the RF domain.

The physically smaller, and usually lower power, audio frequency (AF) filter immediately comes to mind – especially to the audio aficionado. But mention filters to an RF engineer and he immediately thinks in terms of kilowatts and much larger physical size. And that dreaded word "interference."

As a matter of fact, the topic of RF filters can become quite esoteric when the whole gamut of the field is considered. Filter consistency and construction can vary from a small collection of capacitors and inductances through quartz crystals and electromechanical combinations of garnet and yttrium such as are used in microwave operation, to tuned cavity filters that are often used in VHF and UHF operations. The major concern of most engineers in the radio broadcast field is with simple L, Tee and P networks and sometimes with acceptor or drain series networks. The Ls and tees are usually the last filters in the station's RF network and are used to match the transmitter output to the antenna.



Filter characteristics of a Bessel low-pass (top); Chebyshev group delay (middle); and Butterworth (bottom).

Silver-plated wire

When a radio engineer speaks of an RF filter, many of us tend to visualize a sturdy coil of silver-plated copper tubing and a few physically large capacitors.

This is especially true of engineers who are fortunate enough to be involved with transmitters. In this area of radio engineering, where heavy currents are frequently handled and skin effect losses are important, it is usual to silver-plate the comparatively large diameter copper tubing used. To further reduce losses, as well as improve stability, this process is frequently extended to silver-plating the flat copper straps used for interconnections in antenna tuning units (ATU) and phasors, it also reduces I^2R losses.

At the other end of the scale we find that RF filters used in such devices as radio receivers and similar low-power devices tend to use smaller gauge insulated copper wires and quite small physically, molded capacitors. In some cases, although less frequently these days, multi-stranded, very small gauge, insulated Litzendraht wire is used in inductors to reduce losses. In the audio field we can find an interesting similarity between radio tuners and loudspeakers.

Tuners and loudspeakers

The combination of the loudspeaker cone, surround, voice coil and centering spider form the mechanical equivalent of a parallel resonant tuned circuit. At the bass resonance frequency of the combination, the impedance of the voice coil rises to maximum and a VTVM connected across the voice coil peaks at the resonant frequency.

Looking at a schematic diagram of a receiver with a variable capacitor connected in parallel with an inductor, the similarity to an ATU may not be immediately apparent. However further consideration reveals that a parallel resonant circuit of an inductor and capacitor presents a high impedance circuit across which, at resonance, maximum voltage is being developed. This of course constitutes the tuning device in many radio receivers.

In the case of the ATU the combinations of L and C develop a network of impedances that matches the tower base operating impedance to the transmission line. In each case the filter operates because it is tuned to the frequency of interest and it only performs as designed at this one frequency. In effect it becomes a tuned transformer.

As the science of radio developed, the field of filters expanded considerably and a number of brilliant engineers gave their names to the specific type of filter that they designed. Some names associated with filters include, Bessel, Butterworth and Chebyshev (characteristics shown at left).

High- and low-pass

In the radio broadcast field, where the required pass or reject bandwidths are narrower and measured in kilohertz and megahertz, we generally find that the simple high-pass, low-pass and bandpass filters take care of most of our needs.

Sometimes an additional type of filter is required and is often referred to as a stop-band filter. This

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function is occasionally necessary when a strong signal on a critical frequency is received from a close-by transmitter. Internal cross modulation occurs in a final stage because the unwanted signal enters via the antenna and output coupling circuits and becomes a modulating signal in the final tube or transistor. Once again the simple parallel resonant circuit provides high impedance to the unwanted signal at resonance. The desired transmitter carrier is passed without loss and a series resonant drain circuit bypasses the unwanted cross modulating signal to ground through its very low impedance path.

In the case of a multiplex antenna system driven by more than one transmitter with different frequencies, drain and reject filters are required for each individual transmitter frequency.

Most station engineers are confronted by RF filters whose purpose and functions are clearly known and somewhat obvious. Occasionally a piece of equipment is found in an area, or circuit, without any apparent reason for its being there and lacking paperwork and information. Absent the availability of information concerning the purpose of such a filter it is often possible to obtain an idea of its purpose by drawing out the circuit and trying to determine its function based on filter knowledge.

Sometimes it's possible to determine if the filter is low or high-pass by remembering the effect of inductor and capacitor characteristics. For example a filter in which an inductor is in series with the input with a capacity to ground the filter will pass more low frequencies. This is based on the fact that as frequency increases, inductor impedance increases, so lower frequencies are passed. This is known as a low-pass filter. In the same way, if there is a capacitor in the input circuit and an inductor to ground, higher frequencies will be passed on more easily than lower frequencies. The resulting characteristic is known as a high-pass filter.

In brief, these filters take advantage of the frequency characteristic of capacitors and inductances. A capacitor passes higher frequencies and tends to attenuate lower ones as its impedance decreases with frequency. That's one reason larger capacitors are used for inter-stage audio coupling. An inductance has the reverse effect.

Contrarily, if there is an inductance in the input to the filter with a capacity to ground, the L and C characteristics will pass lower frequencies while shunting high frequencies to ground. Such a filter is known as a low-pass filter.

E-mail Battison at batcom@ohio.net.

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Who are these guys? • Why buy a console from Axia? Element was designed by Mike Dosch and his team of ex-PR&E renegades (who know a bit about consoles). And Axia is a division of Telos, the DSP experts.

Perfect timing • You can't have too much time. That's why Element's control display contains **four different chronometers**: a digital time-of-day readout that you can slave to an NTP (Network Time Protocol) server, an elapsed-time event timer, an adjustable count-down timer... and there's also that big, honkin' analog clock in the center of the screen (Big Ben chimes not included).

Screen play • Use any display screen you choose, to suit your space and décor. Get a space-saving 12" LCD, or go for a big 21" monster. (This is Dave Ramsey's favorite Element feature, by the way. Anyone want to bet he bought his monitors on sale?)

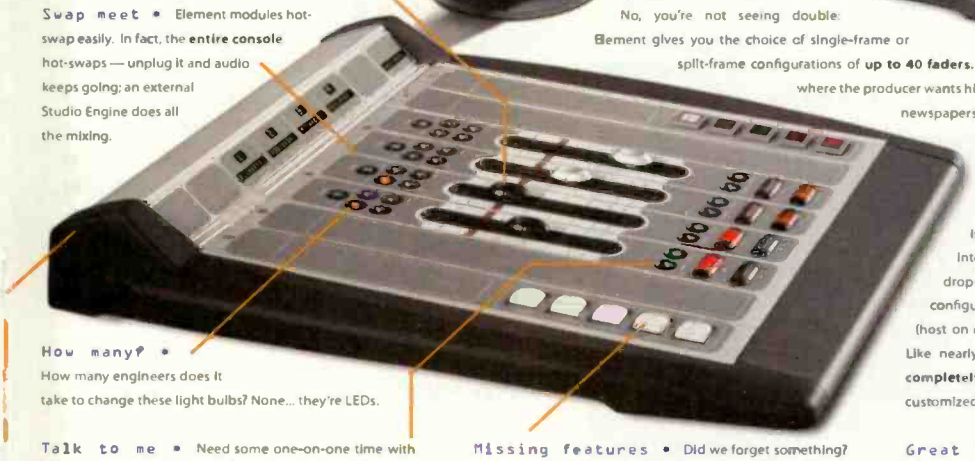
Lovely Rita • LED program meters? How 1990's. SVGA display has lots of room for timers, meters, annunciators and more — enough to show meters for all four main buses at once. Reboot to 5.1 surround mode and the light show is even cooler, with surround audio and associated stereo mixes all going at once.

Memory enhancer • We know how forgetful jocks can be. That's why Element remembers their favorite settings for them. Element's Show Profiles are like a "snapshot" that saves sources, voice processing settings, monitor assignments and more for **instant recall.** Profiles are easy to make, too: just have talent set up the board the way they like it, then capture their preferences with a single click for later use. (Hey, make *them* do some work for a change.)

Black velvet • Some things **just feel right.** Like our premium, silky-smooth conductive plastic faders and aircraft quality switches. We build Element consoles with the most durable, reliable components in the industry — then we add special touches, like custom-molded plastic bezels that protect on/off switches from accidental activation and impact. Because we know how rough jocks can be on equipment. And nothing's more embarrassing than a sudden case of *broadcastus interruptus.*

Split decision • No, you're not seeing double. Element gives you the choice of single-frame or split-frame configurations of **up to 40 faders.** Perfect for complicated talk or morning shows where the producer wants his own mini-mixer, or to give talent space for copy, newspapers and such. Solomon would be proud.

Swap meet • Element modules hot-swap easily. In fact, the **entire console** hot-swaps — unplug it and audio keeps going; an external Studio Engine does all the mixing.



Stage hook • This button activates the emergency ejector seat. OK, not really. It's the Record Mode key; when you press it, Element is instantly ready to record off-air phone bits, interviews with guest callers, or remote talent drop-ins. One button press starts your record device, configures an off-air mix-minus and sends a split feed (host on one side, guest on the other) to the record bus. Like nearly everything about Element, Record Mode is **completely configurable** — its behavior can even be customized for individual jocks. Sweeeet.

How many? • How many engineers does it take to change these light bulbs? None... they're LEDs.

Talk to me • Need some one-on-one time with your talent? Talk to studio guests, remote talent, phone callers — **talk back to anyone** just by pushing a button.

The Busy Box for jocks • Element comes standard with a lot of cool production-room goodies you'd pay extra for with other consoles, like per-fader EQ, aux sends and returns and custom voice processing by Omnia™, enabling you to quickly build and capture compression, noise gating and de-essing combinations for **each and every jock** that load automatically when they recall their personal Show Profiles. Context-sensitive SoftKnobs let production gurus easily tweak these settings, while simultaneously satisfying their tactile fixations. (Don't worry: for on-air use, you can turn off access to all that EQ stuff.)

Missing features • Did we forget something? Program these **custom button panels** with any macro you want, from recorder start/stop to one-touch activation of complex routing and scene changes using PathfinderPC™ software. You could probably even program one to start the coffee machine (black, no sugar, thanks).

Mix-plus • If constructing a complicated mix-minus on-the-fly brings a big grin to your face, you're excused. But if you're like us, you'll love the fact that Element does mix-minus **automagically.** Forget using all your buses for a four-person call-in, or scrambling to set up last-minute interviews. When you put remote codecs or phone calls on-air, Element figures out who should hear what and gives it to 'em — as many custom mix-minuses as you have faders.

Great Phones • With Element, jocks never have to take their eyes or hands off the board to use the phones. Element works with any phone system, but really clicks with the Telos Series 2101, TWOx12, and new NX-12 that connects four hybrids plus control with a **single Ethernet cable.** Status Symbols™ (cool little information icons) tell talent at a glance whether a line is in use, busy, pre-screened, locked on-air, etc. Even dial out with the built-in keypad.

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Element

FCC continues active enforcement of radio rules

By Harry Martin

In a recent case, the FCC fined an AM station for operating from an unauthorized location even though the broadcaster had filed an STA extension application and paid all required fees.

The station had experienced technical problems and sought authority from the FCC to move its facilities. The FCC issued a special temporary authorization (STA) for the station to operate from the roof of the owner's residence. When the STA was due to expire, the station filed an application to extend it, but there was a mix-up with the fee payment. While the FCC cashed the check associated with the application, the agency somehow misplaced the application, so it was never processed.

A few years later, an FCC agent inspected the owner's home and proposed fining the station $4,000 for operating from an unauthorized location. The station owner produced a copy of the application and the canceled check for the associated filing fee. The FCC admitted it had taken the station's money, but had no idea what it had done with the application itself. Sustaining its fine, the FCC blamed the station for making no effort to notify the FCC that it did not receive the requested extension. The moral of the story: follow-up.

Dateline

On or before Dec. 3, radio stations in the following states must file their 2007 biennial ownership reports with the FCC: Alabama, Connecticut, Georgia, Massachusetts, Maine, New Hampshire, Vermont and Rhode Island.

Also by Dec. 3, Radio stations in the following states must place their annual EEO reports in their public files and place them on their websites: Alabama, Colorado, Connecticut, Georgia, Massachusetts, Maine, Minnesota, Montana, New Hampshire, North Dakota, South Dakota, Vermont and Rhode Island.

Also by Dec. 3, Radio stations in Georgia and Alabama with 11 or more full-time employees must file a Broadcast Mid-Term EEO Report with the FCC using FCC Form 397 and attach their two most recent annual EEO public file reports.

Temporary fence removal

A California AM station faces a fine for having posts in the ground for its chain link fence, but no fence. The station was inspected by local fire authorities and was ordered, for fire prevention purposes, to remove weeds at the base of its towers. The station obeyed the local authorities and removed the panels of the fence and began applying herbicide to kill the weeds. Shortly thereafter, an FCC inspector showed up at the towers. Noticing that there were posts but no fencing, the inspector proposed a $7,000 fine.

The station appealed, arguing financial hardship and that the $7,000 fine was unwarranted, particularly because the fence had been removed at the direction of local governmental officials. Unfazed, the FCC asserted that even when the fence was down for repairs, the station still had an obligation to maintain some type of enclosure around the towers. The Commission did, however, reduce the fine to $5600 in recognition of the special circumstances.

Lock those gates

A Mississippi AM station was not as lucky in its efforts to reduce its own $7,000 failure-to-fence fine. Although the fine involved an unlocked gate, the FCC still fined the station the full $7,000. Agents from the FCC's New Orleans office arrived at the AM tower array and discovered a gate with a broken hasp that prevented the gate from being locked. The station insisted that the gate had been inspected only a few days earlier and there had been no problem. The station also pointed out that within two hours of the inspection, the hasp had been repaired and the gate was securely locked. These arguments did not work; the FCC upheld the full $7,000 fine.

EAS violations

The FCC has continued to issue fines at the rate of $6,400 per station for failure to have operating EAS equipment. A Las Vegas station was fined for not maintaining proper EAS logs despite various excuses. The former owner of an Arizona AM station faces an EAS-related fine despite the fact that the station had been sold nine months before the citation. The FCC inspection occurred prior to the sale, but the notice of apparent liability was not completed and issued until after. Given the chronology, it is not entirely clear the FCC has jurisdiction over the former licensee. In any event, EAS is one of the FCC Enforcement Bureau's tried-and-true revenue producers. All stations should check regularly to ensure they have functioning EAS equipment, conduct regular testing and maintain EAS logs.

Martin is a past president of the Federal Communications Bar Association and a member of Fletcher, Heald & Hildreth, Arlington, VA. E-mail martin@fhhlaw.com.

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Doing more with less? This might help maximize your effort.

By Chriss Scherer, editor

It's no secret that everyone feels pressed for time. Workloads are increasing while staffs continue to be cut. We are asked to do more, but we're not always sure how to get it all done and keep track of the steps along the way. The *Radio* magazine Annual Salary Survey always includes write-in comments that deal with the heavy workload and lack of sufficient time. The good news is that there could be some assistance already available.

The trend in smaller staffs with higher workloads is not likely to change any time soon. While an extra person would likely help the workload, there are some tricks and even some software that might help overall.

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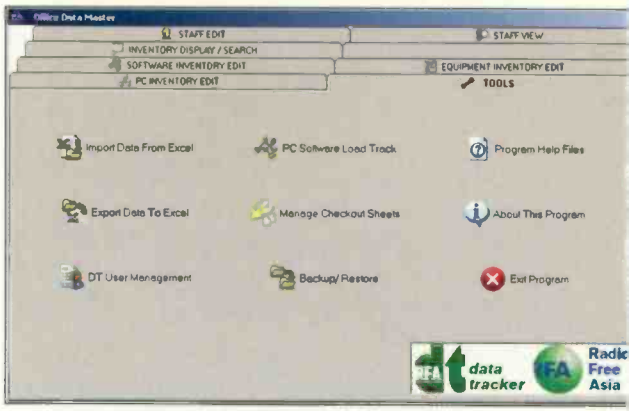
Putting it all together

Modern technology

One fortunate circumstance is that equipment reliability continues to improve. Much of the routine and time-consuming alignment and tweaking isn't a part of regular maintenance like it once was. This is not to say that equipment does not need attention; it just requires a different kind of attention.

Much equipment can operate in a mostly automated fashion. More devices now include some kind of IP connectivity so devices can be accessed and checked remotely. It seems that wireless devices like the Blackberry



Radio Free Asio has developed DTP to track equipment and software inventory.

have become the modern remote control interface. If the device has a Web browser, it can probably access most of the equipment in a facility. This remote access doesn't replace the required on-site maintenance, but it helps.

Because we can't add more hours to the day, we need to find ways to make the most efficient use of the time we have. Keeping track of supplies, resources, maintenance schedules, personnel schedules and facility schedules are all part of the facility's operation. Managing these functions is a part of overall productivity.

So what's the best way to ensure everything receives the appropriate attention at the right time and place? By organizing schedules and establishing methods to track time and resources, more time can be spent on the tasks instead of on trying to juggle all the pieces.

Where do you start? A basic method to track maintenance records, process trouble reports and schedule studio time can be accomplished with common tools and programs that every business has. If something more comprehensive is needed, there are more sophisticated programs and applications as well.

The most basic of any system is just pencil and paper. I see many stations use various forms to request studio time, note equipment problems and submit requests for work orders. One advantage to this method is that a tangible item is created to begin the process. The disadvantage is that these papers will pile up, and the only way to prioritize and organize them is through manual intervention. Reminders must be made manually, and ongoing record-keeping can be difficult.

The information from the paper forms can be added to common office programs to better track all the information. There are many office software programs available, although the Microsoft Office package appears to be the most popular. Setting tasks and reminders in a time scheduler such as Outlook are a great way to keep track of everything. Outlook Tasks can also store deadlines, ongoing project status and other information.

Outlook or a similar program can also be set up to handle requests through a general e-mail box, such as tech@companyname.com. Pair these with the tasks and appointments to arrange schedules.

Excel is another program that seems to be handy for storing much more than financial information. It is handy for simple database functions, and the data can be accessed for merge documents and searched easily to find specific information. If you need more powerful database functions, Access or File Maker is the next step up.

With all this electronic data storage, why use paper at all anymore? You can also create a page on the station's Intranet for people to submit trouble reports. This can send an e-mail message to alert someone of the problem, and it can add an entry to the database system to track the project's status.

As I was investigating some software, I was made aware of Twiki.org as one way to track projects and manage documentation. Twiki is a structured Wiki, which builds on the Wiki idea and adds database functions.

These home-brew methods can work in many applications, but like any do-it-yourself system, you could spend

Seven Tips to Better Time Management

While software tools can help track details and set plans for recurring tasks, the simplest way to maximize productivity is to effectively use your time. There are several established time management techniques that can be reference. A common one is ABC analysis where tasks are prioritized into groups of A, B and C, for high, medium and low priority. Even then, understanding your own schedule can be applied to make the most effective use of time. If you have 15 minutes to spare, complete a 15-minute project. Further still, divide a major project into smaller elements so each step can be accomplished in smaller increments. After investigating several references for time management, I found these ideas that were common in all of them, and they are a good baseline for maximizing time.

1. Examine old habits and search for ways to change or eliminate them.
2. Use down time effectively: Review notes and task lists.
3. Keep something handy to jot notes or ideas during the day. Review these notes later or during down time.
4. At the end of the day, make a list of action items for the next day and prioritize them.
5. Accomplish the most important tasks early in the day.
6. Plan deadlines with a view of other projects and recurring projects.
7. Think on paper when possible to make it easier to review and revise ideas.

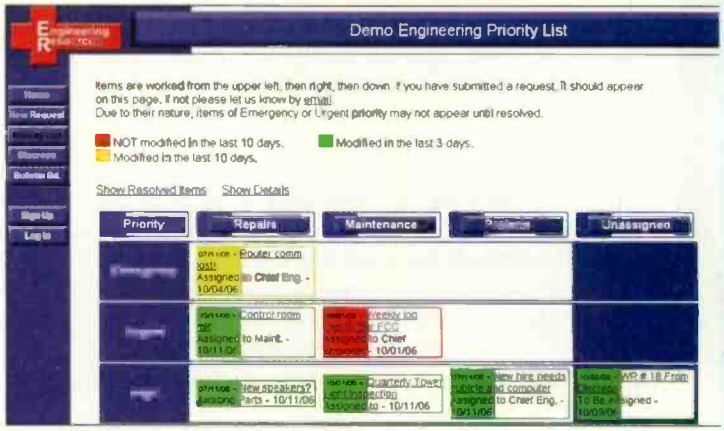
Putting it all together

more time maintaining the system than working on the projects the system is tracking.

Packaged assistance

The next step in productivity is to use a provider's software to manage the data and project status. There are countless packages available because this type of software is used in nearly every industry. Some of them are completely customizable to fit nearly any use, while some manufacturers focus on a specific industry to tailor the system to have the most common and relevant functions.

These software systems can be used to track, report and schedule resources, maintain an inventory of replacement parts, track and schedule studio time, track and manage personnel schedules, and inventory a facility's assets (audio files and equipment).



Engineering Resource adapts the help desk concept to broadcast operations.

The main advantage to these packages is that they are all-in-one. There is no need to write elements as they are needed or modify other programs to achieve the desired result. They also offer some kind of manufacturer support.

Scheduall is one program that has been available to broadcasters for some time. Various modules can be used for specific tasks, such as scheduling studio time, arranging personnel shift schedules and managing a media library. These packages provide a comprehensive approach to nearly every aspect of a facility's operation.

Resource Guide

Scheduall
800-334-5083
scheduall.com

Maximo
877-945-6325
www.mro.com

BMC
877-945-6325
www.bmc.com

Radio Free Asia
www.techweb.rfa.org

Engineering Resources
573-886-2860
broadcastbuyersguide.com

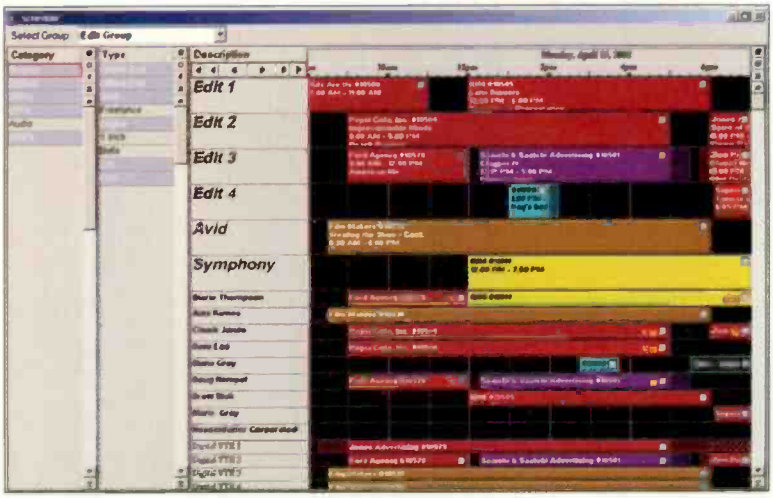
They may also include task options already covered by other software packages, such as commercial inventory and sales reporting. In these cases, use the modules that apply to the facility.

Asset management is one task that can benefit from a concise and manageable database. Two available software packages are offered by IBM (Maximo) and BMC (Remedy). These go beyond basic equipment inventory lists to provide tracking of updates, maintenance and other routine equipment functions.

Radio Free Asia has been developing software utilities for its own use, which it then makes available to others through the open-source initiative. The group's most recent effort is called DTP, a database manipulation and report generator designed to track equipment, computers, software and the staff the equipment is assigned to in remote broadcast field offices and the RFA headquarters. The program is a Visual Basic front end to a Microsoft Access database.

Engineering Resources is a package that came from one TV chief engineer's approach to managing resources. It started as a roll-your-own approach, but it is now fully developed. He took the help desk concept and adapted it to fit his need at the station. Reports can be sent to anyone designated. Time-tracking organizes and tunes the regular tasks, and the Bulletin Board provides an easy way for operators to share information between shifts. The system will also log discrepancies. All this information can be used to generate work requests.

The next time you're feeling pinched for time, try to step back and evaluate the situation. You can't add more hours to the day (nor do you really want to). Determine how you can work smarter, not harder. It may be that you need to find a way to enhance your productivity by using some available tools.



Scheduall has several modules to schedule equipment and facilities in addition to other facility resources.

Planned Transition

The incremental upgrade

FACILITY SHOWCASE

By Chriss Scherer, editor

When a station plans to rebuild its studio facilities, the idea typically involves a complete overhaul. With a few exceptions, all the equipment is updated. The sweeping upgrade also provides a clean slate for the facility. A new wiring plan can be developed and equipment can be housed in the most logical position rather than the only available position. While this approach is usually the most desired, it's not always the most practical.

Planned Transition

There could be reasons for only upgrading part of a facility, and quite often those reasons are budgetary in nature. This is a legitimate approach. While a total studio move has its own difficulties, an in-place upgrade is trickier because the station has to be able to stay on the air during the transition. The engineer can spend a great deal of his time ensuring minimal interruption to the on-air signal, not to mention the extra efforts needed to minimize the interruption and inconvenience to the air staff.

The air studios have identical layouts. This is WJJK's studio.

Each guest has his own mic and headphone control turret.

This Facility Showcase brings us to the studios of the

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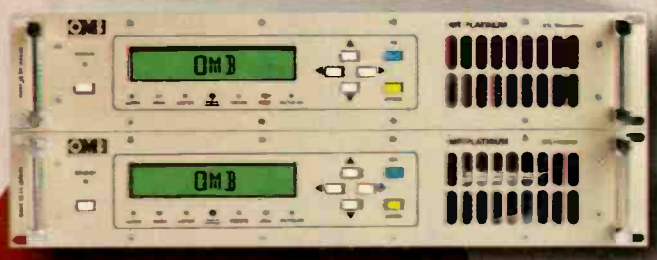
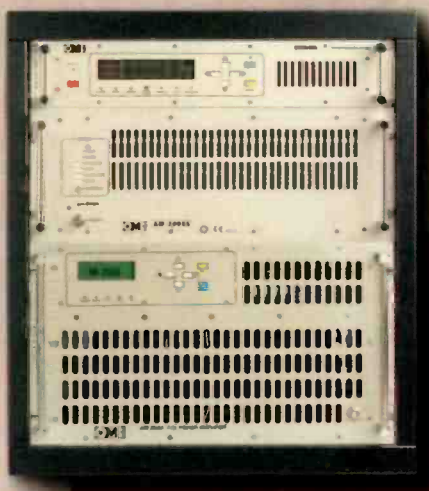


MT/MR PLATINUM

>1GHz

Is a high-performance Studio-to-Transmitter Link. It is made up of the SW MT transmitter externally synthesized in 1MHz sub-bands with a step of 100KHz, and the MR double conversion receiver, that is externally synthesized too. The MT is microprocessor controlled, and includes LCD display for the visualization of the most relevant transmission parameters (frequency (6-digit), forward and reflected power, modulation level, balanced Mono, Stereo (MPX). The MR receiver has the same visualization system as the transmitter. It includes balanced Mono and Stereo (MPX) outputs. Furthermore, the MT/MR Platinum STL includes a jumper in order to get a proper operation with digital signals.



EM 2000

is a 2000W FM transmitter made up of the EM 25 DIG exciter (or EM 20/3C exciter) and the AM 2000 FM amplifier. AM 2000 includes eight 300W high-efficiency MOSFET technology amplifying modules, fed by 2 independent switching power supplies, which are made to withstand the working conditions. The amplifying modules work independently thanks to a power combining structure that provides high isolation between them.

EM 10000

is a 10000W FM transmitter made up of the EM 250 COMPACT DIG exciter and three control units which combine the power of six AM 2000 FM amplifiers. AM 2000 includes eight 300W high-efficiency MOSFET technology amplifying modules, fed by 2 independent switching power supplies, which are made to withstand the working conditions. The amplifying modules works independently thanks to a power combining structure that provides high isolation between them.

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Planned Transition

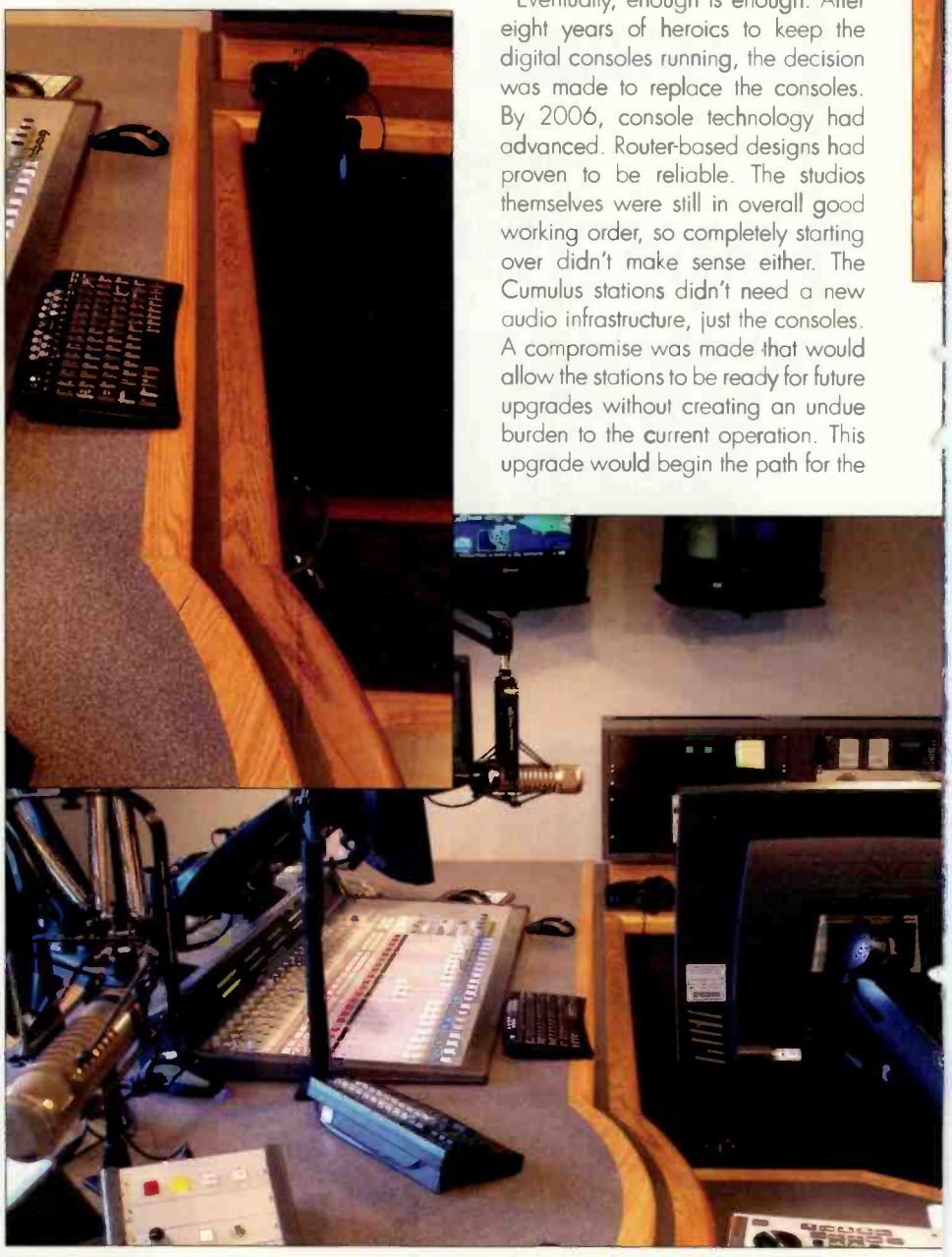
Cumulus stations in Indianapolis. This facility upgrade was primarily centered on the on-air consoles.

In the beginning

The studio facility was actually constructed in 1998. The facility was designed to house the three stations Susquehanna owned. Today, those stations are WFMS-FM (country), WJJK-FM (Jack) and WWFT-FM (FM talk). When it was completed, the three air studios, back-up air studio and production rooms included the most appropriate technology for the function. The air studios were built around a newly designed digital on-air console. The production studios had new digital production consoles. The backup air studio was built around an analog audio console that is still going strong today.

All the consoles were stand-alone designs, which was the leading technology in 1998. Unfortunately, the chosen digital consoles did not perform as well as they were expected to perform. Intermittent failures and susceptibility to static discharges were the common problems. The stations tried to remedy the problems, but they could not eliminate the difficulties and ended up working with and around the problems.

Eventually, enough is enough. After eight years of heroics to keep the digital consoles running, the decision was made to replace the consoles. By 2006, console technology had advanced. Router-based designs had proven to be reliable. The studios themselves were still in overall good working order, so completely starting over didn't make sense either. The Cumulus stations didn't need a new audio infrastructure, just the consoles. A compromise was made that would allow the stations to be ready for future upgrades without creating an undue burden to the current operation. This upgrade would begin the path for the



The secondary countertop is contoured to match the original counter.

The console can be expanded with another fader module if needed.

stations to gradually move into a networked audio infrastructure.

All four control rooms have identical layouts, which simplified the planning for the air studios. The changes to one could be applied to the other two.

Two routers

The stations already used an SAS 64000 for audio routing. Because the other studios would retain their existing stand-alone consoles, the SAS router needed to remain in place. The Wheatstone Bridge is also a router, but instead of replacing the SAS, the two routers were installed to work side-by-side. The Wheatstone

Equipment List

Audiometrics CD-10
Audion Labs Vox Pro
Beta Brite sign
Comrex Matrix, Vector
Cybex Autoboot Commander 4XP
Denon DN-951FA, DN-C550CR
Elo touch monitors
Enco DAD
Ergotron monitor stands
ESE
E-V RE-20, RE-27 ND,
Eventide BD600
Harris World Feed Panel
Henry Matchbox II, Superelay
JBL 4408,
QSC MX700
Rode Broadcaster, NT2
SAS 32000, 64000
Sennheiser MKE4032
Sine Systems MBC-1.5
Sony MDS-E12, PCM R-500
Studio Technology Furniture
Symetrix 528E
Telos One, 1A2 Interface, Zephyr, Zephyr stream
TFT 911
Wheatstone Bridge, Generation 6

Planned Transition

The technical operations center is adjacent to the studios.

Show hosts, producers and production staff have desks in front of the studios.

Bridge router is used as the I/O for the Generation 6 surfaces, while the SAS 64000 is still used for primary source switching. Each air studio also has a Bridge Satellite cage to accommodate local sources in each studio.

Using the Bridge to multiplex the signals to and from the technical operations center has also eliminated another potential problem: insufficient cable pairs between the studio and TOC. Now that signals are multiplexed, there are plenty of signal pairs available.

The transition to the new console surfaces was simplified because the three stations have a back-up air studio. This

studio is often used for voice tracking and interviews, but it served its purpose well during the upgrade as each station was upgraded.

But there was another obstacle to overcome before the new console surfaces could be installed. The original air studio furniture was built by Studio Technology. The opening in the countertop fit the previous consoles just fine, but the new consoles were a problem because they have guest turrets, which meant further modifications to the countertop.

The solution was to build a new countertop, not replace the existing countertop, which was structurally part of the furniture. The top is also part of the wire mounting system in the room. One idea was to add a square platform to cover the old hole and provide support for the new surface. But this would have an odd look and draw attention to the modification.

The solution was to design a new top three inches smaller than the original. The new top was placed over the old one to create a stepped effect. This covered all the previous holes and marks. The result looks designed instead of being an obvious add-on. It solved the problem without a significant demolition and rebuilding of the room.

This project eliminated an ongoing problem for the three stations, but also set the stage for a future upgrade path. This same approach can easily be applied to other stations wanting to upgrade without making a complete change all at one time. The Cumulus Indianapolis facility has plans to upgrade two more analog consoles in the same way. These aren't part of a formal schedule yet.

The studio building is in a highly visible location adjacent to I-465.

Tips, tricks, hints and more

By John Landry, CSRE

Analog Tape Part 2, Electronics

The next aspect of analog tape recording is an interesting one, for it can also apply to audio transmission on long circuits (telephone lines), to FM radio reception and to TV signals. The magnetic recording head is an inductive device and its impedance varies directly with the frequency of the sound being recorded. In addition, the magnetic field available to record on the tape is directly related to the current flowing through the head. Because of this, the high frequencies are not recorded as easily as the lower ones. This is corrected by adding resonant circuits to the audio input stages in front of the record head, and to the playback stages that follow the playback head. In tape recording and telco terms this is referred to as equalization. In FM radio it is pre-emphasis/de-emphasis.

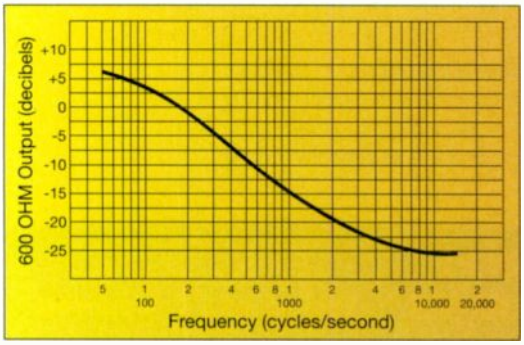


Figure 1. The standardized tape recording and playback EQ curves.

The record equalization circuitry boosts the weak parts of the spectrum, so the tape can "see" and record them. To bring things back to the proper relationship, a similar reduction in those frequencies is introduced in the playback circuit: Reproduce equalization. Often there are separate EQ adjustments for the high frequencies (HF) and the low frequencies (LF). Better quality recorders have more stages and sophisticated EQ circuitry. Lesser quality machines may only have one adjustment, or none at all.

The tape's sensitivity to magnetic fields at different wavelengths is also not uniform. To compensate for this, a super-audible signal (typically about 100kHz) is imposed on recorded signal, usually at a very high level. This signal is called bias. Similar to bias in an amplifier, this signal is mixed with the recorded audio, and it linearizes the record function at high frequencies. Proper adjustment of the level of this signal reduces distortion and noise.

To assure consistently high quality recording, only one specific brand and type of tape should be used at a studio. Each machine should give the same results once all of the adjustments are set up for that house tape.

In a multi-track recorder, all of the adjustments (HF and LF record, reproduce EQ and bias) must be done separately for each track. This requires a lot of set-up time, and is just one of the reasons for the digital migration to systems such as Adobe Audition and Pro Tools.

It's simple logic

Remote starts from console are just the beginning. A simple pulse is the most common form of control – from lighting the on-air light to firing the commercial break from the automation. And over the years, so many different devices with different hookups have been introduced, which means every time a new piece of equipment comes into the rack room, the fun begins again.

Most logic inputs have a voltage reference, and usually the equipment supplies it. When this voltage changes (by being connected to the common terminal) the equipment does its thing. Some devices, such as a popular ISDN codec, requires the user to provide a reference voltage to the inputs. An external power supply can be used, or a pull-up resistor tied to the voltage pin on the logic connector can supply the voltage. Figure 2 shows the connector with a 330 ohm pull-up resistor pulling the high side of the four inputs up. A switch between the low side of each input and the common terminal will change the state and send that change down the line.

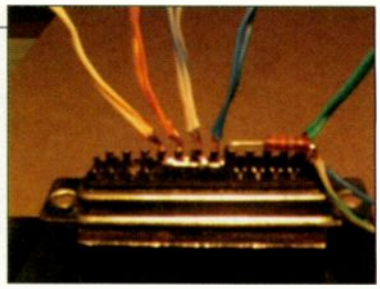


Figure 2. A pull-up resistor can supply the needed voltage for the logic pulse.

Output circuitry can also require a voltage source. Another popular ISDN/Ethernet codec requires voltage to receive the output (and this includes the outputs you can use to tell when it is in use).

It gets a little confusing when a logic pulse has to be used to trigger two different pieces of equipment at the same time. For example, a satellite receiver's closures must be sent to the studio on a T1 link as well as a back-up ISDN. If both devices provide a voltage, the voltages must be isolated. This can be done by inserting two diodes.

If more logic pulses need to be sent to many devices, a better way is to use a pulse distributor, such as those offered by Henry Engineering, Broadcast Tools and Radio Design Labs.

Landry is an audio maintenance engineer at CBS Radio/Westwood One, New York.

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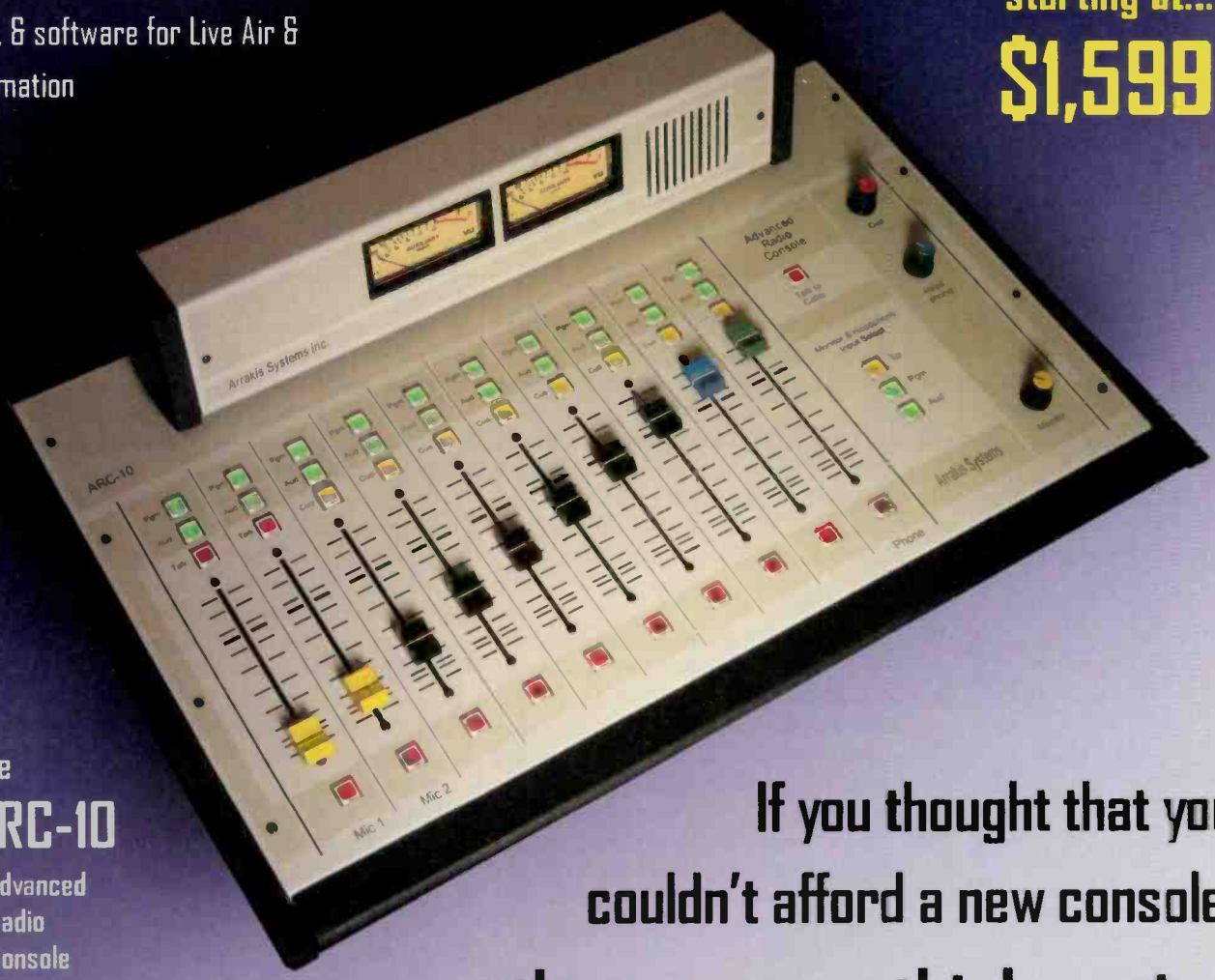

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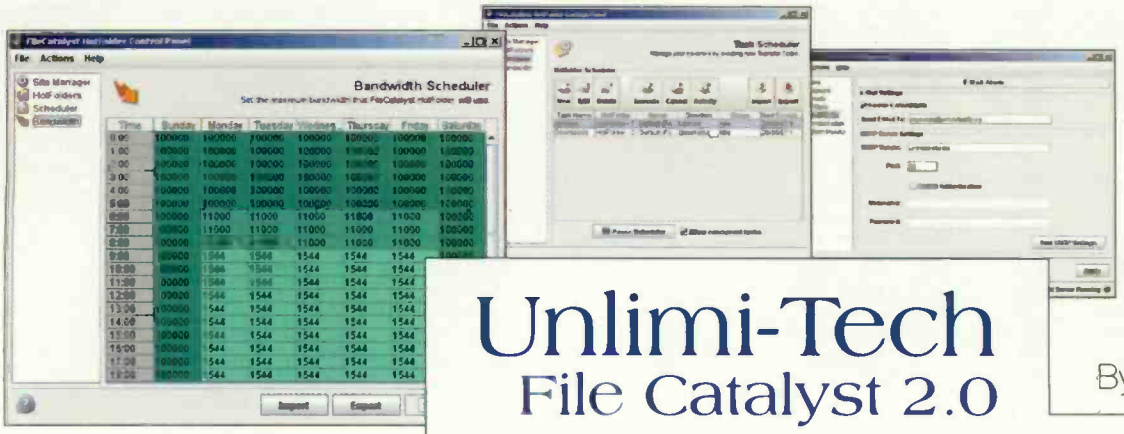

Unlimi-Tech File Catalyst 2.0

By Chris Wygal

Not so long ago, long-form programming arrived at radio stations on reel-to-reel tapes, cassettes and more recently CDs. It also came down via satellite, and could be aired live or taped for later use. But the Internet has now made other avenues available.

Many programming and production folks spend a good deal of their day watching computers download large audio files. While FTP technology and associated PC- or MAC-based clients are seemingly quick, Unlimi-Tech has created File Catalyst 2.0 to streamline and speed up large file transfer over Wide Area Networks (WAN), offering a more efficient platform than current TCP/FTP based protocols.

What is it?

File Catalyst 2.0 is a software-based application made up of two basic parts: Client and Server. File Catalyst Server is the central location for data to be transferred to and from, and is supported on Windows, Linux, Solaris and OS X. File Catalyst Client is a suite of client-side applications adaptable and scalable from a handful to millions of clients. Imagine a radio programming provider or production house with several hundred FM or AM outlets scattered across North America. File Catalyst 2.0 Server would give each station access to .WAV or .MP2 and .MP3 files for download.

File Catalyst Client only requires Windows 95 or higher, Pentium 2 or higher, a Web connection with Java 1.4 and minimum 128MB RAM. A Pentium 4 processor with 512MB RAM is recommended for File Catalyst Server, but Pentium 3 with 256MB RAM is sufficient.

Performance at a glance

- Accelerates file transfers
- Immune to latency and packet loss
- UDP data transport
- Push or pull files or directories
- Adaptive transfer rate control

What does it do?

Wide Area Networks suffer from latency due to lost data packets during transfer and under-utilization of available bandwidth. File Catalyst employs the UDP protocol for the transport of data using re-transmission and congestion control mechanism. File Catalyst provides a secondary, more firewall-friendly transfer method that enhances the performance of TCP/IP by opening up multiple streams of TCP data. Acknowledging very large portions of data and re-transmitting only lost data packets achieve acceleration.

File Catalyst also minimizes the data being sent by compressing it, and transferring only the portions modified since the last transfer. If your software automatically updates available files or directories from the server, File Catalyst will only begin to download portions of data that have been changed, instead of re-writing existing material to your local drive (saving tons of time). File Catalyst also reduces bandwidth usage, thus maximizing throughput on the network.

The File Catalyst Client Suite

File Catalyst Client is made up a several tools for client-side applications. It combines the acceleration and optimization of the File Catalyst core technology, with automation, monitoring and guaranteed delivery features. Hot Folder allows dragging and dropping or saving a file into a folder incorporated directly into existing workflow processes. Hot Folder also allow users to add File Catalyst to existing store-and-forward systems, content distribution systems and media workflow and asset management solutions. Hot Folder includes support for File Catalyst or regular FTP as a transport protocol. The auto-detection feature allows the most optimum of the two protocols to be used for the file transfer. Hot Folder also supports incremental file transfers so only changed directory files and folders are transferred. Hot Folder can budget network traffic and appropriately allocate available bandwidth, plus it can automate tasks for nightly downloads, thus avoiding heavy network usage in large file transfers during busy office hours.

File Catalyst Web is a part of the Client suite, and allows users to send files to a recipient's e-mail address without using the local e-mail server. Large attachments are sent as downloadable links in an e-mail, which eliminates the possibility of bounced e-mails (the result of e-mail size restrictions). This guarantees that files always get to the recipient.

The File Catalyst applet can be embedded into existing Web-based applications to provide access to File Catalyst technology from a Web browser. No installation is required on the client end. The File Catalyst applet provides all the required hooks to integrate with any Web application, regardless of the server-side technology. The File Catalyst applet can be pre-configured to automatically connect to a specific server and perform certain tasks.

File Catalyst acceleration and bandwidth optimization is possible through File Catalyst Command Line. Command Line is an interface that allows the user to drag and drop the file into a temporary folder, and then transfer it using third-party client software. File Catalyst Command Line works well with script-driven applications. Similar to Command Line, the File Catalyst SDK allows users to fully integrate the core File Catalyst technology and acceleration into their existing applications using a Java API, and a SOAP/Web Services API as avenues for integration.

File Catalyst

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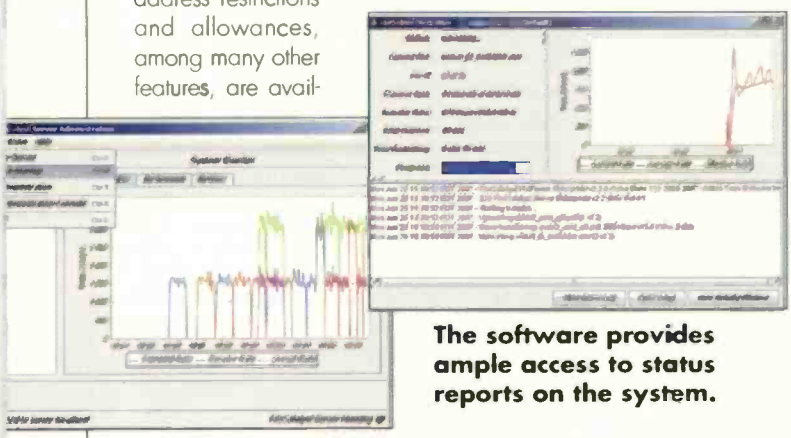
How does File Catalyst Server work?

File Catalyst Server allows the administrator to manage client accounts and access to files and other data. SSL and AES security measures are in place, and the administrator can create his own security certificate through the certificate wizard. Port settings, memory management, IP address restrictions and allowances, among many other features, are available with File Catalyst Server. File Catalyst Server supports the accelerated File CatalystP, in addition to third party FTP protocols.



The software provides ample access to status reports on the system.

Seeing as how every aspect of our technology hinges more and more on Internet connectivity, large file transfer has become a very popular and efficient means by which we move important information and files from one place to another. As efficient as the Internet seems (which of course is arguable to some), data loss and wasted bandwidth are commonplace. With software-based solutions such as File Catalyst, which are easily integrated into an existing infrastructure, minimizing time spent on data retrieval is a quick download and click away.

Wygal is the programmer, engineer and Web designer for WRVL in Lynchburg, VA.

Omega Engineering
PX319 and PX219

By Dennis L. Sloatman

It is my belief that the traditional broadcast view of remote control and telemetry of a broadcast transmitter site provides the engineer with an incomplete picture of the state of the building environment and the systems within. I'm certain you have on more than one occasion received a call from your remote control unit due to an alarm condition and after interrogating the system and clearing the alarm were left with some doubt as to what is going on at the site. Of course, the only way to answer that little nagging voice is to get in the car and head for the tower. But if we engineer our facility correctly, and funds are made available and carefully spent, we can perhaps make that inspection trip at more suitable times than dinner or the middle of a movie.

NASA model

When I set out to design a complete remote control system, I try my best to apply what I call the NASA model. When NASA launches a multimillion-dollar spacecraft to Pluto, that spacecraft is not returning. If a technical issue develops, NASA or JPL cannot send a repair tech to swap a board, reset a breaker or an over-voltage alarm. Further, anything that can be measured within that spacecraft is included in the design so the engineers here on the third rock can work the problem with a more or less complete understanding of the status of the equipment. In this manner, engineers may perform workarounds and bypasses to keep the spacecraft running and preserve the value of the mission. I view our precious transmitter sites in much the same way. Some of our sites are so remote or so challenging to access that they might as well be on a trajectory to Pluto.

I have seen time and time again that a given transmitter site was wired with the barest minimum of status, metering and control. Often I see little if any status brought out, no means of monitoring critical environmental parameters, no means of monitoring line voltage, generator condition, or transmission line pressure, nor whether or not the nitrogen tank is full or nearly empty. Many engineers connect a room or stack temperature sensor, but nothing with regard to the state of the HVAC units, smoke detectors or building intrusion. A very good share of the devices on the market provide dry closures or analog outputs that will provide insight into their current operation. Being technical geeks, we are able to devise our own means of monitoring equipment status using readily available parts from component vendors. The work up front will pay long-term dividends.

A key element

One of the key elements of remote site management is transmission line pressurization systems monitoring. One of my personal favorite vendors is Omega Engineering. This company is a peerless engineering toy store with products for measuring pressure, flow, temperature, humidity, levels, stress and strain, PH, etc. This company caters to industrial environments.

In the final analysis, our transmitter sites or remote studios are much the same in the sense of the need for access, reliable telemetry and control. I can easily visualize the broadcast application of many of their products, such as monitoring transmission line pressure, remaining pressure in the nitrogen tank, monitoring the temperature of key components in an antenna combiner system (transmission line sections, filters, couplers, etc.), three-phase voltage and current monitoring, and precise industrial-grade control of many of our critical systems.

One intriguing application includes employing one of Omega's electrically controlled proportional control valves to remotely adjust transmission line pressure, and monitor the result with the devices I'll look at further in this article. One point: inasmuch as the devices sold by Omega are of industrial-grade, they are by design, manufactured to operate reliably in areas of high EMI such as that found in our transmitter facilities. You will see by perusing the catalog that most of its devices are designed to work with the industrial 20ma standard, and being of a current loop design, resiliency to EMI is inherent.

Performance at a glance

- Various pressure ranges
- ¼" NPT fittings
- Measure absolute or gauge pressure
- Stainless steel body and fitting
- Wide range of output voltages
- Temperature compensated
- Accuracy to 0.25 percent of full scale

FIELD REPORT

Pressure transducers

There have been a few pressure-transducer units manufactured for broadcasters to monitor transmission line pressure. In my view, these units were/are of poor quality and may be easily damaged in the installation process. They leaked in some cases out of the box, which defeats the whole purpose. Omega makes a complete line of high-grade precision pressure transducers to permit remote telemetry of gases with various options. These options include

Omega Engineering

P 888-TC-Omega

W www.omega.com

E literature@omega.com

transducers with milli-volt outputs, 0-5Vdc outputs, 0-10Vdc outputs, 20ma current loop interface, and the choice of absolute pressure or gauge pressure with various ranges of pressure. Other options include the type of signal interface connector: mini DIN, pigtail or twist-lock.

Various connectors are available on the transducers, including a twist-lock, cable connection and a mini-DIN.

I chose two models for use with our remote control system: the PX219-015G5V transducer for 0 to 15psi, gauge pressure, 5Vdc output with a 1/4" NPT connector for monitoring transmission line pressure; and the PX319-3KG5V transducer for 0 to 3,000 psi, 5Vdc output, and gage pressure with 1/4" NPT fitting to monitor our nitrogen tanks. With the application of these two devices, I now have a complete picture of the condition of my pressurization systems and can set alarms with my remote control for low line pressure and low tank pressure (the latter lets me know if it's time to call the nitrogen guy). Thus far, these transducers have been performing flawlessly. In keeping with the NASA model, I now feel I'm a step closer to having that complete picture of the conditions at my sites.

Incidentally, I should mention Omega also sells a product that can be used to monitor pressure and temperature with a built-in Web interface and logging capability, the IPTX-D. I will be testing this device soon.

Sloatman is the chief engineer for the Cox stations in Orlando, FL.

Editor's note: Field Reports are an exclusive *Radio* magazine feature for radio broadcasters. Each report is prepared by well-qualified staff at a radio station, production facility or consulting company.

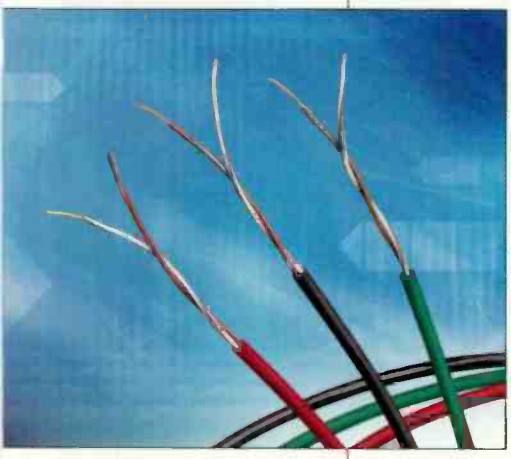
These reports are performed by the industry, for the industry. Manufacturer support is limited to providing loan equipment and to aiding the author if requested.

It is the responsibility of *Radio* magazine to publish the results of any device tested, positive or negative. No report should be considered an endorsement or disapproval by *Radio* magazine.

NEW PRODUCTS FROM THE NAB RADIO SHOW & AUDIO ES

by Erin Shipps, associate editor

Digital audio cable
Belden



Brilliance AES/EBU: This single-pair cable is ideal for use in permanent installations of balanced-line analog or digital audio. In the presence of unbalanced signals, the addition of a balun will enable the cable to support many coax-based signal types, such as analog audio, S/PDIF digital audio and professional AES3-ID digital audio, as well as surveillance cameras.

800-BELDEN1
www.belden.com
info@belden.com

Compact flash card
HHB

CFPRO: This high-speed Compact Flash media is optimized for critical audio applications. Extensively tested with a range of popular audio and video devices and supplied with a five-year warranty, the new 80x rated 1, 2 and 8GB Compact Flash cards feature fast ATA host-to-buffer transfer rates supporting PIO 4 in true IDE mode, and a highly sophisticated error correction code and wear-leveling algorithm to provide superior levels of performance and dependability.

860-434-9190; www.hhbusa.com
sales@hhbusa.com

Liquid-cooled transmitter
Ecreso

2x5kw: The 2x5kW dual-drive, liquid-cooled wide band, frequency agile, FM transmitters have a single 42RU cabinet. Each 5kW transmitter is cooled by water plates built with military-grade components. A Central Unit (CU) that enables quick and user-friendly access (color graphical 1/4 VGA display, bright keyboard and various menus) drives each individual unit to the modules of the system.

305-249 3110
www.ecreso.com; infos@ecreso.com

Announcer's console
Studio Technologies

Model 233: The Model 233 is the sixth addition to Studio Technologies' Model 200-series of announcer's consoles. This unit, incorporating several user-requested features, supports specialized applications including stadium announcement and live-event production. Features include an integrated side tone section, two line-level audio talkback outputs, two line-level audio inputs, sophisticated dual-channel intercom interface, and a tally output.

847-676-9177; www.studio-tech.com
stisales@studio-tech.com

Headphone amplifier
DACS

Headlite 2: The Headlite 2 features a four-input, four-output amp with input selection for each amplifier. This upgraded version features new ICs that significantly improve overall performance, particularly into low impedance headphones. It also features conductive plastic pots, an upgraded selector switch and a balanced input option.

207-773-2424; www.independentaudio.com
info@independentaudio.com

NEW PRODUCTS

Locking IEC power cord
Canford Audio

IEC-Lock: These leads use patented female connectors with an internal locking mechanism that locks an IEC power cord in place to provide a simple way of securing a power cable to any electrical equipment fitted with a standard IEC connector. They are ideal for for use with critical equipment and in areas subject to vibration such as remote vehicles, touring and fly-away equipment where standard connectors may become dislodged in transit. The internal locking mechanism grips the equipment ac ground pin preventing accidental removal of the plug. An external sliding button releases the latch.

+44 1914 181 000; sales@canford.co.uk

Nearfield monitor
ATC

SCM16A: The compact SCM16A active loudspeaker is designed for small to medium-sized studios or in remote locations. ATC's Constrained Layer Damping (CLD) uses two lightweight driver cones to sandwich a constrained damping layer. CLD is different than conventional damping because of the way it shears adjacent cone sections when the cone flexes. The shearing causes unwanted vibration energy to dissipate as frictional heat, instead of as acoustic distortion. The design reduces harmonic distortion between 300Hz and 3kHz, creates an extended resonance-free axial frequency response and improves the off-axis frequency response. In addition to the 150mm CLD mid/bass driver, the SCM16A features a neodymium 25mm soft dome tweeter. The SCM16A's upgraded on-board amplifier pack provides 200 watts to the mid/bass driver and 50 watts to the HF driver. Operating in Class A up to two-thirds of output, this ultra-low distortion design is capable of continuous sound pressure levels up to 108dB.

702-307-2700; www.lasvegasproaudio.com/atcstmo.html
sales@lasvegasproaudio.com

Digital delivery system
Wegener Communications

Ipump 6420: Wegener's Ipump 6420 digital satellite receiver, IP router and media server is specifically designed for regionalizing affiliate radio broadcasts – combining the efficiencies of large network operations with the customized listening experiences offered at the local level. Its next generation architecture integrates file-based program distribution with live programming, blending audio outputs through the use of audio fades, mixes and pre-positioned station liners. Customized playlists, network control commands and audio programs transmitted over satellite to targeted Ipump media servers can be stored to internal hard-drives or output for live broadcast.

800-848-9467; www.wegener.com

DAW
Steinberg

Nuendo 4: Preview mode, Fill commands, Punch Logs, Virgin Territories and the new Touch Collect Assistant are only some of the new functions that unite the best functionality found on traditional hardware mixing consoles with the flexibility inherent in Nuendo 4. The new Mediabay file management system for audio, video and other media files can replace many external FX database solutions. Mediabay browses, archives, retrieves and searches media files across any connected drive. Utilizing intelligent database technology, user-definable tags and other features Mediabay allows instant pulling up and filtering of search results, smart file management and much more.

818-998-4033; www.steinberg.net; info@steinberg.net

Analog modulation monitor
Day Sequerra

M2A: The M2A is an analog modulation monitor that can be upgraded to a full HD Radio modulation monitor. The unit includes adjustable channel spacing, de-emphasis and operating voltage selection for worldwide operation. The M2A provides full off-air and direct monitoring capabilities for analog FM, including demodulated audio level, carrier modulation level, pilot and SCA injection level, incidental AM noise and RBDS decoding and display. The unit includes programmable opto-isolated alarms for audio peak, audio program, carrier loss and RBDS data loss. Options include an off-air AM measurement package with C-Quam AM stereo and Ethernet remote control with Day Sequerra's Remote Dashboard(tm), a proprietary PC-based application that includes monitoring, logging, alarms via e-mail and scanning of up to 100 preset stations.

856-719-9900; www.daysequerra.com
info@daysequerra.com

Analog-to-digital converter
Genelec

AD9200A: The AD9200A features eight-channel balanced analog input delivered via a 25-pin DB25 connector wired to the Tascam/ProTools pin-out. Digital output consists of four XLR connections, each carrying two channels of AES3 audio. The AD9200A converter outputs AES3 format with 24-bit word length and 192kHz sample rate, providing the same consistent quality found on Genelec's 8200 Series DSP products.

508-652-0900; www.genelecusa.com
genelec.usa@genelec.com

Main monitor
Adam Professional Audio

S7A MK2: The S7A MK2 is an active, four-way design that combines paper woofers and Hexacone midwoofers with Adam's X-A.R.T. folded ribbon midrange drivers and tweeters in a full range system for larger control rooms. The S7A MK2 is a unique combination of Adam's proprietary transducer technology, modern PWM amplifier design, a sophisticated control panel and a d'Appolito speaker alignment that result in a no compromise unit for the most demanding critical monitoring environments.

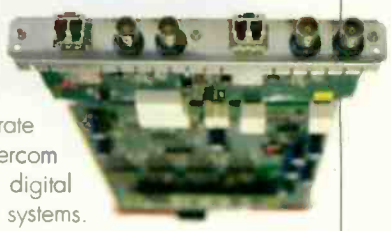
818-991-3800; www.adam-audio.com; usa@adam-audio.com

Double-shielded single-pair analog cable
Gepco International

XB401FB: The XB401FB is a double-shielded version of Gepco's original XB401 single-pair audio cable. Featuring a low-capacitance and low-noise design, it is the ideal single-pair cable for permanent installation in critical audio applications. The XB401FB conductors are made from finely stranded 24AWG oxygen-free copper to allow for maximum conductivity and corrosion resistance. For exceptional RF/EMI noise rejection, the XB401FB features two shields – a 95 percent TC braid and a 100 percent foil shield – as well as precision, high-twist conductor pairing. Each conductor is insulated with a data-grade foam dielectric for low capacitance and easy termination. The outer jacket is constructed from Gepco's G-Flex compound which is extra-flexible and easy to strip.

800-966-0069; www.gepco.com; gepco@gepco.com

Communications interface
Riedel Communications



MADI: The new card provides a MADI interface to integrate the Artist intercom platform with digital audio router systems. All Artist intercom control panels are connected to the matrix via standard AES3 signals. So instead of laying additional cables, it is now possible to connect intercom panels to the audio router using the router's infrastructure for panel distribution. The MADI card also furnishes a convenient solution for connecting multichannel audio between the audio router and the intercom system.

818-563-4100; www.riedel.net
info@riedel-intercom.de

Storage server
Globalstor

Extremestor-Capella: This 4GB Fibre Channel Host data storage program is designed to support the uncompressed audio sessions for direct attached and SAN implementations. Scaling anywhere between 16TB and 80TB on a single system that requires minimal rack space Extremestor-Capella offers on-line capacity expansion at SAS and SATA II disk levels. Its enterprise dual disk architecture simplifies management and growth for a full range of mid to complex applications.

818-701-7771; www.globalstor.com

FM bandpass filters
Jampro Antennas

RCBC: The Jampro RCBC-FM RF System series of combiner bandpass filters utilize capacitive-loaded copper center conductors inside 4" aluminum cavities to ensure low passband loss. The filters are designed to provide optimum performance for low (1kW) to medium/high (up to 35kW) power transmitter systems in a modular configuration. Filters with two, three, four or five sections are designed, assembled, tested and shipped from stock to meet the required rejection specifications. Wide passband bandwidth is maintained for all designed to ensure no signal degradation. EIA connectors are standard and unflanged available upon request.

916-383-1177; www.jampro.com; jampro@jampro.com

Condenser mic
Blue Microphones

Joe: The newest addition to Blue's microphone line, Joe is a cardioid, large-diaphragm condenser mic. Joe is designed to capture a wide variety of sound sources, such as vocals, acoustic instruments, drums and more. The microphone cable plugs into the mic clip, leaving the capsule housing floating in balance to accommodate a wider range of positioning options.

818-879-5200; www.bluemic.com

Twin receiver
Sennheiser Electronic

EM 3732: The EM 3732 offers automatic scanning functionality, choice of five frequency ranges, transmitter synchronization via infrared interface, flexible analogue and digital connection options and exemplary audio quality. The receiver features six user-selectable fixed frequency banks and one user bank with up to 60 channels that can be programmed in increments of 5kHz. The EM 3732 automatically searches for free frequencies within a frequency bank. An integrated antenna splitter allows up to eight EM 3732 twin receivers to be daisy-chained.

860-434-9190; www.sennheiserusa.com; lit@sennheiserusa.com

Realtime noise reduction
Izotope

ANR-B: The ANR-B uses noise reduction technology to identify and suppress environmental broadband noise, hum, phone line artifacts and more, increasing the quality of audio broadcasts involving radio call-in programs and on-location broadcasting. The ANR-B adapts to changing noise over time, allowing for automatic operation. The two channel ANR-B features broadcast connections including analog and digital I/O, LAN for advanced parameter control, and MIDI for remote automation.

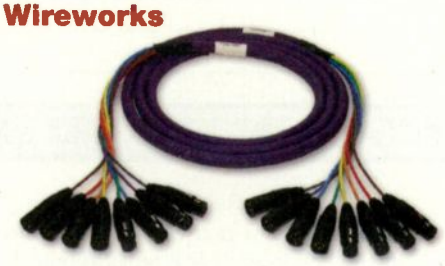
www.izotope.com; izotope@izotope.com

Stereo reverb/effects processor
Lexicon

PCM96: Featuring a wide array of algorithms with related delays and effects, the 1RU PCM96 integrates as a control-only DAW insert or Firewire streaming hardware plug-in. The PCM96 offers a selection of Lexicon reverbs and effects plus new Room and Hall algorithms and an assortment of new mono reverbs and effects. Selectable, reversible reflection patterns, multimode filters, and infinity switches provide additional new capabilities. It includes two channels XLR analog and two channels XLR AES3 digital I/O, as well as MIDI, Wordclock, Ethernet and Firewire connectivity.

781-280-0300; www.lexiconpro.com

Audio cables
Wireworks



AESX Series: These interconnect cable assemblies are manufactured with Neutrik XX Series XLR connectors. The series includes single- and eight-pair 110ohm AES3 digital cable assemblies. The single-pair cords provide two digital signal paths and are available in 10 to 100ft lengths, while the eight-pair multicables allow for 16 digital signal paths configured with XLR fanouts on each end. Two application-specific models are available: studio select featuring 26 gauge conductors for added flexibility in 10 to 50ft lengths and road-tough assemblies featuring extra low loss 24 gauge conductors and super durable cable jacket in lengths from 10 to 250ft.

800-642-9473; www.wireworks.com
info@wireworks.com

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Streaming audio program
OK Radio Group

Stream on Fiber: Using the Ogg Vorbis encoder, Stream on Fiber saves a station time and money while generating more revenue and listenership through Web streaming. Stream on Fiber is simple to use: Attach audio into the encoding appliance. It features an independent audio player, no maintenance is required and there are no encoder licensing costs.

780-423-2005
www.streamonfiber.com
services@streamonfiber.com

NEW PRODUCTS

Fiber optic connector system

Neutrik

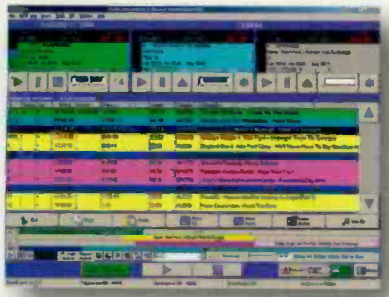
IP65 Rated Opticalcon: This solid, ruggedized and protected fiber optic connector system has been upgraded for dust tight and water jet protection. To achieve a water-resistant IP65 connection, additional seals and gaskets have been employed on the chassis connector and cable ends. This new system is based on a standard optical LC-Duplex connection; however, the Opticalcon improves this original design to ensure a safe and rugged connection. It enables up to four copper wires to run power or data signals through. A special SMPTE-version has been optimized for broadcast applications, which provides an additional ground-shell contact.

732-901-9488; www.neutrik.com
info@neutrikusa.com

Broadcast Software

1-888-274-2721
www.bsiusa.com

Radio Automation

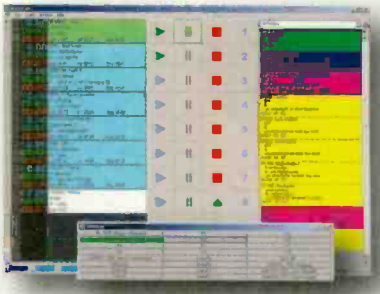


Simian - radio automation and digital play out system

Instant Audio

Stinger- instant acess to 288 'rapid fi-e' audio files

Digital Cart Player



WaveCart - the original on-screen cart machine

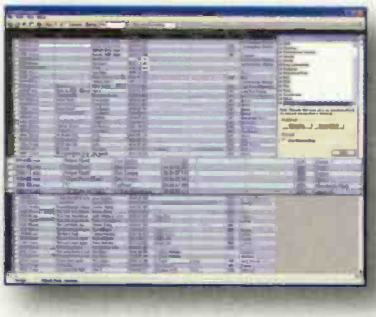
Audio Logging

SkimmerPlus - professional audio logging and skimming

Full PC Systems

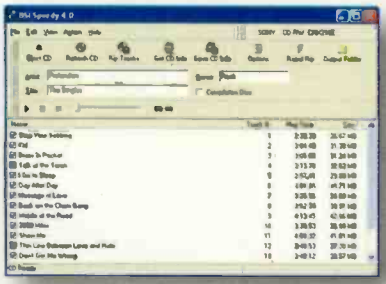
Complete PC systems - with hardware and music

Music Library



MusicStore - over 55,000 ready to play (tagged) songs

CD Ripping



Speedy- professional CD to PC ripping and file tagging

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Trigger & Relay Devices - for GPI/O & remote control

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BSI

The high cost of HD Radio receivers

It is amazing that in the article on why HD Radio adoption lags (Digital Radio Update newsletter, Aug. 22) you ignore completely what is probably the most important reason, namely the outrageously high cost of HD Radio receivers. One can buy a cheap portable AM/FM radio for $10. One can buy a pretty darned good tabletop AM/FM radio for $50. One can buy a very good Sony tabletop AM/FM radio and CD player combination for $100. Until very recently plain old HD Radio receivers have been typically $300 and up. Some of them are starting to be discounted down to $200 or so, but that is still a lot of money for something that is only a radio. For the same price one can get a combination AM/FM radio and stacking CD/DVD player, with 5.1 audio, including detachable speakers.

I have wanted an HD Radio receiver for some time, but only recently bought one when I found a Radiosophy unit I could get for $75 including shipping. (It was priced at $100 plus $15 shipping, with a $40 rebate from Ibiquity.) However, in every category except sound quality, the Radiosophy sucks compared to a $50 AM/FM tabletop radio. It is a clock radio, but the display is so small and dim that you can't read the clock from farther than about three feet away. The user controls are very difficult to understand. The user guide is worthless. Even after one figures out the user controls, they are extremely awkward. The external appearance is hokey. I'm glad I have it, because I live halfway between New York City and Philadelphia, and it picks up stations from both cities with crystal clear quality, but I can't say it was a great bargain.

When the price of HD Radio receivers comes down to where one does not have to pay a huge premium for them, the market will almost certainly take off. Of course, this may not happen for 17 years, when Ibiquity's patent expires.

Gomer Thomas
Piscataway, NJ 08854

Thanks for the microphone

Just a quick note here to say "Thank You!" to *Radio* magazine and Transaudio for the Heil PR-20 microphone. It will be put to good use, as I routinely record live jazz concerts here in Nashville for broadcast on our local jazz station. It will be good to have another option for live vocals. I can't wait to try it.

Tom Knox
Nashville Public Radio

Find the hidden mic icon on each month's issue of Radio magazine and you could win a Heil mic, too. See page 6 for more information.

The write stuff

Bravo to Kapur and Ringer for their words in the September issue Field Report on Netia Radio-Assist! It pleased me to no end to see the comment, "In late 2006, after extensive user interviews, we identified 108 requirements ..."

That is exactly how technology decisions should be made – by beginning with the end user and finding solutions that address their needs. Too often hardware or software is picked by a tech person, and users wind up spending the next six months trying figure out how to squeeze their work into a system that doesn't really fit.

Barry Rueger
Hamilton, ON

Vampires and the RIAA

Ever notice how vampires operate? They suck your blood all the while making you think they are doing you the favor. It really does appear that the RIAA and its net representative, Sound Exchange, operate under the same principle.

The RIAA has the Copyright Royalty Board under its thumb and appears to dictate Web policy to that board, the RIAA tells webcasters what they will pay or else they go to jail or get sued. This seems to be coercion to me. So, in effect, the RIAA sets royalty payments unilaterally, sucks the funds from the webcasters and makes them think that the RIAA did them the favor.

If the RIAA had its way, there'd be no webcasting at all. Each note of music would have to be bought from one of the RIAA's constituent members. No more free music of any kind, no more fair use would exist, nothing without payment. Pay through the nose, then give up your nose.

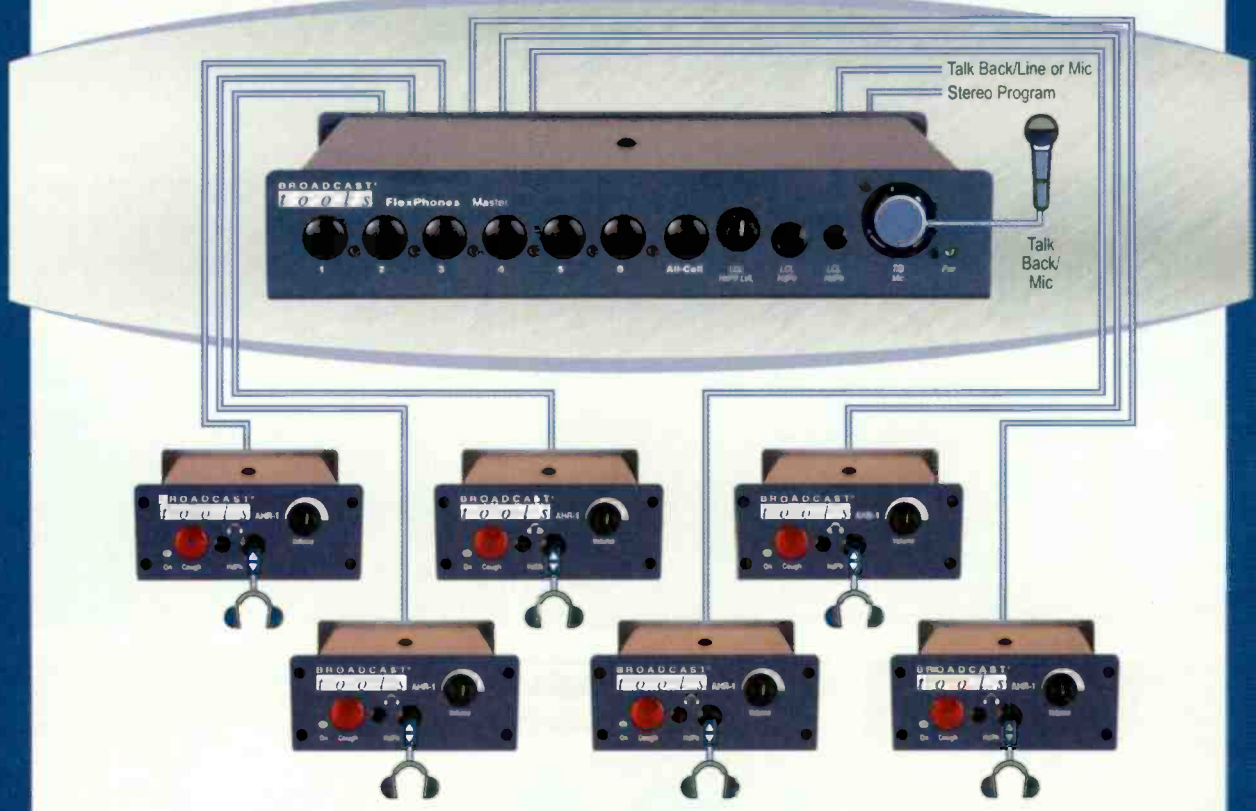
One thing that webcasters forget as victims of this policy is that they could put a stop to it fast. Just stop webcasting music. When the public starts complaining to Congress to do something about it, perhaps the RIAA can be controlled by reason and not avarice. Victimizers often forget that if they destroy the victim, their victimization ceases and they have no source left from which to suck.

Unfortunately, the so-called musical performance artists contribute to this victimization by profiting from the RIAA's activities, whether vicariously or otherwise. You can't take your profits with a clear conscience when the agency collecting for you is known to be set on destroying the source of those profits. Musicians can create music without an audience, but do they really want that?

Brian Lee Corber
Panorama City, CA

Independent Talkback

A Headphone System with Selectable Talkback for Each User



FlexPhones Master

The FlexPhones Master is a professional Broadcast/Studio six channel distributed headphone system with independent talkback capabilities. Each of the six channels provides stereo program monitoring and selective talkback with interconnection via CAT5 cable to multiple Active Headphone Remotes (AHR-1) and/or Monitor Selector Interface (MSI). Multiple masters may be cascaded to form larger systems.

The FlexPhones Master is equipped with inputs for stereo program and talkback audio. Rear panel program and talkback trimmers are provided to pre-set maximum input levels. The microphone/line level talkback input is available via a rear panel plug-in euroblock connector, while the front panel XLR connector facilitates the use of a user-provided gooseneck microphone or headset. The front panel is equipped with a level control for local headphones with both 1/4" and 1/8" stereo headphone jacks. The six front panel talkback switches allow the user to independently communicate with each AHR-1 listener and can be configured to insert talkback audio into only the left or both ears and dim either or both program channels. Any combination of switches may be pressed, while the "All-Call" interrupts all listeners. The Talkback function can be remotely controlled. Six RJ45 jacks are provided to distribute audio and power via CAT5 cable to the AHR-1's, which conform to the Studio Hub format. Low-Z balanced audio distribution is used to preclude audio degradation with long cable runs.

AHR-1 Active Headphone Remote

The Active Headphone Remote (AHR-1) contains a stereo amplifier designed to work with any combination of high-efficiency headphones with impedances between 24 and 600 ohms. The AHR-1 is equipped with 1/8" and 1/4" headphone jacks, level control, user-configured utility momentary pushbutton and LED indicator. Two rear panel RJ45 jacks are provided for connection via CAT5 cable to the FlexPhones Master. The AHR-1 may be desktop mounted, under counter or with the optional HR-1/MP or HR-1/MP-XLR mounting plates, which may be turret or counter-top mounted.

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Contributor Profile

Meet the professionals who write for *Radio* magazine.
This month:
Field Report, page 42.

Dennis Sloatman
Chief Engineer
Cox Radio Orlando

Sloatman is a broadcast veteran with 37 years of service including positions as corporate technical director for Metroplex, market director of engineering for AM/FM, and field service with Harris, Sloatman Associates Broadcast and IT Consulting. He is a graduate of the University of Central Florida College of Engineering, holds IT certifications including the Microsoft MCSE for Windows 2003, and a commercial pilot license with instrument rating.

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Written by radio professionals
Written for radio professionals

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ADVERTISER INDEX

This index is a service to readers. Every effort is made to ensure accuracy, but *Radio* magazine cannot assume responsibility for errors or omissions.

by Erin Shipps, associate editor

Do you remember?

In the March 1965 issue of *Broadcast Engineering*, RCA advertised a new look for its transmitters. Pictured here is the 20kW, RCA BTF 20E, but the 5 and 10kW versions had the same cabinet. The transmitters' new look came with new exciters and new circuits for "operating simplicity and full fidelity sound." The newly designed transmitters included eye-level monitoring, "space age" colors, a built-in remote control, solid-state power supply, fewer components and better accessibility. Field modification of 5 or 10kW to a higher power required only a change in basic power-determining parts.

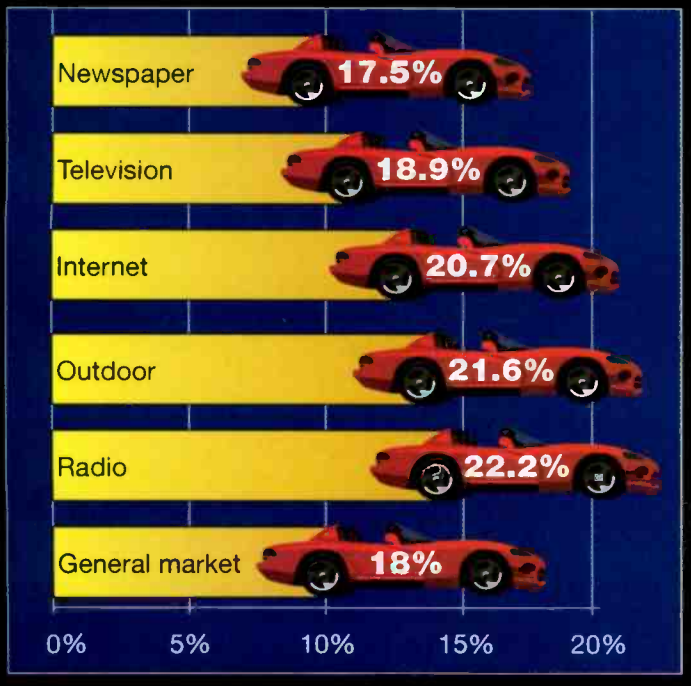
Do you still have one of these old transmitters in use? Take a photo and tell us about it at radio@RadioMagOnline.com.

Sample and Hold

The Influence of Radio

Of heavy users of various forms of media, radio listeners are more likely to purchase an automobile.

Adults planning to purchase a vehicle in the next 12 months



Heavy users defined: radio – listen three or more hours per day; outdoor – 200 or more miles per week; Internet – one hour per day; TV – five hours per day; newspaper – one hour per day

Source: Media Audit

That was then

During the atomic-fearing 1950s and 1960s, many buildings were equipped with bunkers. WBT-AM in Charlotte, NC, is one of those buildings. The aboveground transmitter facility dates back to the 1930s, but WBT's bomb shelter is frozen in the 1960s. It was built in 1963 and is still capable of transmission, with equipment including a Gates five-channel console, which replaced the original RCA, a tube-type Marti receiver, Magnacord tape machines and RCA 18" transcription turntables.

The station is also stocked with survival crackers, proudly stamped April 1963, and a 7-gallon water barrel, both unopened. There are also giant air filters, a wool blanket, a sanitation kit and a quart of old iodine. The studio was tested on-air in the Sixties, but was never actually used. Today it stands as an untouched symbol of the past, and the fear the entire nation once felt.

More photos of the WBT facility can be found online at RadioMagOnline.com.

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