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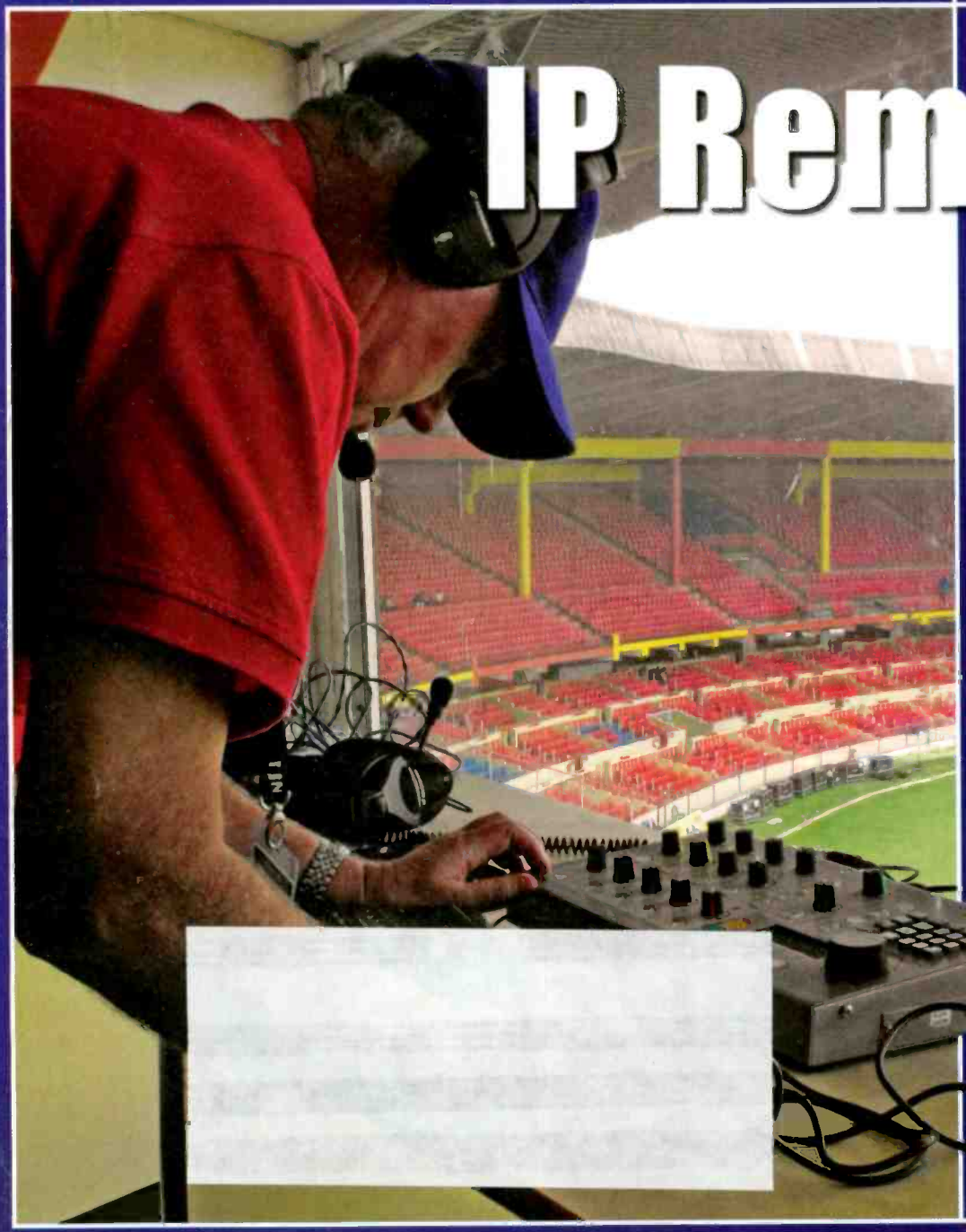

IP Remotes

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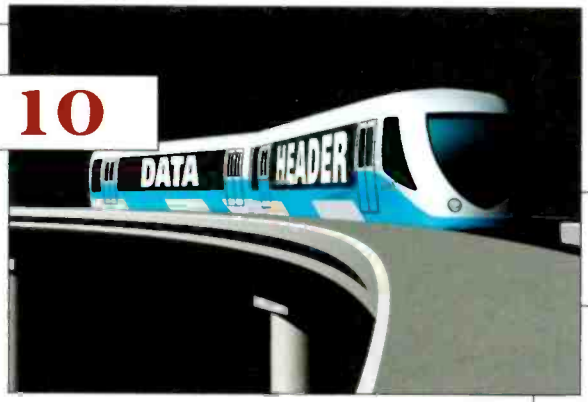
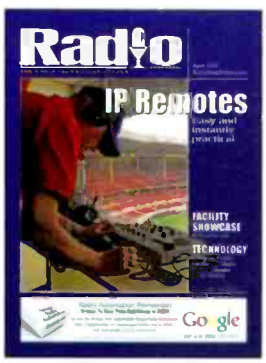


ON THE COVER

We've come a long way, Baby! The Internet is revolutionizing remote broadcasting, but not without its own ups and downs. Take a look on page 14. Cover design by Michael J. Knust.



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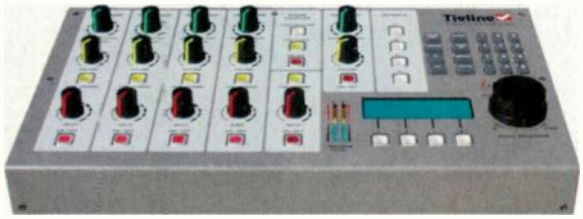

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Currents Online

Selected headlines from the past month.

Audemat Group acquires APT Broadcast Codec Division

APT Licensing will continue on its own, developing and licensing Aptx algorithms.
Also listen to the podcast interview.

Broadcast Electronics Turns 50

The company was founded on June 18, 1959, when it introduced the Spotmaster, the first broadcast cart machine.

NAB Convention Tips from a Veteran

With 15 years of convention experience behind him, Kent Kramer shares some tips on making the most of the convention.

HD Radio Multicasts Reaches 1,000 Stations

WODS-FM HD2 in Boston, owned by CBS, is the 1,000th HD Radio multicast with the launch of Soft Hits - Love Songs

Cox Enterprises Looks to Acquire Remaining Public Stake in Cox Radio

Cox Enterprises' interest is in acquiring the shares of Cox Radio held by the minority shareholders and it has no interest in a disposition of its controlling interest in Cox Radio.

BIA: Radio Industry Revenues Expected To Remain Low in 2009

Small and mid-size markets are performing better.

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Download the weekly Radio Currents Podcast and stay on top of current radio events, or the monthly Radio Mag Online Podcast where you can hear more about APT selling its hardware manufacturing business to Audemat.

- *RadioMagOnline.com/podcast*

Industry Insight in Talkback

The blog from *Radio* magazine Editor Chriss Scherer is updated throughout the week. It's commentary and views on radio events and news.

- *blog.RadioMagOnline.com/talkback*

FASTtrack for Your Handheld

Make your way around the 2009 NAB Show fast with our exclusive FASTtrack, Exhibitor Directory and Broadcast Engineering Conference session guide. It's written to run on devices that can view HTML.

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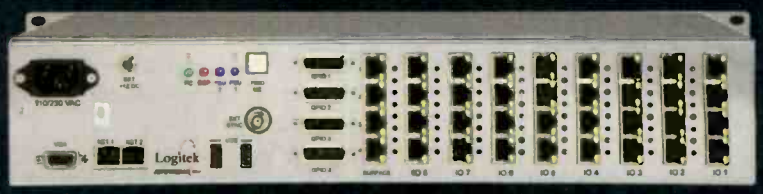

Call us at 800.231.5870 or check out JetStream IP Audio routing solutions at logitekaudio.com today!

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More connected than ever

I'm not a fan of most blogs. Notice I said most. Too often, when I find a blog, it's little more than some stream of consciousness blabber about nothing of any importance whatsoever. Consciousness doesn't really count in many cases. Perhaps synapse diarrhea is a better term.

This isn't to say that I don't read any blogs. I'm just choosey about what to read. I resisted starting a formal blog with *Radio* magazine for a while because I didn't want to add more chum. Besides, I write this column every month (as I have since 1997), which is something like a blog, although it is more than some off-the-top-of-my-head ramblings. When I prepare a Viewpoint column I consider topics, pick one to pursue and then gather the necessary information to make it informative, provide some insight and hopefully provide you with something to ponder on your own. (I hope I hit that more than I miss it.)

I have a formal blog now. I started it in January 2008. You can access it at blog.RadioMagOnline.com/talkback. I try to post to it at least twice each week, and I welcome your comments. A few of the posts stray just off the formal radio technology track, but not too far. Recently in Talkback I talked about my plans for the NAB Show, a recent visit to an electronics retailer on an HD Radio quest, and a brief report on a trip to Miami. I look at Talkback as an extension of Viewpoint. Viewpoint can dive into deeper topics. Talkback can cover shorter and spur-of-the-moment items.

Talkback is just one of the ways we tie to our focus for RadioMagOnline.com. Yes, it's a website, but it's also a community. Everything you see in print is also available online. There's much more online that you don't see in print, too. Some things are fun, such as the dates in radio history. Some are utilitarian, like the industry events calendar. Many are practical and informative, like the Engineer's Notebook and the Radio Currents news.

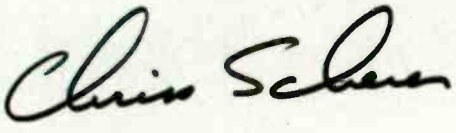
You can be a part of this community as well. We have added article commenting so you can share your views and insight on topics. Some recent items in Sign Off have sparked some interesting comments as readers recall their experiences with some of the vintage equipment we have featured.

The community experience extends to the *Radio* magazine Forum, which is ideal for discussions about all aspects of radio's technical side. It's a quality source of information without the clutter that bogs down some discussion lists.

We also make it easy to take *Radio* magazine with you. We have plenty of RSS feed options, and we're on Facebook and Twitter. It's easier than ever to stay connected to what's happening in radio broadcasting from *Radio* magazine.

And if you still prefer e-mail, we have the weekly Radio Currents, the twice-monthly Digital Radio Update and the twice-monthly New Products Extra newsletters. Around the NAB Show and the NAB Radio Show, we also have special weekly newsletters to help you prepare for those conventions, too.

I want you to be a part of our *Radio* community.



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IP audio:
The new audio format

By Kevin McNamara

By now, "IP audio" is a well-known term, widely written about and, I suspect, many have a pretty good understanding of how it works. The concept of having all the audio and control combined in a simple data packet is appealing on a number of levels, such as reduced studio and facility cabling, ease of originating programming outside the facility, fewer components required and also operating wirelessly over Wi-fi, broadband modem, etc. for quick deployment or permanent STL system. In addition, IP audio can also be sent to a single location or broadcast to many.

The ability to transport audio and video over Ethernet/Internet has been around for years, so how is IP audio different? The simple answer is that there are similarities in terms of how the data is transported, but that's where it stops. Let's start at the beginning with the evolution of IP audio.

Of course, no discussion "audio contribution over IP," would be complete without a quick review of the protocol that makes transmission possible (that would be the IP part). Internet Protocol consists of a specialized data packet. The data, to be transmitted to a specific destination, is encapsulated in the IP packet. The packet can be viewed as the train that carries a payload, in this case the encoded audio and control data. The engine of the train is called the header, which contains specific information such as: where the train is leaving from, where it is going, in what parts of the train the data is enclosed and how to handle that data once it arrives.

The IP packet alone doesn't have an enormous amount of intelligence; it is just a means to transport data. There are other protocols combined with IP to steer the packets to their intended destination, essentially the engineer of the train. The two common protocols used for this purpose are TCP (Transport Control Protocol) and UDP (Universal Datagram Protocol.) The major difference in these protocols is how they communicate back to the originating network interface. When an IP packet is sent under TCP, confirmation of proper delivery is sent to the sender. If a packet does not arrive, it asks the sender to resend until it has been completed; this is also known as a reliable or connection-oriented transport method. IP under UDP control simply broadcasts the data and assumes it has arrived properly. If a packet fails, it is necessary for the system on the receiving end to have the proper means to handle those errors; for this reason, UDP is called an unreliable or connectionless transport scheme.

A better IP audio method

For the transport of IP audio, one may first think that TCP transport would be the only sensible option, but in reality, what we really want is UDP. Why? Assume we are sending the streaming content (audio or video) over a busy network (Ethernet, Internet, etc.). Under TCP control, many of the packets will need to be resent; while this is going on, most of the other packets are making it through. What happens is that now the packets are showing up in a different order than they were originally sent. That will cause a multitude of problems including significant delays (or latency) between the source and destination codecs.

The fact is that UDP is the common control protocol used for streaming content, including IP audio. The algorithms in the codec handle any errors and provide the necessary means to make the streaming content meet the intended quality criteria.

Here is where it gets interesting. To overcome some of the challenges presented by sending data using UDP, manufacturers have proprietary protocols that permit a higher level of error control between their encoder and decoder. This may mean that units from different manufacturers might not work together.

That was until February 2008 when the European Broadcast Union (EBU) finalized a standard for IP audio. The solution was simple: Just add another protocol on top of the UDP protocol. Remember that all things in the data communications world utilize a

layered architecture. The Open System Interconnect (OSI) model is based on seven layers, although IP transmission only needs four. There has been much written on the subject, but the simple explanation is that encoded data flows through several different layers, each with a specific job. These layers take care of the creation, packaging, management and control of data. It handles everything including getting the signal through the cable. The process is reversed on the receiving end.

The EBU used a protocol called RTP (Real-time Transport Protocol), a protocol standard created in the late 1990s specifically for the purpose of sending audio, video and telephony over the Internet. It provides a complete set of tools for the transmission of a wide variety of multimedia formats and provides management functions that minimize some problems found with transmissions over UDP alone. The details of RTP are an article in itself, but basically the data from a codec is packaged in the RTP packet layer then sent to the UDP layer for transmission.

More options

Other protocols used for IP audio include:

- SIP (Session Initiation Protocol), which can control the setup, termination and flow of the session, similar to how a telephone network controls a call.
- SDP (Session Description Protocol) provides information about the specific audio format to the destination. This permits the codec on the receiving end to match that of the transmitted format.
- SNMP (Simple Network Management Protocol) provides control and monitoring of the equipment. While SNMP has been a time-tested protocol for this purpose, the EBU is currently working on an IP audio specific standard.

The EBU specifies four primary audio encoding formats: MPEG Layer 2, ITU G.711, ITU G.722, and PCM. However, RTP can also support a number of other current and future formats.

As manufacturers all move toward the IP audio environment and you only need to deal with power and data, I wonder if anyone will miss the days of punching down all those cables?

McNamara is president of Applied Wireless, Cape Coral, FL.

While IP audio systems are gaining acceptance, many have proprietary protocols that prevent interoperation at this time.

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Filing fee confusion

By Harry Martin

The FCC's new application fee schedule will go into effect on April 28. There is a long history of starts and stops behind this change.

In September the Commission issued an order increasing all application fees across the board. This was mandated by Congress and was not open to public comment. While the bump in fees amounted to a 4.9 percent increase, it was pegged as an effort to adjust for cost-of-living increases, and it did not attract much attention. That was especially so because the increases were not to take effect until 90 days after the FCC notified Congress of the changes. Then, on Jan. 29 a notice appeared in the Federal Register spelling out the new fees and indicating they were effective as of *that very day*, Jan. 29. But that date was suspended because the fee calculating function in CDBS was not reflecting the new fees.

The FCC's Office of Managing Director (OMD), which is generally responsible for fee collections, later advised that the 90th day after Congressional notification was really Dec. 30, so by the terms of the Commission's September 2008 order, the new fees were supposed to have taken effect then. But with the end-of-year holiday season, the change of administrations, or other unknown factors, the Dec. 30 date came and went. By the time the Commission got the notice into the Federal Register it was Jan. 29.

The notice as originally sent to the Federal Register specified the Dec. 30 effective date, but personnel at the Federal Register pointed they could not publish an announcement about fees that would have a retroactive effect. So it was decided the Federal Register notice should show Jan. 29 as the effective date.

However, the FCC was not able to implement the new fees in January, so despite the Federal Register notice the agency has continued to charge the old fees. But the latest announced implementation date, April 28, is firm. The new fee schedule can be accessed on the FCC's website and will be incorporated into CDBS as of April 28.

Dateline

June 1 is the deadline for submission of biennial ownership reports by radio stations in Arizona, DC, Idaho, Maryland, New Mexico, Nevada, Utah, Virginia, West Virginia and Wyoming.

June 1 is the deadline for radio stations in Arizona, Idaho, New Mexico, Nevada, Utah and Wyoming with more than 10 full-time employees to electronically file their Broadcast EEO Mid-Term Reports (Form 397) with the FCC.

June 1 is the deadline for radio stations licensed in the following states to place their annual EEO Reports in their public files: Arizona, DC, Idaho, Maryland, Michigan, New Mexico, Nevada, Ohio, Utah, Virginia, West Virginia and Wyoming.

Moment method computer modeling in effect

The changes in the AM technical rules to permit moment method computer modeling for some directional antenna proofs have finally taken full effect. Those rules, adopted in September, were held up because the Commission had to revise some of its application forms to accommodate the changes, and those revisions in turn had to be reviewed and approved by the Office of Management and Budget. In early February that process was completed, so AM licensees (and their consulting engineers) can now take advantage of the less onerous method of proving in a DA pattern.

Unauthorized broadcast or recording of telephone calls

FCC fines are levied regularly for telephone calls broadcast or recorded without prior consent. In a recently-reported case involving a West Virginia station, a fine was decreased to $3,200 from the $4,000 standard because the licensee was a first-time offender. The fine arose from a morning radio stunt called "Wake Your Lazy Carcass Up." As the name suggests, the radio station randomly selected victims from a phone book, called them very early in the morning putting their reactions on the air. Needless to say, for the full comedic effect, the station did not pre-call and pre-clear its victims. The obviously angered recipients filed complaints with the FCC and the FCC dutifully fined the station. In another case a Michigan station was fined $6,000 for *recording* a message for broadcast without permission even though the message was never put on the air.

Martin is a member of Fletcher, Heald & Hildreth, PLC, Arlington, Virginia. E-mail: martin@fhhlaw.com

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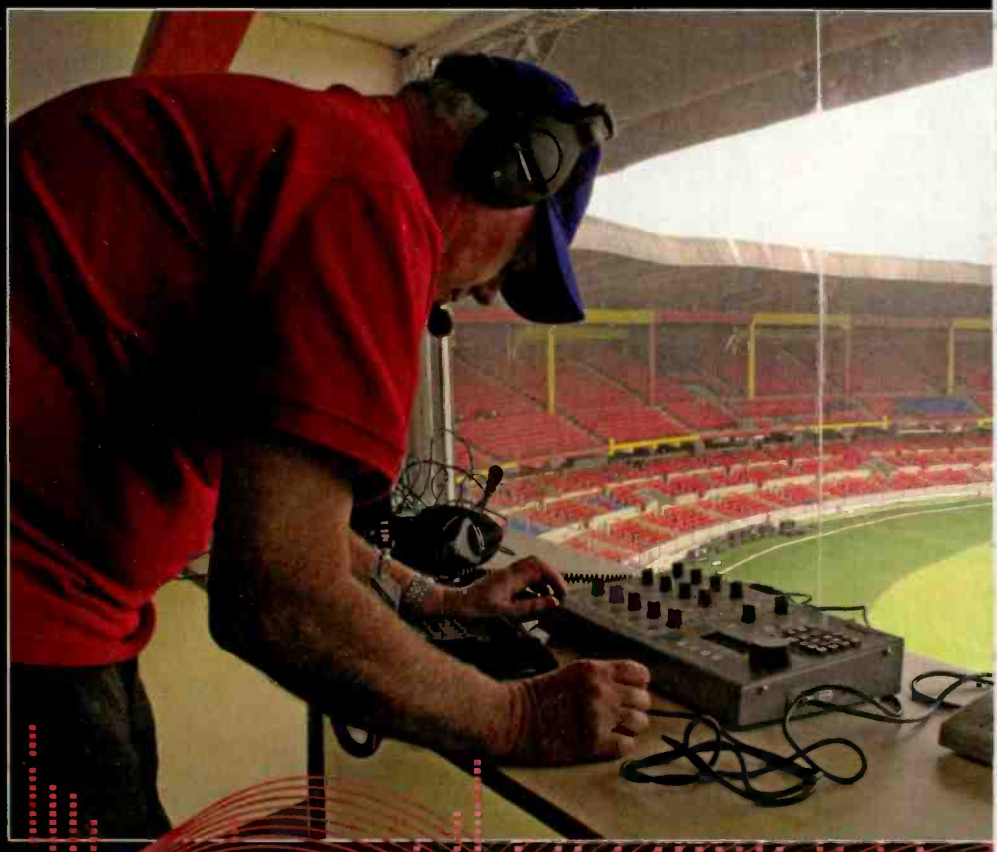

Photo courtesy of Tieline Technology

The way we carry out remote broadcasts hasn't really changed that much over the last 50 years – at least until recently. The introduction of ISDN codecs in the early 1990s was really the only substantial change during that time. If you wanted to do a remote, you either a) got a phone line, or b) used your own semi-private (RPU) radio channel. The equipment has modernized over the years; but the point is that the resource you used was not shared. The phone line was yours and yours alone; you didn't need to worry that there would be another remote going on over it when you went to use it. ISDN is pretty much the same: when you dialed-out on it, and connected, those two B channels are all yours.

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IP REMOTES

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Consider the nature of the Public Switched Telephone Network: For many years it was strictly done on a TDM basis. Your DS0 was all yours (at least till you hung up).

But time and technology have moved on. Ethernet became common around radio stations in the early 1990s, and the Internet really came into common use in radio around the mid 1990s. The idea that users would have their own, unshared data connections has become obsolete (even though it is still in common use). Phone lines and ISDN are still frequently used for the execution of remote broadcasts, but the shared-use nature of the Internet is finally making inroads in that particular aspect of broadcasting.

Along with the obvious advantages of using the now-ubiquitous Internet for remotes come certain issues (I hesitate to call them disadvantages) that need to be addressed.

Several methods of wireless remotes are available, such as a Comrex Access portable unit with Verizon EVDO card.

Internet access is everywhere

As I said, the Internet is ubiquitous; you find it in every office with a computer – and when was the last time you saw an office that didn't have a computer? But in places that we do remotes – whether it's a sports bar, a nightclub or the county fair, common access to the Internet is still fairly new. It's become so easy now. Broadband access is common; you can buy Ethernet switches all around town; and you can buy CAT-5 and an RJ-45 crimper at the local hardware store. This is the obvious advantage to using the public Internet. How many times (in the old days) did you wait to hear back from the telephone company to see if a line could be dropped in to the proposed remote location? Or, if you use RPU, how many times did you find the signal out of the remote site was OK but maybe slightly noisy?

But using the public Internet gets a little more difficult after you get past the fact that it's already there and in place for you. The shared nature of the Internet doesn't easily lend itself to the sort of continuous, high-rate data output that would be easily accommodated by ISDN or a telephone line. When a user receives documents on the Internet – such as a webpage, or a photo – errors in transmission are easily overcome and likely not even noticed. Lost packets, for example, can be retransmitted. Late packets just slow the download a little.

Another issue regarding the use of the public Internet is a little more subtle. As you sit in your office or workspace everyday and use the Internet, you are originating a connection from the private side of your network to the public side of your network via a router and firewall. When a website (for example) sends a message back to you, your router/firewall is expecting it, knows it's for you, and lets it through back to your host computer. But, if you try to originate a connection from outside of your firewall on the public Internet, with the idea that you will communicate with a host on the private side of your network, all bets are off. Unless the firewall is specifically configured to allow this to happen, it won't work. After all, that's the firewall's job – to prevent intrusion. As far as it is concerned, the attempt to communicate from outside the network is just that.

An APT Worldcast Eclipse built in to a remote kit.

Internet data transmission problems

So let's take a look into how these problems are addressed. First, it makes sense when contending with other users for bandwidth in a system that has a limited amount available that there is an advantage in minimizing one's own bandwidth requirements. For this reason, codecs that use the Internet for connectivity make use of many of the same audio compression schemes we've become familiar with, codecs that work over synchronous networks (like ISDN or TDM).

The packet-switched nature of the Internet (as opposed to the circuit-switched, TDM nature of the PSTN) complicates the situation considerably though. The data stream that represents the audio output of the encoder is made up of frames, which are strings of data that comprise the payload data bits, overhead data bits, and of course timing.

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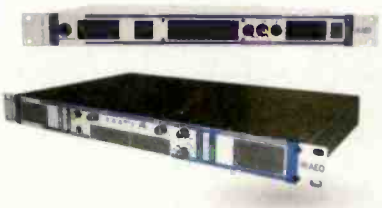

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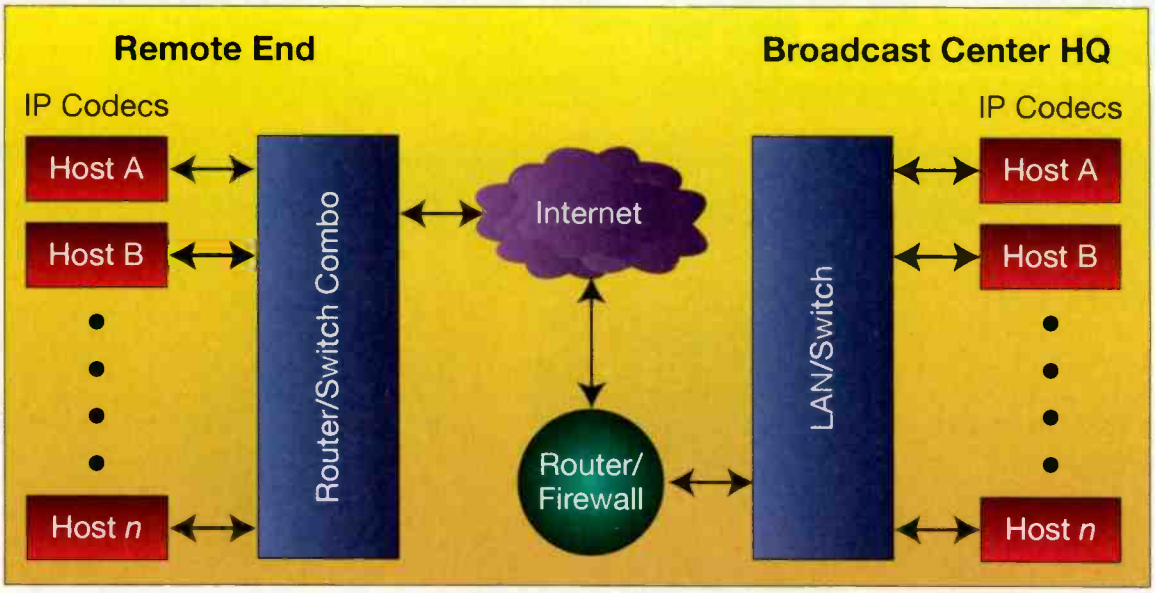

Figure 1: In a packet-switched model, connections to the Internet Service Provider are shared among all hosts, and all Internet traffic from hosts A through n are shared through the connection between the Internet and the router/firewall.

These frames are subsequently assembled into packets (or datagrams) and each packet has additional information (source and destination IP addresses for example) appended to it prior to its injection into the network. That packet overhead is the same on a per-packet basis; so one can see that by changing the packet size (by adding more frames) one affects that overall bandwidth needed to move the packets.

An unfortunate characteristic of the Internet is that sometimes these packets are lost along the way, for various reasons. Ideally the packet size should be large because the overall bandwidth requirement is reduced. However, if one of those large packets is lost, then a substantial amount of the audio encoder data will be missing at the far end. One aspect then, considered to be important in gaining success in transmitting audio across the Internet, is the ability to alter the packet size on the sending end, so that different network conditions can be met, and the effect of dropouts can be minimized. Some of the units actually adjust the packet size dynamically based on changing network conditions. In any case, the user needs to be able to adjust the packet size so that the best compromise between packet size and overall bandwidth can be met.

Inevitably, some packets will still be lost though, and there are other mechanisms designed to further minimize the negative effects. One such method is known as forward error correction (FEC). FEC is basically the addition of redundant packets to the data stream – the idea being that these redundant bits will effectively take the place of the packets that somehow end up missing at the far end. One can easily see that the addition of too many redundant packets could possible create a problem in and of itself with respect to network congestion. Therefore, like packet size, the amount of FEC should be adjustable by the user, to best meet network conditions.

The nature of the Internet also results in packets sometimes arriving late at the receive end late, or even out of order. For an audio stream, this is obviously a problem – one addressed by way of a packet jitter buffer. This buffer stores received packets for a certain amount of time, allowing late packets to catch up; out of order packets can also be re-sequenced prior to being sent to the audio decoder. The obvious problem here is that the buffer adds delay time-generally considered to be something that isn't good when doing remotes. Therefore, once again, one must strike a compromise between problems in the audio caused by late or out of sequence packets, and the amount of delay one can deal with at the remote site.

To review, let's summarize the problems with Internet transmission of audio and the techniques used to minimize them. First, there is network congestion, or plain lack of bandwidth. That issue is tackled by minimizing the necessary bandwidth, by using a lossy codec and striking a correct balance between bandwidth and packet size. Loss of packets is addressed to the extent practicable by FEC. Packet jitter is addressed with a jitter buffer.

So the problems I've just discussed are ones taken on and solved by the equipment designers themselves. Now let's go in to some of the issues you'll experience as a user of this type of equipment. They're all related to network security.

Network security

At your studio headquarters, likely you'll have a rack-mounted version of the IP codec you've chosen. Obviously it will need a network connection and access to the public Internet. Assuming you originate your remote broadcasts from the field, your HQ device will need to be able to be contacted from the public Internet. This presents a big problem to most network administrators because it is often against company IT policy to allow uncommon ports to be

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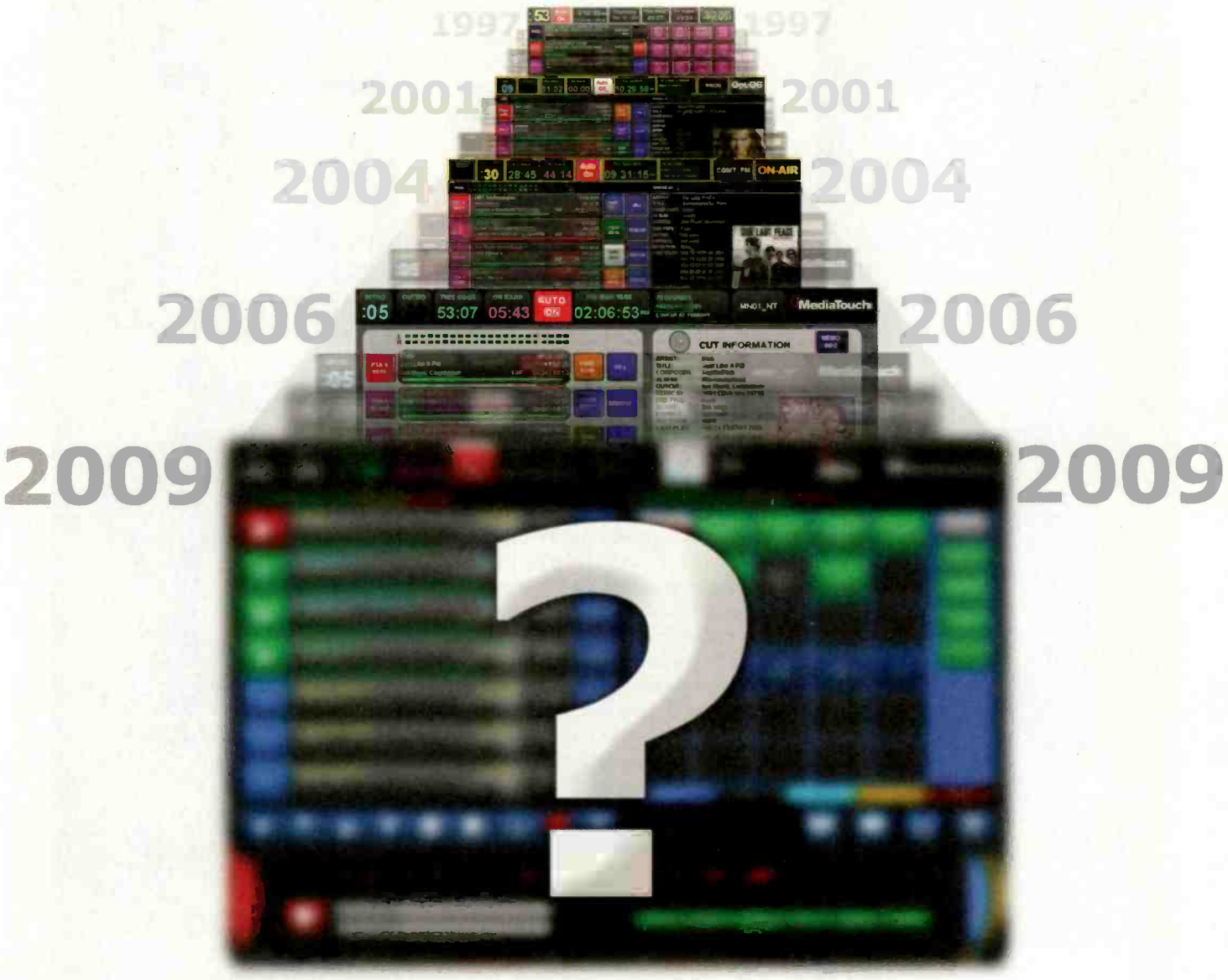

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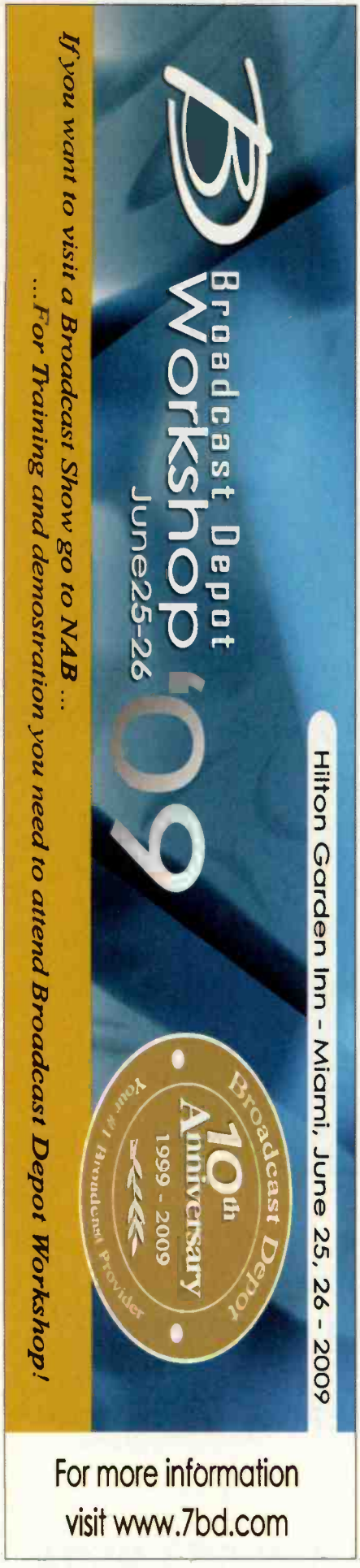

IP REMOTES

open on the router or firewall. (More on the topic of ports below.) For this reason, the HQ unit will not be able to work on your company LAN.

One way around this (and there is more than one) is to put the HQ unit on its own network. As I wrote earlier, broadband access is common now: you can look into the installation of a DSL line in to your facility, or alternatively, if cable TV is available, a cable modem. Hang the HQ codec on this mini-LAN, and it will be easily accessible from the outside.

Another way to get around this security issue is by way of a proxy server. This proxy server is located outside of your network, and a connection is made to it from your HQ codec via the public Internet. A session is initiated by your HQ codec, and the proxy server records the IP address of your codec and actually maintains a connection with it thereafter. From the field, then, you connect to the proxy server, and it in turn redirects the packets to your studio codec through the connection that it has maintained.

The issue of connecting to the public Internet with the portable IP codec is a little more complex though. I've used three different methods. The obvious one is to jump on a LAN that already exists. As I wrote earlier, many venues have some sort of network in place now, usually by way of a broadband connection of some sort: DSL or cable. If they have a router attached to it (likely) then you have to deal with the same network security issues that I also mentioned earlier. In this case, you'll have to have access to the router itself, so you can configure it for port-forwarding.

Let's talk about port-forwarding. One aspect of the common broadband connection you find is that it has one IP address on the Internet. The router is able to accommodate multiple host computers on its private side even while only having one public Internet address by way of network address translation. When a host computer on the private side runs an application that needs access through the router out to the Internet, that application will have an associated *port* number. The router makes note of this port number; and so when it later receives messages from the Internet that include a particular port number, it knows to use that port number in sending that received information back to the correct host computer on its private side. Since these small routers are used to give small

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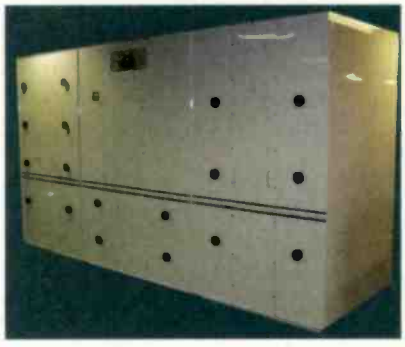

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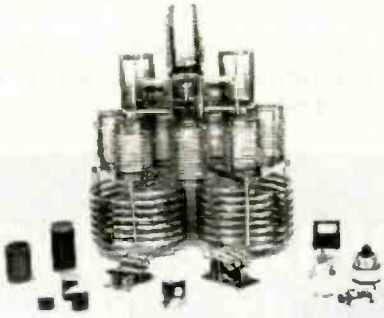

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offices Internet connectivity, the port associated with http is by default, open. However, when you want to add an uncommon application to the private side (like your Internet codec) you will need to configure the router to have the necessary ports open so the traffic will be allowed to pass in both directions.

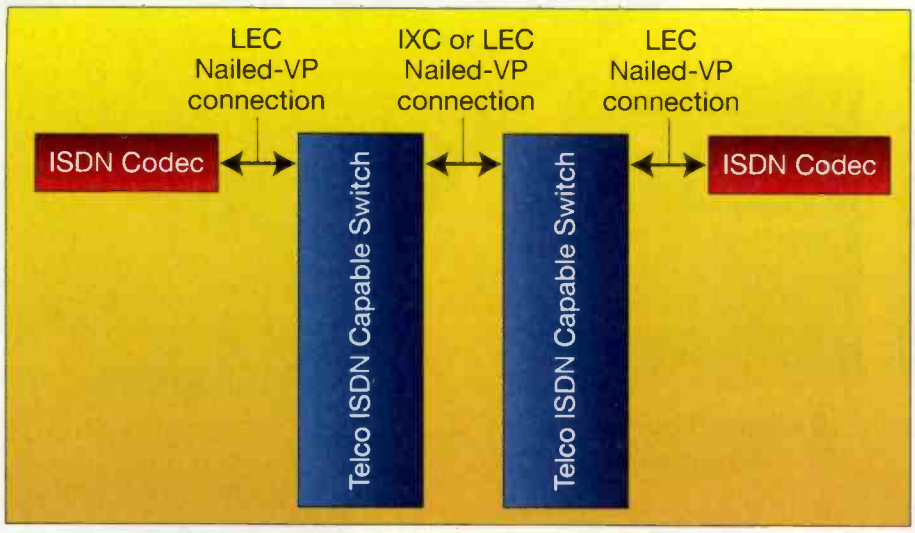

Figure 2: After the connection is made (Nailed-VP), the two bearer channels (64kb/s each, duplex) and the data channel (16kb/s) are dedicated strictly to the user for the duration of the call.

If you can get the credentials to log in to the router's administrative console (done via its LAN) you can generally make the necessary changes. (If you have a good relationship with the venue owner, he will hopefully give you the credentials or he'll have his own administrator do the configuration for you.) I'm generalizing here, but once you log in to the particular router, you will be able to find the page for port-forwarding. Two pieces of information are needed: first are the necessary port numbers, which you will get from the specific equipment documentation. Second will be the IP address of the codec itself when on the LAN in question. When configuring the port-forwarding, you are basically telling the router to allow packets for applications that correspond to the port number you have programmed to pass through to the IP address you have also programmed. That's it in a nutshell.

In many instances, the router attached to a broadband Internet connection at a venue will have Wi-fi capability. You'll need to go through the port-forwarding process whether

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If a broadband Internet connection is available, IP codecs make last-minute remotes a simpler possibility.

you use a wired or wireless connection. You'll also likely need credentials to be able to log on to the Wi-fi access point. Get those from the network admin, or look them up at the same time you set up the port forwarding.

The third means by which I've used a remote IP codec is by way of a plug-in EVDO card. This was certainly a very convenient way to go, and offered reasonably good service, though not as good as a network that was more under my control.

Once your IP codecs are talking end-to-end, you'll be doing a remote that is very much like any other, especially compared to ISDN. There will be some amount of delay going both directions, so it'll be necessary to develop a mix-minus at the studio. Depending upon the quality of your connection through the Internet, you may occasionally experience a drop-out or other odd audio quality related to traffic issues. My experience so far has been that these are brief, and parameters that can be adjusted to minimize the negative effects are adjusted inside the codecs without our notice.

Learning how to use IP codecs takes a little time and may require some patience on your part. Hopefully learning about new techniques is something you like to do. Using IP codecs for remotes has provided some excellent results for the group of stations I work for. Not only have we done the standard type of remote, but we've given our programming people a new tool as well, since we've now greatly expanded our capability, in terms of where we can do them, and their timeliness.

Irwin is transmission systems supervisor for Clear Channel NYC and chief engineer of WKTU, New York. Contact him at doug@dougirwin.net.

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Station Upgrade: KEXS

A local AM station invests in its future

By Chriss Scherer, editor

KEXS is licensed to Excelsior Springs, MO, a community about 25 miles northeast of Kansas City. The station has operated for more than 30 years from a transmitter site located at the studio building. This 1kW, non-directional daytime signal covers most of the Kansas City metro, but the licensee, the Catholic Radio Network, wanted to increase its coverage to serve all the metro. Thus, it began to investigate the possibilities.

Adding more towers on the small existing site presented some challenges. While the station operated a two-tower array on the site many years ago, the possibility of installing a three-tower array was not feasible.

A new tower site was inevitable. Early in the process, a site was found, and the plans were drawn to install a tower with folded unipole skirts. But, the unipole approach was quickly abandoned in favor of a simpler radiator; likewise, the search for a suitable piece of land continued. In time, a section of land was found about

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The transmitter, rack and phasor are mounted on a 4" stud to provide just a little extra clearance.

The coax exits the building through the floor and through two heavy conduits.

four miles south of the studio. Surrounded by farmland and away from the growth of the town, the new site would comfortably host three towers. There was just one problem: The land sits in a flood plain.

A stream runs along the back of the property, and on occasion, the low elevation suffers some flooding, but the site was still promising. It was a little closer to the Kansas City metro and had an easy line of site from the studio.

Reviewing the flood history in the area, it was noted that the highest the waters reached was four feet. This was taken into account for the construction design, and the towers and the transmitter building were mounted above ground level.

Reaching high

It's not uncommon to find elevated tower bases, but to see a transmitter building sitting on 9' stilts is rather unusual. The transmitter building, a prefabricated VP steel building, sits on four beams. Measuring about 24' x 16', the garage-door entrance is accessed by a staircase. Inside, the Phastek phasor and Broadcast Electronics AM10A transmitter are set in place on 4" tall wooden beams. The beams were added to provide just a little extra space in case of a severe flood.

While the main purpose of the elevated building is to safeguard against flooding, there is an added benefit: security. There are no blind spots around the building now. The ground system and coaxial cables are also buried. The coax leaves through the floor of the building and enters the ground through two heavy-wall conduits. A large conduit houses the radiating cables. A smaller one houses the antenna monitor cables.

Contract Engineer Ben Weiss, CPBE, oversaw the project. Weiss worked with Chris Kreger of RF Special-

Burying the cables

Photo by Ben Weiss

Map the sites

Studio: 39° 17' 39.00" N, 94° 15' 37.00" W
New site: 39° 17' 39.00" N, 94° 15' 37.00" W

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Shiny, new components inside the phasor

ties of Missouri – based in nearby Kearney, MO – for the equipment. Kreger also offered his services to construct the site.

Because the field was used as farmland, there was little that needed to be done to prepare the land before construction could begin. Overall, Weiss says the project went like clockwork. All the materials and crews arrived on time, and even the weather cooperated in December 2008 and January 2009.

Work begins

After the building was raised, the transmitter, phasor and ATUs were lifted into the building with a fork lift. Once the towers were erected, the ATUs were moved from the transmitter building to the towers with a high loader. The towers themselves are top-loaded and use about 1/3 of the upper part of the guy wires to effectively create 1/4-wave radiators. Rocky Mountain Tower erected the radiators.

Once all the equipment was installed, Charles A. Hecht, the consulting engineer, and Kurt Gorman of Phasetek arrived on site for the final tuning and system proof. Weiss says that step took about a week. A very short time later, the station had its FCC authorization to commence program transmission. The new KEXS site was on the air.

Currently operating at 3.4kW, the station plans to apply for a power increase to 7.5kW soon, which is why a 10kW transmitter was installed. Once the licensing

The STL antenna is mounted on the building. The studio is only four miles away.

is complete on the new facility, the station expects to authorize the non-directional site as a backup with a reduced power level from the previous 1kW.

The pattern looks like a loose hypercardioid pattern aimed at Kansas City. The nulls of the pattern result in a slight decrease in coverage in two nulls compared to the non-directional pattern, but the loss is minor.

While FM installations and HD Radio get most of the attention today, it's encouraging to see a station owner invest in a stand-alone AM signal. For KEXS, the attention to building a quality facility will help that station serve its devoted audience, and likely improve that audience because of the increased coverage area.

More photos online at www.RadioMagOnline.com

Equipment List

Andrew Heliax LDF4-50A (0.5"), Heliax LDF6-50 (1.25")
Broadcast Electronics AM10A
CRL MDF-400, PMC-450
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Radio 2009 Excellence Awards

Winner

Excellence Recognized

The first *Radio* magazine Excellence Awards competition is complete. The entries, which were profiled in the 2009 Buyers Guide in our December issue, showcased four outstanding installations. We also posted the entries at RadioMagOnline.com and asked you to vote on a winner.

The response to the voting was tremendous, and while all four entries received a great response, there can be only one winner.

Congratulations to all the entrants in this year's contest. They represent the highest standard of radio technology. Special congratulations to Cox Radio Birmingham for winning this year's award.

We will seek entries for the next Excellence Awards this summer. We hope to see your project profiled in the 2010 awards.

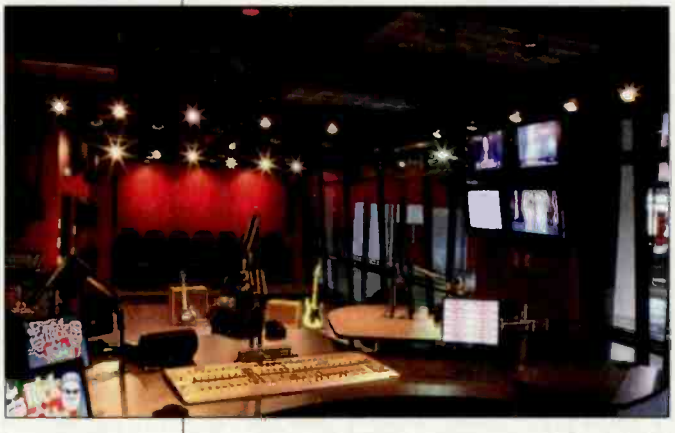
Chris Closson

Cox Radio

Birmingham, AL

The Rick and Bubba Show, heard nationally on more than 50 stations, recently joined the lineup at Cox Radio Birmingham's flagship station WZZK-FM. The show was moved to a new broadcast facility in Vestavia Hills, AL, to develop a complete morning show experience with a live band performance area, audience seating in the studio, and an exterior broadcast plaza area for public viewing.

The 5,000 square foot facility features a complete Harris digital studio solution including VistaMax audio networking, studio consoles, furniture, and various tools for the on-air and production operations. Featuring spacious studios for on-air, production, video control and call screening, the facility provides a fully functional digital studio solution for today with an eye toward future growth through the VistaMax platform.



The VistaMax mainframe and associated processing gear reside in the technical operations center. A T1 link transports programming to New York for national satellite distribution, and an IP connection to the Birmingham headquarters addresses local distribution. The system considerably reduces facility wiring, with clean, centralized routing to and from VistaMax and studio destinations.

All studios feature custom-designed Harris Smoothline furniture to match the size of the operation while also providing a visually appealing presence for TV station cut-ins. The on-air studio is the life of the operation, with plenty of space for the four show players and several guests. A venue-like atmosphere in the studio incorporates a separate space to host

live bands and accommodates seating for in-studio audiences.

The Harris RMXdigital was the choice of console for the on-air studio. The RMXdigital features six mix/minus busses that prove very convenient for remote broadcasts. The busses are programmed into the system, so the operator can avoid punching in a matrix of channels. Four assignable program busses allow the operator to feed audio around the facility, including a set of speakers outside the studios.

The on-air operation includes a Telos Twox12 interface drop-in within the furniture surface for bringing phone calls live to air. Harris also provided several of its World Feed Panels to accommodate laptops and other non-traditional source equipment. The World Feed Panel is also ideal for external camera crews. Pre-delay audio feeds to synchronize audio with video from the camera crew are easily assigned over a program bus for camera.

The RMXdigital provides redundancy as a standalone console and can immediately go online in this configuration should VistaMax be taken offline. Most sources are wired directly to the console, including the automation system, an Allen & Heath mixer for live band performances, microphones, ISDN equipment, and traditional source equipment including CD players.

The RMXdigital has an intercom feature allowing players outside the on-air studio to contribute to the on-air program. The show's webmaster, Ryan Greenwood, often contributes to the show over the intercom, which is picked up by the microphones to create a "drive-through" audio effect. Intercom stations are also present in the screener room, production studio, TOC and TV control area.

The production studio features a Harris NetWave eight-channel mixer (NetWave-8). The NetWave-8 serves as an edge device for VistaMax, with three channels used for external audio source selection, and several more to route sources to and from the automation system.

CATEGORY

New studio technology — station

SUBMITTED BY

Harris Corporation

DESIGN TEAM

Cox Birmingham: Tom Scott, director of engineering

Harris Corporation: Nick van Haaster, architectural and interior design, and installation; Todd Peterson, audio infrastructure design

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Fuel Ce

Power for the future

By Doug Irwin, CPBE AMD

Undoubtedly while you carry out your day-to-day work around the radio station you use at least several rechargeable batteries. In a sense we are slaves to those batteries – because other technological considerations aside – if its battery is dead, it doesn't matter how good and useful the technology of the device is. And to make matters worse, the energy we need to recharge those batteries (i.e. ac power) usually isn't available where it is needed anyway, right? Otherwise we wouldn't need the batteries in the first place.

Battery technology hasn't kept up with the advancements in technology of the myriad of portable devices available now. Conventional wisdom is that the last important battery innovation was the introduction of the lithium-ion type, back in 1991. There have really only been incremental improvements since then! However, the late interest in electric vehicles has accelerated further developments. Very large versions of the lithium-ion battery type, for example, are expected to show up in hybrid vehicles this year.

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Fuel Cells

The fact of the matter, though, is that all batteries run out of charge eventually. Wouldn't it be great to have an alternative power source that was easily portable (unlike a generator), that worked day or night (unlike solar cells)?

Ever heard of fuel-cells?

Fuel-cells exist today, and have been used to generate power for decades. But for everyday applications, they aren't quite ready for prime-time. Development is on-going, though, and it's likely that we will be seeing fuel-cells come in to regular use in the not-too-distant future. In this article, we'll take a look at their history, how they work, and the technological development of fuel-cells over the last 150 years. We'll end by looking at the state of the technology in 2008.

Early work

The original idea behind the fuel cell is credited to the German Christian Friedrich Schönbein who published the idea in 1838. The following year, the Welsh engineer Sir William Grove demonstrated the first application of the idea.

In the 1930s, the British engineer Francis Bacon took up the idea, and developed it over the following two decades. In 1959 he successfully demonstrated a 5kW unit powerful enough to run an arc-welder. Pratt and Whitney licensed Bacon's patents in the U.S. and they were subsequently used for the fuel-cells that flew in U.S. space missions in the 1960s. These fuel-cells generated electricity and the waste product of pure water.

Basically a fuel-cell is a device inside of which are three components: the anode, the cathode and electrically non-conductive separator. Both the anode and cathode are coated with a catalyst.

On the anode side, the hydrogen fuel is exposed to the catalyst, which encourages the disassociation of electrons from hydrogen atoms. The positive hydrogen ions will migrate through the separator; but, since the separator is electrically non-conductive, the electrons cannot move through it. This creates a potential difference (voltage) between the anode and cathode.

When the anode and cathode are connected with a conductor, the electrons will move around the separator to the cathode, which is exposed to the oxidizer. The chemical reaction is completed; water is created as the byproduct. An electrical load can be connected between the anode and cathode, and therefore work can be done. This is what allows the fuel-cell to be a power source.

It's important to note that this is an exothermic chemical reaction, which means that a substantial amount of heat is given off.

The potential between anode and cathode is on the order of 0.7V; and so just as in the case of batteries

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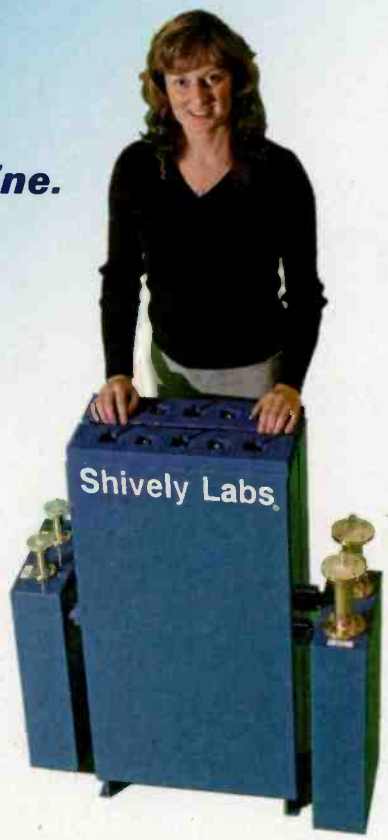

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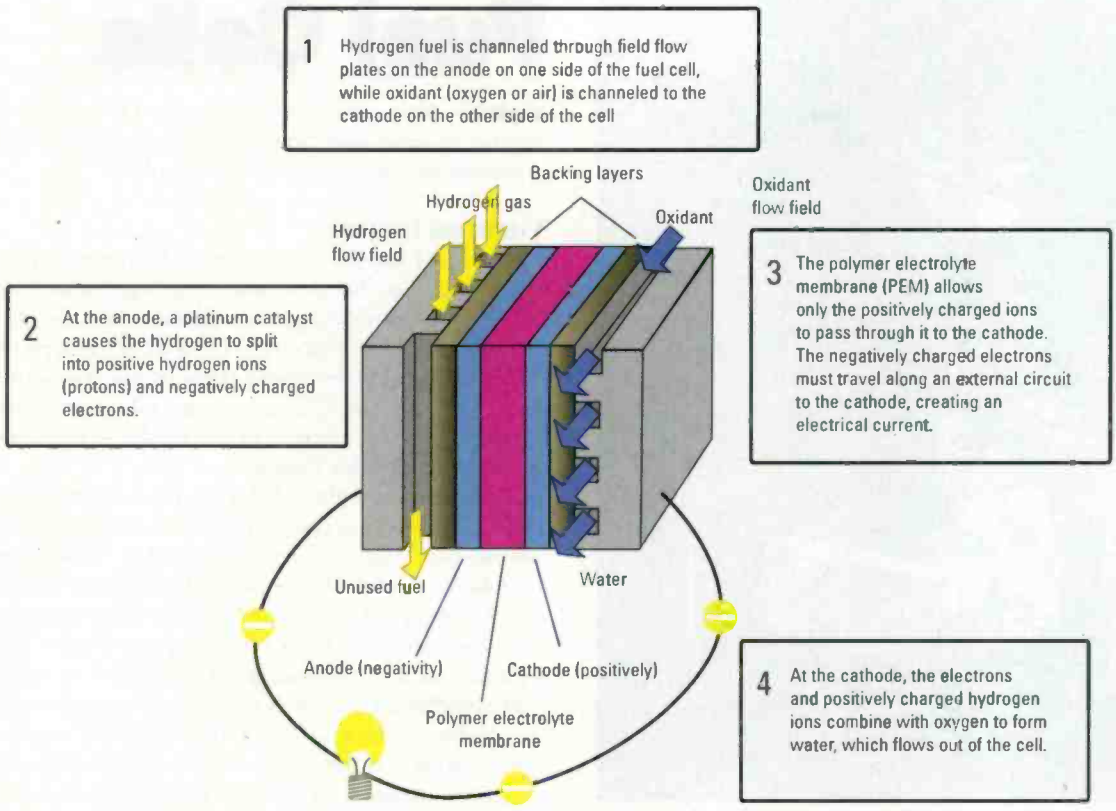
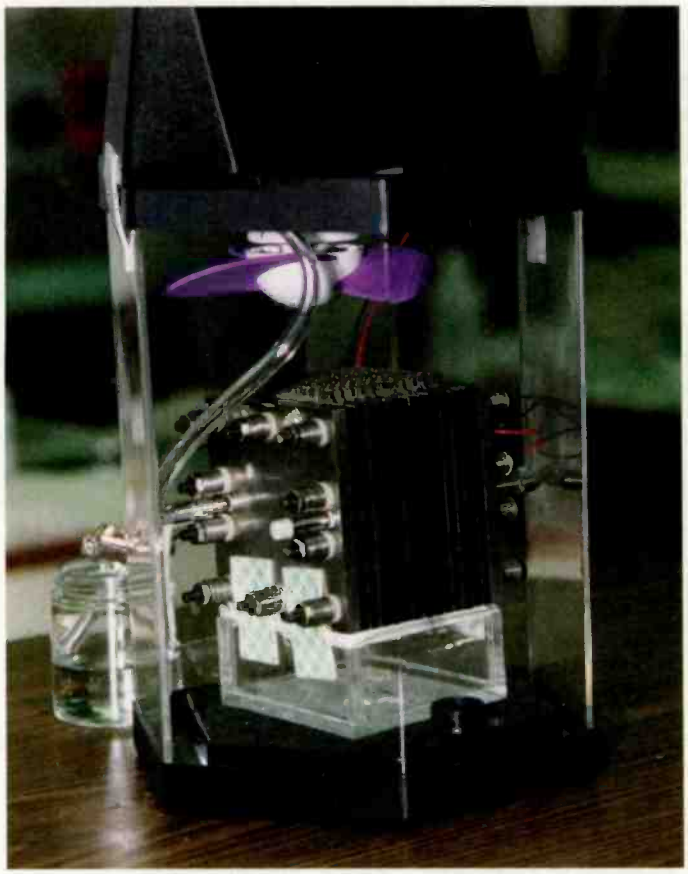


The components of a proton-exchange membrane fuel cell.



A direct-methanol fuel cell. The actual fuel cell stack is the layered element in the center.

Fuel Cells

or photo-voltaic cells, the fuel-cells can be connected together in series and parallel, making a system with higher-voltage and greater current capability.

Various forms

The type of fuel-cell that uses pure hydrogen for the fuel is known as the proton-exchange membrane fuel-cell. (The proton-exchange membrane makes up the separator I referred to above.). There is another type of PEMFC that uses other hydrocarbons as fuel; the waste byproducts are then CO_2 and water. (More on those below.) Operating temperature of a PEMFC is between 50 and 220 degrees Celsius.

One key component to a PEMFC is the catalyst, which is typically platinum or palladium. There is another type of fuel-cell, known as a solid-oxide fuel cell (or SOFC) that operates at a much higher internal temperature – 600 to 1000 degrees C. One advantage is that it does not need the catalyst on either the anode or cathode. The separator (as the name suggests) is ceramic. At these high temperatures, disassociated oxygen ions will move through the ceramic to oxidize the fuel on the anode side. Again, water is a byproduct. Connecting the cathode and anode together with a conductor allows electrons to flow; they can be used to do work just like any other electrical generator.

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Hydrogen alternatives

As I mentioned above, it isn't necessary to use pure hydrogen as fuel for a PEM fuel-cell.

Some manufacturers have worked to develop PEMFCs that use methanol as the fuel source. Methanol can be used to generate about 4.4kWh per liter of fuel. However, Lilliputian Systems of Wilmington, MA, has spent five years developing a matchbook-size SOFC that uses butane as its fuel. Butane, according to Lilliputian, is a better source of energy, since you can generate about 7.4kWh of power with one liter.

They make use of the intense heat to crack the butane molecules into hydrogen and carbon. The entire SOFC is enveloped in glass under a vacuum – much like a light bulb. Lilliputian expects to market the SOFC in 2009.

The Direct Methanol Fuel Cell type is an offshoot of the PEMFCs discussed herein. MTI Micro Fuel Cells of Albany, NY, has produced and demonstrated prototypes of its DMFC, mainly for use as battery replacements for electronic cameras and camcorders. Like Lilliputian, MFI expects their fuel-cell to reach the marketplace in 2009.

Toshiba has touted its DMFC fuel-cell technology for several years and has shown it at various technology showcases during that time. It showed a new cell-phone at CEATEC just this fall that uses a small DMFC to charge the lithium-ion battery that goes with the telephone. It has commenced mass production of the DMFC technology.

Panasonic (which recently officially changed its name from Matsushita) is producing a PEMFC for home use, with an output of 120Vac and a power capability of 1kW.

Panasonic has tested these units in Japanese households since 2005, and expects production in 2010. Some of its more interesting specifications: lifetime is 40,000 hours with 4,000 startup cycles (good enough for 10 years of service). It holds up to 200 liters of fuel (assuming you can find it) and it weighs 275 pounds – so don't get too excited about buying one for use at remote broadcasts. Not yet anyway.

For the last three or four years, the introduction of the mass-production of small fuel-cells has been "right around the corner" so the current claims of all parties that 2009 is their target year need to be taken with the proverbial grain of salt. With the energy crisis of 2008, and the strong desire for more green technology from more and more consumers, and the ever-present desire to be freed from the tyranny of rechorgeable batteries, it's only a matter of time before small fuel-cells reach the market for real.

Irwin is transmission systems supervisor for Clear Channel NYC and chief engineer of WKTU, New York. Contact him at doug@dougirwin.net.

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Tips, tricks, hints and more

By John Landry, CSRE

Mount up

Who hasn't had trouble mounting computers in racks? Many servers supplied by broadcast automation providers as well as corporate IT vendors do come with some rack-mounting hardware, but many are designed for computer-type racks (the ones with large square holes that accept threaded inserts) or they are too deep or not wide enough to fit into the broadcast rack. Many times a one- or two-unit rack shelf can be used to hold a server in place. If there are rear rack rails, another shelf mounted in the rear can add extra support for the deeper servers. A more permanent and professional solution can

be found at www.racksolutions.com (903-453-0801). This company specializes in rack mount kits, and they have a complete index online for most IBM, Dell and HP hardware. The company can also design and build custom rails or sliders for just about anything that will fit inside a rack. Most rack kits also include a cable management system, which will look good and keep cabling under control while maintenance is performed.

Flat-out repairs

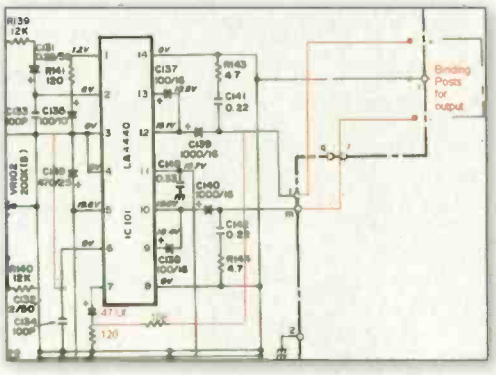
Flat LCD screens are now the standard for most desktop workstations and TVs. They are certainly easier to carry and set up than their old CRT counterparts, but my experience has shown that they don't hold up well in a 24/7 operation. We have several Samsung Syncmaster 940 TVs that went into service at the end of 2006 and have already failed. Most of them stop working because the capacitors in the little switching power supply burst open.

The capacitors chosen for this TV were some of the smallest available. While they were rated for 105° C operation, they were not low ESR types, which compounded the problem. Most of these TVs have been repaired by complete replacement of all of the capacitors on the power supply board. The United Chemi-Con Type LXY and KMG have been used as replacements with great success.

One Planar desktop monitor needed not only a power supply rebuild but also new backlight tubes. These tubes are very small fluorescent light bulbs housed in a plastic slot in the rear of the display. JKL Components makes the bulbs, which are available through Digi Key. While these bulbs come in many lengths and nine different diameters, virtually all of them draw the same amount of current per tube (5mA). Most of the lamp driver boards have an adjustment pot and usually after adjusting it the screen works again.

More power

A friend recently had to produce a remote and was short a headphone amplifier (there also was no money to buy anything, so whatever we could find would have to do). Digging through the equipment pile resulted in several pairs of headsets and cables, and a Realistic SA-150 amplifier. When we set up the remote (a talk show at a small diner) it was obvious we would need more volume in the headphones. I took the SA-150 home and found a simple solution: Turn it into a bridging amplifier. The SA-150 uses a Sanyo LA4440 amplifier chip. After downloading the spec sheet from www.datasheetarchive.com I found out the chip could deliver 19W in bridging mode instead of the as-designed 6W. And because the Radio Shack designer used Sanyo's circuit straight from the datasheet, this would be an easy mod. The end result was good enough.



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

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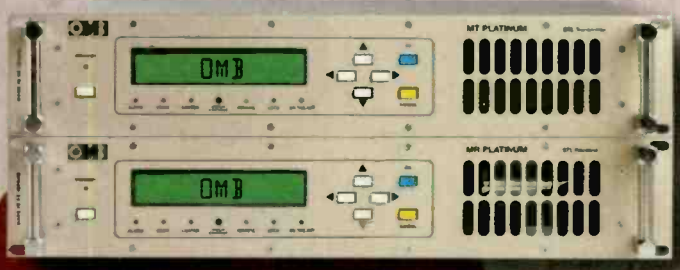

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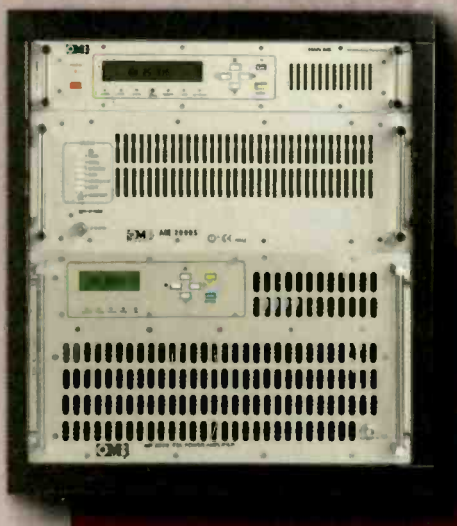
is a high-performance Studio-to-Transmitter Link. It is made up of the 5W MT transmitter externally synthesized in 10MHz sub-bands with a step of 100KHz, and the MR double conversion receiver, that is externally synthesized, too. The MT is microprocessor controlled, and incaudes LCD display for the visualization 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.



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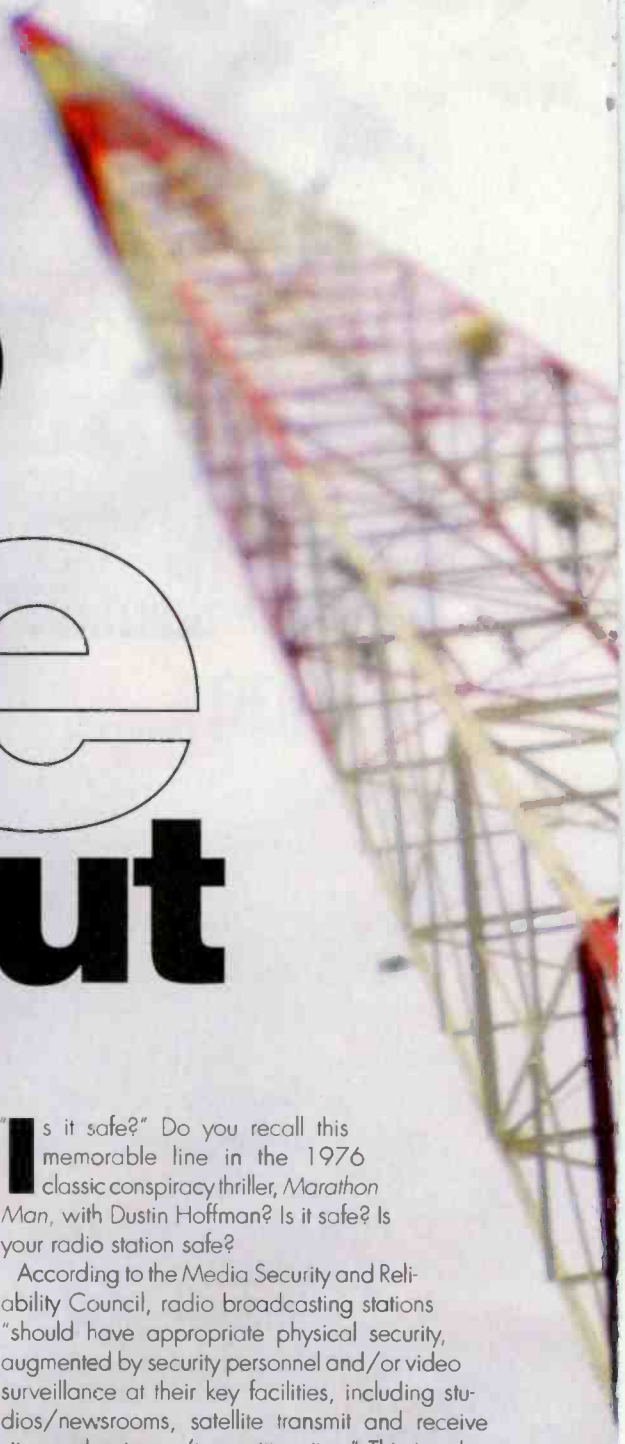
Keep an Eye Out

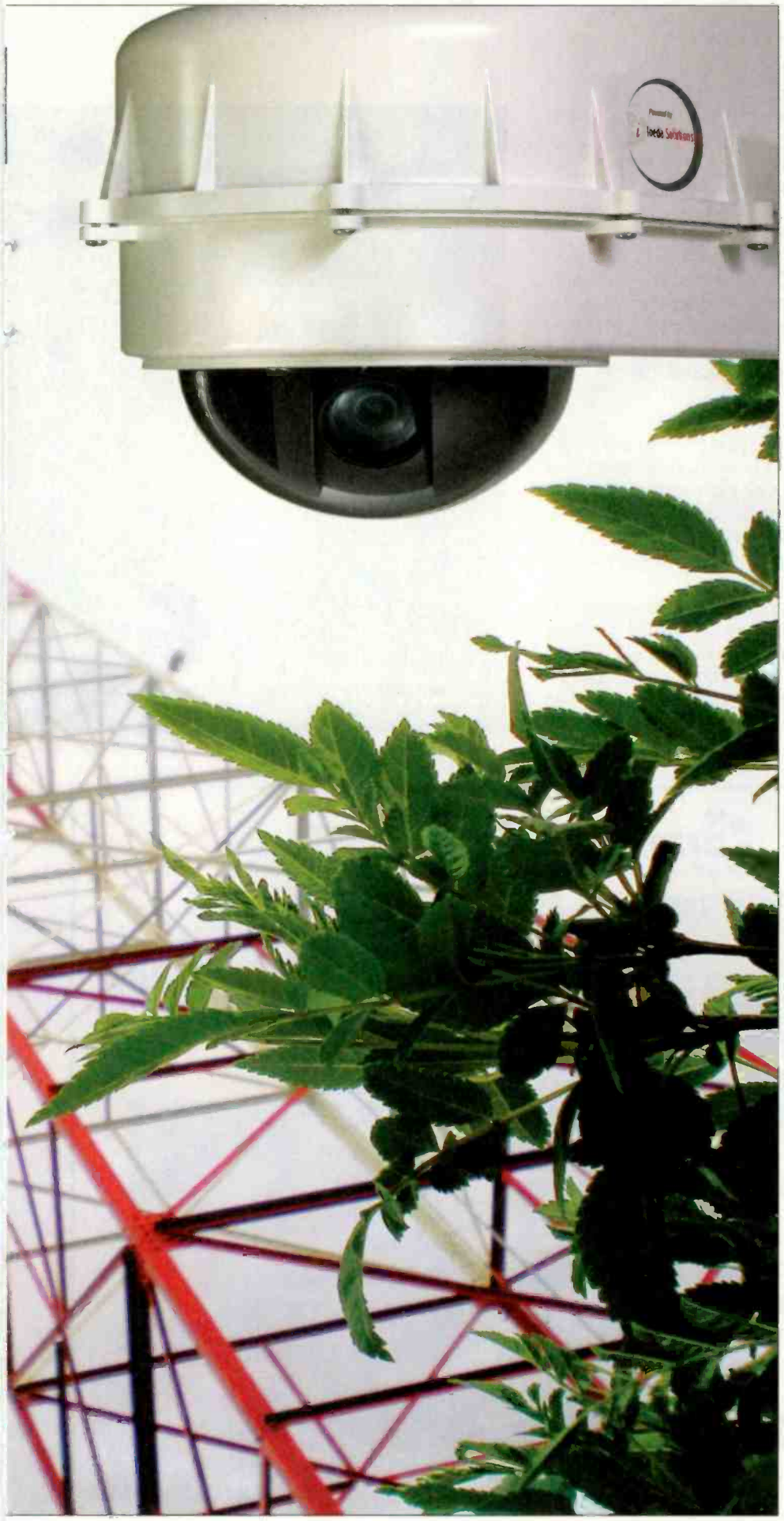
Live remote video surveillance

By Bryce Witcher



"Is it safe?" Do you recall this memorable line in the 1976 classic conspiracy thriller, *Marathon Man*, with Dustin Hoffman? Is it safe? Is your radio station safe?

According to the Media Security and Reliability Council, radio broadcasting stations "should have appropriate physical security, augmented by security personnel and/or video surveillance at their key facilities, including studios/newsrooms, satellite transmit and receive sites and antenna/transmitter sites." This is a best-practices measure they are promoting so broadcasters



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Keep an Eye Out

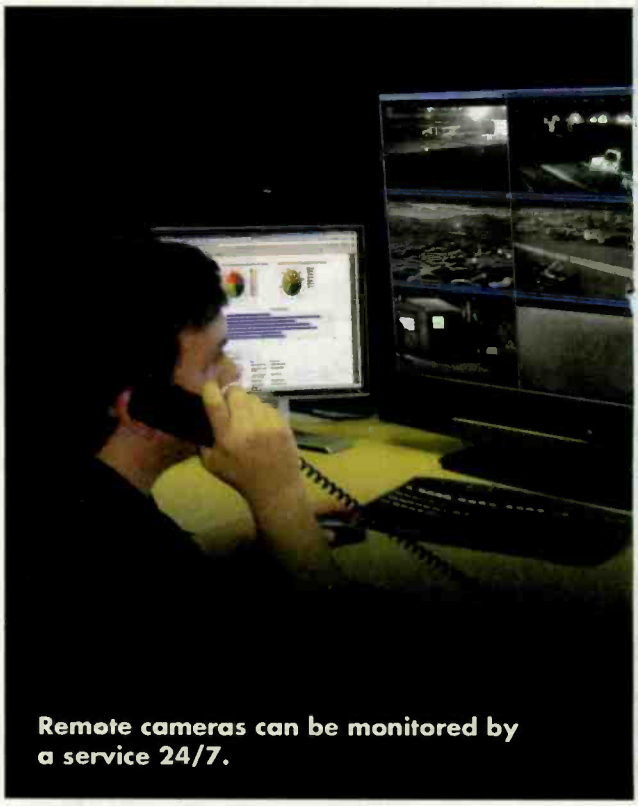
and other mass communication entities protect themselves and their listeners from vulnerabilities in the event of natural and man-made disasters.

But how is a small, remote radio station supposed to afford additional security measures when they can't afford to take on the extra expenses or hassle? There are many factors in evaluating the need for added or updated security, a variety of preventative measures that can be taken to prevent unwanted acts. One of them includes using video surveillance to achieve detection and early response in the event of an intrusion.

Enforcement tools

Law enforcement representatives indicate that surveillance cameras can act as powerful enforcement tools and crime deterrents. The reality for personnel or security staff at a radio station is that they cannot be everywhere at once. By using video surveillance, the staff can be empowered with an extra pair of eyes to both prevent crime and catch criminals in the act.

Many businesses choose video surveillance as part of their overall security approach because of the nearly conclusive evidence it can create, especially when it comes to prosecuting in court. And they are striving to get the most out of their investment. After all, these are tough times, and you have to maximize your investment.



Remote cameras can be monitored by a service 24/7.

Some station managers may feel that video surveillance is a luxury, but many will agree that employing it is a necessity. Some facilities do not have much in the way of security other than locks on chains on the fencing that surrounds their transmitting towers. Adding a camera can go a long way toward keeping this type of area secure.

Reports indicated that nearly a dozen radio station facilities in Texas were broken into in October 2004. Power supply lines were interrupted and log books were stolen or rifled through. Other fairly minor theft and vandalism occurred, but no expensive equipment was taken, though it could have happened. Law enforcement officials believed in this case that this simply was not ordinary mischief, but a terrorist test to establish police response times and determine how extensive efforts would be to infiltrate the stations to cause a possible interruption of emergency broadcast communications. Had there been some sort of perimeter intrusion detection or video surveillance in place, the perpetrators could have been apprehended.

In creating the most ideal physical security scenario for your station, you don't always have to start from scratch. Many broadcast facilities already have an existing IP infrastructure that can be exploited by plugging in network cameras. However, installing all the appropriate equipment does not necessarily get you to your goal. You can

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Keep an Eye Out

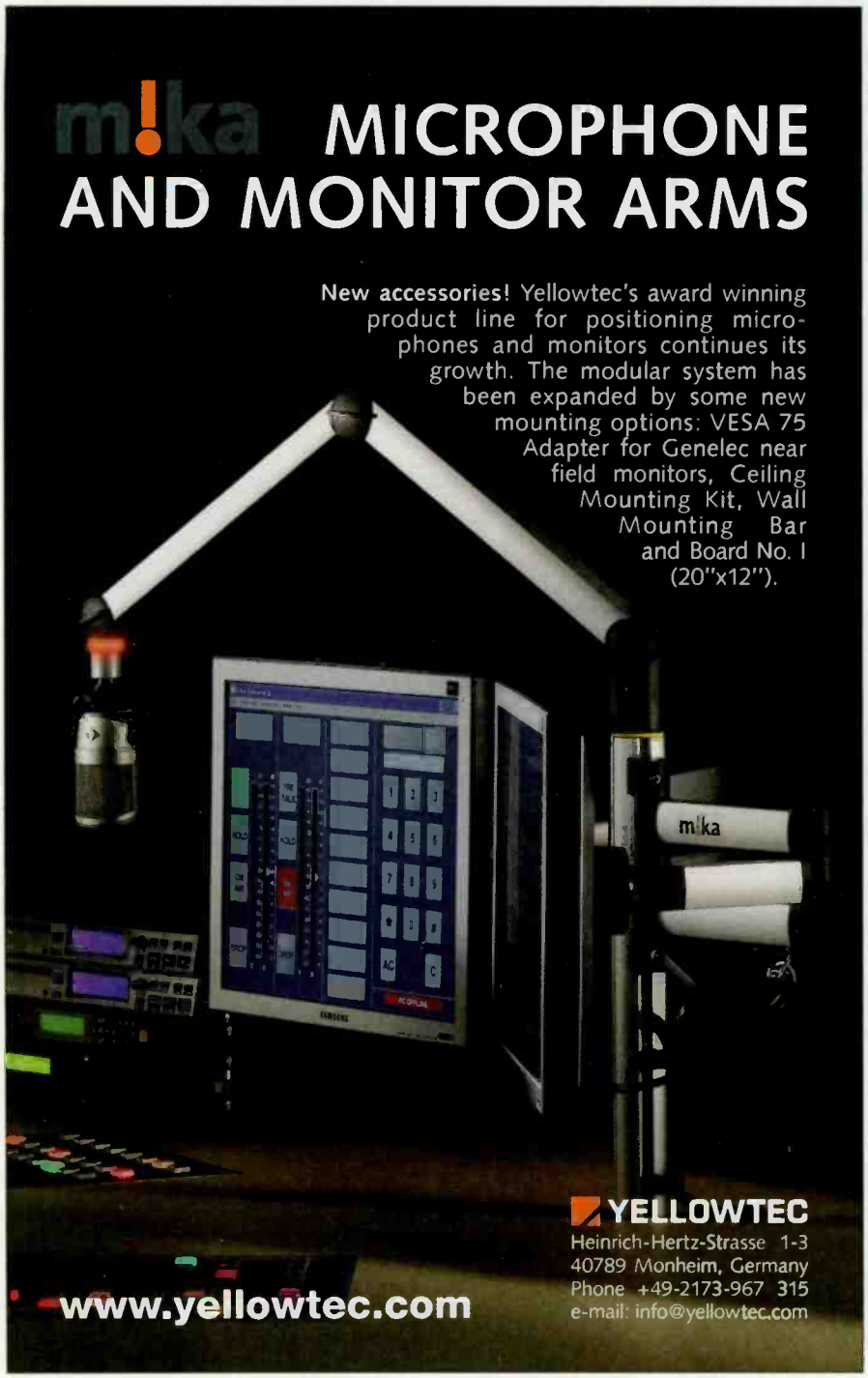
have all the cameras in the world, but the system needs to be managed and watched on a regular basis.

Most stations are short on staffing, so watching the cameras could become the added responsibility of existing personnel. On the other hand, there are companies that offer monitoring services – for a significantly lower cost compared to hiring your own staff or security guard. The decision to take advantage of that expertise will depend on how you want to allocate resources. If you are fortunate enough to operate a radio station that has security guards, outsourcing the monitoring function can actually save a lot of money because it allows you to reduce or even eliminate your on-site security guard staff. So instead of adding costs, you can minimize them when stepping up your security. Besides, staffing guards who are actually willing to show up to work odd hours can be a headache.

Video storage options

As you're considering installing a video surveillance system, you will be faced with many video storage options. There are on-site recording devices, such as a DVR, but a technology becoming more widely accepted is video hosting and off-site recording.

Use of this method of recording video is especially promising if an IP network has already been built, and offers several advantages. Because the video is hosted online, the recordings are safely stored off site. You do not need to worry about someone stealing or destroying the on-site recording device while he commits his crime. The video is always accessible through a



Surveilance cameras themselves must be in secured locations.

Trained personnel can watch a site for signs of trouble.

But, you will be surprised of the savings when you compare the cost of traditional guard services, even when you have to buy equipment in the first year. Needless to say, savings in subsequent years is astronomical. The pros definitely outweigh the cons; therefore it is time to consider using video surveillance for your facilities.

Witcher is the marketing manager for Iveda Solutions, Mesa, AZ.

Web interface, which is especially useful if the staff wants to keep an eye on the transmitter site from the studio. Because the video is online, access can be granted to first responders such as the police so they can assess what kind of response team to dispatch.

Because constantly monitoring the surveillance video is important and knowing that station staff is limited, we can take this one step further. Real-time remote surveillance, or a remote monitoring service, allows trained personnel with the appropriate monitoring equipment to view the surveillance camera system at your studio or tower from their off-site location. This is a security option a growing number of businesses are using, and becoming increasingly popular for anyone interested in mitigating their losses at their broadcasting facility. If you have real-time surveillance services as part of your security program, you have a person working on your behalf to intervene while the incidents are taking place.

Alex Arredondo, an officer at the Los Angeles Police Department (LAPD), was recently involved in an arrest made possible by the services of Iveda Solutions. The California facility is remotely monitored by the company's staff via the Internet from its surveillance center in Arizona. When the intervention specialist on duty alerted the LAPD that a break-in and theft was taking place, Arredondo and his fellow officers were able to apprehend the perpetrator.

Whether or not you use video surveillance at your station will largely depend on how secure you need the facility to be, compared to what you are willing to invest. The benefits of using video surveillance can speak for themselves in terms of reducing the chance of experiencing lost air time. Reductions in the occurrences of theft and vandalism are also an advantage. The only drawback of implementing video security can be the initial investment on cameras.

Installing a new STL System?

Here are 10 Reasons why APT's WorldNet Oslo should be considered for your next STL

The choice of professional broadcasters throughout the US & Canada, the WorldNet Oslo offers everything you could want from a studio transmitter link for T1 or IP operation.

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2) Future-Proofing for your Network
Incorporating both IP & T1 / E1 transport in a single chassis, the WorldNet Oslo makes it easy to migrate your audio networks to IP.

3) Proven IP Technology
With several major project installations throughout the networks of companies such as Clear Channel, Citadel, the BBC, ABC and the European Broadcast Union, the WorldNet Oslo has become the professional IP audio codec of choice worldwide.

4) Flexible, Scalable Solutions
Providing a tailored fit for your audio requirements, APT offer a range of stereo codec solutions such as the WorldNet Rio (T1) or the WorldCast series (IP) for use in stereo drop-off locations.

5) Great Channel Density
Over 15 different varieties of pre-configured, plug-in modules are available for the WorldNet Oslo enabling the delivery of up to 24 channels per chassis.

6) PSU Redundancy & Range of Back-Up Options
The WorldNet Oslo has no single point of failure and can be configured to provide multiple layers of redundancy ensuring your station stays on air even under the most stressful network conditions.

7) New & Innovative Technology
The WorldNet Oslo is APT's flagship product and new features and modules are regularly added to ensure that the unit continues to meet the changing needs of broadcasters.

8) High Quality, Low Delay Audio
With pure linear audio and high quality Enhanced apt-X coding supplied as standard on all duplex audio cards, the WorldNet Oslo will make your station sound simply outstanding!

8) New & Innovative Technology
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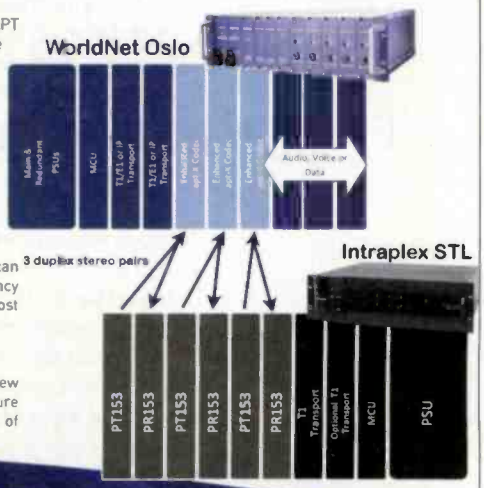

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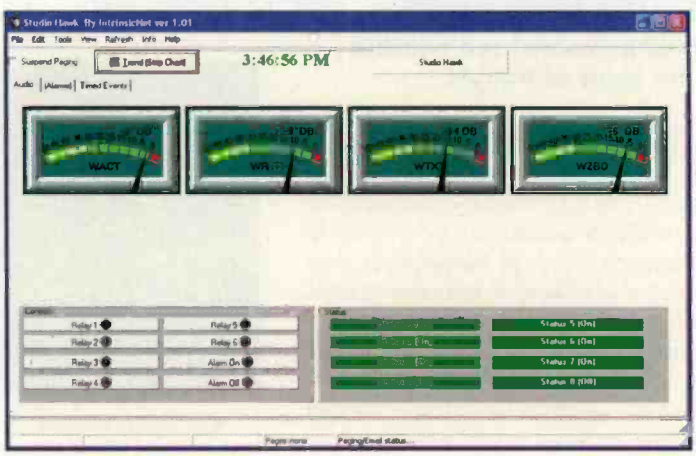
Intrinsic Net
Studio Hawk

By Bob Newberry

More often than we would like, our radio stations are being left unattended for longer periods of time. The recent global economic downturn can only make this situation worse. It is important to have a device that can monitor each of your radio stations and alert key personnel whenever silence is detected. Often these silence sensors take the form of an appliance that will make a call to a predetermined phone number when a set of contacts closes on a separate audio relay. This report highlights a full-featured silence sensor capable of alerting a list of key personnel by e-mail and text messaging to cell phones.



The Studio Hawk is a mission-defined version of the Plus Sine transmitter remote control from Intrinsic Net. It includes a self-installing program CD, a security dongle and a small USB-connected analog to digital converter box. You supply a computer with Windows XP Operating system and a UPS to keep the system running through power failures. Installation of the Studio Hawk program on a computer was straight forward using the simple instruction guide that comes in the box. Use a computer dedicated to this task to ensure consistent and reliable alerting. The Studio Hawk does not require a separate audio relay device to act as a trigger. Instead the audio is fed directly into the supplied A/D convertor. The A/D is a small box attached to the computer via USB 2.0. The computer will need to have access to the Internet and a mail relay server. The mail relay server is usually maintained by your Internet Service Provider and is almost always free for your use.

The Studio Hawk can be configured to monitor the audio from up to eight different audio sources by using the unbalanced inputs of the supplied analog-to-digital converter. If you prefer using balanced inputs you can configure the Studio Hawk to monitor four audio sources. In my use, four radio stations was a perfect fit. I bridged the audio coming from the air monitor distribution amplifier going to my air monitor archive recorder. The high impedance of the Studio Hawk's A/D convertor assures it will not load the audio being sampled.

Performance at a glance

Monitors EAS receivers

Detects up to eight audio sources

Alerts via text messages or e-mail

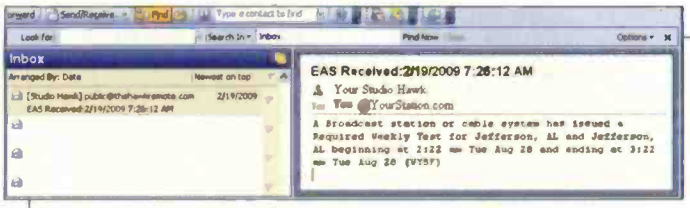
Generates e-mailed reports

Runs on Windows

VU meters

The main screen of the Studio Hawk shows a representation of an analog VU meter for each station monitored. A right double mouse click on any VU meter brings up the setup screen for that channel. This is where you can grab a large slider fader for precise audio level adjustment. Each channel can be independently set for the threshold where the level is considered silent, the amount of time in seconds before a silence is logged, and the amount of time in seconds before an alarm is sent. The report capability of this software is worth the price alone. The software keeps a database of all silence incidents even if they are below the amount of time you set for immediate notification. The Studio Hawk can be set up to e-mail this report on a daily or weekly basis to as many employees as you like. Custom reports can be made for a particular radio station. Any report can be e-mailed as often as you like to any number of recipients. Now you have a record of even the short silences that need to be investigated later but not long enough to bother waking people up in the middle of the night.

The e-mail addresses of program directors and anyone else who should receive silence notifications are entered in the contact information screen. I prefer to have an entry for each person's e-mail address and cell phone text messaging address. The text message will usually arrive to a person's phone in a matter of seconds while the e-mail message is a good record to keep for a follow-up investigation at your leisure. On another screen each of these addresses is combined into a "paging group". In this way specific groups of people can be targeted for a silence detected on specific stations. Each time silence is detected for a specified amount of time the entire paging group you assign will be notified.



Studio Hawk reports problems via e-mail (above) and text messaging.

If the silence continues into a second time period you specify, the paging group is alerted again by another barrage of text messages.

In my application, I have set my Studio Hawk to log silence periods lasting longer than 10 seconds and to send the group e-mail and text messages for silences longer than 30 seconds. If the silence continues longer than say, 5 minutes, another salvo of e-mail and text messages are sent. Thereafter, every 5 minutes, messages are resent until the silence is corrected or the maximum amount of attempts you set in the program are made. The beautiful aspect of this is not lost when you are at dinner with the wife and family. You can discreetly look at your cell phone's text message notifying you of the problem. If you don't get any further messages you can safely assume the problem has corrected itself and you can check it out later at your convenience. Customized ring tones for your alerts can be added to most cell phones that will let you know before you look down that the Studio Hawk has sent you a message.

Several versions of the Hawk and now the Studio Hawk have been an indispensible safety net for our operations in Birmingham and Tuscaloosa for several years now. I feel comfortable enough to "disengage" from constant monitoring knowing the Studio Hawk will alert me the minute any one of our stations has an audio problem.

Newberry is the market engineering manager for Clear Channel Radio, Birmingham and Tuscaloosa Al.

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.

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Genelec 6010A & 5040A

By Chris Wygal, CBRE

One of the most bizarre-looking machines ever invented is the monster truck. Failing to notice the tires on monster trucks is impossible, as they weigh nearly 1,000 pounds each. While not suitable for daily driving, monster truck tires are perfect for their task: crushing cars.

Many smaller production studios today simply have a computer, a microphone and possibly a favorite rack-mounted processor or two. Plus, if editing software is loaded onto a laptop, one must ask, Does a pair of permanently mounted near-reference studio speakers look like monster truck tires by comparison? When it comes to choosing speakers, deciding on their size, SPL and frequency response is tough. To make the choice easier Genelec developed the 6010A and 5040A active speaker system and it performs like a car-crushing, all-weather radial.

Start at the bottom

The system is actually a union of the 6010A active loudspeaker and the 5040A active subwoofer. The sub is a 12" round metal canister-like LFE speaker (next page) that fits nicely under a desk or in a corner. It weighs just under 14 pounds and is the connection point for the system, which can facilitate two to five 6010A loudspeakers (stereo or 5.1 surround). Inputs and adjustments are located on the bottom of the speaker facing the floor (the sub sits on three legs for total height of 10").

For stereo operation (using two 6010As), two RCA jacks or a 3.5mm stereo jack are available. The 3.5mm input jack makes portable setups quick and easy, as the headphone output from a laptop or other editing device can feed the system. The connector and control section of the 5040A contains all audio inputs and outputs, the mains input, subwoofer level control, volume control unit jack, and roll off and phase dipswitch adjustments. The subwoofer level control adjusts the sub level to the main speakers. Roll off adjustments can be set in 2dB increments to achieve anechoic response. Phase control dipswitches allow for phase correction due to subwoofer placement in relation to the main loudspeakers, and can be adjusted in 90-degree increments.

The handiest feature of the system is the volume control unit. It looks like a miniature 5040A, except that it sits on the desk at arm's reach. The 5040A is equipped with six inputs to facilitate 5.1 surround operation. The integrated crossover network in the sub feeds five main channels, directing frequencies below 85Hz to the subwoofer and the rest of the range to the loudspeakers. It contains a 6.5" magnetically shield driver with a response range from 35 to 120Hz that can generate SPLs up to 98dB (measured at 1 meter). The driver cone faces downward toward the floor. The design of the 5040A makes its placement in the studio seemingly transparent. It reacts well to the acoustic environment, making LFE reproduction true and accurate. Of course with any speaker system, experimentation in subwoofer placement is inarguably mandatory.

Moving on up

With the low end taken care of by the 5040A, 120Hz and above is accurately handled by a pair (or more if in surround) of 6010A active loudspeakers. The sleek and compact design complements any desktop where pristine 74Hz to 18kHz response is needed. It is just over 7" high, about 4.5" square, weighing 3 pounds. It contains a 3" bass driver and 0.75" metal dome treble driver (each with their own independent 12W amplifiers) and can produce an SPL greater than 100dB.

As is the 5040A, the 6010A is made of die-cast aluminum and boasts the Minimum Diffraction Enclosure design, which reduces edge diffraction. It also boasts Directivity Control Waveguide, which helps correct frequency imbalances in poor acoustic

Performance at a glance

- Magnetically shielded design
- Volume control unit for arm's-reach volume control
- Compact size
- Independent two-way amplifiers
- RCA and 3.5mm connections
- Iso-Pod desktop mounts for speaker isolation
- 35Hz to 18kHz response

5040A subwoofer with volume control

environments. The 6010A is magnetically shielded, making it operable near CRT monitors.

While not necessary for normal operation, the 6010A is fed by the RCA outputs on the 5040A (cables supplied), but it can be fed by other means if the sub is not included in the system. Level control, bass tilt and desktop control, along with power mains and audio input are located on the back of the speaker. Level control adjusts the input sensitivity of the speaker for proper level matching. Bass tilt dipswitches allow for bass response adjustment in increments of 2dB. This feature is used when the 6010A is placed near a wall or other boundary that may skew the behavior of its lower frequencies. Desktop control attenuates frequencies near 200Hz by 4dB, which can be problematic when a horizontal reflective surface exists between the user and the speaker. The 6010A has three pairs of threaded holes on the back that are compatible with Omnimount, Vesa or Sanus brackets. However, for everyday desktop use, it sits on the Iso-Pod, which very effectively insulates the table from speaker vibrations. The adjustable Iso-Pod allows for correct alignment. The 6010A can also be mounted on a mic stand using the 3/8" UNC threaded hole.

The evolution of our industry and audio production is moving us toward more condensed gear. Genelec's 6010A and 5040A system is portable and compact with no sacrifice of quality and accuracy. When car-crushing reference monitors are needed and lack of space and portability are the reality, this all-terrain system is the right fix.

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

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Kintronic Labs Kinstar

By Tom F. King

More and more communities and neighborhoods across America are growing tired of the proliferation of cellular telephone towers, resulting in the establishment of revised local zoning laws for new structures that reflect a lowering of the maximum allowable height. Star-H Corporation and Kintronic Labs are now able to offer a solution for AM non-directional station operators. The Kinstar antenna conceived by Star-H Corporation, particularly Dr. James Breakall, professor of electrical engineering at Penn State University, was developed into a marketable broadcast product by Kintronic Labs. The Kinstar was officially type-accepted by the FCC on October 25, 2005, for full-time omnidirectional operation in the AM band in the U.S. market in accordance with Public Notice DA 05-2741 entitled *Media Bureau Adopts Simplified Application Procedures for AM Nondirectional Kinstar Antennas.*

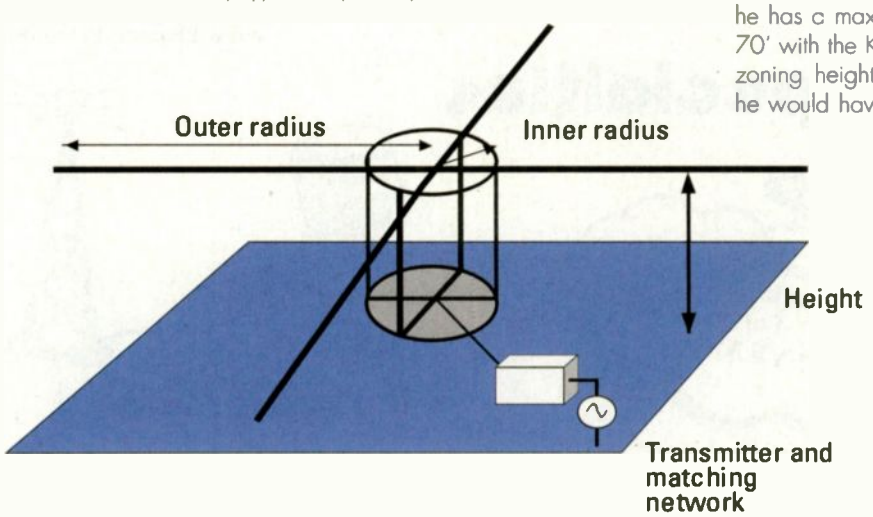

Figure 1. Kinstar antenna final design configuration using lumped element matching and with top and bottom of vertical radiating wires connected together. All antenna wires are insulated from ground and supports.

On Jan. 11, 2009, the first Kinstar antenna was placed on the air by KCST-AM in Florence, OR, operating on 1250kHz with 900W daytime power and 37W nighttime power. KCST owner, Jon Thompson, needed to replace his 57.89 meter tower. His contract engineer, R. Sparks Scott, recommended he consider the Kinstar antenna, which, following further investigation with his consulting engineer, Bob McClanathan, P.E., he decided to install at a location 1.3 miles northeast of his old tower site. As his frequency of 1250kHz, he has a maximum height above the ground of 70' with the Kinstar, which fit well with the local zoning height restriction of 72'. Also realizing he would have no tower painting required with the Kinstar, Thompson saw the decision to go with the Kinstar as a logical move that would save substantially on long term maintenance costs.

The Kinstar antenna design licensed by the FCC as a top-loaded antenna is shown in Figure 1.

The KCST Kinstar was designed in accordance with the scaled electrical dimensions defined by the experimental antenna operated under FCC experimental license WS2XTR for operation on 1680kHz. With an electrical height of 63' and top loading of 134 feet the KCST Kinstar operating on 1250kHz was installed with five 85' wooden utility poles, and standard pole line hardware and cable in one and a half days by a utility company out of Portland. All of the anchors were screw anchors buried in the soil using a hydraulically-driven auger; therefore, no concrete was required in the installation. A 120-radial quarter wave ground system was installed following the antenna installation.

pictured: Modulux Standard

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Figure 3. View of the KCST Kinstar antenna with the center feed at the left, three of the five total support poles shown and the transmitter building on the right with the STL dish installed on the pole closest to the transmitter building.

A photo of the feed point at the base of the center pole of the Kinstar antenna is shown in Figure 2. An overall view of the KCST Kinstar antenna is shown in Figure 3.

With the height of the Kinstar pole supports falling below the average height of trees in the nearby forest, the antenna blends into the background rendering it invisible to the passers by on the coastal highway. As a result, the Kinstar is clearly an environmentally friendly antenna technology.

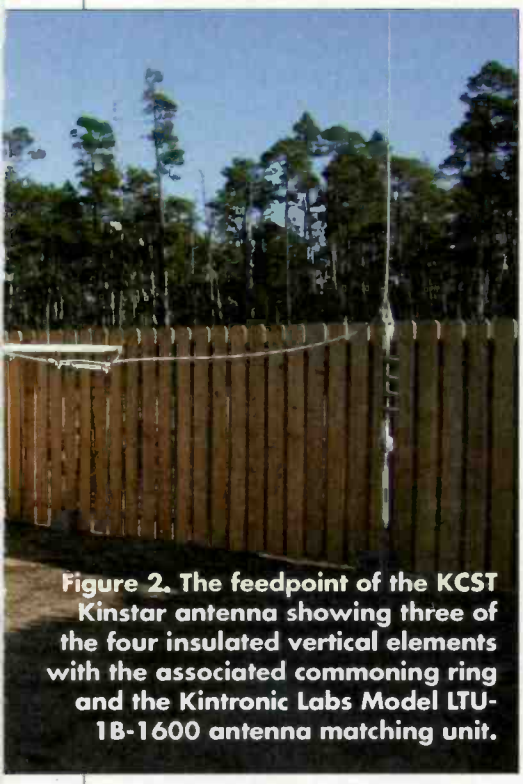

Figure 2. The feedpoint of the KCST Kinstar antenna showing three of the four insulated vertical elements with the associated commoning ring and the Kintronic Labs Model LTU-1B-1600 antenna matching unit.

Another advantage of the antenna is the wide audio bandwidth it offers in comparison to the typically narrow band characteristics of electrically short AM antennas. Figure 4 illustrates the small change in resistance and reactance of the KCST Kinstar measured over the 1250 ±15kHz band.

The inherent audio bandwidth performance of the Kinstar is evidenced by the less than 2 ohm variation in R and the less than 10 ohm variation in X over the 30kHz bandwidth of a typical HD Radio

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channel. Following the initial antenna tune-up and commissioning of the transmitter operation into the antenna Bob McClanathan responded, "This past Sunday, Jan. 11, I worked with Jon Thompson and Sparks Scott at KCST in Florence, OR, to complete the ATU adjustments and measurements for their new Kinstar AM antenna. I am very impressed with the quality of the antenna construction, and the operation is much better than what I expected. The impedance at 1250kHz is Z=15.1 + j80.0 ohms and is flatter than a pancake ±20kHz. Would be excellent for IBOC but fortunately KCST is not going there.

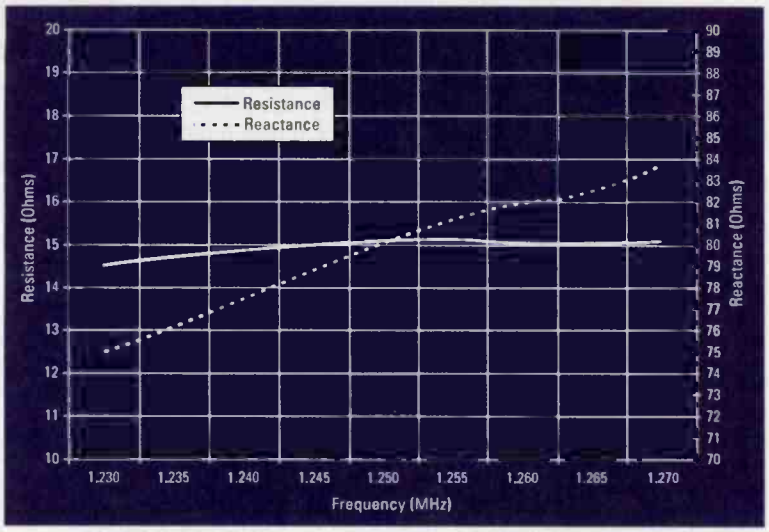

Figure 4. KCST-AM Kinstar antenna drive impedance measured at the output J-plug of the antenna matching network by Bob McClanathan, PE.

"The Kintronic ATU is of excellent quality as usual and built for easy impedance measurements. Very little adjustment was necessary to set the T for Z=50 ± j0 at the transmission line input. The KCST Kinstar is excellent in performance. I met a neighbor near the antenna site who is very pleased with the unobtrusive and nearly invisible appearance of this antenna. When considering the FAA restrictions, local zoning and neighborhood objections, this Kinstar will certainly prove valuable and popular for non-directional AM antenna sites."

King is president of Kintronic Labs.

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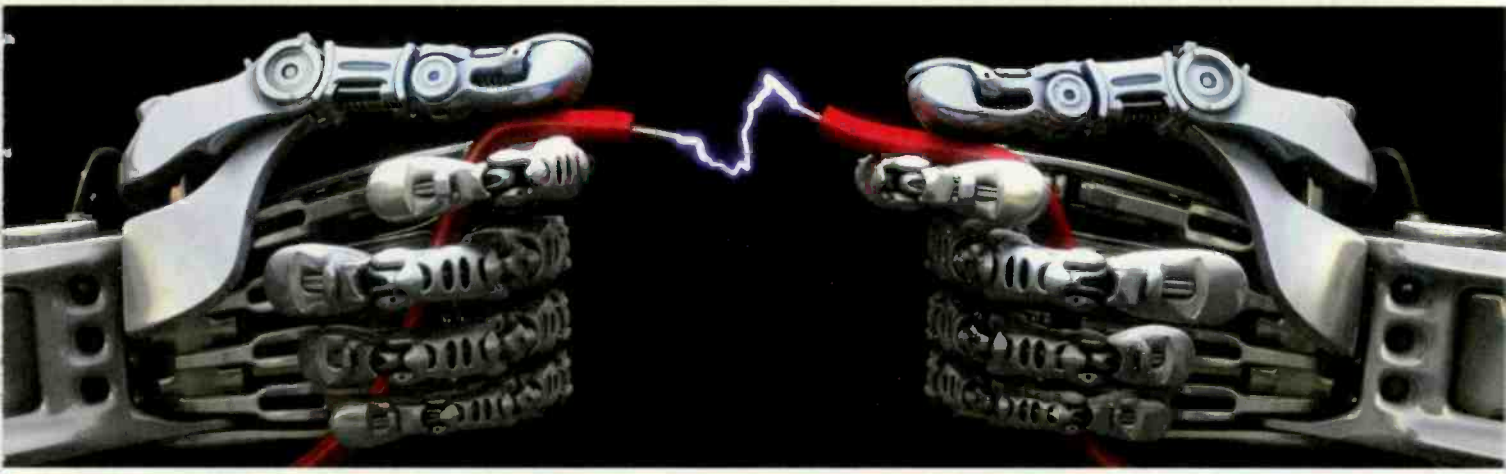

Not since Axia audio-over-IP was introduced to the broadcast industry have we at BGS been so excited! It is with great enthusiasm we'd like to invite you to take a look at the new Op-X Radio Automation delivery system for any single or multi-station cluster. Op-X works seamlessly with Axia IP-Audio networks or as a stand-alone system.

*"The merging of traffic and music logs takes a mere :30 seconds, making it among the easiest I have ever worked with. Once you get used to your adjustable personal color scheme, everything is pretty easy to follow. The best part about this system is the LACK of "dead-air" or "hangups" during automation. PD's will breathe a sigh of relief at this. Another thing that stands out is the absolute ease with which you can build your personal hot keys for each air talent. If you organize your show properly ahead of time and know where you are going, this system will make your show much easier and let you concentrate on *sounding good* on the air."*

~ Jim Franklin, Program Director
WVBO, Appleton/Oshkosh - Wisconsin

"Finally, an automation system that keeps in mind that not every jock is also a computer whiz. This system is easy to operate from the word go.....
yet offers all the bells and whistles that help make your station sound great. The clock builder option makes interfacing with satellite shows very easy. Plus, it has the best voice-tracking capabilities available."

~ Matt Scurry, Operations Manager
WWFN/WHLZ, Florence - SC

"A fast paced station needs a system that can keep up and is easy to use. Op-X gives us the tools we need to deliver the sound Houstonians have come to expect from KRBE."

~ Leslie Whittle, Program Director
KRBE, Houston - TX

If you're looking for an audio delivery system~ you owe it to yourself to find out more about Op-X. Give us a call or email info@bgs.cc!

Broadcasters General Store

352-622-7700 • www.bgs.cc

Op-X RADIO AUTOMATION

BSI

AXIA

by Erin Shipps, associate editor

Digital media system
Broadcast Electronics
Booth N7917

Audio Vault Flex: The Audio Vault Flex digital media system offers new resource allocation tools and studio networking capabilities to broadcasters. New capabilities such as remote voicetracking, interactive talent collaboration, work environment customization and advanced segue editor enable broadcasters to do more with less. BE Audio Vault systems are digital media systems for live-assist or satellite operation, including scheduling and production modules for multi-track editing, music rotation and ad insertion. The new AVFlex platform offers these features as well as advanced features such as in-group program syndication, centralized music library management and multi-location workgroup collaboration. AVFlex is also the first studio platform of its kind with the flexibility and capacity for repurposing content and personalizing format channels for the Internet or over the air.

217-224-9600; www.bdcast.com; bdcast@bdcast.com

Monitors
Fostex

PM0.4 MKII: This powered studio monitor has new high-gloss white front baffles for a striking look. These studio monitors are designed to provide a quality, accurate monitoring experience with minimal resonance. It is recommended for desk-top use, but its compact size expands its applications to console-top studio monitoring, audio installation, and portable audio monitoring. The PM0.4 MKII features a 4" woofer and UFLC 0.65" soft-dome tweeter, high efficient bi-amp drive with 19W each for LF and HF, and independent amplifier in both left and right unites.

800-7-FOSTEX; www.fostexusa.com
sales@fostex.com

Cable tester
SM Pro Audio

CT-2: Powered by a 9V battery, the CT2 is a multi-format cable/connector test unit designed to test a wide variety of standard audio cables and connectors. To use it, connect the cable ends and turn the rotary dial through each position and take note of the LED indicators status. An LED indicates the status. Two banana connections are wired as a continuity tester with LED and beeper indicators.

+61 3 9555 8081; www.smproaudio.com
sales@smproaudio.com

Dynamic mic
Rode

M1: With a rock solid die-cast body and sturdy dynamic capsule the M1 can take a lot of abuse without showing signs of age or neglect. The M1 features a lifetime warranty. Key features include a high-output dynamic capsule, gold-plated XLR connectors, internal pop-filter to reduce plosives, feedback rejecting pickup pattern and low handling noise.

877-328-7465
www.rodemic.com
usasupport@rodemic.com

1RU CD player
Denon Professional
Booth N7636

DN-C620: Housed in a compact 1RU enclosure, the DN-C620 is a versatile CD player. It is compatible with standard audio data file formats including CDDA and MPEG-1/2 Layer III, allowing up to 20 hours of MP3 or similar audio playback from a single CD, CD-R or CD-RW. The DN-C620 features intuitive front-panel control, which allows customizable program playlists and output of ID3 or CD-Text title, artist and album information via RS-232C. Additionally, standard 25-pin contact closure (GPIO) and 9-pin RS-232C control connections are included. The RS-232C remote capability provides added flexibility and allows the DN-C620 to be controlled from third-party devices.

630-741-0330; www.d-mpro.com
info@d-mpro.com

NEW PRODUCTS

Universal DVD/CD player

HHB
Booth N6520

UDP-89: Developed to fulfill the requirement for a compact, industrial-strength, universal DVD/CD player, the HHB UDP-89 production model adds a clean-screen feature that will enhance the UDP-89's suitability for use in broadcast applications. The clean screen ensures that the video output remains free of the brand logos that render consumer DVD players unsuitable for professional use. Furthermore, menu commands and transport status appear only in the front panel display, leaving the screen a clean plain grey when no content is being played. Housed in compact 1RU chassis and engineered for dependable, long-term use, the UDP-89 plays CD, Video-CD, SACD, DVD-Video, and DVD-Audio discs, and features a built-in preamp with volume control for direct connection to active 5.1 speaker systems, Dolby Digital and DTS decoding, MPEG audio decoding, professional cueing, A-B repeat function and RS-232 and parallel control interfaces.

860-434-9190; www.hhb.co.uk; sales@hhbusa.com

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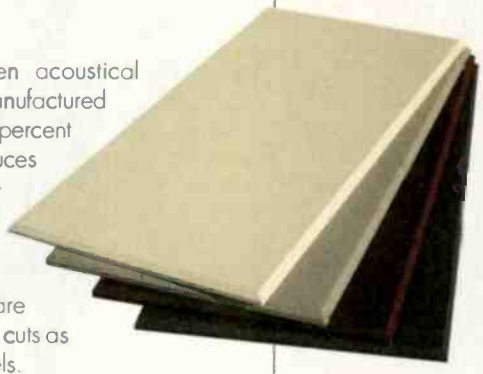
Acoustic panels

Auralex Acoustics



Ecotech: The company's first green acoustical panel, Ecotech acoustic panels are manufactured with a proprietary formulation of 100 percent recycled polyester fibers. Ecotech reduces the ecological footprint of acoustic treatment by reducing the need for fossil fuels for raw materials. The panels are also manufactured without using chlorofluorocarbons (CFC). The panels are available in the same color choices and cuts as the company's original acoustical panels.

317-842-2600; www.auralex.com; auralexinfo@auralex.com

Cable line

Cable Up

Premium: The Cable Up Premium line utilizes a proprietary, low-capacitance Belden cable with a high strand count of 99.5 percent oxygen-free copper. For a long, reliable life of heavy professional use, these cables feature rugged, vulcanized Neoprene rubber jackets that withstand wide temperature extremes, while remaining highly flexible. The XLR cables are terminated with Neutrik X-HD connectors featuring weather resistant O-rings designed for heavy-duty outdoor applications.

608-227-2040; www.cableup.com; templin@fdw-w.com

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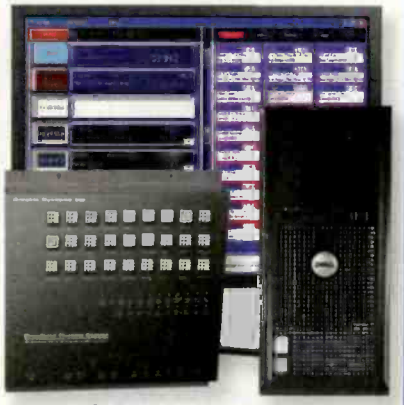

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Digital audio workstation
Cakewalk

Sonar 8 Producer, Sonar 8 Studio: Sonar 8 Producer adds updates to the core application including workflow enhancements, new features, and performance optimizations throughout. Sonar 8 Producer also reinforces its production toolset with new go-to instruments, effect processors and creative content. New Sonar features include: updated Loop Explorer 2.0 view, dedicated instrument track (single track optimized for mono/stereo virtual synths), Send Assign Assistant (wizard); numerous audio engine optimizations; transport, control surface, routing and editing refinements; workflow enhancements; and Quick Time 7 import/export. Sonar 8 Studio contains all of the features of Sonar 8 Producer minus a few Producer exclusives.

617.423.9004; www.cakewalk.com

Surround monitor
RTW Radio-Technische Werkstatten

Booth N3123

10600-Plus: The RTW Surround Monitor 10600-PLUS, a high-performance display system for monitoring digital stereo, multichannel and surround audio signals, now incorporates an integrated loudness display according to the ITU BS.1771 guideline. Further improvements include a full-screen mode for enlarged display showing individual instruments used as well as detail enhancements within the featured Surround Sound Analyzer. All current-production Surround Monitor 10600 systems now leave the factory with the new display options; existing units can be updated free of charge by replacing the built-in EPROM. The PLUS option includes the power supply and a table stand.

+49 221 709130; www.rtw.de

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Digital silence detection
Sonifex
Booth N3217

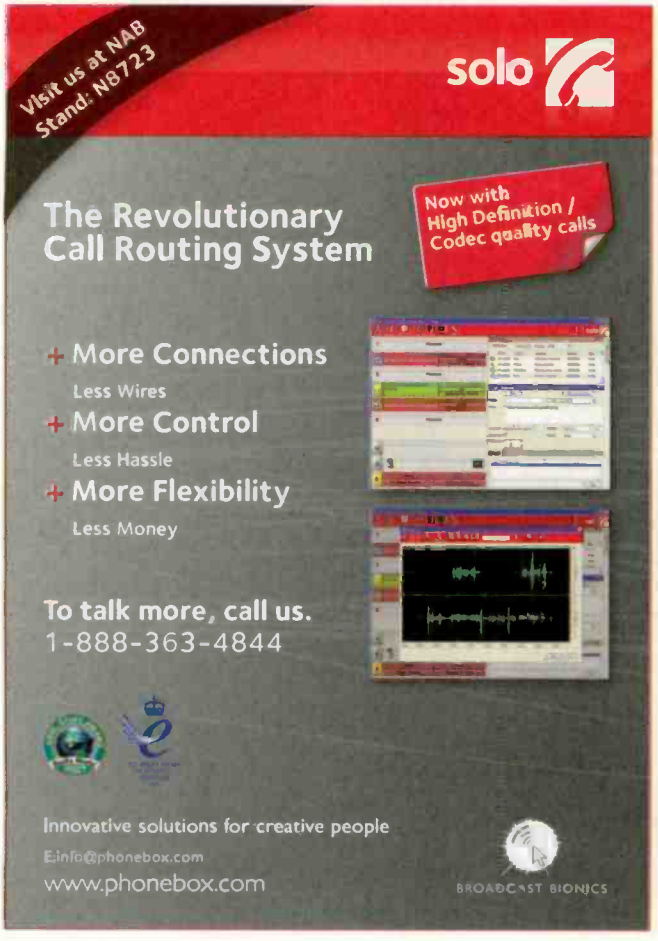
RB-DSD1: Functioning similarly to the Sonifex RB-SD1 analog silence detection unit, the RB-DSD1 digital silence detection replaces the I/O with AES3, S/PDIF and Toslink inputs and outputs. The unit can switch on loss of level of the main input, on loss of level on one channel of the main input, or on loss of synchronization lock of the main input. Each source is monitored for failure and includes a failure alarm. The RB-DSD1 has two digital stereo audio inputs, each one selectable via front-panel push buttons. The inputs include sample-rate converters. The silence detect level is adjustable between -39dBfs and -84dBfs and from 0 seconds to 252 seconds.

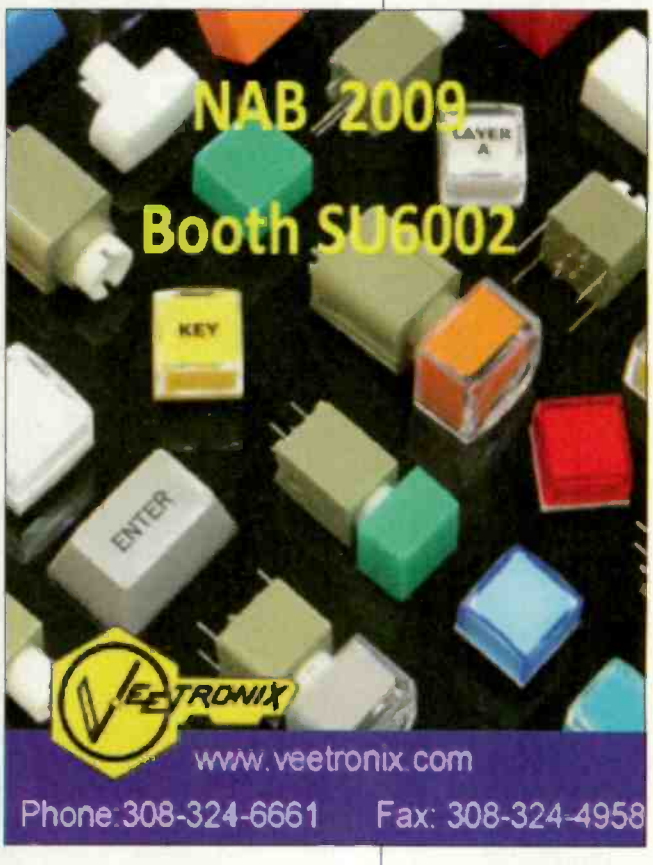
207-773-2424; www.sonifex.co.uk
sales@sonifex.co.uk

FM scanning receiver
Deva Broadcast

Band Scanner GPS: This is a tool to evaluate FM broadcast band congestion and to log station identification parameters. Band Scanner GPS is a Google Earth-compatible tool for visualization of collected FM Radio measurements. When running any campaign with the Band Scanner GPS, results will be saved in a log file that can be converted into KMZ format for Google Earth. The log file can be exported also as transitional format for future analyze or to keep it in record. The Band Scanner GPS can measure RF level, MPX deviation, left and right audio levels, RBDS and pilot injection levels. The system is powered by the USB port of any Windows PC. Free Windows software sweeps the receiver across the FM band, logging every carrier and generating a spectrum display of carrier level vs. frequency. Spectrum plots may be saved as JPG or BMP files.

+359 56 820027; www.devabroadcast.com
sales@devabroadcast.com





Bundled analyzer system
Kaltman Creations

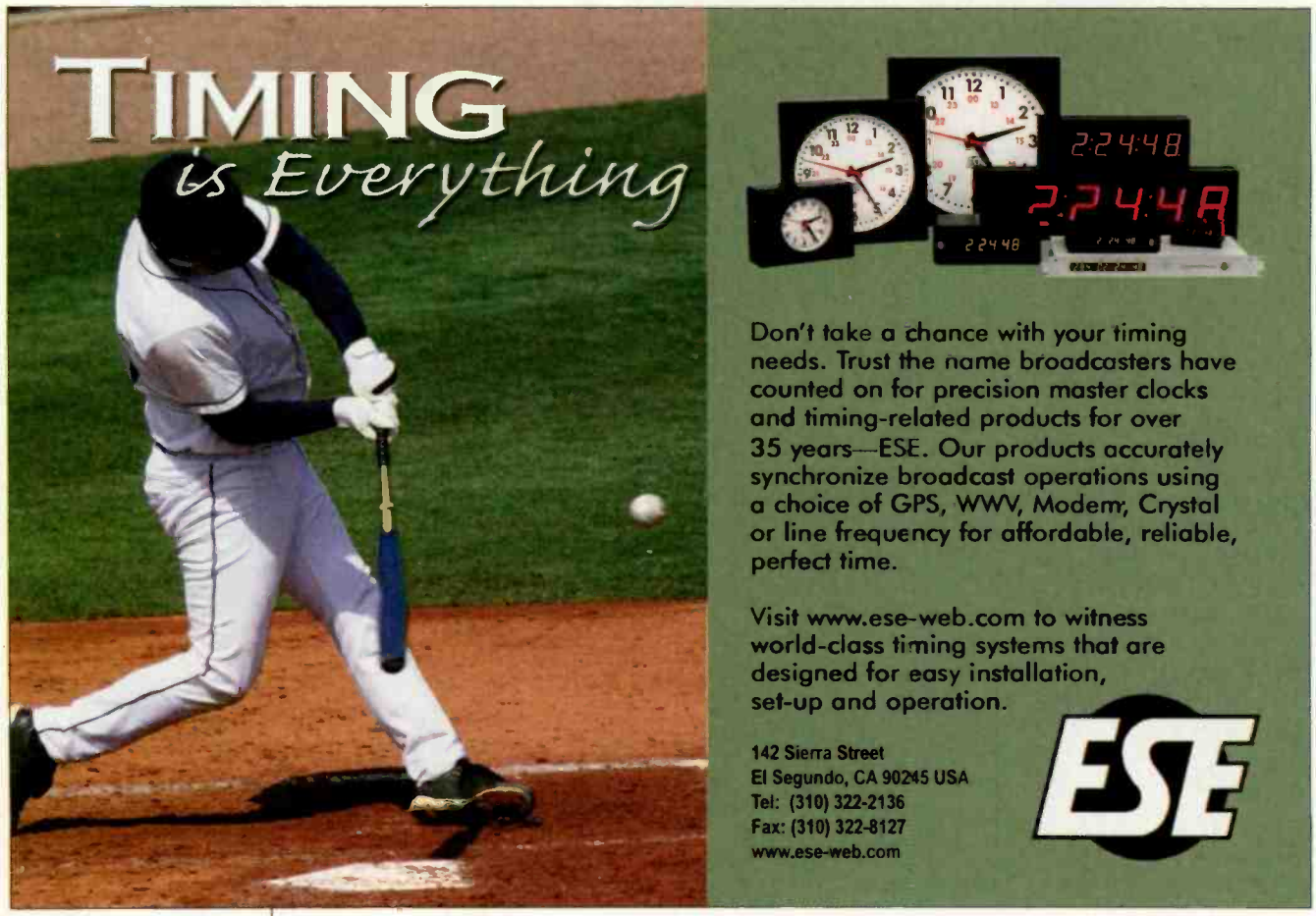
Air Sleuth Pro Bundle V2: The Air Sleuth Pro Bundle V2 combines a software-based 2.4GHz RF spectrum analyzer and a 2.4GHz, 11-channel signal generator. The analyzer allows the user to view Wi-fi channels 1 through 11 individually or simultaneously, with peak, average, and raw trace modes. There are 10 diagnostic modes including Traces, Spectrogram, Channel Time Course, Differential Channels and Pie Charting. Also included is a real-time calculation of Best Wi-fi Channel. There is also a logging and playback recorder for extended monitoring. The bundle also includes Airhorn, a 2.4GHz ISM band signal generator that can be set to generate selective RF signals for any number of the 11 Wi-Fi channels.

678-714-2000; www.kaltmancreationsllc.com
sales@kaltmancreationsllc.com

IP audio console system
Axia Audio
Booth N7620

Power Station: Power Station, an all-in-one IP-audio console system, combines analog, digital and microphone I/O, a console power supply, DSP mixing engine and network switch into one easy-to-deploy package. To set up Power Station, connect the studio equipment with standard CAT-5 cables, connect an Element console with just one cable, name the sources with a browser, and it's ready for air. Power Station can be the heart of a standalone studio or part of a larger Axia network. Power Station Simple Networking can daisy-chain up to four Power Stations for a multi-studio installation without a separate core switch.

216-241-7225; www.axiaaudio.com
inquiry@axiaaudio.com

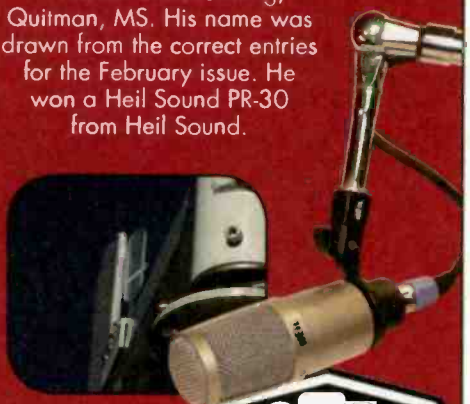


Find the mic winner
February issue

Congratulations to

A.C. Elliott

of Martin Broadcasting, Quitman, MS. His name was drawn from the correct entries for the February issue. He won a Heil Sound PR-30 from Heil Sound.



The mic icon was part of the rudder on the wind turbine.

HEIL SOUND

www.heilsound.com

No purchase necessary. For complete rules, go to RadioMagOnline.com.

NAB

Audio and video broadcast
Netia Digital Audio
Booth SU822

Warehouse Web 2.0: The Warehouse Web Version 2.0 audio and video broadcast and display platform can provide new services and revenue opportunities for Manreo users. It provides companies with a system for centralizing, sharing, and viewing audio, image, and video archives, and broadcasting them across multiple distribution channels. Because Warehouse Web 2.0 has been developed using the REST (Representational State Transfer) architecture and includes XML Web Services, it now offers up to four interfaces, making it more ergonomic and powerful. Warehouse Web's Catalog Interface offers Manreo users a global view of all files and metadata, along with more powerful searches. The Terminology Interface manages the Thesaurus and allows users to add, delete, and modify words and interaction between words. The Media Interface manages the storage of both audio and video files. Using this interface, users can view various files and file format support. Finally, Warehouse Web's Monitoring Interface lets the user track file conversion and publishing workflows to various platforms including mobile phones.

866-638-4222; www.netia.net; j.martin@netia.net

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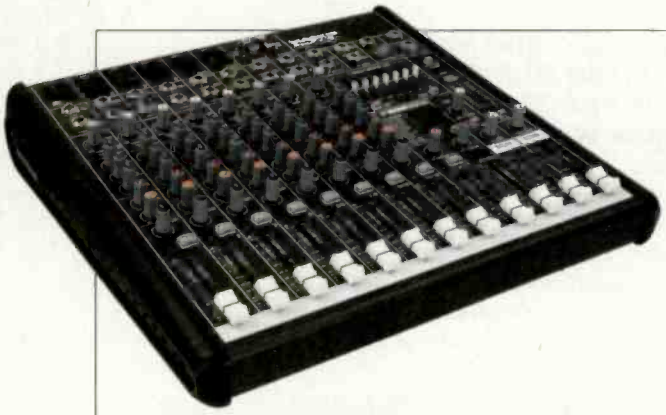

Universal rigid line bracket
ERI-Electronics Research

RLA001-02: The universal bracket for 3-1/8", 4-1/16", and 6-1/8" rigid transmission line hangers provides an interface to adapt lightweight rigid hangers and vertical spring hangers to round horizontal tower members from 3/4" to 3" in diameter. This provides an off-the-shelf solution eliminating the need to have custom brackets fabricated prior to commencing installation.

812-925-6000; www.ERIinc.com
sales@ERIinc.com

NAB 950MHz STL
Harris
Booth N2502

Intraplex HD Link: This 950MHz STL was designed from the ground for today's data communications. Built around an integrated IP gateway, HD Link supports multiple channels of Intraplex-quality audio along with IP transport for HD Radio, and can take advantage of any available IP return path for TCP support with plug-and-play operation. The integrated IP channel for HD Radio program transport provides an ideal link from Importer-to-Exporter or Exporter-to-Exciter for both audio and data carriage, with a separate low-priority Ethernet port included for other LAN and control traffic. Advanced coding and error correction mechanisms provide resistance to bit errors that can cause glitches in HD Radio performance. Intraplex HD Link also offers powerful, reliable RF performance, high-quality multichannel audio performance, plus convenient set-up and reliable operation including full metering, monitoring, and command and control capabilities.

800-622-0022; www.broadcast.harris.com
broadcast@harris.com

RDS/RBDS encoder
Inovonics
Booth N5829

Model 730: Building on the Model 713, this TCP/IP-capable encoder is filled with new features. A front-panel knob allows virtually every setting to be viewed and modified from the front panel. This includes settings such as PI, PTY, DPS, IP, IP-Port numbers, AFs, time/date and RS-232 baud rate. The Model 730 also has built in dynamic DNS client service. This allows a static IP-name while being behind a dynamic IP address. Improvements in RAW command with FIFO buffer incorporate flexible free-format group redundancy. It supports DHCP and manual IP, either configurable from the knob/LCD. MAC address is visible from front panel LCD as well. It includes automatic RDS Group 4, clock time/date packets. When connected to the Internet, the internal clock is automatically updated. Easy time zone selection plus Daylight Saving Time scheduler can change the clock for up to 10 years. The Model 730 also includes scheduler capabilities to allow a planned scrolling PS message independent of an automation system. Allows events to be saved as either a one-time event (date/time, then expires) or a recurring event (M, T, W, Th, F/time, never repeats). Up to 99 events can be scheduled this way.

800-733-0552; www.inovon.com; info@inovon.com

UPGRADES and UPDATES

V-Soft has added a new FCC Activity Alert service for its software clients. The service will alert the users of the construction permits granted, dismissals and other similar FCC activities. (www.v-soft.com)...All **Tieline Technology** G3 broadcast codecs will now include IP on-board as a standard feature. Wireless 3G/3.5G, POTS, ISDN, X.21, satellite ISDN and IP can be added as needed. (www.tieline.com)...**Sage Alerting Systems** is now shipping its new Digital Endec EAS encoder/decoder. This unit replaces the original Sage Endec. (www.sagealertingsystems.com)...With eight codecs in 2RU, the **Telos** Zephyr Iport is now shipping. (www.telos-systems.com)...**NTI** has added a Pin 1 Cable Tester functionality feature to the Minirator MR-Pro. (www.nti-audio.com) ■

Monitoring system
Dielectric

RF Scout XLT: The Dielectric RF Scout XLT monitors RF transmission system VSWR and forward power and is designed to aid in detecting VSWR problems as they develop. The system displays the values and can hold up to a year's worth of data and alarm events. In addition, the system can also be configured to monitor transmission line pressure and temperature. User settable options include warning and alarm levels, enable/disable interlock trip for each monitoring function and a VSWR alarm strike-out number. The unit's status is available via a 3" touch panel and through an Ethernet interface.

800-341-9678; www.dielectric.com
dcsales@dielectric.com

NAB Active stereo matrix switcher
Broadcast Tools
Booth N8120

SS 4.4: The SS 4.4 provides matrix audio switching of four stereo inputs to four stereo outputs. Matrix switching allows any or all inputs to be assigned to any or all outputs. The SS 4.4 may be controlled via front panel switches, contact closures and/or the multi-drop RS-232 serial port. Additional features include stereo silence sensor with relay, front-panel stereo LED VU meters, stereo headphone jack with level control, powered monitor level control all with output selection switching, 16 GPIs, four GPO-open collectors and four SPST relays. Installation is simplified with pluggable Euroblock screw terminals. The SS 4.4 is supplied in a 1RU chassis.

877-250-5575
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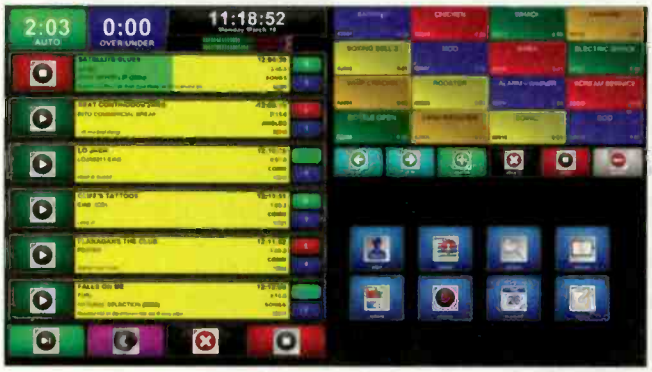
Automation interface
Enco Systems
Booth N7607

Presenter: Presenter, like its predecessor DAD, supports all forms of audio technologies including IP audio, traditional sound cards, audio router control, console interfaces, and general purpose I/O, touch screens, etc. The single screen interface features a panel design with many user selectable tools including voice tracking, hot buttons, recording, database, search and more. Other features include cut, paste and block move of playlists elements, user tabs, backsell log and a number of new and refined user friendly tools designed for live assist and voice tracked operations.

800-362-6797; www.enco.com; sales@enco.com



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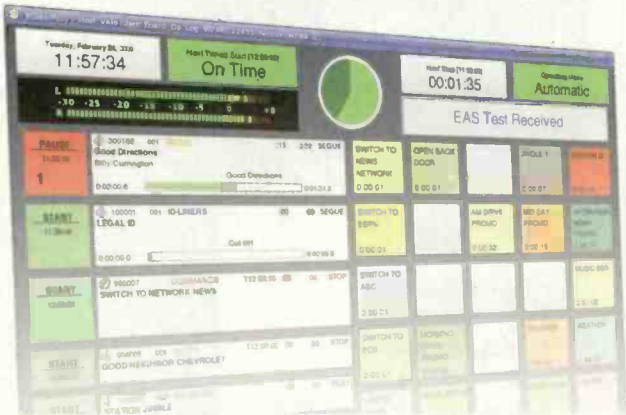

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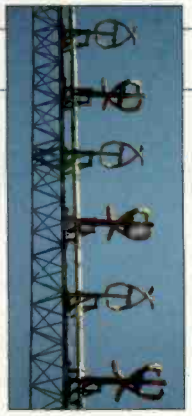

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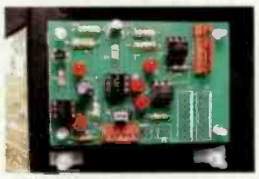

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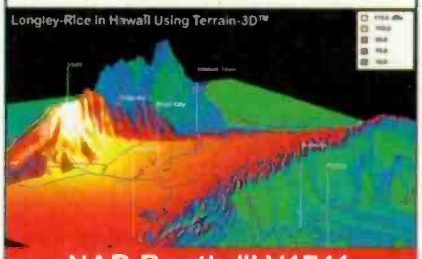

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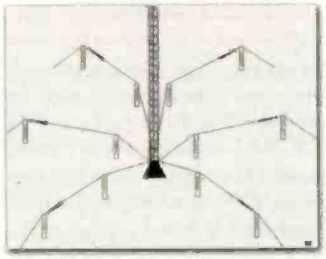

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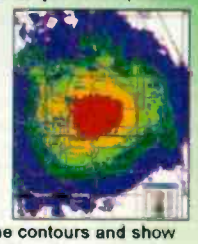

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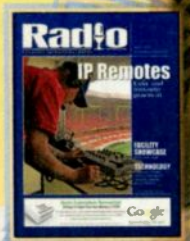

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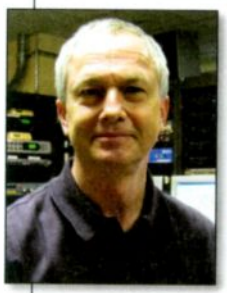

Bob Newberry
Market Engineering Manager
Clear Channel Radio Birmingham/ Tuscaloosa, AL

After six-years in the Navy servicing radar, Newberry began his broadcasting career in 1975 in Brunswick, GA, and bootstrapped himself into chief engineer positions at stations from Mobile, AL, to Louisville, KY. A five-year detour at Martin-Marietta Aerospace started in 1985. He returned to radio in 1990 and is now market engineering manager for Clear Channel Radio in the Birmingham/ Tuscaloosa Alabama market.

Radio
THE RADIO TECHNOLOGY LEADER

Written by radio professionals
Written for radio professionals

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by Erin Shipps, associate editor

Do you remember?

Broadcast Electronics is celebrating 50 years in the biz. According to a press release, the company was founded in 1959 as the inventor of the first broadcast cart machine, the Spotmaster. (Check out the photo of BE's first product, initially used at WWDC Radio in Washington, DC.) In 1965 BE was the first to introduce a multi-deck tape cartridge machine, and in 1978, it introduced the first microprocessor-based program control system. In 1989 the company introduced the first automation system based on the open PC platform, which several generations later carries the BE Audio Vault brand. In 1979 it introduced the first single-tube high-powered FM transmitter. BE entered the FM transmission market with a patented folded half-wave cavity design, the first of its kind capable of eliminating plate-blocking capacitors and sliding contacts. At the same time, the company introduced an FM exciter design that later developed into BE's current FXi exciter line with the use of a direct-to-channel RF frequency generation. During the 2000s, BE became the first to market with second-generation HD Radio products and soon after, developed and acquired technology for the introduction of new data services for HD Radio. Today, BE studio and RF products are used daily in thousands of radio facilities in nearly 100 countries.

Broadcast Electronics is looking for the oldest surviving BE transmitter currently in operation, either operating in standby or as the main transmitter. Visit www.bdcast.com/contest for more information.

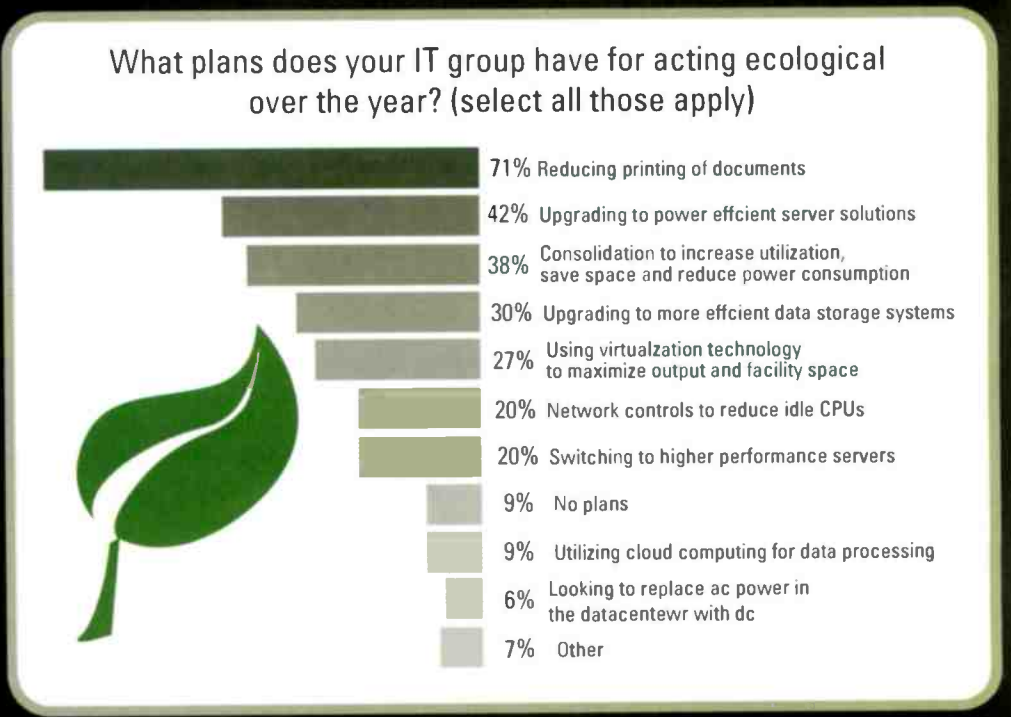
BE Spotmaster

See BE Spotmaster ads from 1961 at www.RadioMagOnline.com

Sample and Hold

Digital Media and Entertainment Industry Going Green

The BPM Forum conducted a pilot online survey of 225 IT professionals across multiple industries to assess the validity, resonance and supporting drivers for the Think Eco-Logical initiative. An astonishing 96 percent of respondents strongly support the idea of going green and reducing energy. Data center energy conservation was a high priority to 85 percent. To download the full report, visit www.rackable.com/thinkecological/index.html.



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For FM stations, expect a sound that easily holds its own with your high-power major market competitors. Listeners comment that with the VP-8 they now hear the rest of the music! AM stations often experience a dramatic increase in coverage area along with greatly improved intelligibility and sound quality.

The VP-8 is also ideal for streaming audio, studio processing, as a versatile backup processor or as an STL protection limiter.

Of course, if tweaking is your thing, VP-8 lets you under the hood with a complete toolset – in the VP-8, nothing is hidden. With its 4-band AGC/compressor and 8-band limiter, the VP-8 boasts more bands than any other processor in its price range to give you a very clean, loud, competitive sound that doesn't destroy the music.

It also includes features rarely found even on top-of-the-line processors: a reference-grade stereo encoder for FM, built-in test oscillator, diversity delay, multi-point headphone monitoring, and extensive metering.

The bottom line? The Vorsis VP-8 gives more bang per buck than any other audio processor in its class (and then some). And since Vorsis is designed and built by Wheatstone here in the US, you know it'll hold up and be supported 24/7 for years and years.

Intrigued? Call us or visit us on the web to learn more or set up a demo. You'll be happy you did. Vorsis—more listeners listening more.

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