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November 2009
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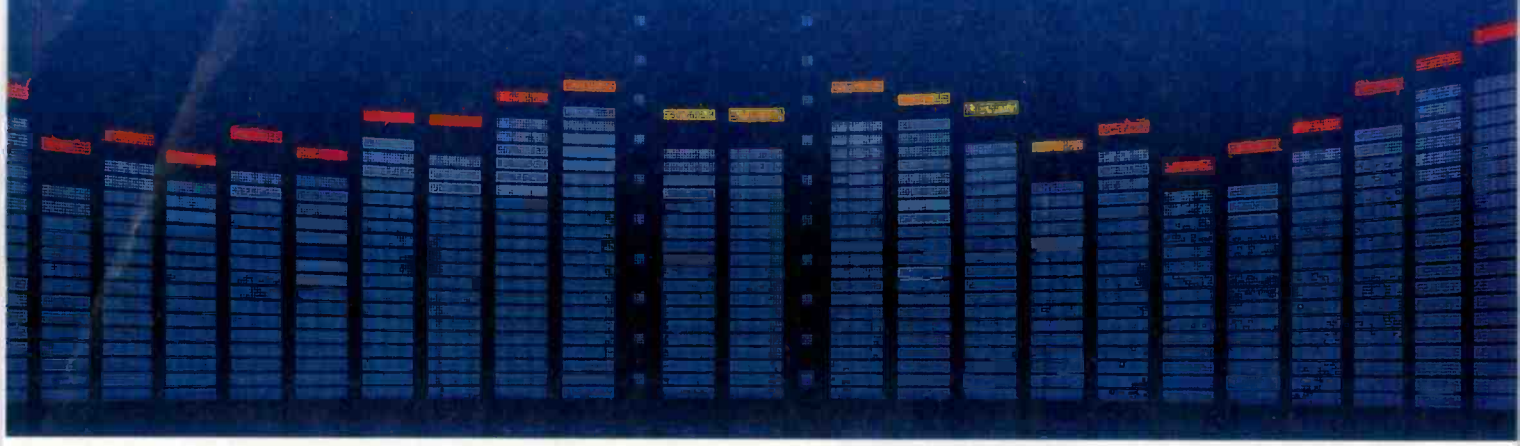

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ON THE COVER

When WFCR decided to base its news staff in its major coverage city, it discovered more than news in the beautiful century-old brick and post-and-beam facility. Cover design by Michael J. Knust.

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Currents Online

Selected headlines from the past month.

FCC Updates ECFS

The 2.0 upgrade adds many new features, including Section 508 compliance and the ability for users to file multiple documents to multiple rulemakings in a single submission.

Don Markley Dies

Donald L. Markley, founder of D.L. Markley Consulting Engineers died Oct. 22, 2009. He was 73. Markley was an occasional contributor to *Radio* magazine and a regular contributor to *Broadcast Engineering* magazine.

Society of Broadcast Engineers Appoints 2010 Committee Chairs

The appointments took effect during the 2009 SBE National Meeting in Verona, NY.

Jim Godfrey Joins Jampro and Comrex Sales Staffs

He will focus on sales in Latin America for both companies.

Monroe Electronics and Digital Alert Systems Merge

Under the terms of the merger, DAS will become a wholly owned subsidiary of Monroe.

Thorsteinson to Retire from Harris

Tim Thorsteinson became the president of Harris in 2006, joining Harris in 2005 when Harris acquired Leitch.

It's not Dyslexia, RTNDA becomes RTDNA

The group's new name is the Radio Television Digital News Association.

Site Features

RSS, Facebook and Twitter

All the content at RadioMagOnline.com is available as an RSS feed, and through Facebook and Twitter.

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Radio News Updated as it Happens

What's happening in radio? Turn to us to find out. Daily news and industry information is posted in the Radio Currents throughout the day.

Webinar: IP Audio in the Studio

Join us Nov. 17, 2009, for a free webinar. Get up to speed on IP Audio technology.

Podcast: John Battison on the SBE

John Battison recalls the early days of fouding the Society of Broadcast Engineers.

Advertiser Links

Web links to the advertisers in the November issue.

Industry Events

The *Radio* magazine Industry Events section lists upcoming conventions and conferences.

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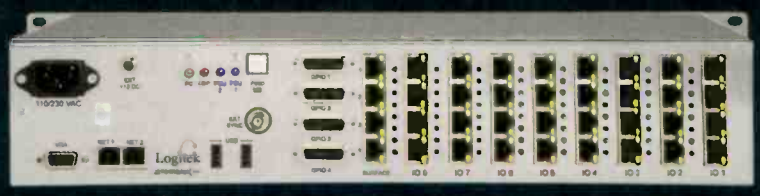

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Changing of the guard

When you think of AM RF systems, the names of a few individuals come to mind. Over the past few years, Ben Dawson and Ron Rackley have been holding the exalted AM guru post with their visible appearances at NAB convention presentations. Carl Smith is of course another name associated with AM. But as a *Radio* magazine reader there's one name you know that is held in high regard when it comes to AM: John Battison. I'm proud to say that he is a significant contributor to *Radio* magazine; you regularly see his column here.

John's career in radio is long and varied. And while I noted his experience with AM, he is just as knowledgeable in FM and TV. His work with RF has taken him around the world, and he epitomizes the title of his RF Engineering column with his knowledge of transmission systems.

John's involvement with *Radio* magazine begins with his work on *Broadcast Engineering* magazine. While *Radio* magazine on its own has been around since 1994, its roots begin in 1959 when *Broadcast Engineering* covered radio and TV. Not long after *Broadcast Engineering* was founded, John was writing for it.

In December 1961, he became consulting editor and penned an editorial outlining the need for a new technical society that would serve the interests of the station engineer. That suggestion took root, and by 1964, John had built the foundations and became the first president of that new society: The Society of Broadcast Engineers.

And while John's RF work is extensive, he has many other interests. He was an RAF pilot in WWII. He is an ordained minister. He loves cats.

In the years of reading his columns before I joined *Radio* magazine in 1997, and then working with him since becoming the editor, I have learned a great deal from him. I'm the first to admit I got into radio because of my interest in audio. I picked up RF along the way, and I certainly have gained a great deal of understanding from John.

Several years ago, John retired from his regular consulting work. He retained a few clients, and he continued writing for *Radio* magazine. What saddens me is that John has told me the time has come for him to surrender his regular column post. He has put in nearly 50 years of writing for *Broadcast Engineering* and *Radio* magazines. I'd say that's a pretty good run.

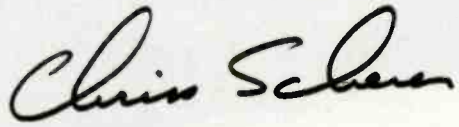
I don't plan to let him just disappear, however. While he may not write a regular column, I will tap his knowledge as a technical resource in the future. You may still see his byline on occasion for special features. So rather than saying John is signing off, let's just say he is going to reduced power for post-sunset operation.

John's last regular column appears in this issue.

Because John has touched so many people in radio, we have created a blog for your comments at RadioMagOnline.com and a discussion thread on Facebook. Please post any comments for John that you would like to share.

Also, look to Sign Off for more of John's accomplishments and history with *Radio* magazine.

The RF Engineering column will continue, and another RF expert takes over the reins from John: Jeremy Ruck. Jeremy has many years of RF experience working with Don Markley (yet another legendary name in RF). Jeremy has written for *Radio* magazine in the past, so it's my pleasure to bring him on to the regular roster.



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

The phasor

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

Over the nearly 80 years that have passed since the first AM DA was built in this country, the state of the art has progressed slowly but steadily. The FCC's engineering department coped well with the new challenge, and through necessity developed a set of engineering rules establishing a method of proving that the completed antenna systems produced radiation patterns similar to the proposals made in the original Forms 301.

Providing the information the Commission required became an expensive proposition and quite possibly resulted in a few less-directional stations being constructed. As the proposed operations tended to become more exotic, a lot of thought was expended on developing a more convenient method of proving a directional antenna pattern. In 2008 the industry's efforts were rewarded and the FCC approved the new simplified directional antenna proof of performance program. Gone now are the mandated expensive, time-consuming and occasionally dubious, lengthy radial runs. In their place is what has become almost a computerized proof. The new DA proof of performance requirements have already been broadly described and discussed; however, the new reduced actual field measurements still entail a minimum amount of actual measurement. These measurements, plus a number of very accurate system measurements, combine together to prove the working directional antenna system's compliance with Form 301.

Heart of the antenna system

The phasor is basically the heart of the AM directional antenna system. This unit, together with other circuit items such as antenna tuning units (ATU), accurately calibrated instrumentation and accurately cut lengths of coaxial cable forms the brain and heart of the DA. Over the past 60 or so years I have come across many different phasors, some were beautiful precision works of art, others were good, solidly constructed work horses and one or two were unbelievable. But they all worked – according to the licenses on the station walls. It seems that with the greater emphasis being placed on the actual system's measured values of individual units ease and accuracy of measurement should have high consideration in phasor design.

The purpose of the phasor is to direct RF of the required phase and magnitude from the transmitter to the individual towers in the antenna array. This is accomplished by feeding the signal into a power dividing and phasing network system whose name was well known by radio engineers long before "Beam me up, Scotty" was a popular phrase, and with a very different connotation!

We have all encountered conditions at transmitters where one had to be a contortionist to access the desired measurement points. Often it was necessary to disconnect components and devices in order to insert a measuring instrument. Examination of the new rules seems to imply that repeatable readings are an even more precise requirement of an acceptable system. For example, in some critical cases it might be necessary to record the actual positions of the OIB leads and also whether the short or long clip lead was used so as to be sure of repeating the measurements under the same conditions. This sort of statement may seem like splitting hairs but my interpretation of the new rules seems to call for much greater care in making and recording circuit and component values than has sometimes been required in the past.

Perhaps some modifications in facilitating easier measurement of circuit values might be worth considering by phasor manufacturers. The placement of such things as jacks for inserting inline operating bridges and similar devices does not always make for easy accomplishment. Some engineers find that a permanent inline bridge mounted at the phasor input common point is very convenient. It certainly is, but it confines bridge use to that one circuit. To facilitate OIB flexibility it might be worthwhile locating a common point input jack on the front panel of the phasor with adjacent provision for supporting the bridge during measurements. Such an arrangement would require a removable insulated cover at the access jack for the OIB clips, but it would obviate the need to disconnect the input cable, which sometimes is necessary when measuring common point impedance.

Inside job

Most engineers have had to open the back of the phasor and connect an OIB to a jack in an individual tower cable. This generally requires opening a phasor door or even occasionally removing a piece of the cabinet. It is not uncommon to find a slight change in the measured circuit values when the cabinet door is closed or the piece of cabinet replaced. I have also noticed this occurs occasionally when opening or closing ATU cabinets in the field. In view of the reliance placed on circuit values and measurements in the new computerized directional antenna proof of performance this may be a point worth considering by equipment manufacturers.

One of the *bete noires* of many station engineers (myself included) is the tapped inductor. This is a useful device, but in my opinion, in many cases its time has passed. For one thing, positive identification of critical tap positions is comparatively difficult to determine. Nail polish is still good, provided it doesn't unwittingly interfere with clip connection. But every time it is changed the flexible lead can also move and change reactance values. The actual tap changing also requires transmitter shutdown and reentry into the phasor or ATU. After this has occurred several times while trying to find the correct tap position, a good-enough position may be accepted through laziness or sheer fatigue.

The use of continuously adjustable inductances is preferred. Not only is correct tuning usually achieved more quickly, but precision adjustments can be made very easily via smooth turning panel mounted control knobs. There is no need to open cabinet doors or remove cabinet panels. Excessive transmitter ons and offs are avoided leading to longer component life and generally improved operational economy. Although continuously variable inductors are more expensive than tapped coils, the additional cost is worth it overall.

Even the lonely ATU inductor in a doghouse or all-weather field mounting would benefit from a change to a continuously variable coil. The time may be ripe now for phasor and ATU designers and manufacturers to look at operational flexibility in the design of such equipment. Maybe the upcoming generation of radio engineers will encounter a new ease of measurement as a facet of the Commission's new directional antenna proof rules.

E-mail Battison at batcom@verizon.net.

Engineers propose abandonment of "ratchet" rule

By Harry Martin

Ron Rackley and Ben Dawson have filed a petition for rule making on behalf of their firms (du Treil, Lundin & Rackley, and Hatfield & Dawson) proposing a significant change in the AM allotment rules – specifically to footnote 1 of Section 73.182(q). Initial comments were due on the proposal on October 9.

The following simple example taken from the Rackley-Dawson petition illustrates how the ratchet rule currently operates: Station A is a 5.0kW station on 1000kHz with a quarterwave nondirectional antenna and a nighttime interference-free level of 3.0mV/m and Station B is a 5.0kW co-channel station located some distance away that has a nighttime interference-free RSS of 13.0mV/m including a single limit from Station A of 8.3mV/m. The Station B antenna was designed to have a null in its vertical radiation pattern protecting Station A, but Station A was there first and does not protect Station B. Both stations have 5mS/m ground conductivity within their coverage areas. If Station A makes a transmitter site change subject to the "ratchet clause" [*i.e.*, Section 73.182(q), footnote 1] and is required to reduce its interference contribution by 10 percent, the single limit from station A will decrease from 8.3mV/m to 7.5mV/m and the nighttime interference-free RSS at Station B will decrease from 13.0mV/m to 12.5mV/m.

Dateline

The FCC has indefinitely suspended the previously-announced Nov. 1 deadline for submission of biennial ownership reports for *commercial* radio stations in *all* states and territories. Licensees will have a minimum of 30 days to prepare and file their reports once OMB approves the new Form 323.

For *noncommercial* radio stations in Alabama, Connecticut, Georgia, Massachusetts, Maine, New Hampshire, Vermont and Rhode Island, their biennial ownership report deadline is Dec. 1.

Dec. 1 is the deadline for radio stations in Connecticut, Massachusetts, Maine, New Hampshire, Vermont and Rhode Island to electronically file their Broadcast EEO Mid-Term Reports (Form 397) with the FCC.

Dec. 1 is the deadline for radio stations licensed in the following states to place their annual EEO Reports in their public files: Alabama, Connecticut, Georgia, Massachusetts, Maine, New Hampshire, Vermont and Rhode Island.

Ratchet rule

The ratchet rule was adopted in the early 1990s as part of an effort to reduce interference in the AM band. Unlike FM and TV, at night AM signals bounce off the ionosphere and come back to earth far away from the transmitter. This leads to serious nighttime interference problems, because the bounce (also known as the skip effect) tends to be somewhat unpredictable. (In fact, the calculations are possible only statistically.) To deal with those problems, the Commission over the years devised a complicated set of standards designed to limit, but not absolutely prevent, the nighttime interference stations could expect to encounter.

The ratchet rule was intended to induce reduction of interference by making reductions in a Class A or B station's contribution to potential nighttime interference a condition to changes in that station's facilities.

The Rackley-Dawson petition illustrates how the rule, in practice, tends to discourage service improvements even when such improvements would greatly outweigh any advantage gained through supposed reductions in nighttime interference. In this connection the engineers point out that the stations most likely to be constrained by the ratchet rule tend to be older ones that cause relatively little nighttime interference, while the stations to which interference would be reduced are newer stations that agreed to accept the existing levels of interference when they were authorized. It appears from the petition that elimination of the ratchet rule would provide meaningful relief for a significant number of AM stations.

Depending on the response to the first round of comments received in October, the FCC may decide to embody this proposal in a formal rule making proceeding. While radio is not a priority for the current Commission, this type of technical proposal, because it does not have any political implications, could well get the agency's ultimate blessing.

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

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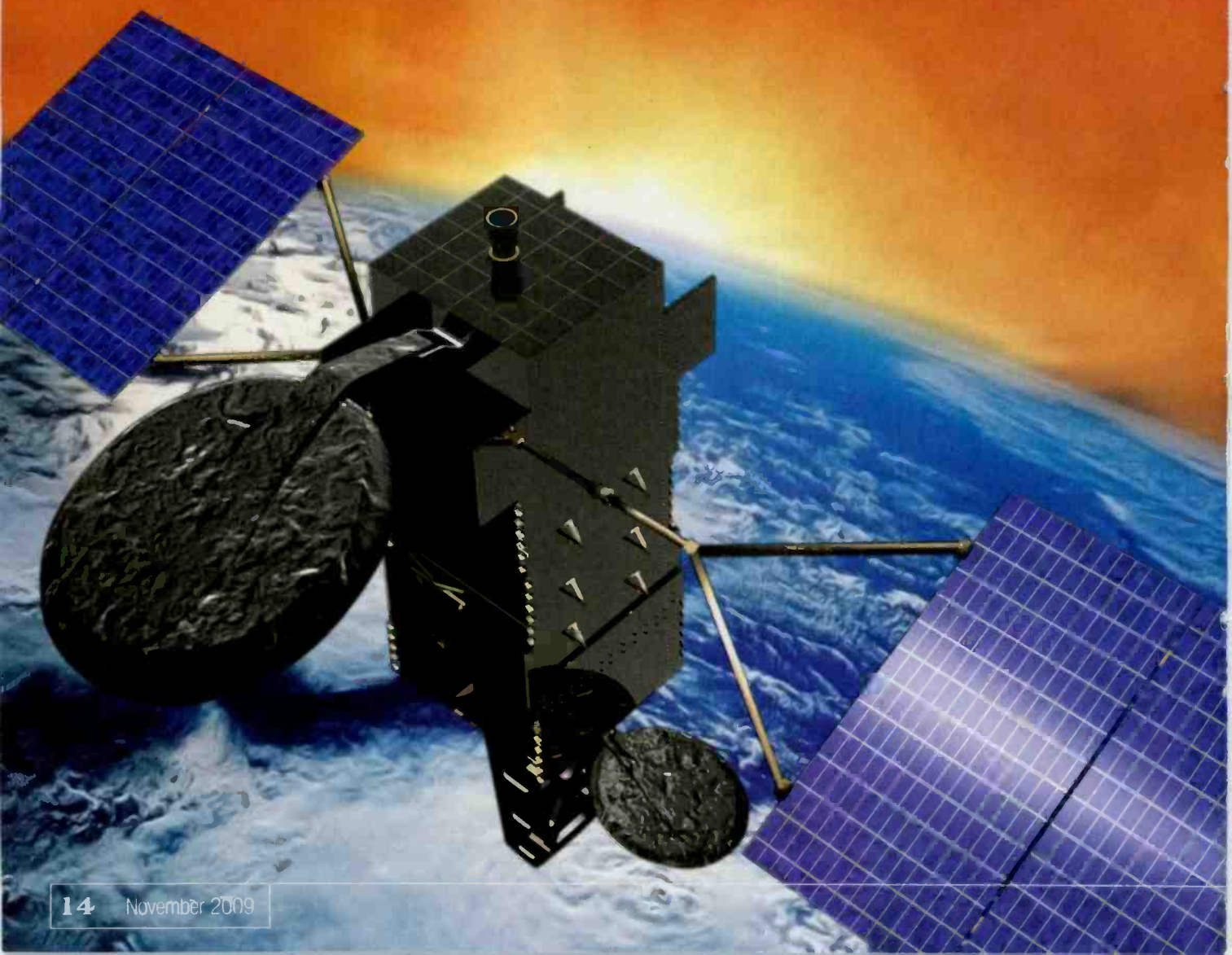
WISE RECEIVER

More than just audio sources, satellite receivers are smarter now.

By Conrad Trautmann, CPBE

The top questions radio station engineers ask about the radio networks satellite delivery systems are, "Why are there so many different manufacturers of receivers? Wasn't it better when the major networks used the same receiver? Now I have a rack full of receivers that all work differently from each other and they take up more space."



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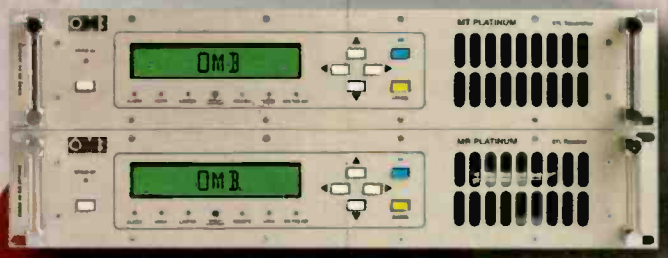
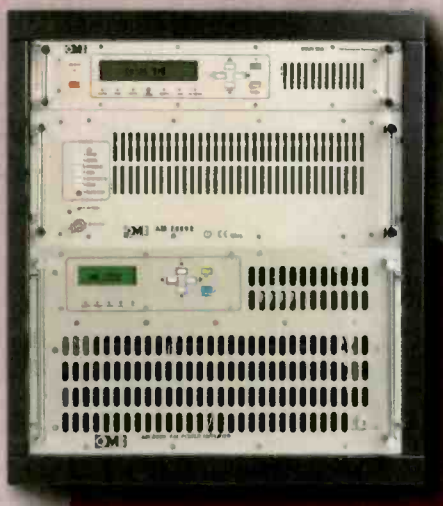


MT/MR PLATINUM >1GHz

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 includes LCD display for the visualization of the most relevant transmission parameters (frequency (6-digit), forward and reflected power, modulation level), balanced Mono, Stereo (MPX). The MR receiver has the same visualization system as the transmitter. It includes balanced Mono and Stereo (MPX) outputs. Furthermore, the MT/MR Platinum STL includes a jumper in order to get a proper operation with digital signals.



EM 2000

is a 2000W FM transmitter made up of the EM 25 DIG exciter (or EM 20/30 exciter) and the AM 2000 FM amplifier. AM 2000 includes eight 300W high-efficiency MOSFET technology amplifying modules, fed by 2 independent switching power supplies, which are made to withstand the working conditions. The amplifying modules work independently thanks to a power combining structure that provides high isolation between them.

EM 10000

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

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Wise Receiver

A big reason is the introduction of store and forward technology a few years back that requires a closed loop network in order to work properly. Store and forward allows the radio networks to do what the advertising world commonly calls copy splitting. The network uploads the commercials in advance to the satellite receiver in a digital file format and they reside on the receiver's hard drive or flash RAM card and wait for a command to play. At the appropriate time during a commercial break, the head-end sends the command (or trigger) and the spot plays from the satellite receiver instead of streaming from the network head-end. Consider the possibilities. In a network with 2,000 satellite receivers, 2,000 different ads could play out of each of those receivers at the same moment. In reality, that's a highly unlikely scenario, but it is possible. The technology gives the networks the ability to be more geographically targeted for their advertisers by offering the ability to regionalize ad campaigns.

Store and forward depends on the receiver always being tuned to its home network so those file transfers make it to the receiver. They are uploaded via a data channel reserved for those file transfers. When this was deployed by Premiere and ABC on the Starguide III system using the EDAS card, a challenge both networks faced was stations tuning away from their carrier to pick up a program on a competing network. While the receiver was tuned away the spots wouldn't be transferred to the receiver and they wouldn't play.

Back to the original question; "Why different systems?" There are definitely other factors that entered into the selection of a manufacturer by the networks including price, long term support, system design and features. However, because of store and forward, there is a strong desire for each network to maintain a secure system to make sure their receivers always remain tuned to their home network in order to facilitate successful file transfers. As described above, a common platform actually created more problems for the networks. Even if all of the networks had selected the same manufacturer to replace Starguide, stations would have still needed a receiver for each network in order to maintain that closed system approach.

Looking at the playing field today, Jones Radio Network, now owned by Dial Global ,the BBC and EMF chose Wegener as their new platform. National Public Radio and Westwood One selected International Datacasting (IDC). ABC, who is now owned by Citadel Media and Premiere Radio Networks who is owned by Clear Channel both selected X-Digital (XDS).

The current generation of satellite receivers offer many new features. Some are shown in the sidebar. Let's explore more in depth what these devices can do.

- *Channel changing*. It's now possible on these systems to make maximum use of the audio cards. Before, with the Starguide platform if your station took more than one show from a network at different times during the day, you either needed to have someone change the channel manually, automate the

Modern Satellite Receiver Features

- Channel change programming, maximize use of the audio cards, no more split channels
- Time shifting
- Logging of signal and closures
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- Web control
- PAD data
- More relays
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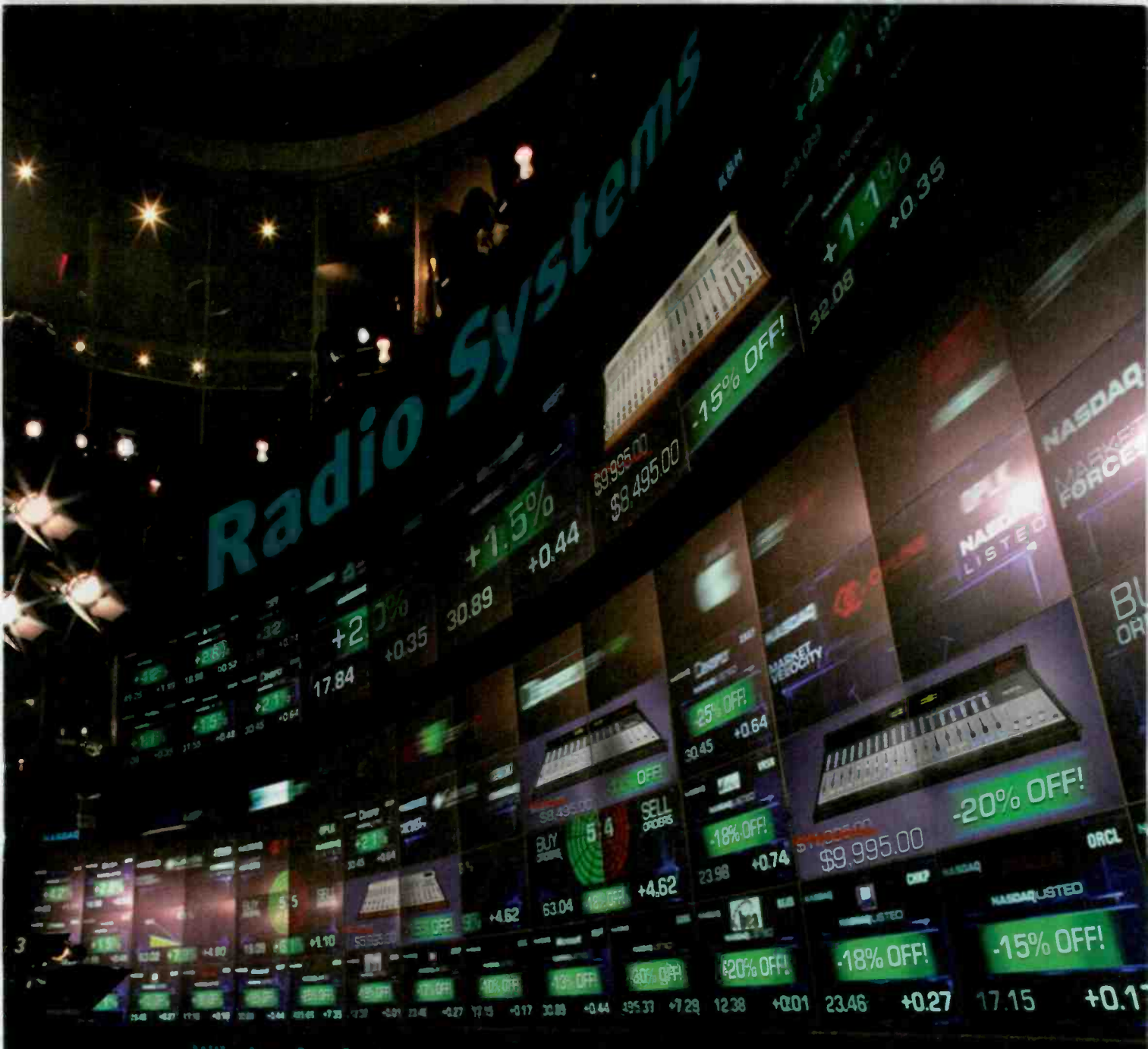
Wegener Ipump 6420

X-Digital XDS-Pro

IDC SFX 3100

The major networks now use one of three receivers



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channel change using some type of serial command from an automation system or third-party device, or use more than one output card from the receiver and tie up multiple inputs on the router or console.

Now, it's possible to pre-program channel changes on a schedule so all of the programs come out of the same audio card on the receiver (provided the shows don't run concurrently). All of the programming uses only one audio card, which makes station engineers happy because they only need one input to their equipment for multiple programs from the same network. Engineers are also happy that they can automate this and not depend on human interaction to make the switches. As a result of this efficiency, manufacturers were able to design the receivers with fewer audio cards. Most networks have either two or four audio cards available on their receivers. Some networks provide direct control of this function while others provide this as a service through the network uplink.

Also gone from most networks is the old left-channel/right-channel audio split to carry two mono programs on a single stereo feed. A program is now on its own channel, no longer sharing one half of a stereo pair.

• *Time shifting.* Many people refer to this as Tivo-type function because it works in a similar fashion. It's possible on most of the systems to save a program on the receiver's hard drive or flash memory as it's playing live and play it out at a later time. This eliminates the need

A URL You Should Know

www.ses-worldskies.com

SES Americom, formally GE Americom is now known as SES World Skies. This Web address has a number of important tools you should know about. The radio network community all use the AMC-8 satellite, which is important to know when using these tools.

First is pointing data. You can enter your latitude and longitude to find out the elevation and azimuth settings for your dish.

Next are the center-of-the-box charts. Satellites fly within a virtual box in the sky. It's important for best reception that you tune your downlink dish at the time that the satellite is in the center of that box. This way as it flies around within the box it your antenna is peaked for the best reception possible.

Finally there is the sun outage calculator. Sun outages can occur when the sun lines up directly behind the satellite. The radiation from the sun interferes with the satellite reception and can cause an outage. The calculator uses your latitude and longitude information to determine exactly when you might experience this type of outage.

for the station to tie up their automation system to do those recordings and playbacks freeing up resources.

• *Logging.* A great troubleshooting tool, most receivers now have logging built in, which is accessible via a Web interface. If you experience a loss of audio, you can check to see what the receiver signal strength was at the time. Or if you miss a relay closure, you can determine if the receiver actually received the trigger to help determine the cause of the problem. This allows the station to investigate issues directly without the need to contact the network's headend.

• *Web interface.* Virtually all of the receivers have a way to reach a dashboard via the Web that allows you to view system receive parameters and make system configuration changes. In some cases you can program your channel time shifting for channel changes from here, in others you may need to go to an Internet Web interface for that. Some networks allow access to their audio files stored on the hard drive through the Web interface, FTP, windows share or other methods as well.

• *Audio quality improvements.* The new fleet of receivers from all of the manufacturers have improved audio quality. There have been many advances in DSP power and the quality of linear analog audio ICs since the design of older systems.

The new receiver platforms, being software based allow the use of higher reduction audio algorithms such as MP3, AAC and others. In any case, engineers have noticed and reported improvement in quality when swapping from the legacy systems to the newer ones.

• *Program associated data.* With the wide use of RBDS and HD Radio, delivering PAD took on a new sense of urgency. Most of the networks have the ability now to deliver title and artist info to the back of the receiver for use to feed those systems.

• *Automation.* Some networks offer the ability to program your own triggers on the system. Rather than depend on a network trigger at the time you want, you have the ability to program a one-time trigger or recurring trigger to close a relay when you need to. A common use of this is a top of the hour trigger, which many stations like in order to synchronize their automation systems to the network.

• *More relays available.* On some of the legacy systems, in some cases the maximum number of relays available per program was two. Now that's climbed to a minimum of four and in many cases 16 relays per channel is a standard.

• *Software upgradeable.* All of the current generation of receivers are able to be upgraded over the air with new software. The predominant platform is a specialized Linux kernel that allows a tremendous degree of flexibility. This isn't new, since Starguide also had the capability, but these newer receivers have much more upgrade flexibility than the older systems.

The latest generation of satellite receivers are clearly the most advanced that we've seen so far. The fact that there are competing systems is probably a benefit for the stations since competition will drive company research and development, leading to new features.

Trautmann is the EVP Technology, Dial Global, New York City.

The control room looking into the studio

Photo by Scott Tulay/Juster Pope Frazier

New Wine

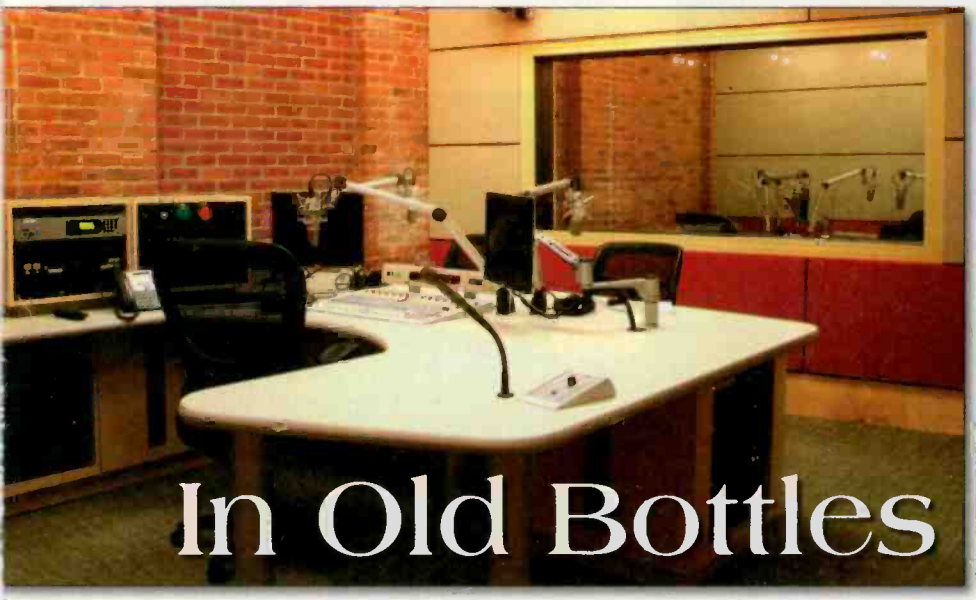

Photo by Scott Tulay/Juster Pope Frazier

In Old Bottles

WFCR exposes more than news in its new studio

By Richard Malawista

Old brick walls and century-old post-and-beam construction are not the first things that come to mind for a state-of-the-art radio studio, but for public radio station WFCR's newsroom, it was all about the character.

WFCR's home studio on the Amherst campus of its licensee, the University of Massachusetts, is set among the rolling green hills and small college towns of Western Massachusetts. It is literally and figuratively far away from the largest city in its coverage area, Springfield. The station decided to enhance its reporting from Springfield by basing part of its news staff right in the city.

The concept

The facility would need a single control room, a studio for four people, and an office for two reporters and two interns. Space was leased from Springfield's public television station, WGBY, which occupies an old warehouse renovated 30 years ago.

Beyond functionality, the WFCR space also needed an identity that would distinguish it from the television offices that surround it. This would help convey the message that the radio station is now physically, as well as in its programming, a part of the Springfield community.

The 1,145-square-foot space is rectangular in shape, allowing the main working space to be only 15' wide – not bad but somewhat limiting the options for room layout. A suspended ceiling had been hung 7' above the floor to accommodate existing ductwork, even though the full ceiling height of the old warehouse was almost 10'.

In addition, an interstate highway runs past the building on one side and a railroad track on another. And the studio was to be built within an office area of the television station, with the potential for noise to pass from office to radio studio and vice versa.

On the technical side, the facility had to be usable for live programming and pre-recorded news pieces. This could include discussion and call-in shows, and the local versions of national news programs like NPR's *All Things Considered* and *Morning Edition*. The control room had to support every level of news production from a single reporter recording a voice track to a fully-staffed call-in program.

New Wine In Old Bottles

Photo by Scott Tulay/Juster Pope Frazier

The studio looking into the control room

Pope Frazier, immediately saw that reclaiming the old posts and beams, brick wall and high ceilings would give character and warmth to a modern radio facility. The existing television offices had to be completely demolished and something new created that would blend the old and the new.

Chrobak lined up the office, studio and control room in a row, with a corridor running along one side to connect them. The low HVAC ductwork was re-routed away from the studio and control room to run over the

Photo courtesy Studio Technology

The studio with control room through the window

Design solutions

Although WGBY had done a very good job of preserving the look and feel of the old warehouse when it renovated the building, the particular space designated for WFCR had been subdivided into many small offices with ordinary walls and that low ceiling. Architect Kevin Chrobak, principal architect of Juster

corridor, so the broadcast rooms could open up to the full height available.

The studio and control room have a raised floor sitting on small blocks of fiberglass isolators. Double walls provide acoustic isolation, with the side corridor serving as an additional buffer. Acoustic panels were applied to all new walls in the studio and control room. The acoustical ceiling has extra sound-absorbing fiberglass backing each panel.

The old posts and beams were left partially exposed to preserve the historical qualities of the building. Instead of burying the posts within new walls, the wallboard was placed between them so the posts are visible between the acoustic panels. Instead of burying the beams behind an acoustical ceiling, the ceiling was hung between the beams, leaving four inches of the old hand-hewn wood exposed.

The brick wall running along one side of the space was once an exterior wall of the old warehouse, but had become an interior wall when a television studio was built on the other side. Demolition of the television offices revealed that the wall's window openings had been filled with unpainted cement block. This was carefully pulled out and the gaps filled with new brick treated to blend with the old.

Equipment

In selecting equipment and furniture for the Springfield studio, WFCR was thinking ahead to the eventual upgrading of its main studio in Amherst. The control board system, microphones, CD players and studio furniture chosen for Springfield will later be used in Amherst.

The control boards will be the biggest change, taking WFCR from the traditional architecture of stand-alone boards with audio running through their modules to a digital audio engine system. The flexibility this gives will be most valuable in the multi-control room setting of the main studio, but for consistency the same brand was installed first in the single control room of Springfield.

WFCR uses Neumann U-87 microphones in the main studio, but needed something less expensive for the Springfield studio. After careful auditioning – because the microphone has more to do with what listeners hear than most other elements of the project do – the station chose one that is much less expensive than a U-87, but good enough to use beside them – the Shure KSM44.

Equipment List

- A-S Matrix office furniture
- ATI distribution amplifiers
- Audio-Technica AT804
- Belden equipment rack
- Comrex Bric-link
- Crown D45
- Dell computers
- Denon DN-C635
- Harbeth P3-ES2
- Kinetics Model RIM floor isolation system
- Middle Atlantic rack panels
- Presonus D8 microphone preamps
- RDL STPA2
- Shure KSM44
- Sierra Automated Systems Rubicon
- Studio Technology studio furniture
- Tascam TU-690
- Tectum acoustical wall panels
- Telos 1x6, Telos One, Xstream
- Torpey CLK20B
- Yellowtec Mika

New Wine In Old Bottles

Photo courtesy Studio Technology

The control room with guests on the right and call-screener station on the far left.

Photo by Scott Tulay/Juster Pope Frazier

The office with two reporters in front and intern workspaces beyond.

Connection to the main studio

Technical integration of WFCR's two studios is critical. Springfield reporters have to use the station's news wire and production software, file stories and get e-mail. A two-way audio link is needed to produce live programs, so that if the local broadcast of NPR's *Morning Edition* is to originate from Springfield, the raw satellite feed can be sent down on one channel and the finished program sent back to Amherst.

At this off-campus site, the Springfield studio needed its own telephone and Internet connections. DSL lines leased from a local ISP support a VoIP phone system and the Internet connections. Reporters can access WFCR's computer system for ordinary purposes like e-mail, but

a direct connection to the News Boss server proved problematic through the relatively slow DSL lines.

At this writing, WFCR is experimenting with two possible solutions: one creates an internal News Boss website that acts as a transfer point for data moving between the two facilities, and the other uses importers at both ends of the link to pull in data from the other end. To send live program audio back and forth, WFCR will install a point-to-point IP audio link through the DSL circuit.

Taking a tour

Visitors enter through the office, whose facade of maple-framed glass and maple-veneered walls make the visual statement the station sought. The office contains work spaces for reporters and interns and a small alcove that doubles as a meeting space and green room. From the office, visitors enter the corridor that connects to the broadcast rooms, and rises four inches to meet the raised floor.

The studio is 12' by 15', with one angled wall to break up standing waves. A custom designed desk places the program host on one side facing the control room and three guests sitting along a curve on the other. The table sits at an angle so the host has good sightlines into the control room between seated guests.

The control room at the end of the corridor is 20' by 15', on the other side of the angled wall. Custom designed furniture places the board operator facing two guest positions across the counter and the studio beyond, with a director's station behind the operator on the right and the call screener behind on the left.

Project Team

Kevin Chrobak, principal architect, Juster Pope Frazier
Laurie Frazer, interior designer, Cobalt Design Studio
L. N. Berneche, contractor
Chuck Dube, CBRE, chief engineer, WFCR
Richard Malawista, assistant station manager, WFCR

Putting it into action

The work progressed quickly. Architect Kevin Chrobak had his first look at the space in December 2007, plans were completed by early spring, and the contractor began work in July. Named for major supporters of WFCR, the Peggy and David Starr Broadcast Center was dedicated in January 2009.

Reporting and programming from Springfield has developed step by step. News reports filed by resident reporters, interviews with Springfield-area guests and live call-in programs are putting the bureau to good use.

WFCR's Sustaining Success Capital Campaign, which supported the creation of the Springfield studio, now turns its attention to improving the station's main studio. The experience and knowledge gained in developing the Springfield studio will contribute greatly to the next project's success.

Malawista is assistant station manager of WFCR. He managed the Springfield studio project along with chief engineer Chuck Dube, CBRE.

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KJDL, Lubbock, TX

" I like (Xtreme) a lot! Once we got things together we never have any problems. (Xtreme) is a 9 out of 10 for usability. It didn't take me long to figure out, I picked up most of the major (features) in the first day. (The Xtreme) is user-friendly for all involved."

Jessie Walker, Program Director

DMS Broadcasting, San Francisco, CA

" When we started, we were jumping into something we knew nothing about! We called your tech support & within a day they had a solution. It was miraculous. They helped us get wired up & set up. (Tech Support) had a positive & upbeat attitude. They went above & beyond!"

David Trudrung, General Manager & Co-owner

WDHC, Berkley Springs, WV

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George Lemait, Station Manager

KSMZ, Alexander, AR

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Broadcast History

Through John Battison's Eyes

Battison addresses the crowd to accept the NAB Engineering Achievement Award at NAB1998 (left); with *Radio* magazine Editor Chriss Scherer after accepting the NAB award (center); and accepting the Society of Broadcast Engineers Lifetime Achievement Award at NAB2006 (right).

In 1998, John Battison was awarded NAB's Engineer of the Year Award for radio. To know John is to know the history of our industry, and to hear him speak is an education in itself. The acceptance speech he delivered to accept the NAB award outlines part of John's amazing career and illustrates perfectly to the industry's relative newcomers just how far we've come. A transcript follows.

In addition, in 2006, John was awarded the Society of Broadcast Engineers Lifetime Achievement Award. John is the founder of the SBE.

Good afternoon NAB, fellow engineers, ladies and gentlemen. Thank you National Association of Broadcasters and my sponsor for this honor. I'm very proud to receive it. I finally retired this spring, and it's 1000dB nicer than a gold watch.

Looking back over 52 years of broadcast engineering, I want to thank all the people who have helped me. Among these are Frank Marx, who hired me in the ABC Engineering Department, and especially Carl Smith, who has been a very good friend for most of my engineering life, as well as a fine employer.

Television came to life when ABC received its TV CPs, and we had to find a TV studio site in New York. We decided on the old riding stables just off Central Park. Then we had to get rid of the birds and the horse's souvenirs.

We had hoped to put the WJZ-TV transmitter on the RCA building. In the interim, we put it on the Pierre Hotel and got a horrendous ghost on Westchester County.

I met most of the famous engineers who made US radio what it is today, and many of the pioneer radio inventors including Lee de Forest and Major Armstrong, the inventor of FM. I built an Armstrong Super Regenerative receiver in the 1920s, so of course I already knew his name. When I met him, he was "Major FM."

As time passed, AM became "ancient modulation" and FM became the "forgotten medium." Eventually, FM took hold and we engineers pretty well filled up the New England area with FM stations.

In 1961, in a *Broadcast Engineering* magazine editorial, I urged the creation of a broadcast engineering society. I received lots of support. In 1963, I personally wrote to every radio and TV chief engineer – about 6,000 letters – proposing that we start one.

In 1964, NAB gave us space in the Chicago Convention; about 100 engineers turned up. I was made steering committee chairman, and the Society of Broadcast Engineers was formed. We published a quarterly SBE journal with a lot of member input. We had great industry support and led off with a greeting from the FCC chairman.

In 1965, I was elected president. We had about 400 members and eight chapters around the country. I handed [the reigns] over to Charlie Hallinan as president

in 1966, and the SBE never looked back.

Also in the sixties we had the "10% Rule," which allowed us to build new AMs - provided there was not more than 10% interference! Finally, the FCC imposed an AM freeze to undo the mess that AM was in.

Then there was a burst of activity from the daytimers, and Ray Livesy headed up another attack on the FCC to liberalize night operation. This resulted in some strange night powers ranging from about six Watts to several hundred. Many small towns received some level of new, local night radio service.

Sometime during this period, AM stereo came – and went – mainly through FCC vacillation. By the way, I liked Leonard Kahn's system best.

The US participated in the Region Two World Administrative Radio Conference in Buenos Aires in 1980, and I was honored to be a member of the FCC/Industry team. We went down to the conference with strict orders from the FCC to plug for nine kc AM separation.

The reason given was compliance with the official Region Two channel spacing and to make room for more AM stations. Another argument was to avoid one kc heterodynes from increasingly powerful AM stations in Europe and the emerging nations. Actually, there were very few "whistles."

After being in Buenos Aires for about four days, we had succeeded in persuading many other delegations from the Americas that the change was good. Then we suddenly received orders from the FCC to forget nine kc separation! With rather red faces, we had to change horses in midstream and persuade them to switch back to 10kc.

The FCC introduced the "standard" antenna pattern. It replaced the old MEOV that was the consulting engineers lifeboat when a pattern wouldn't come in.

The end of the eighties saw LPTV come into bloom and CPs were issued by the hundreds - but not all were built.

By this time, engineers in radio stations were a thing of the past. "Five-week wonder" First Class Licenses made DJs into engineers, and remote control took over many of the operations. Automated transmitter operation and reduced FCC logging requirements were introduced, and only high-power and directional AMs had to make log readings every three hours.

I wonder how many remember the days of logging transmitter readings every half hour? Or logging base currents daily? It's quite different today.

So different, in fact, that we don't need licensed operators any more. Unfortunately, the pirate broadcasters think *they* don't need licenses either!

The AM band has been expanded to 1710 kc and a few new stations and a few new stations are on the air.

We've advanced from the Conelrad system, through EBS to EAS. This still has problems, but no doubt, eventually, it will work as planned.

Perhaps the greatest change has been the introduction of a piece of rare metal contaminated with an exotic oxide - I'm referring, of course, to the transistor. This little device has changed radio engineering. First came transistor radios plugged into the world's ears. Then came its big brother - the transmitting transistor. Transmitter manufacturers switched from tubes to transistors as fast as new methods of RF power generation were developed.

The old, single-modulated channel, Class A, triode AM transmitter has developed into multi-channel units like its FM brother. Satellites are offering direct multi program sources and the days of the crystal receiver and headphones are numbered!

When the digital revolution hit radio, its amazing versatility spawned new transmission methods. Almost every day we hear of new ones.

Spread spectrum, once top secret, has given us legally unlicensed STL operation with low power and low costs.

I haven't even touched on Eureka, DAB, RBDS, cell phones, PCS, GPS, wireless services and the dozens of things still to come.

Radio engineering's advances from 1945 through 1998 have been fantastic. Someone will say, "He's forgotten – whatever." I apologize. Too many things have happened to cover them all.

Speaking as an RF engineer, I still maintain: "Audio is something that messes up a nice, clean carrier."

NAB, fellow engineers and ladies and gentlemen - I thank you.

A podcast of John's SBE acceptance speech discussing the roots of the SBE is posted at RadioMagOnline.com.

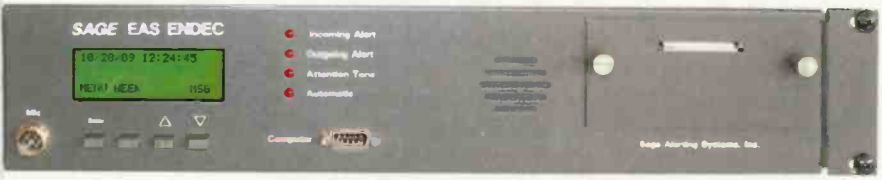
Tips, tricks, hints and more

By Chriss Scherer, editor, and John Landry

EAS check-up

Regular maintenance and inspection should be a part of any maintenance routine, but it's often easy to shift into a deal-with-it-when-it-breaks routine. One piece of equipment that can be left untouched for some time is the station's EAS encoder/decoder.

Bad weather and emergencies can happen at any time, so it's important that the EAS units are always functioning.



Phil Johnson, chairman of the LECC in Seattle, recently shared his thoughts on maintenance steps for the Sage Endec.

1. Replace the clock battery once a year. It uses a CR2330 button cell.

2. Check the unit's time and date and correct it as needed. Johnson suggests checking the time accuracy once each month.

3. Set Daylight Saving Enable to NO. While the unit can adjust for Daylight Saving Time, EPROM versions 6.2 and earlier have the old Daylight Saving dates imbedded in them.

4. Manually set the UTC offset to account for the change in Daylight Saving Time.

In addition, the wall wart power supply is known to deliver just enough power to the unit. Over time, the supply may be insufficient to power the unit reliably, especially if the internal printer is used. Many engineers replace the supply with one of a higher current rating.

Daryl Parker of TFT has also provided some notes for the TFT 911 EAS encoder/decoder.

1. Update the firmware if necessary. It should be V.87.2.EN or V.82.1SP

2. Replace the lithium battery if it has not been replaced in the last 6 years.

3. Replace the battery in the digital voice recorder if it has not been replaced in the last 8 years.

4. Check the Vcc voltage at U19 pin 32 or at the front side of R101, a 1 ohm, 1/2W resistor near the junction of U17 and U19, and adjust VR1 on the switching power supply as necessary to maintain a supply voltage of of +5.0/-5.1 Vdc.

5. Ensure the ac transformer is plugged into a 60Hz reference. The internal clock is referenced to this source.

Do you have another brand of EAS unit and have some tips to share on keeping it operating at its best? Perhaps you have additional tips for the Sage and TFT units. Tell us about them.

USB audio interfaces

Professional quality audio cards are expensive and many times you have no choice but to make do with the built-in sound interface from standard PC. One example is the Henry Engineering USB Matchbox II, a generic, stable USB interface with stereo professional level XLR inputs, outputs and even a headphone monitor. Windows PnP recognizes it and it provides error-free great sound for almost the same price as the old analog Matchbox. And the extra added bonus of a headphone is perfect for editing.

Several manufacturers provide similar interfaces, including Yellowtec, Tascam, Digigram, Musicam, SBS and Edirol. Some are extremely portable and can be tossed in a laptop bag.

We need your tips!
Ideas submitted to Tech Tips may be suitable to earn SBE recertification credits.

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

Do you have a tech tip? Send it to us at radio@RadioMagOnline.com

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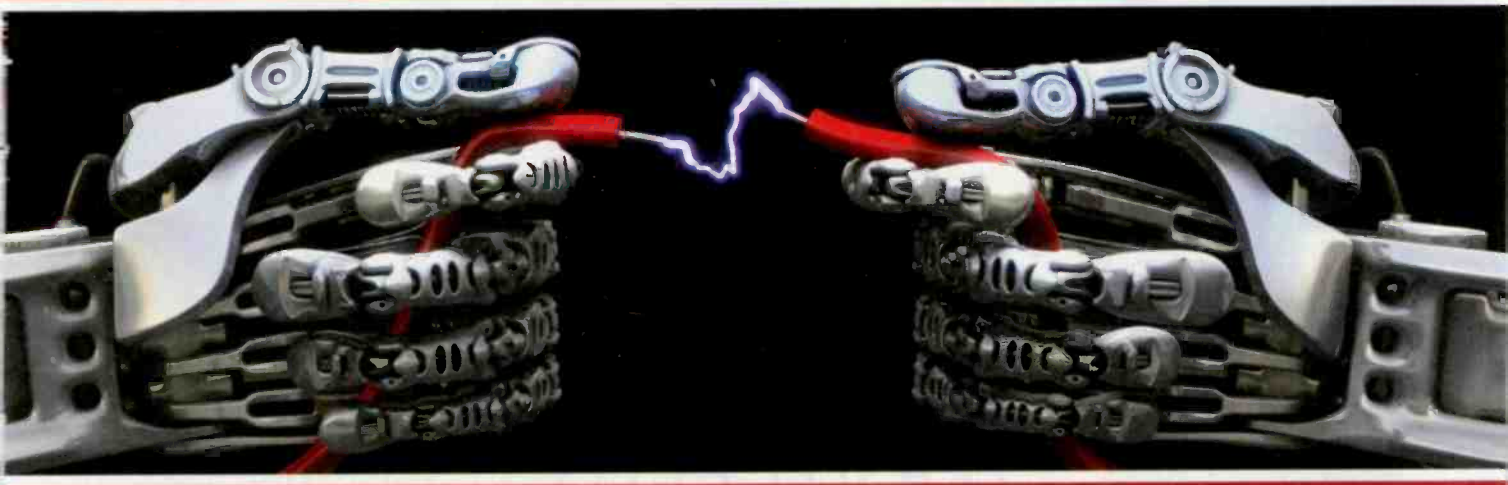

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~ Jim Franklin, Program Director
WVBO, Appleton/Oshkosh - Wisconsin

"Opx is very functional and easy to use. One the best features is the log merge. On our old system it took minutes and with Opx it takes only seconds"

~ John O'Dea , Operations Manager
WNNK-FM, Harrisburg - PA

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~ Leslie Whittle, Program Director
KRBE, Houston - TX

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Zoom H4n

by Chris Wygal, CBRE

In an era when our world is computer-based and everything needs to be finished yesterday, we'll invite any opportunity to make our jobs faster and easier. The Zoom H4n is a perfect solution when top-level audio must be captured quickly. With every on-board tool needed in today's competitive and high-impact ENG or production environment it is more than capable.

During a recent interview I was asked to record the interviewer and his guest as they strolled around the airplanes at an aviation mechanics training facility. So I took the H4n on its maiden flight. There was nothing intricate about recording the interview material; I simply brought along my favorite condenser shotgun mic and plugged it into one of the two XLR jacks on the bottom. Luckily, the H4n provides 24V and 48V phantom power. I wanted to also capture the ambient noises of machinery and tools used during the interview. Typically, I would have plugged another shotgun mic into another channel on the recorder. However, I wanted a lively, stereo recording of the room noises. Good nat sound was a priority on this project.

Atop the device is a built-in X-Y mic configuration. The mics are switchable between 90- and 120-degree directivity patterns (by rotating the mic elements), which make the reproduction of ambient source sound remarkable. A very accurate stereo image is reproduced without the threat of off-axis anomalies such as phase and delay problems found in typical V-shaped miking techniques. Since the mics are mounted directly to the body, I was careful to handle the unit so as to not record handling noise on the two tracks. The H4n includes a 3.5mm headphone output, so monitoring the handheld shotgun mic and the stereo mic pair was easy.

When the recording was ready for production, one track was the interview material from my shotgun mic, and two tracks were from the built-in stereo mics. Simply dumping the files from the recorder to a folder on my PC via USB was a snap. The file folder configuration is easy to navigate when moving, editing, playing back or deleting files if necessary. With the USB connection in mind (cable included), the H4n can also be used as a USB interface for PC (XP) or Mac (OS X) and it can also make a handy SD card reader. It uses an SD card as the storage format. A 4GB card, for example, will record 68 hours of stereo audio.

Performance at a glance

- 1/4"/XLR combo jack inputs with phantom power
- 3.5mm input
- High-quality X-Y built-in stereo mic configuration
- Quick recording setup
- USB interface
- Includes 1GB SD card
- File editing and multitrack capabilities
- Includes Cubase LE4 editing software
- Records MP3 and WAV files
- Powered by two AA batteries

The warehouse

In an interview session much like the aforementioned, I recorded another interview with the same shotgun mic, headphones and recorder. The session took place in a warehouse where noisy packaging equipment, large metal doors and forklifts were actively making ambient noise. I wanted to capture natural sound on this project as well and we set aside time to do so. I closely followed the forklifts, stood next to the doors while they opened and shut, and hovered nearby while workers boxed items. All of these sources were piercing and loud and would typically be cause for nervously checking recording levels for peaks and distortion. I applied Limit3 (Studio) and the H4n handled high SPLs and general conversation on the shotgun mic perfectly. Low-cut settings ranging from 80Hz to 237Hz are available for each input and five other compression settings and limiters are available for vocal and instrument recording as needed.

Recently, I placed the H4n in front of a guitarist and vocalist each at separate times. From 6' away, the stereo reproduction of the guitar was accurate and especially transparent. The recording of the vocalist was accurate as well. One may assume that an expensive microphone should be used with the H4n, but the built-in stereo X-Y configuration mounted on the unit is deathly accurate.

Zoom

P 631-784-2200

W www.samsontech.com

E info@samsontech.com

All in one

The Zoom H4n comes with a 152-page manual covering endless applications explaining where and how the unit can be used, especially for musicians who need metronome, chromatic tuners, simultaneous multitrack recording and playback and track bouncing. A resourceful producer may find a need for these musical features. However, for now we'll focus on the absolutely necessary functions. A 3.5mm jack is located on the back for an external stereo mic. On the bottom of the unit are two XLR and 1/4" combo jacks for mics and instruments plus the jack for the supplied power supply. The left panel facilitates a wired remote control (not included) 3.5mm headphone and/or stereo line output, output volume control, USB jack and power switch. The right panel includes a slot for the SD card, record level control, menu button and the menu toggle dial. The front panel is home to the LCD menu screen, transport buttons, input select buttons and four buttons that double as track select or menu navigation buttons. The H4n is highly menu driven. Within minutes however, the user finds the menu and its submenus easy to navigate.

The recorder operates in stereo, four-channel (4CH) and multitrack (MTR) modes. In stereo mode, the built-in stereo mics, an external stereo mic or the XLR/1/4" combo inputs are recorded to two tracks. In four-channel mode, four tracks of any combination are recorded. In multitrack mode, the H4n acts as a mulitrack recorder, using a built-in menu-driven mixer with pan, level and other common mixing capabilities stored with the multitrack files in the folder archive. Available recording formats range from 48kb/s to 320kb/s or VBR MP3 files to 96kHz/24-bit WAV files in stereo mode. It will record at resolutions up to 48kHz/24-bit in four-channel mode. Of course, it will make mono recordings as well.

The H4n uses two AA-batteries. The battery compartment is on the back and inside the compartment is a stamina switch. Stamina mode tells the device to conserve battery power by using the orange backlight and other display and recording features more economically. The unit is packaged with a microphone stand adapter, wind screen for the built-in mics, a 1GB SD card, USB cable, ac adapter and a clear carrying case. A Cubase LE4 DVD comes standard as well so editing can happen immediately on a PC or Mac. Information about how to create surround recordings using the H4n and other Zoom products is also available online.

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

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

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

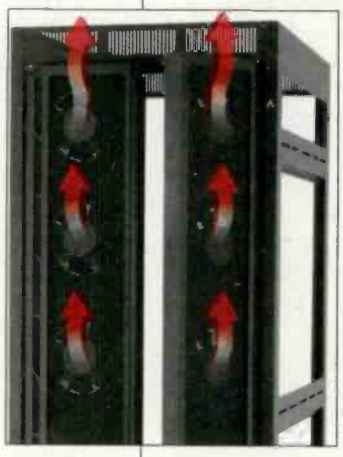
It is the responsibility of *Radio* magazine to publish the results of any device tested, positive or negative. No report should be considered an endorsement or disapproval by *Radio* magazine.

NEW PRODUCTS

www.RadioMagOnline.com

by Erin Shipps, associate editor

High CFM split rear doors
Middle Atlantic Products



MW-CFRD: Protect equipment from the damaging effects of heat from servers, NVR's and DVR's with the adjustable six-fan High CFM Rear Door. This cupboard style split rear door pulls hot air from the rear of the cabinet and directs it up toward return air ducts. Fan placement is adjustable for optimal airflow and up to 10 additional fans can be added for 3,520 CFM of free air movement. Two adjustable half blank panels are included for versatile fan arrangement. Additional half blank panels are available for greater control of fan placement.

973-839-1011; www.middleatlantic.com
sales@middleatlantic.com

IP codec
Tieline Technology

Tieserver: Tieserver, Tieline's IP traversal server and management software makes connecting over IP networks simple. It takes care of all the IP call routing automatically and works for studio-to-transmitter links, audio distribution between studios and remote broadcast connections. Tieserver is a secure independently hosted global server that tells your codecs how to find each other. Using a simple Web browser interface, you can log in and register your codecs to Tieserver. For networks with large numbers of codecs, you can create groups or buddy lists such as news or sports which will only display the codecs belonging to a specific group in the address book list. It can connect over wired and wireless IP networks including LANs WANs, the Internet, satellite IP, Wimax , Wi-fi, as well as 3G/3.5G/4G IP networks.

888-211-6989; www.tieline.com
sales@tieline.com

Anaconda digital snake system
Aphex Systems

Model 828M: The Model 828M features two MADI outputs as well as pass-through for digital audio at 96kHz sample rate via SMUX protocol. It is a point-to-point 64-channel bi-directional snake that easily and cost effectively connects preamplifiers, consoles, DAW systems, recorders, processors, etc. Comprised of two identical units on either end of a multimode fiber run, the Anaconda provides eight ADAT optical inputs and outputs on each unit. The 828M also offers an ultra-precision crystal generating internal word clock and one RJ-45 for control and metering/status feedback for any equipment.

818-767-2929; www.aphex.com; sales@aphex.com

Social networking community
JellyRadio.com

Jelly Fish: Jelly Fish is an online community that combines the concepts of My Space, Facebook, Craigslist, Stumble Upon and Youtube into a single network. So much more than just another social media site, this niche community includes the best elements from other networks to be the go-to site for everything from industry networking and job postings to discussion forums and entertaining videos. Members of the Jelly Fish community start by making a profile and can get involved in many ways that include chat, classifieds, events, sharing and music.

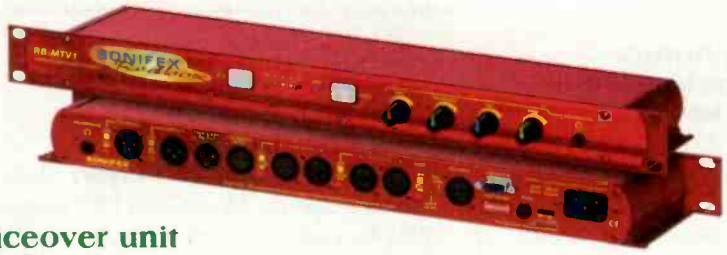
www.jellyradio.com; info@jellyradio.com

Iphone application
Inergize Digital Media

Mobile Local News: Mobile Local News is an Iphone and Ipod Touch application that distributes locally branded news, weather, sports, politics and entertainment to consumer mobile digital devices. Television and radio stations, magazines, newspapers and other information publishers deploy Mobile Local News to provide text, images, photo galleries and videos while leveraging valuable revenue generating opportunities.

952-417-3294; www.inergizedigital.com
sales@inergizedigital.com

NEW PRODUCTS



Voiceover unit
Sonifex

RB-MTV1: The RB-MTV1 voiceover unit is a 1RU rack-mount designed to be used in voice-over booths, news booths, commentary locations, for continuity announcements and for any other similar applications where voice needs to be added to program content and then monitored. Program feeds, auxiliary feeds and a talkback feed can be taken and monitored. The RB-MTV1 has four inputs and two outputs. It has a mono microphone input on XLR with switched coarse gain and variable fine gain control using a multi-turn preset potentiometer to give an overall gain range from +20dB to +80dB. There is also a switched LF rumble filter, switched +48V phantom power and switched level limiting control.

+44 1933 650 700; www.sonifex.co.uk; sales@sonifex.co.uk

Microphone cords
Wireworks

Dazzler: Designed to replace a traditional microphone cord that connects to a hand-held microphone, Dazzler cords present a unique eye-catching element to any presentation or performance with Crystalcon, an XLR encrusted with Swarovski crystals on both ends or only on the microphone end. The ultra-flexible PVC satin finish outer jacket is available in black, brown, red, orange, yellow, green, blue, violet, gray and white. Standard lengths range from 25' to 100' with custom lengths to order.

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

Balanced power conditioner
Furman Sound

P-2300 IT E: Designed for the most critical, ultra-low noise installations, the P-2300 IT E can supply balanced and isolated ac power broadcast stations. Furman's symmetrically balanced power provides dramatic noise reduction through the use of a symmetrically balanced isolation transformer. This noise reduction is extraordinarily efficient and linear across a huge frequency range, eliminating the masking effects of ac line noise, especially with high-bandwidth, high-definition program content. The P-2300 IT E offers 14 balanced, GFCI-protected IEC C-13 outlets with a total operating capacity of 10A.

707-763-1010; www.furmansound.com; info@furmansound.com

Portable HD headphones
Sennheiser Electronic

HD 428, HD 438 and HD 448: The HD 428, HD 438 and HD 448 headphones are optimized for portable players but also deliver strong audio performance on home hi-fi systems. The HD 448 model offers a life-like sound experience with precise detail. The HD 438 also offers a natural sound signature, while the HD 428 is more focused on the lower frequencies and delivers powerful bass response. Each model features a closed-back, around-the-ear design that provides impressive sound isolation. For perfect sound on a home stereo system, each headphone comes with a gold-plated quarter-inch stereo adapter.

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

Software modules
Netia Digital Audio

IP Recorder and IP Player: These two software modules allow Open NET users to simplify the acquisition and distribution of IP-based content. The IP Recorder and IP Player modules reduce the complexity of taking SDI video from the camera to editing by eliminating the need for a video server. A simple file server and a facility's existing architecture can instead be leveraged for acquisition and delivery of digital video. The IP Recorder streamlines acquisition of SDI content, accepting the encoded IP stream and delivering media to the file server, where it is available for editing, archiving and autoindexation. The elimination of the video recorder, video grid, and video encoder reduces overall costs and supports a fast, completely digital workflow with more timely delivery of rushes and replays of live content with delay. A simple computer system can be used for review and quality control.

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

IP audio endpoints
Digigram

PYKO-in, PYKO-out: PYKO-in converts mic (with phantom power) or line analog audio sources to high-quality MP3 or PCM IP streams. This device can also be used in mono-in, mono-out mode for intercom in PCM or G711. PYKO-out plays audio from standard MP3 or PCM IP streams or locally stored MP3 files. Together with Digigram Audio Manager software, PYKO IP-based network audio terminals enable designing fully managed audio distribution solutions.

703-875-9100; www.digigram.com
input@digigram.com

Wirless photography system
Hilomast

Hilo CAM Mini: This system has a 65' range, is license exempt, features an 8" preview screen and removable, rechargeable battery pack. There are no wires, and no computer is required. It features an aluminum case, and zoom, shutter and pan/tilt are controlled from remote control.

407-688 2806; www.hilomast.com; sales@hilomast.com

Console
Custom Consoles

System Two - Lite: System Two - Lite is a single-surface electrically height-adjustable desk designed specifically for use with flat screen monitors. At the touch of a button, it can be adjusted in height between 660 and 1,200mm, enabling operators to vary their seated or standing posture throughout the working day. An electronic anti-collision sensor safeguards the desk if it comes into contact with an adjacent object during height adjustment. The desk has a 2,000 by 900mm footprint and curved corners with PVC edging. It incorporates a wood finish with a hard-wearing Marmoleum dual-colored work surface. Other finishes are available on request. Additional features include four front-facing worktop-mounted USB ports, five individually fused mains sockets and and two rear-facing RJ45 adapters.

44 1525 379909; www.customconsoles.co.uk

UPGRADES and UPDATES

Audio Science has received certification from Ibiquity for its ASI8914 four-channel HD Radio tuner adapter. The ASI8914 is a universal PCI card that contains four HD Radio/AM/FM tuners. (www.audioscience.com, www.ibiquity.com) ...**Audio Precision** has introduced the BW52 high-bandwidth option to extend the APx's FFT capability to 1 megahertz, with 24-bit amplitude resolution and 2Hz frequency resolution. The option is for the APx525 family of audio analyzers. (www.ap.com)...**Comrex** has released 2.7 firmware for its line of Access IP codecs. Enhancements include HTTP streaming, added support for 3G wireless devices, and N/ACIP compatibility with other IP codec brands. (www.comrex.com)...**HHB** has updated the firmware for the CDR-882 dual CD recorder. (www.hhb.co.uk)

Surface-mount AV plate
Altinex

SP107-101: Designed for tables, podiums and other AV furniture, the SP107-101 provides surface level connection points for a variety of audio and video inputs, providing an easy and convenient means of patching a laptop computer or other AV equipment on the surface to a presentation system's connections beneath the furniture or in another room. Featuring a black painted finish that mounts flush with the surface, it offers interconnections for the most frequently used AV presentation inputs, including AC power, computer audio, video, Network and USB. Computer connections include a 15-pin HD female RGBHV video port, a 3.5 mm female stereo audio jack, and an HDMI Digital Video input. Video connections include an RCA Composite Video input, a 4-pin Mini Din S-Video input, plus left and right female RCA audio inputs.

800-ALTINEX; www.altinex.com
solutions@altinex.com

Mic disinfectant
Microphome

Microphome: Microphome is a safe and easy-to-use disinfectant/deodorizer for microphones. Available in individual 50ml bottles (enough for more than 100 applications) and as a complete cleaning kit, this fast-drying cleaning foam takes only two minutes to use and kills 99.9 percent of all germs. The secret to its effectiveness lies in its alcohol-free formula and foam aeration system. The antimicrobial cleaning fluid is pumped in a measured dose of gently aerated foam that clings to the external microphone surface, never touching the internal electronics, then completely dissipates within two minutes.

727-403-9354; www.microphome.org; microphome@gmail.com

Broadcast traffic management
Broadcast Traffic Systems (BTS)

BTS Express: BTS Express is a downloadable broadcast traffic management system based on the BTS Enterprise application. An expandable, modular package, Express provides traffic and ad-sales management for single-channel or multi-channel presentation suites and playout centers.

805-856-9103; www.bts.tv
us_sales@bts.tv

Solid-state FM amplifiers
Bext

RB 5000: The Bext FB Series, previously available in the 2kW and 3.5kW power levels, is now available also in the 5kW version, still in the same extremely compact size. In just four standard rack spaces, Bext provides broadcasters with a remarkably space-efficient FM Transmitter: a 5kW so small and lightweight you can carry it with you and install virtually anywhere. Highly energy efficient, the FB 5000 will also cut down on your utility bills. Like all other FB Series FM Transmitters from Bext, the enclosure is solid stainless steel, and the unit offers flexibility, ease of operation and local or remote control through user friendly menus, all backed up by the Bext reliability and customer service.

619-239-8462; www.bext.com
sales@bext.com

Three-way DSP system
Genelec

8260A: The 8260A features advances in audio driver technology and Genelec's proprietary Minimum Diffraction Coaxial (MDCTM) mid/high driver technology, which prevents acoustical diffractions. It combines a coaxial driver with a modern waveguide technology ensuring that drivers couple coherently over their full operating bandwidth, as well as creating coincident mid-frequency/high-frequency point source. The 8260A also features Genelec DSP signal processing responsible for all loudspeaker functions.

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

Subwoofer
Blue Sky International

SUB 212: Blue Sky's SUB 212 is a sealed box, dual 12", push-pull, 400W subwoofer. It features an anechoic frequency response of 25Hz to 200Hz, ±3dB. In addition, the SUB 212 also has built-in 2.1 bass management electronics with both a fourth order 80Hz Linkwitz-Riley low-pass filter and a second order 80Hz high-pass filter perfectly matched to the response of the SAT 8 (the SUB 212 is also compatible with the SAT 12, SAT 6.5 and SAT 5). The SUB 212's push-pull configuration is designed to increase output and reduce distortion. A push-pull subwoofer uses two drivers: one mounted facing forward, the second mounted backward with the magnet facing out.

516-249-1399; www.abluesky.com
info@abluesky.com

Broadcasting tape
RMG International

Studio Master 468: This high-bias studio tape offers excellent dynamic range over the entire frequency spectrum, minimal print-through, high level uniformity up to the highest frequencies, excellent winding even at high speeds allowing flangeless operation and archiveability, long term stability.

+31-162-408950; www.rmgi.nl; info@rmgi.nl

Portable PA
Behringer

Europort EPA900: The Europort EPA900 PA system is a complete sound reinforcement system in a small suitcase for ease of transportation. It features 900W of power, eight channels, 10" woofers and 1.35" aluminum-diaphragm compression drivers, a 24-bit stereo FX processor with 100 presents, feedback detection, four mic preamps with switchable +48V phantom power for condenser mics, stereo aux inputs, and an integrated storage compartment for mics, cables and accessories.

877-672-0816; www.behringer.com
support@behringer.de

Audio-over-IP codec
BW Broadcast

IPCA1: Using latest-generation IP and audio coding technologies, the IPCA1 was designed for stable operation with the lowest latency and best audio performance possible based on network characteristics. To keep latency as low as possible, it uses a proprietary, dynamically adjustable jitter buffer that adjusts to network conditions, providing 24-bit audio, with up to 48kHz sampling, at the lowest possible delay at all times. Supporting UDP, UDP Multicast and TCP/IP protocols, the unit includes a range of low delay codecs operating at bitrates as low as 32kb/s with fewer quality/bit-rate trade-offs.

866-376-1612; www.bwbroadcast.com
info@bwbroadcast.com

Vistamax software
Harris

Vista Vue: Vista Vue is a software application that gives on-air and production personnel more control and visibility of the Vista Max network operation. The centerpiece of the Harris networking and infrastructure equipment range for the radio broadcast industry, the Vista Max audio management system provides routing and connectivity across the radio broadcast studio to more efficiently share resources while reducing costs associated with traditional audio routing systems. Vista Vue software provides a choice of two user interfaces and flexible access rights that can be defined for each user. Individual and community macros provide one-click routing changes and supplement scheduled and automated macros available through Harris Vista Touch software. Definable interfaces for each user simplify changes to signal routing.

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

Multi-channel mic-pre
Focusrite Audio Engineering

Octopre MkII: Octopre MkII features eight channels of pre-amplification and a built-in 24-bit/96kHz ADAT output, providing an affordable input upgrade for your Pro Tools system, or any digital audio workstation. It combines Saffire Pro pre-amps with digital conversion and JetPLL jitter elimination technology. The digital output allows users to make the most of often-neglected ADAT inputs. It is equally suited to the live environment as a quality mic-pre expansion for any analogue or digital console, or hard disk recorder.

516-249-1399; www.focusrite.com; sales@focusrite.com

Portable recorder
Sound Devices

788T-SSD: The premium model of the 788T replaces the 160GB SATA hard drive with a factory-supplied, high-performance 256GB solid-state drive. The addition of the SSD provides several important benefits including: vast internal storage capacity; continuous recordings of more than 60 hours of 24-bit, 8-track audio; increased transfer speed versus a spinning hard drive; increased immunity to shock and temperature extremes; and zero acoustical output.

608-524-0625; www.sounddevices.com; info@sounddevices.com

NEW PRODUCTS

USB Type A connector
L-com Global Connectivity

USBAFT: The USBAFT is a unique, field terminate USB Type A connector deigned to be used in the field for quick and easy terminations. Separate connection points are provided for all four positions of the connector plus the ground. Terminal block design with set screws provides reliable electrical connections utilizing no special tools. The terminal block area is clearly marked making proper termination virtually foolproof. The USBAFT is panel mountable using 4-40 screws provided.

800-341-5266
www.l-com.com
sales@l-com.com

Messaging technology
Spinvox

Voice-to-content messaging: Voice-to-text technology allows listeners to contribute to a radio show's dialog by speaking messages that are then converted into text and either read on air by the hosts and/or posted to the show's website. Listeners can leave short and concise messages without being put on hold or talking to a call screener first. While similar radio call-in shows invite listener participation, the opinions that make it to air are selected to keep the conversation moving forward. With the Spinvox technology, radio hosts are able to sort through these messages quickly and deliver more of the most salient thoughts on the air.

678-393-5501; www.spinvox.com
us.sales@spinvox.com

XLR in-line RF iso transformer
Connectronics

XLR-ISO: XLR-ISO is a new product for inline matching transformers. It is an XLR Female 0dBm at 600Ω to XLR Male 600Ω line level matching transformer in a shielded case. It features a compact transformer with XLR male and female ends. The shield is lifted from input to output. It removes hum and passes phantom power to condenser microphones.

800-322-2537; www.connectronics.com
sales@connectronics.com

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Radio
THE RADIO TECHNOLOGY LEADER

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Penton Media, Inc.
249 West 17th Street
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POSTMASTER: Send address changes to Radio, P.O. Box 2100, Skokie, IL 60076-7800 USA.

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Contributor Pro-file

Meet the professionals who write for *Radio* magazine.
This month:
Trends in Technology, page 14

Conrad Trautmann, CPBE
EVP, Technology
Dial Global
Radio Networks
New York

Conrad Trautmann is certified by the Society of Broadcast Engineers as a CPBE, has served on the SBE national board of directors and also as chairman and treasurer of NYC Chapter 15. He has close to 10 years of experience working for radio networks and prior to that spent roughly 20 years as chief engineer/IT manager of some well-known radio stations including WBAB, WBLI and WALK on Long Island; WSYR, Y94FM and B104.7 in Syracuse, NY; and WEBE 108 in Fairfield County, CT.

Radio
THE RADIO TECHNOLOGY LEADER

Written by radio professionals
Written for radio professionals

Radio, Volume 15, Number 11, ISSN 1542-0620 is published monthly and mailed free to qualified recipients by Penton Media Inc. 9800 Metcalf, Overland Park, KS 66212-2216 (www.penton.com). Canadian Post Publications Mail Agreement No. 40612608 Canada return address. Bleuchip International, P.O. Box 25542, London, ON N6C 6B2 Additional resources, including subscription request forms and an editorial calendar are available online at www.RadioMagOnline.com. To order single copies call 866-505-7173 or 402-505-7173

ADVERTISER INDEX

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

by Erin Shipps, associate editor

Do you remember?

In 1986 John Battison wrote an article called "Making History" in which he made predictions about the future of broadcast radio. Here are his predictions, followed by comments from Editor Chriss Scherer on the actual state of these topics now.


Making history

1986 **– Cellular telephones** are obviously going to play an increasingly large part in our lives and in the development of personal portable telephones. These phones have been available for years, and many engineers have had 2-meter rigs in their cars for some time. However, cellular radio will make phones far more efficient and attractive to the general public.

2009 – They're not just phones anymore: They are media players, cameras, Internet browsers and broadcast receivers.

1986 **– Stereo broadcasting**: We've heard quad stereo and I, for one, have been unimpressed by it. Now we have stereo AM. That technology seems a little more impressive, but I can't help wondering how far it will go in the future. Will it really do that much to boost sagging AM radio ratings?

2009 – We know that AM stereo never really took off. And except for a few market-leading stations, AM ratings continue to fall.

1986 **– Subcarriers**: SCAs are old hat by now. The only recent change is that the commission has now increased the number of channels that may be carried on an FM carrier. Similar control systems can be carried on AM. AM still cannot do as much as FM in the way of providing ancillary services on a carrier, but AM-SCA can certainly provide a means of increased revenue for an astute operator.

2009 – SCAs have changed little since then, although digital methods (including FM Extra) have given some stations new uses. Multicast capability on FM HD Radio is today's modern equivalent to the 1980s SCA.

1986 **– Radio control**: Children are now playing with radio-controlled airplanes, and I recently saw an ad for a radio-controlled submarine. UHF propagation is so much better understood than it was 30 years ago, and is being used in ways undreamed of in 1950. Unfortunately, the mobile radio interests are dreaming of unused UHF channels for communication purposes. This is something that all UHF operators should watch closely.

2009 – Everyone wants a piece of the spectrum used by broadcasters. TV stations are fighting the white spaces and 2GHz encroachers, while terrestrial radio is struggling with low-power services.

1986 **– Digital**: The catchword today is digital, and everyone is climbing on the band-wagon. Digital techniques certainly offer freedom from noise and allow international compatibility. As the industry develops additional standards, further use of the technology will take place. Computers are almost commonplace today. We have passed the era when people saw the computer as a *vade mecum*, or a universal panacea, and purchased thousands in high hopes of gaining a third hand. However, as the wild enthusiasm levels off, computers are becoming more and more a part of our daily lives. Self-repairing and operating equipment and robots are also on the horizon.

2009 – Digital is still the catch word, but we know how to use it better. The enthusiasm over computers hasn't really waned, but it has matured. No one can imagine life without the Internet today. Self-repairing equipment? In some ways, yes. Robots? Not yet.

And what are Battison's thoughts on today's industry? He writes, "In the field of transmission we have a number of dubious designs and devices including the unpopular IBOC. Dissident engineers are demanding the end of AM broadcasting, which has been considerably weakened by excessive interference due to laxity on the part of the FCC in enforcing non-radio sourced anti-interference rules (very foolish because with AM all you need for reception is headphones, a semiconductor a capacitor and a little wire. Other systems require more complicated receiving devices.)"

Here's to the next 20, 40, 100 years.

How many articles has Battison written for us? Find out at RadioMagOnline.com

FINALLY...FAILSAFE NETWORKED AOIP.

WHEATSTONE E-SERIES & WHEATNET-IP ARE YOUR BEST CHOICE BY A LONG SHOT.

When it comes to networking your facilities, there's only one best choice. Wheatstone. For years, we've been the network/control surface choice of top broadcasters. And with good reason – we care.

Wheatstone's Audio-Over-IP product is the best in the business. Here's why:

1. WheatNet-IP is easiest for a station to implement and configure. It is, hands down,the easiest in the industry. No need for Wheatstone to provide factory on-site assistance unless you really WANT us there. The manual and app notes will have you up, running and stable in less time than any other system.

2. WheatNet-IP is a natural for large facility multi-station networking (and for smaller facilities too!). It uses the IGMP features of Ethernet Layer 3 switches to identify a multicast packet, see which ports are requesting that packet, and send it only to those ports. Traffic control is maintained and system bandwidth is optimized.

3. Redundancy is critical. A typical WheatNet-IP installation has multiple levels of redundancy. Each BLADE holds the complete map of the entire system within its onboard memory – we call it distributed intelligence – a system with 50 BLADEs has 49 backups with failover in the event of a failure. Cisco Stackwise technology provides redundancy in the central core TOC switch. A WheatNet-IP/E-Series console studio complex can stand alone, even if the TOC goes down, with backup analog or digital program audio feeding a back end router independent of the core Gigabit infrastructure.

4. Modular is better. Why would you want to combine your switch, mix engine and I/O into one box? Beats us. With WheatNet-IP, you install only what you need, where you need it. We believe in not overselling.

5. Manufacturing quality is very important. Wheatstone is proud to have the best track record in the business for build-quality, reliability and intelligent functionality. With far more up-and-running installations than anyone else, this is where we really shine. An investment in WheatNet-IP and E-Series control surfaces today will reward you with a future-proof, failsafe networking/control environment that's infinitely updatable and in for the long run.

6. WheatNet-IP has an advantage. Take a look at your entire environment. Wheatstone is a perfect partner because we are always there, always innovating. Built into every WheatNet-IP BLADE are features others just didn't think of – handy utility mixers, silence detection, crosspoint routing control, headphone monitoring of any source, lots of logic GPIO, and comprehensive metering of audio I/O, not just signal-presence indicators. And, in the hugely unlikely event that a BLADE needs to be replaced, you just plug in a new one and enter the BLADE number. That's it.

7. Wheatstone is local. WheatNet-IP and the E-Series, just like ALL Wheatstone products, are designed, engineered and built from start to finish in our New Bern NC USA facility. Everyone who works on our products is 100% knowledgeable and immediately available. You can relax – like the famous insurance company, you actually ARE in good hands.

With WheatNet-IP, we think we've done our homework. In fact, we know we have. And we're happy to say that we've got the best product on the market. To learn more, and there's a LOT more, get us on the phone or visit us on the web. We'll be happy to meet with you and get you everything you need.

Wheatstone

Audio Networking—Simply Evolved

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