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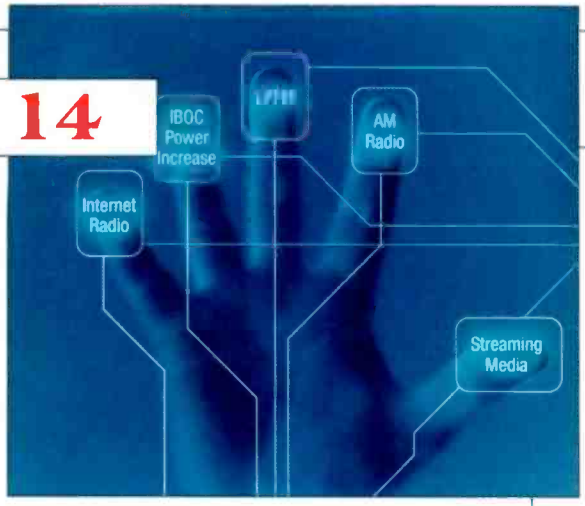

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Five challenges face radio including the IBOC power increase, Internet radio, LPFM, AM radio and streaming media. Will it prevail? Cover design by Michael J. Knust.

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Currents Online

Selected headlines from the past month.


Fox

2009 Radio Revenue Soft, But Future is Bright

Online revenue is up, all other sources are down.

Michael J. Fox to Receive NAB Distinguished Service Award

The five-time Emmy and Golden Globe winner will be honored at the 2010 NAB Show.

NPR, Ibiquity Strike Deal on HD Radio Power Increase

A 6dB increase in digital sideband power is being presented to the FCC for approval. An additional increase is possible and still under consideration.

FCC Dismisses KWVE EAS Fine

While the monetary fine is set aside, the station is still being admonished for the error.

Local Community Radio Act Moves to Senate

The Senate and House versions move to full votes in Congress.

Livio Ships NPR Internet Radio

The unit provides access to all Internet radio stations, but adds a exclusive menu for NPR stations and programs.

House Oversight Committee Calls Hearing on Radio Ratings

The hearing will focus on the Arbitron Portable People Meter. The committee hopes to determine the PPM's effect on diversity in radio broadcasting.

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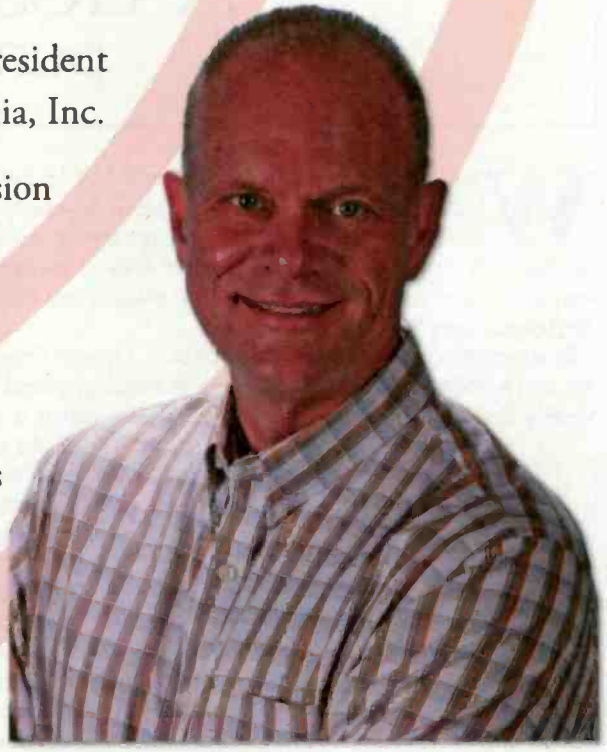

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A deserved punishment?

When the FCC levied a fine against KWVE for bungling a required monthly EAS test, I was surprised at the outcry from broadcasters. My surprise was not the opposition itself, but rather the number of complaints that were expressed. One of the strongest arguments was jointly filed by all the state broadcast associations who expressed their displeasure over the fine.

To recap, KWVE, a local primary station in Orange County, CA, transmitted an EAS test on Oct. 19, 2008. The test was supposed to be a required weekly test, but the station operator accidently started a required monthly test. Realizing his mistake, the operator aborted the test, but failed to transmit the end-of-message tones. When the KWVE operator resumed programming, downline stations carried commercial programming from KWVE.

In August 2009, the FCC issued a letter of inquiry on the matter because of a complaint. That's when everything started. KWVE admitted to the error in its reply to the FCC, but also noted that the error was not willful and that station operators had been trained so another error would not occur. Despite this, the FCC levied a $5,000 fine.

Following the industry outcry, the FCC has re-evaluated its action and has dismissed the fine, but has admonished the station for the mistake. Naturally, the station is protesting even the admonishment.

This situation has brought EAS to the forefront yet again. EAS is not a perfect system. Its intent – to use the airwaves to alert the public of a pending or current emergency – is valid. As we all know, the system is only as good as the operational area plans and the entities that can activate alerts.

This was a test of the system, and the test failed. The error was innocent. As many of the letters to the FCC said, the fine will not serve to teach broadcasters a lesson, but rather make broadcasters want to have nothing to do with EAS. With no station volunteers to serve as the local primary, the system in its current design breaks. I was even told by one EAS area chairman that he was told by an FCC field inspector that if no station will volunteer to be the LP, the field inspector will find a way to assign it to a station. No one wants that.

I like the concepts behind EAS. Alerting the public as quickly as possible is important when a crisis is pending. The reality is that EAS does not really work as well as it was intended. In many cases, the local news media and even social networks do a better job of getting the word out. Many operational plans are still designed around former EBS plans.

A further complication to EAS is that other consumer devices do not carry the same alerts. No existing common consumer devices (radios, TVs, cell phones) will turn on if an alert is transmitted. There are some efforts to rectify that, but without a federal mandate it will take a long time before it's a reality.

Meanwhile, the work continues on enhancing emergency alerting with the Common Alerting Protocol (CAP), and private efforts are being pushed such as Alert FM. Again, these are all good ideas, but we're not really solving the problem. Unfortunately, it takes a disaster such as 9/11, Katrina or a tsunami to remind us that there are shortcomings.

I don't believe any broadcast station should ever, as part of a standard plan, originate an alert. In case of some unusual circumstance broadcasters could originate an alert, but that is a delicate situation in itself.

Despite all this, the only people I ever hear talking about EAS are the engineers. I rarely if ever hear managers or owners discuss EAS, yet they are the ones who have the authority to actually do something about it. The engineers should implement it, not be the chief designers.

Chris Scherer

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Safety in the workplace

By Kevin McNamara

Those of us who got into the broadcast business years ago had very little training about safety procedures and guidelines. Early in my career, I watched a more experienced colleague get thrown across a transmitter building from attempting to measure plate current from an operating transmitter. Fortunately he was thrown away from the transmitter before any fatal injury ensued, but it made me acutely aware of two lessons: 1. Always have someone else in the room when working on a transmitter and 2. don't stick your hands in an operating transmitter.

A typical broadcast facility contains an unusually large amount of potential hazards – electrical, climbing, RF exposure, etc. And reductions in personnel mean engineers are working alone.

Large group owners now provide routine safety awareness programs, which can be valuable assuming the company backs up the training with the proper tools, support systems and resources.

If you haven't had awareness training, or have been doing this for awhile and have it figured out, it is worth mentioning just a few of the hazards that lurk in your facility.

Electrical safety

How many times does the transmitter decide to quit when you are awake and alert? My experience is that the call comes just after getting into a sound sleep. Let's not forget the majority of maintenance work also happens overnight.

We all know that shock occurs when one electrically places himself between a voltage source and a ground path. The rule of thumb has always been when working on electrical equipment, keep one hand in your pocket.

Figure 1 shows how humans experience the effects of electrical shock from as little as 1mA to 50mA when death can occur. Notice also that the trip current of the typical circuit breaker is about 15A. Ground fault breakers will trip under much lower current leakage conditions typically 5-500mA. You cannot depend on the circuit breaker to protect from lethal shock.

It is worth mentioning that dc power supplies can also be extremely deadly if precautions are not taken to remove the input power and completely discharge all capacitors. Older tube transmitter power supplies typically deliver dc outputs of several hundred volts at respectable amperage; it seems pretty obvious these will hurt. However, the power supplies in the newer solid state transmitters and dc UPS/battery backup systems might operate below 100V but would be capable of supplying several hundred amps of current. These low-voltage/high-current power systems are nearly perfect constant current sources.

OSHA specifies requirements to provide proper "Lockout/Tagout of electrical circuits where employees are exposed to electrical hazards while working on, or near, or with conductors or systems that use electric energy." 29 CFR 1910.333 sets forth requirements to protect employees working on electric

Effects of Electrical Current in the Human Body

Current	Reaction
Below 1mA	Generally not perceptible.
1mA	Faint tingle.
5mA	Slight shock felt; not painful or disturbing. Average individual can let go. Strong involuntary reactions can lead to other injuries.
6-25mA (women) 9-30mA (men)	Painful shock, loss of muscular control. The freezing current or "let-go" range. Individual cannot let go, but can be thrown away from the circuit if extensor muscles are stimulated.*
50-150mA	Extreme pain, respiratory arrest, severe muscle contractions. Death is possible.
1-4.3A	Rhythmic pumping action of the heart ceases. Muscular contraction and nerve damage occur. Death likely.
10A	Cardiac arrest and severe burns. Death is probable.
15A	Lowest overcurrent at which a typical fuse or circuit breaker opens a circuit.

* If the extensor muscles are excited by the shock, the person may be thrown away from the power source.

Figure 1. From NIOSH Publication 2009-113

circuits and equipment. This section requires workers to use safe work practices, including lockout and tagging procedures.

Tower work

Tower climbing is now considered the most dangerous job nationally. According to a 1998 study by NIOSH (National Institute for Occupational Safety and Health), 108 tower worker deaths were reported between 1992 and 1998. Of these, 93 were cause directly by falls from structures.

In 2008 alone, 12 deaths were associated with falls from tower structures in the Communication Construction Industry.

For a summary of tower work incidents occurring in 2008, access this article at RadioMagOnline.com.

It goes without saying that any crew you permit to work on your tower needs to provide proof that it possesses the proper training equipment and training before being permitted to work on a tower, rooftop or other structure. You should always require qualified tower climbers produce a current certification card prior to start of work. Organizations such as the National Association of Tower Erectors (NATE) provide training and certification programs to qualified tower workers.

RF safety

We became aware of the issues related to non-ionizing radiation back around 1996 when the FCC adopted guidelines to ensure the exposure of employees and the public to RF energy is below stated Maximum Permissible Exposure (MPE) limits. Since that time broadcasters have been required to take steps in preventing casual access and marking areas where levels are in excess of stated limits.

In the event you find yourself in an area rich in RF sources such as a rooftop, there are some signs to watch for to indicate RF exposure: Confusion, vertigo, headache, blurred vision, overall nauseous feeling, body heating, shocks and burns, and bad or metallic taste in the mouth.

It should become a requirement that any employee or subcontractor working in these areas carry some form of RF personal protection monitor with them at all times.

One last word. If it is necessary to work alone be sure to take a few minutes to assess the potential hazards that could cause injury. Categorize the potential hazard and create a control measure that would help address any risk. These control measures would include getting regular calls from someone at regular intervals, having surveillance monitoring of the area or periodic checks by someone nearby.

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

NPR asks FCC to end TV-6 protection rules

By Harry Martin

National Public Radio (NPR) has asked the Commission to rescind TV channel 6 protection obligations set out in Section 73.525 of the rules. The current protection requirements were imposed on noncommercial FM stations in 1985.

The restrictions were imposed because the portion of the FM band reserved for NCE operations (87.9 to 91.9MHz) is immediately adjacent to Channel 6 (82 to 88MHz). As a result, the potential for interference to channel 6 operations from stations in the NCE-FM band was thought to be considerable, leading the Commission to impose TV-6 protection requirements on noncommercial stations at certain distances from Channel 6 stations. Interestingly, the receivers used to determine the appropriate level of protection were all manufactured prior to 1979, meaning the protection standards in place today are based on 30-year-old receiver technology.

According to NPR, the increased sensitivity of today's television receivers – particularly in the wake of the DTV transition – warrants reconsideration of the standards. In support, NPR has presented two studies, one conducted by its own labs and the other by Hammett & Edison. These studies, according to NPR, show that the rule no longer serves any real purpose.

NPR also claims that not too many viewers are likely to notice NCE-FM-induced interference to channel 6 operations because more than 90 percent of U.S. viewers get their TV by cable or satellite, sources that are not subject to such interference. Also, NPR points to the seemingly insatiable demand for NCE-FM service. The most recent window filing opportunities for new noncommercial radio authorizations (full-service and translators) have attracted tens of thousands of applications, each subject to the limiting effects of the channel 6 rules. According to NPR, NCE-FM stations would enjoy, on average, a 75 percent increase in 60dBu population coverage if Section 73.525 were rescinded, and such primary coverage might increase by more than 200 percent for some stations.

NPR does not mention that, while there may be only a few full-service DTV stations still operating on channel 6, there *are* a significant number of TV-6 analog LPTV stations operating. These licensees do not yet have a deadline for converting to digital operation, and they typically provide service to the 10 percent of the public that does not have satellite and cable service. In addition, it is not clear whether analog TV sets plugged into DTV converter boxes will continue to experience interference if the interference protection requirements are lifted. Nor is it clear that DTV converter boxes introduce or reduce the possibility of increased interference. Thus, adoption of NPR's proposal could lead to considerable reception problems for over-the-air viewers still loyal to channel 6 stations.

The Commission has not yet taken any action on the NPR proposal, which was filed in October. In view of the relatively controversial nature of the proposal and the FCC's current focus on broadband issues to the exclusion of broadcasting matters, it is unlikely any action will be taken in the near future.

The NPR proposal is unrelated to the proposals of the Minority Media and Communications Council and the Broadcast Maximization Committee which want the FCC to look into the allocation of current TV-5 and TV-6 spectrum for use by radio broadcasters.

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

Dateline

Jan. 11 is the deadline for filing of biennial ownership reports for all commercial broadcast licensees.

For *noncommercial* radio stations in Arkansas, Louisiana, Mississippi, New Jersey and New York, their biennial ownership report deadline is Feb.1.

Feb. 1 is the deadline for radio stations in New Jersey and New York to electronically file their Broadcast EEO Mid-Term Reports (Form 397) with the FCC.

Feb. 1 is the deadline for radio stations licensed in the following states to place their annual EEO Reports in their public files: Arkansas, Kansas, Louisiana, Mississippi, Nebraska, New York, New Jersey and Oklahoma.

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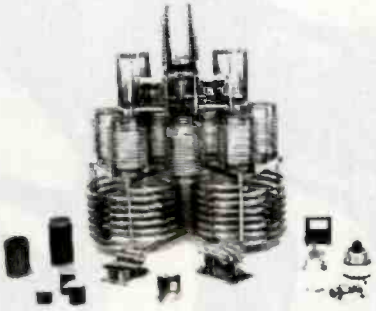

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SINCE 1963

THE FUTURE OF RADIO

Radio is beginning to have significant competition; will it continue to stand the test of time?

By Doug Irwin, CPBE DRB AMD

The Trends in Technology feature typically examines hard and fast methods to accomplish particular technical feats. This time around, the feature focuses on the trend aspect and speculates about the future of radio – how it will change in the not too distant future. For this reason, I'll make some assertions and postulate some. For starters, though, let's review some of the updates in technology that are either in the pipeline or close to becoming reality.

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Power increase

A power increase for HD Radio transmissions has been in the works for some time now, and as of this writing, National Public Radio and Ibiquity have agreed to agree on a blanket 6dB power increase for HD Radio transmissions. They jointly presented their recommendations to the FCC, in the hope that the Commission will allow power increases in the immediate future. NPR and Ibiquity also propose that further power increases beyond 6dB should be considered on a station-by-station basis. For the technical implications of an increase in HD Radio power, see my article "Are You Ready for an HD Radio Power Increase?" in the July 2009 edition of *Radio* magazine and "Elevated Sidebands" in the August 2008 Insight to IBOC.

I am a proponent of HD Radio, having been involved with it on a first-hand basis for more than five years. It's an impressive technology and works well. It hasn't caught on as well with the public as many of us had hoped it would by now; but it took 20 years for FM radio to catch on, after all. I believe we are still in the early innings when it comes to the public's acceptance of this new technology.

LPFM

Where are we with LPFM? This service has been in existence for nearly 10 years, yet it seems to have gotten little if any traction. That may be changing soon, though. The Local Community Radio Act of 2009 was passed by the House's Energy and Commerce committee on Oct. 15, and has been forwarded to the full House of Representatives. The Senate's version of the bill (S.592) appears to still be in committee as of this writing.

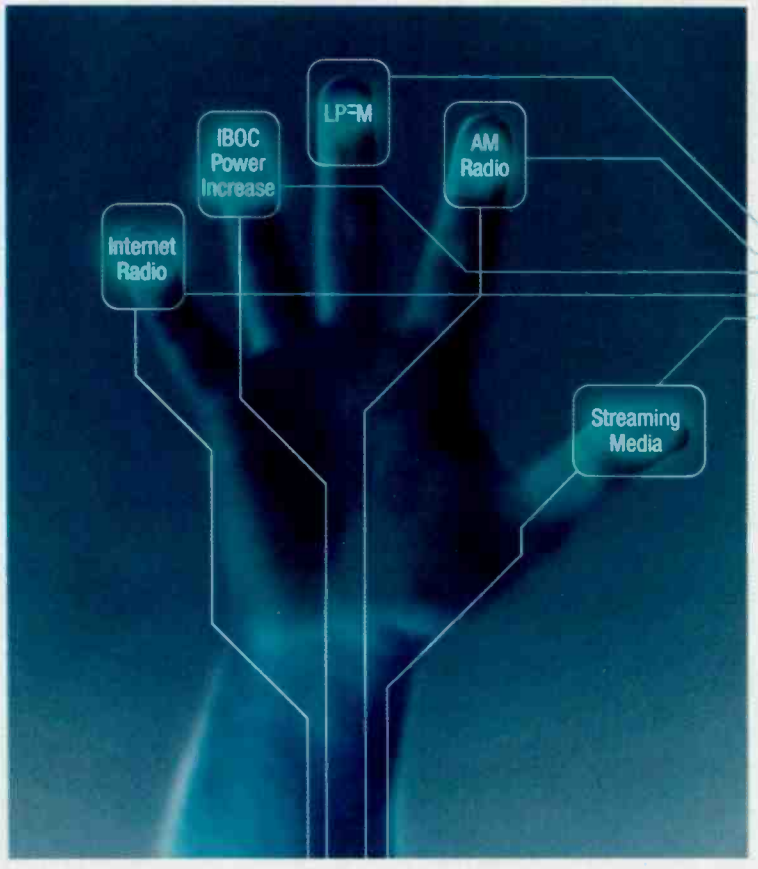
The aim of both of these bills is the elimination of the protection requirements that potential LPFMs have with respect to the third-adjacent channel of full-power FM radio stations. If these bills do pass in congress, the Commission may pursue further elimination of second-adjacent interference protection requirements as well. The elimination of these protection requirements will allow for many more LPFM stations to be licensed.

Looking to the future, it seems clear that if there are any "quiet" channels on the FM dial in your city that they may soon be filled with LPFM stations.

AM radio

Will there be a saving grace for AM radio? While it is clear that many AM radio stations remain successful, they are in large part high-power stations in major markets. I reached out to Steve Manuel, owner of station WWJB in Brooksville, FL, and asked him about the future of stand-alone, small market AMs such as his. "Success demands that we work harder and smarter every day. There is never a time to sit back," he wrote. "A small market stand-alone AM must super serve its community or it simply can't work. You must provide equal or better service than anyone else, period. You better provide at least half a day of live and local programming. It's not going to work if you hook up to the satellite and forget it. Miracles are hard to come by these days, so if you want to succeed you better roll up your sleeves and get to work".

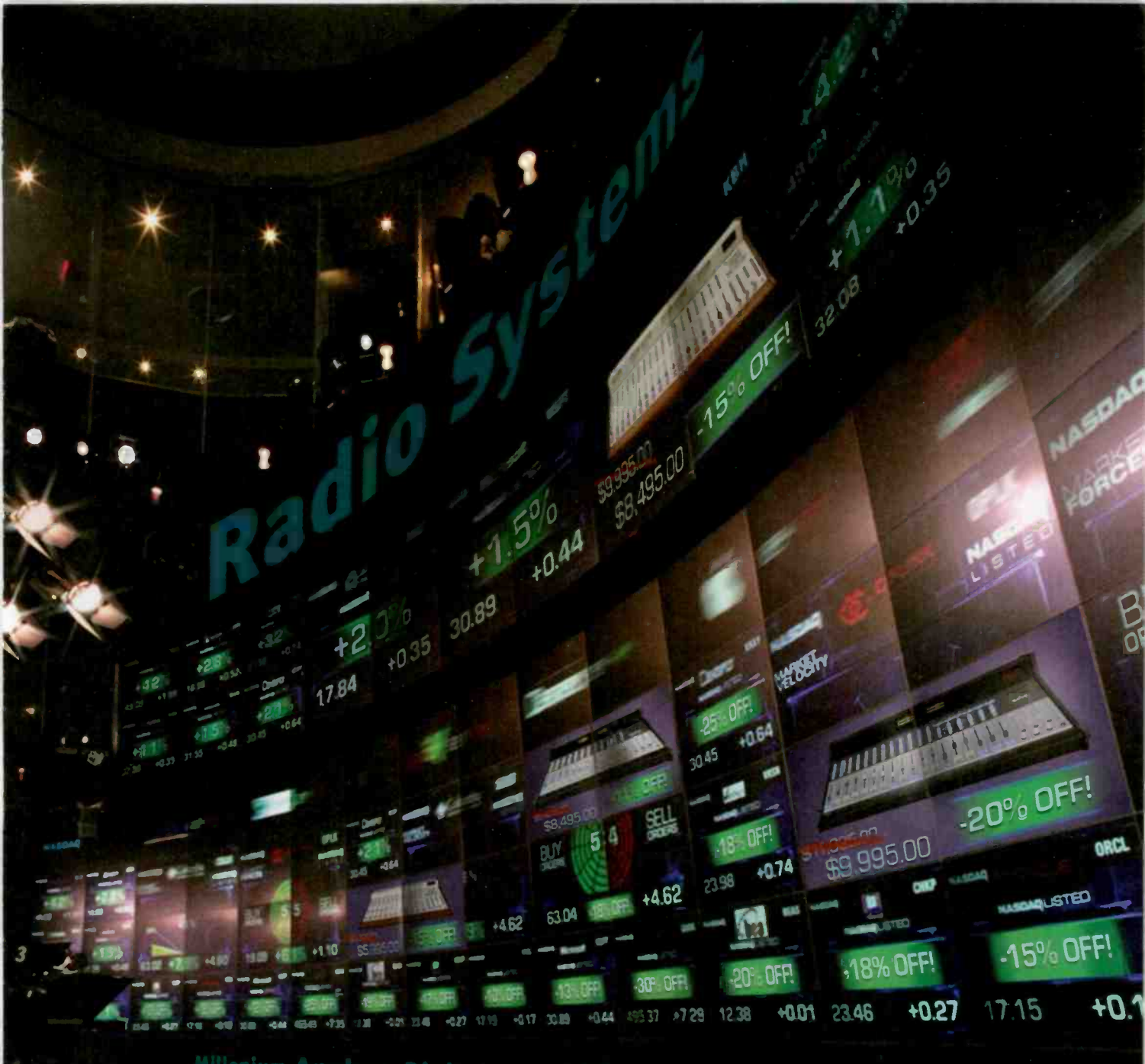
Manuel (like many AM station owners) is of course very interested in the proposal by the Broadcast Maximization Committee that would reallocate now (mostly) unused spectrum formerly used by VHF TV transmissions on channels 5 and 6. AM radio stations such as WWJB would migrate to this new spectrum, turning on a digital (only) version of themselves. Parts of this spectrum would be allocated for LPFM, and part would become an extension of the current NCE FM band. As of the time of this writing, the Commission does not appear to have taken any action, beneficial or detrimental, on this proposal.



I believe as we look toward the future that we will continue to see a thinning of the herd – meaning more AM and FM radio stations will go dark as they fail as businesses. So, on one hand, we have the possibility that the surviving stations will benefit from less competition; and on the other hand, we have a huge number of new radio stations to contend with – LPFMs and HD Radio stations – that will be available on the radio dial soon. It's not hard to predict that radio will remain as competitive as it has been, if not more so.

Internet radio

What about the ultimate competitive juggernaut though? Will all the changes in over-the-air broadcast technology



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2020 THE FUTURE OF RADIO

be mooted by the overwhelming presence of the Internet, and more specifically, Internet radio?

The answer is no. Internet radio will continue to grow in importance, but it will not completely supplant broadcast radio as we know it. Let me tell you why.

There are two points that the early adapters of Internet radio often make and point to when they prophesy the ultimate demise of radio. (There are others, of course.)

- Point 1: I can listen to whatever I want, whenever I want
- Point 2: I can listen to previously unknown radio stations and not be limited to what is in my own market

First, point 1. We can categorize radio programming in to three types: background entertainment, real-time importance, and specialty programming. Radio is, for the most part, background entertainment; it's something that people turn on and have on in the background while they do other things, such as getting ready for work in the morning, driving, cooking or working in an office. The time that a certain hit song plays is of no relevance; what it relevant is that the listener hears songs he likes. There's no compelling reason, then, to be able to hear it when you want to hear it, because for the most part, it's always available anyway.

Much of radio programming has immediate relevance, with fast spoilage. The perfect example is of course, weather and traffic reporting. Weather changes fast, but traffic changes even faster. Soon after traffic issues are reported, they're forgotten about. Radio talk shows are much the same way, because the topics are generally very timely, and therefore

Soon after traffic issues are reported, they're forgotten about. Radio talk shows are much the same way, because the topics are generally very timely, and therefore become irrelevant days (if not hours) after they are broadcast. Sporting events carried on the radio are very much the same: There's no point in listening to a game after the fact when you already know how it turns out in the end. So there again, there's little compelling reason to be able to have this type of programming on an on-demand basis.

The specialty type of programming is more akin to television programs. "A Prairie Home Companion" (to name one) would be a good example of a show that has little real-time relevance, no spoilage, and is more of a foreground entertainment. The ability for listeners to have it available in an on-demand fashion via streaming media, or via a file download, is obviously important, and represents a valuable resource to listeners.

I will assert that most people, though they may claim to want to be able to listen to whatever they want whenever they want will not, in practice, do it that often. It is easier than ever before, to be sure; however, most people just want to be entertained in some fashion, without putting a lot of work in to it. The on-demand aspect of listening to music has been around as long as radio: from lacquer 78s, to 45 RPM singles, to 33-1/3 RPM albums, to CDs and now file downloads, music users have had that capability. That's nothing new. The ability to use a thumb-drive – to plug it in to the dashboard of your vehicle – is a fairly new capability. It really is no different, though, than burning your own CDs – which people have been doing for years – or making your own cassette tapes, which people did 20 years ago.

Although the on-demand aspect is very important with respect to specialty programming in radio, it has little if any importance with respect to much radio programming.

Point 2 – the ability to listen to a much greater selection of radio stations. While I think this capability is interesting – and novel – I don't see it having much effect on radio as we know it. My arguments are very much like those I posed with respect to point 1. Yes, you can listen to 10,000 radio stations. However, much of them are playing the same music – they're hardly unique. And, their unique aspects may be completely irrelevant to a far-away listener: local traffic, weather and events come to mind. A distant station's specialty programs provide the only compelling reason to listen to it over the Internet, or to otherwise download them for play later on.

The real reason streaming media will never kill radio

The answer is connectivity.

Radio waves have a tendency to get into places that you wouldn't necessarily expect them to; a lot of effort goes into blocking them.

Internet connectivity, though, for an end user at least,

is very much dependent upon the network administrator. If that network admin decides to block your stream from users on his or her network, it's very simple to do. You need to keep in mind that streaming media uses up a lot of network resources – that's the primary reason for blocking. Or, they may just have a policy to not allow streaming. Keeping radio out of your office though – that's a different matter.

Another technical possibility is that an ISP will decide to block streaming media on a source-by-source basis, unless of course, the user is willing to pay extra for it. An alternative to that would be simply to charge by the bit for Internet access. If that were to be the case, the number of applications that use up lots of bandwidth (such as streaming media) diminish.

Internet connectivity – cheap as it has been over the last 10 years – will cause one of two things to happen. The explosion of Internet usage via mobile devices will bog the Internet down to the point that some users will use it less, or; it'll become anything but cheap. I see that as the more likely scenario.

Do you really think major providers are going to continue investing in their internet delivery capability without seeking a large return on their investment?

Take a look at AT&T's network capability. It's easy because it's been in the news a lot lately. A recent *New York Times* article (see link at RadioMagOnline.com) reveals that AT&T has had trouble with its network's ability to handle all the traffic from 9 million Iphones. AT&T

will spend $18 trillion this year alone to upgrade its 3G network so it can better accommodate smart phones (not all of which are Iphones).

And of course it isn't just AT&T having to heavily invest in its network infrastructure. Verizon recently paid nearly $10 billion for nationwide licenses in the 700MHz band, and is now starting to make use of them for its LTE (Long Term Evolution) technology (a variant of 3G). Verizon wants to have 30 markets built-out using this new technology next year, with the entire country's network done by 2014.

It should be no surprise, then, that both AT&T and Verizon are opposed to the FCC's proposed rulemaking with respect to Net neutrality in regards to wireless Internet access. The issue of Net neutrality has come to light because it is technically possible for an ISP to slow down data flow across their network selectively. What if a large provider decided it would make it faster for you (as the end user) to access one particular search engine as opposed to another? Likely then you might form a habit in using the one with faster access. This would be against the rules if the new FCC chairman, Julius Genachowski, gets his way.

The point: high-speed wireless Internet access, necessary to connect to real-time streaming media, is going to cost consumers more in the long run. If a service such as radio costs money, some people will opt not to use it or they'll look to free versions of it – just like we provide now. If end-users have two means by which they can access the same content – one free and one not free – many will opt for the free version.

I'm not a futurist – and I don't have a crystal ball to gaze into, or tea leaves to read. I would call myself a technical skeptic. I have seen a lot of technology come and go. Most of it worked great – it was novel in many cases – and in many cases it did something at least somewhat useful. The new technologies that catch on though – like the Ipod – are the exception, not the rule. I believe radio's longevity speaks volumes about its future potential. The creation and development of the Internet is just as important – if not more so – than the development of the telephone system 100 years and more ago. Still, radio will live on because it's a cheap and efficient means of doing what it does.

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

Triple Transfer

By Gary Smith

Bonneville Phoenix recently moved its entire broadcast radio operation to a new location, consolidating three stations (KTAR-AM/FM and KPKX-FM) into a remodeled, 29,000-square-foot facility. Several factors contributed to the move, beginning with the acquisition of the second FM signal in 2006. This allowed us to split the KTAR brand into two operations: News/Talk 92.3 KTAR-FM and Sports 620 KTAR-AM. Consequently we saw a large increase in staff and the previous facility lacked adequate space and parking.

We considered an upgrade of the existing facility, but it would not solve the parking issue or add real estate. A second option was to purchase space in a nearby building to accommodate our music station, KPKX-FM 98.7 the Peak. This was a not feasible option from a financial perspective.

A year-long evaluation led to the selection of our new location. Program management firm The Murray Company provided interior design, project management and construction services, encompassing the complete remodel job. The interior was gutted and built to its current configuration, utilizing 27,000 square feet of the rentable 29,000-square-foot space.

Bonneville Phoenix moves its three-station music and talk operation out of a crowded downtown space.

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" 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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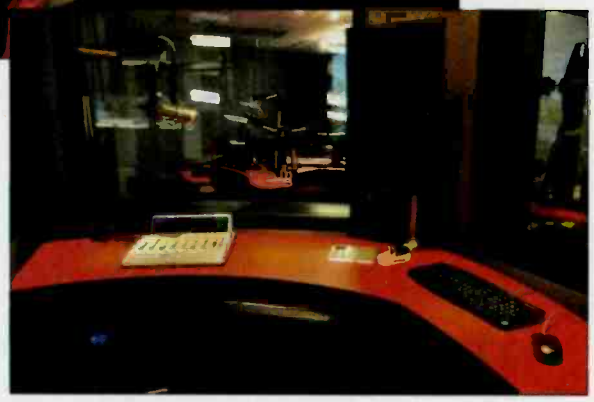
Triple Transfer

Facility layout and infrastructure

The conceptual design phase concluded with an intelligent layout plan. The goal was to ensure that the music operation received the same space and attention of the news/talk/sports operation. KPKX had little room to evolve in the old facility, so it was crucial to provide an environment where the station could establish a personality.

We decided to create talk and music wings. Each wing has its own rack room, studio suites, production facilities and workstations, as well as dedicated sales and office staff. Both technical operations have Harris PR&E Vistamax facility routing and studio networking at their respective cores.



News/talk 92.3 KTAR-FM features a master control room (above) and voice track studios (right). Operators have views of each studio in the KTAR cluster, ideal for visual cueing in a fast-paced environment.

Each rack room employs a Krone 110 punch block interface system from ADC to accommodate cross connects for various studio components. Quabbin Datamax single pair CAT-5e cables accommodate the core low-density wiring for rack-mounted equipment. Krone punch blocks are reliable and capable of supporting high-quality audio, AES3 audio, networking and control, even when mixed in the same 25-pair cable. The Krone 110 blocks are CAT-6-rated, high-band, network-quality punch blocks that minimize failures and establish patch bays for permanent and temporary connections. Datamax is the Harris cable of choice for console wiring and handles all but mic level applications with ease.

The more complex talk wing has the larger of the two rack rooms, featuring 19 Harris Integrator racks and one open-frame 23" communications rack to house fiber for ISDN, optical Internet, IFBs and PRIs, while the music wing contains six racks. Both rack rooms are populated with a variety of satellite receivers (XDS, Starguide III, Max, Tiernan), studio workstation computers and infrastructure for various studio components (Telos 2101 Desktop Director, Comrex ISDN and POTS encoders). All computers for Broadcast Electronics Audiovault Flex automation delivery are KVM-extended to their respective studio destinations. This removes the computers from the operational areas, leaving only the monitor, keyboard and mouse.

The Vistamax studio networking systems for each wing reside in their respective rack rooms, with the music wing opting for the Vistamax Envoy system. Both Vistamax frames are wired to their associated punch block systems via Hitachi Power Sum 25-pair CAT-5e trunk cables terminated with Amphenol connectors. Studio trunk cables are done with Mohawk CAT-5e 25-pair cables along with a number of four-pair CAT-5e and CAT-6 home runs for specific equipment applications. All office telephony and networking is done with CAT-6 cabling. KVM extension is done with CAT-5 cabling since the CAT-6 twist introduces timing and phase error. This simple connection completes a large portion of the high-density wiring requirements and minimizing cable runs across the facility.

The Vistamax systems map signals from each station en route to the processing system. The first two stops in the air chain out of Vistamax are the EAS Interrupter unit and an AES/EBU splitter. The splitter sends the signals in two directions: One stream feeds a real-time Omnia processing and monitoring system, and the second stream hits an Air Tools 6100 profanity delay and ATI Digital DA before reaching the Moseley STL systems, stream encoders and Ilogger.

Bonneville Phoenix uses Moseley Starlink fixed 950kHz STL units with Starlink T1 backups. All radio STL units are installed on the roof to reduce RF in the rack rooms and minimize transmission line runs. The units are housed in a DDB Unlimited Insulated Outdoor Rack, with a 6,000 BTU side-mounted AC unit. The Starlinks are lightning protected with feed-thru polyphasors, mounted to the lower wall of the rack and bonded to the master ground system.

Two alternating, redundant Liebert air conditioning systems consistently cool each of the rack rooms at 65 degrees, providing the best trade-off between air conditioning expense and extended equipment life. The closed room system takes in air at floor level and exhausts high. Dual-redundant APC UPS systems provide electrical protection for the entire technical core.

General studio design

Mohawk CAT-5e 350MHz 25-pair cables provide the backbone wiring for analog and digital audio from each studio, control room and voice booth, to and from the rack rooms. Cable trays are employed where required.

Double-pane 1/2" glass is used in many of the studios and control rooms with 16" walls, including 3/4" plyboard

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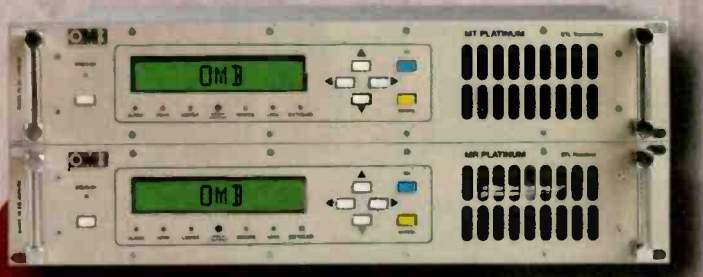
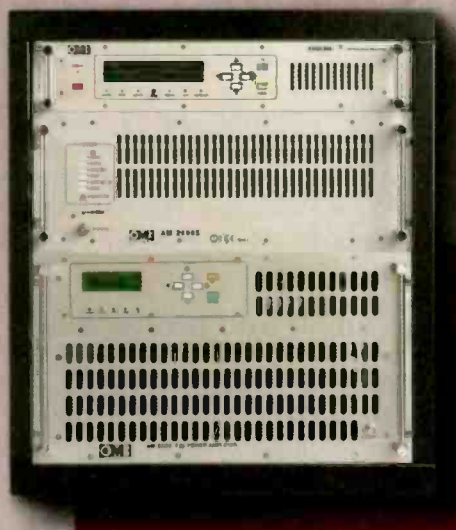


MT/MR PLATINUM >1GHz

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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Triple Transfer

KPKX-FM (98.7 The Peak) is the music outlet for Bonneville Phoenix. This is the master control room.

"The Flower" is a six-station cluster of workstations for Web content editors built from custom Harris PR&E furniture. The KTAR rack room is seen at right.

layers and 1" sound deadening panels to enhance acoustical isolation and reflectivity inside each room.

Harris PR&E custom furniture was installed throughout the facility for a consistent look and feel. Harris studio design representatives provided insight and design advice to make each room more ergonomically correct.

The furniture designs are similar in many rooms. For example, the three KTAR talk studios all feature two host and four guest positions, a separate voice booth and an isolated master control room. Each host has a Harris PR&E Stereomixer digital console with logic control, Vistamax Source Selectors, dropped keyboard trays and Vistamax intercoms. The intercom system is tied to the Stereomixer consoles to provide direct communication to the individual talent positions.

Individual headphone controls tied to a Harris PR&E 3x6 headphone distribution amplifier are built into the guest positions, with Electro-Voice RE-27ND microphones overhead. The on-air master control and voice booth studios feature the same setup for news and producer positions. In the music wing, custom furniture in the main KPKX air studio and production/backup air studio has two host and two guest positions, with much of the same built-in technology.

Every studio also utilizes Humanscale LCD monitor arms providing flexibility in positioning the computer monitors. This is critical for producers and technical directors who rely on visual cueing and require an unobstructed view of the talent.

The jewel of the furniture layout is a six-station work facility for Web content editors that we call the flower. This is a six-position cluster where the editors face each other while maintaining some privacy in the workspace. Each position has a view of one of two 48" monitors showing alternating Web pages and TV news from around the nation. The Web content cluster is located in the newsroom so Web editors can immediately produce breaking news for the Web pages. Humanscale monitor arms used in the Web content cluster are also used throughout the newsroom.

Talk wing, on-air and production

Three studio suites are at the center of the KTAR-AM/FM operation: News/Talk 92.3 KTAR-FM programs news during morning drive from the news suite, also clearing games on the weekends, and programs both live and syndicated talk from mid-morning through the evening and early morning hours from the talk suite. Sports 620 KTAR-AM runs live, local morning and afternoon drive talk shows; clears live play-by-play and runs ESPN sports overnights from the sports suite. Each on-air operation has a dedicated on-air master control studio, talk studio and voice booth studio.

Technology is similar across the three suites. Each on-air studio includes Harris custom furniture with a host and producer position; the host has a Stereomixer digital console with RE-27 microphone for on-air/production use, and a technical director is situated behind a Harris PR&E RMX Digital console with 28 input channels.

The RMX Digital is an ideal console for talk and sports programming. The technical directors often simultaneously bring in multiple remote sources. This is especially true for Sports 620, the flagship station for Arizona Diamondbacks baseball, Arizona Cardinals football, Phoenix Suns basketball and Arizona State University sports. The RMX Digital is a powerful, programmable console that offers instantly changeable mix buses so technical directors can juggle multiple remotes from various arenas, restaurants or other remote locations; and create mix scenarios on the fly in challenging situations.

Remotes are brought in a number of ways, with 8kHz equalized program loops from around the valley, including talent homes, Metro Traffic, Chase Field, United Airways Arena and a KTAR studio located on the Chase Field Plaza. Four Marti STL receivers are located on two nearby mountains to pick up and backhaul audio to the studios for the news department, sports department and a traffic airplane. The Martis are also regularly utilized for remote broadcasts in conjunction with a Comrex Access,

with no send latency and minimal latency on the IFB return.

On-air hosts, producers and news reporters working out of the news wedge studios all rely heavily on Wireready for audio editing and news production. The Wireready system provides integrated text and audio for news and sports reporters. Stereomixer allows hosts and reporters to bring in Wireready sources, produce content and route that content to the RMX Digital for play to air; and subsequently onto the Vistamax networking system for distribution to other studios, if desired.

Operators can divorce the Stereomixer from the RMX Digital via a simple source selector if the host or reporter prefers to go direct to air from their positions. Similarly, the Stereomixer can separate from the RMXdigital for production purposes during breaks or downtime. Stereomixer consoles are also used in two Pro Tools-equipped production studios (a third, production B, uses a Harris Netwave console), the newsroom, a Tivo recording studio and an imaging studio.

Other equipment present in the on-air and production studios include Air Tools 6200 dual-channel microphone processors, a Telos 2101 Desktop Director, Mackie HR824

Equipment List

- Air Tools 6100
- Broadcast Electronics Audiovault Flex
- Comrex Access
- Electro-Voice RE-27ND
- Fostex RM-1
- Harris Control Turrets
- Harris Integrator HRK, furniture, PR&E 3X6 headphone amp, Harris PR&E Netwave 16, PR&E RMX Digital, PR&E Stereo Mixer Digital, PR&E Vistamax Envoy, Vistamax intercom, World Feed Panel
- Humanscale LCD monitor arms
- Krone blocks
- Mackie HR824, HRS120
- Marantz PMD570 compact flash recorder
- Mohawk wire and cable
- Moseley Starlink
- Symetrix 6200
- Tascam CD-01U Pro 1RU CD player
- Telos 2101
- Yamaha Active HS50M

Triple Transfer

powered studio monitors, Mackie HRS120 studio subwoofers, Marantz compact flash recorders, and Tascam 1RU professional CD players. Harris World Feed Panels in each studio also provide additional inputs and outputs for TV stations or other external media productions.

The Pro Tools-equipped imaging studio sets the sound for the station, using specialized equipment to enhance the talent's voice during breaking news. The imaging studio is an exact replica of production A and production C, with the exception of a Neumann microphone and a Manley voice processor instead of the usual Electro-Voice/Air Tools system.

Talk wing, news and Web

The complexity of the KTAR-AM/FM operation extends far beyond the on-air and production elements.

News/Talk 92.3 KTAR-FM is a rapid-pace operation that alternates between day parts, airing news in the morning and talk in the afternoon. The news team is comprised of three on-air talents and a technical director. The talk talent requires at least 30 minutes of studio preparation prior to going to air. Separate morning and afternoon studios minimize the confusion and provide a seamless air transition.

The non-stop action between these two suites – not to mention the third studio suite for Sports 620 KTAR-AM – partially motivated the decision to establish a KTAR Command Center. The Command Center overlooks all three studio suites. It is home to the news editor and news managing editor, both of whom have a commanding view of everything happening in the various studios.

Each workstation in the newsroom is used to produce news clips for KTAR-AM-FM and KPKX-FM.

More importantly, the Command Center is the bandleader for the newsroom. The editors control the dispatching of news reporters and communicate with the sports department. The Command Center is equipped with most of the technology found in the on-air and production studios, and can send and receive audio to multiple studios and workstations over Vistamax.

Newsroom reporters, content editors and command center editors communicate using Vistamax intercom stations, present at all 16 workstations in the news and sports rooms. Reporters/editors at these workstations can also communicate with any of the control rooms in the three studio suites. News and sports reporter workstations are also equipped with Stereomixers, source selectors and Wireready stations to produce content for immediate or future broadcasts.

There are eight workstation positions for news reporters and six for sports reporters in the newsroom. While positions 1-6 for the news reporters are specifically for editing/reporting, positions 7 and 8 are reserved for Tivo recording. KTAR-AM/FM has four dual-channel Tivo systems recording as many as eight TV programs at any time to capture news, current events and entertainment shows that can potentially be used for audio clips. Operators pull audio bits through the course of the day, using a Stereomixer coupled with Adobe Audition to produce broadcast clips.

Behind the newsroom is a curved wall with three positions for Web page code writers and a graphic artist. Web content is updated throughout the day, including video received from remote broadcasts. The studios are also designed and ready for video. Camera angles are set in two directions: Hosts are framed with the station logo behind them and guests are framed between the hosts, and the command center is visible in the background.

Music wing

The music wing seems comparatively simple in contrast to the talk wing. Most of the rack room and studio

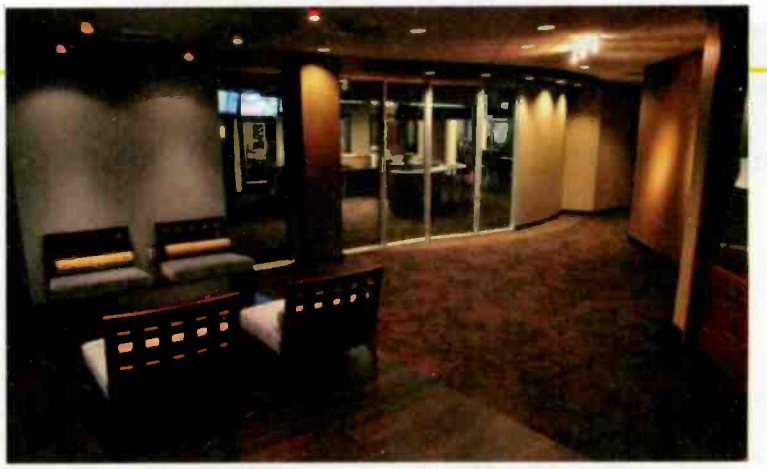
infrastructure is similar, but there is one difference crucial to the on-air and production operation: the Harris Netwave console.

The NetWave is ideal for the music operation because KPKX 98.7 The Peak talent operates the console while on-air. There are limited remote needs and less on-air complexity. The Netwave lends itself well to a music operation because it provides access to multiple sources, but is not complicated to operate while focusing on the show.

The Netwave frame allows for mapping through the Vistamax Frame and for access to external sources, or to route audio to other parts of the facility. Two routable module panels were added to the Netwave consoles, providing four source-selection inputs as part of each console. This quadruples the amount of inputs of our previous one-input system, and is more than adequate for a music operation.

A large conference room near the KPKX studios is available for special on-air events such as visiting bands, radiothons or news conferences. This large room has a movable wall and is ideal for a 12-to-15 telephone bank; shows can be done live from this room using a World Feed Panel routed to the Vistamax Envoy studio networking system.

The Harris World Feed Panel is essentially a remote from inside the building, and is treated the same way as an ISDN or other external feed when called as a source on a Netwave or RMX Digital. Its capacity as a multiple I/O board is very handy for giving real-time program feeds at a professional mic or line level to television crews, musicians and even full bands with multiple instruments.



The lobby provides entry to the news/talk wing on the left and the music wing to the right.

The complexity of Bonneville Phoenix operation is apparent with just a short visit to the new facility. It would be next to impossible to operate as we are today had we decided to remain downtown. The new space is serving us well in the early days, and we expect to discover new technical possibilities moving forward.

Smith is director of engineering, Bonneville Phoenix.

Tips, tricks, hints and more

By Chriss Scherer, editor

Nice PAD

Transmitting program-associated data (PAD) – also called program-specific data (PSD) – has become a standard practice for many stations. With RBDS and HD Radio receivers being more common, stations that do not transmit this data are at a disadvantage. Some stations want to provide the data stream, but don't think they have the resources to do it themselves.

Porting a data stream to an RBDS encoder of HD Radio importer often requires some kind of conversion step. There are commercial products and services to do this, but it can be done in house.

Rob Landry has prepared a Perl script that does it. He currently has it running on two Boston-area stations. Landry notes that it would be easy to modify the script to read an XML file as well.

The script is running on WUMB-FM 91.9 Boston and on WCRB 99.5 Lowell, MA. Because WCRB does not provide scrolling PS but only Radiotext, the WCRB script is different than the WUMB script. The scripts are posted online.

interpring.com/downloads/xmtr.txt

interpring.com/downloads/studio.txt

This script was originally developed for RBDS at the old WCRB 102.5 Waltham, MA. In January 2006 he installed HD Radio at WCRB and added PAD capability to the script. He also developed a version for SPS PAD that ran on WCRB's HD2 channel until the station was sold to Greater Media.

SPS PAD uses a different port (4444) and TCP instead of UDP. He had long been using Perl scripts on Linux boxes to manage file uploads and downloads, backups, remote voice tracking and the music library for the old WCRB and its former sister stations. I chose GNU/Linux because it is a low-cost, low-maintenance operating system that runs reliably on hand-me-down hardware, and it is easy to add scripts to implement new features.

He runs the script on a box at the transmitter site to feed PAD and RBDS from a file uploaded by one of two scripts at the studio that have access to the studio automation system and the music library database. All the scripts monitor themselves by spawning child processes; the child does the work, and the parent monitors the child. If the child crashes, the parent will spawn a new one, so data flow will not be interrupted.

Landry notes, "You may notice in xmtr.txt a variable $MGC that is assigned a string of hexadecimal values used in forming the ID3 tags for PAD. I found these by looking at the output of an Ibiquity demo program. I don't know what they are, but the tags weren't readable without them, so I included them with a comment describing them as 'magical incantation.'"

Handheld Tools

Almost everyone carries a handheld device today. Some started with Palm Pilots and moved up to Pocket PCs before owning an Iphone or Blackberry. I asked Gary Kline for a suggestion of his favorite Iphone app for radio engineering purposes, and he told me about Islipstick (www.carry-onsoftware.com). The app is available through the Itunes store, and it was written by Sam Virgillo, CBRE CEA. Islipsitck is a collection of commonly used electronic formula calculators and value converters.

Calculators:

- Ohm's Law
- Reactance - Find the reactance of a capacitor or inductor at a specified frequency.
- Resonant Frequency - Find the resonant frequency of a capacitor inductor pair.
- Voltage Divider - Find the unloaded output voltage of two resistors in series.
- Parallel Resistance - Find the total resistance of up to six resistors in parallel.
- Impedance and Phase - Find the resultant impedance and vector angle of a series or parallel RLC circuit.
- Op-Amp Gain - Find the gain of both inverted and non-inverted op-amp stages by entering two resistor values.

Converters:

- Resistor Color Code
- SMT Resistor Marking
- dBm Converter - for 50, 75 or 600 ohm loads.
- Voltage Converter - between RMS, average, peak and peak-to-peak
- Temperature Converter - Fahrenheit, Celsius, Rankine and Kelvin
- Period to Frequency Converter

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- Modular Operation in Op-X allows for a tiered system at a fraction of the cost of it's competitors.
- Each studio client is capable of accessing all Audio Server modules on the network.
- Remote voice-tracking allows for creation of content for remote studios also running Op-X.
- The revolutionary design of Op-X's clock builder turns the previous task of scheduling satellite programming into a few simple clicks.
- Share serial devices from any machine using the Op-X Serial Server.
- Importing logs now gets its own module that takes confusion out of the process.
- Engineers will enjoy Op-X because it's easy to install, maintain, and has automatic backup features.

Op-X
RADIO AUTOMATION

AUTOMATION

SIMPLE • POWERFUL • REDUNDANT

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's versatility allows it to operate seamlessly with either Axia IP-Audio networks or legacy audio consoles.*

Broadcasters General Store
352-622-7700
www.bgs.cc

Trilithic EASyCAST

By Chris Wygal, CBRE

On the outside, most listeners would say a radio station's daily operation seems fairly simple: Play the music, run the shows, say the news and sell the advertising. However, those of us who work on the inside know that "fairly simple" is a gross understatement. Many systems must run smoothly and in tandem in order to create a marketable product. One system in particular is critical to public safety and taken very seriously by the FCC. It's another broadcast acronym: EAS. While important, EAS can be tricky. The EASyCAST encoder/decoder from Trilithic has taken away most, if not all of the potential EAS headaches. It is designed with FM and AM facilities in mind.

Upon purchasing the EASyCAST system, the firmware, software and hardware will be specified for radio broadcast. The system is designed for television and radio, so FM and AM users will ignore the character generator and other video keying features and set the encoder/decoder to operate in broadcast mode. The system is housed in a 2RU chassis and has a front LCD screen and buttons that allow for setup and operation on the physical unit. Phoenix connectors on the back allow for quick integration into an analog signal chain and easy connection to logic controls. Programming using the front control panel is handy, but the beauty of the system is its IP configurability. The EASyNIC expansion upgrade includes a network/modem card that can be installed in the field. A firmware upgrade can be made (via RS-232) to EASyCAST systems not shipped with EASyNIC IP compatibility.

Performance at a glance

- Manageable via IP
- Easy to program events and generate tests
- Manage multiple EASyPLUS systems from one PC
- Store logs as data files or print outs
- Monitor up to four FM, AM and NOAA frequencies

Network ready

A little more than basic knowledge of IP networking is necessary for initial setup. The system will need a static IP address assigned by the local switch or router. Once the system has found a home on the local IP network, telling the software which system to look for is as simple as entering the IP address of the new system. Multiple EASyCAST systems can be managed using the software and friendly names can be stored to identify each system. The software should be installed on a PC that is accessible to management and on-air staff. The system can be configured and monitored by more than one PC with EASyCAST software, but care must be taken to load the updated configuration to each PC when changes are made to the physical unit. Otherwise, one PC will see the correct configuration and the other will not.

The rack-mounted unit can be expanded to include up to four FM/AM/NOAA radio receivers on two audio expansion cards using 75Ω F connectors. Tuning the cards, in addition to adjusting ATT and FSK tone modulation settings is done by using the software, as is the case with all other controls. Ultimate care should be taken when adjusting these settings, and the user will find that the default tone modulation levels should perform correctly on the air. The unit houses a front-panel-mounted speaker and microphone for monitoring tones and messages and generating voice messages. For improved voice messaging, an external source such as a control room microphone or control console output can be connected to the unit.

FIPS made easy

Remember FIPS codes? Trilithic has made it easy. Setting the city of license and other municipalities and counties is done with drop-down menu. All 50 states and 24 other regions ranging from American Samoa to the Virgin Islands, Guam and Micronesia are included. Under the events tab, the familiar three-letter EAS events (such as RWT) are listed and can be set to automatically forward by checking a box. The event can also be set to forward manually or it can be delayed as much as one hour. The EASyCAST system can operate in automatic, manual, global (manned) and unmanned modes.

Generating a test or an actual alert starts under the utilities tab. Using the EASyCAST software, select the event from a drop-down menu. Then select the county or area for which the event will be issued. Once all the parameters are correct, simply click "Send Event to EASyCAST." At once, the unit will air the test. The correct corresponding header and

EOM are present, depending on the event selected. Originating an actual event, including a voice message, while more complex, is actually easy to conduct using the system. The user-generated voice message (up to two minutes in length) will play out between the header and EOM of the test or alert generated. Air staff should be most familiar with the encoder functions under the utilities tab.

The EASyNet controls the EASyCAST via telephone. Local emergency authorities can access and override the system and issue necessary information. This requires close collaboration with local officials who would need to know the correct telephone touch pad commands.

As usual with EAS operation, keeping records of all tests sent and received and other events generated by the EAS encoder/decoder is critical. The system logs all activity, which can be viewed under the logs tab using the EASy Plus software. Printing, saving and other log management options are available. The EASyCAST unit will store more than 1,000 EAS log items, but it is recommended that the logs be cleared periodically and stored elsewhere. When logs are saved, they are stored as .TXT files in a folder on a specified hard drive. The logs can also be printed for hard copy backup and archiving.

Numerous other settings are available and very easily accessed when using the EASyCAST management software. In the event that multiple EAS units must be monitored and managed, each unit can be controlled from one PC workstation. Upon IP setup, the software is very intuitive. Within a few minutes of browsing through the available options under each tab, the user will find the setup to be simple. Care must be taken to keep the configuration settings updated on each PC used to manage the hardware. In addition, logs should be saved and printed periodically. After a brief instructional period with air staff and management members, the entire radio station team will find the EASyCAST EAS system to be a friendly tool for public emergency event notification.

Trilithic
P 888-895-7629
W www.trilithic.com
E EASsales@trilithic.com

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.

by Erin Shipps, associate editor

Industrial Ethernet cordsets/patch cords

Belden

Hirschmann Media Line: When Hirschmann Industrial Ethernet cordsets and are used in conjunction with Belden's line of Hirschmann Industrial Ethernet switches and Belden's Industrial Ethernet cable, a complete (end-to-end) industrial solution is realized. These cordsets and patch cords are manufactured using Belden's patented Bonded-Pair technology, meaning the cables have the individual insulated conductors bonded together along their longitudinal axis to assure uniform conductor-to-conductor spacing for maximum electrical integrity. These cables are also chemical- and temperature-resistant and incorporate rugged RJ-45 or over molded M12 (IP67 rated) industrial connectors to ensure reliable performance in extreme or mission-critical environments.

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

Server rack

APW Mayville (Stantron)

Nexserv: Nexserv server cabinet is designed to integrate equipment, cabling, power and cooling in a way that is smart, effective and saves installation time. It was designed especially to handle the extra weight capacity, power, cooling and cabling needs of both today's and tomorrow's server applications. Nexserv's most unique feature is the X design of the top and bottom of the structure. It eliminates the need to pull or push cables over or through port holes or around the frame. Allowing cables to be moved or laid in saves time and effort and reduces the chance of potential damage to cables. Easy access to the front, rear and sides of the cabinet make cabling a simple task. With the ability to split the rear rails to accommodate differing depths of equipment, Nexserv is a multi-platform enclosure capable of being useful after the next technology change.

800-558-7297; www.apwmayville.com

Multi-channel BLITS tone generator

Sonifex

RB-TGHD: The RB-TGHD is an 8-channel audio tone generator with line identification for multi-channel audio systems, including BLITS 5.1 and 7.1 surround sound. By using a wide range of industry standard tone sequences, channel identification and associated levels can be determined easily. Correct channel configuration in fold-down mixes can also be highlighted when a broadcaster needs to mix several audio channels into a stereo feed. Available tone sequences include EBU R49, GLITS and BLITS stereo line-up, EBU R49 and BLITS channel identification and a standard Phase check. The RB-TGHD caters for 2-, 4-, 6- and 8-channel configurations and all of the available audio tone sequences for each channel configuration can be cycled through automatically, or selected manually. A loop mode allows patterns of tones to be repeated. A bank of four pushbuttons on the front panel sets these options and the associated LEDs indicate the current setting. A set of eight LEDs on the front panel indicate audio presence for each output channel.

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

Surround monitoring system

Studio Technologies

Studiocomm 76DB/77B: By eliminating the need for an add-on analog-to-digital converter, the fidelity of the 5.1 digital signals from the source to the loudspeaker is maintained. Broadcasters can realize the full benefit of their investment in digital, both in loudspeakers and routing infrastructure. The Studiocomm 76DB/77B, comprised of a Model 77B control console connected to a rack-mounted Model 76DB central controller, provides two 5.1 surround inputs, three stereo inputs, along with pre-fade and post-fade 5.1 surround outputs. Flexible source selection, Dolby E dialnorm support, and a two-channel auxiliary output for special applications such as monitoring site-event cue signals, as well as downmix, channel solo, level adjustment, reference level, and dim, make this system suited for broadcast master control applications.

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

NEW PRODUCTS

Loudness display
RTW Radio-Technische Werkstatten

Loudness Family: The Loudness Family, with its Surround Control, Surround Monitor, and Digital Monitor, now includes an integrated loudness display conforming to the ITU BS.1771 guideline as a standard feature. With this line-up, RTW now offers easy-to-use solutions for monitoring the loudness of stereo, multichannel and surround signals in a wide range of applications, as a complement or an alternative to conventional peak meters. Users can select integrated loudness measurement, as per ITU BS.1771 for stereo signals, as an alternative to the usual peak meter bar graphs. This feature can be activated quickly and easily via suitably programmed presets.

+49 221 709130; www.rtw.de

LED decibel display
American Audio

dB Display: The LED decibel display is designed to sit in an amp rack to view decibel levels and creates a light show in the rack. It features sensitivity adjustment on both left and right channels and two separate modes: dot and bar. It includes 12V power supply and has left and right RCA inputs and outputs.

323-582-2650; www.adjaudio.com; info@americanaudio.us

Advanced Room Correction System
IK Multimedia

ARC System: ARC System delivers advanced, accurate solutions for acoustical problems for any DAW-based studio. Version 1.1 features full range bass correction: It is now possible to disable the automatic bass roll off point detection feature, allowing ARC's correction to be applied to the entire frequency spectrum, down to 20Hz. In rooms with especially odd low-frequency issues, correcting the entire spectrum gives users a more accurate flat response and corrected listening environment. Maximum boosting/correction applied at the low end is never more than 9dB, thus protecting the speakers from excessive boost. With this feature, users now have more options for room correction, as well as the ability to tune their speakers with more power than ever before. The ARC System 1.1 update is a free download for all registered users of ARC System.

+39 059 285496; www.ikmultimedia.com

Cam-locking, demountable panel system
Eckel Noise Control Technologies

Acoustic panels: Eckel studios feature 4" cam-locking attenuating panels in a fully demountable system. They also feature single- and double-wall construction, silent ventilation systems, single-, double- and triple-safety glass window designs, flush sill doors with double-magnetic gasket seals, non-visible, internal electrical wiring, vibration isolated floors or low-profile, easy access floor design, a wide variety of lighting options and custom designs.

613-543-2967; www.eckel.ca; ballan@eckel.ca

Digital pocket studio
Tascam

DP-004: The DP-004 Digital Pocketstudio, a portable four-track digital recorder, retains the ease-of-use of cassette-based four-track recorders but updates it with CD-quality digital recording. The recorder uses a set of dedicated knobs and buttons. A pair of unbalanced 1/4" inputs accept mic or line signals, or musicians can employ the built-in stereo microphone. A stereo mix-down track is also included, and tracks or mixes can be transferred to a computer using USB 2.0. Smaller than a paperback book, the DP-004 is portable enough to bring anywhere. The DP-004 records to SD Card media, and a 1GB card is included. It features autopunch recording, track editing and an undo function. A metronome and tuner are built-in, and the Input A jack accepts a guitar-level signal for direct recording.

323-726-0303; www.tascam.com
tascamlit@tascam.com

Rectangular, dual membrane mic
Pearl Microphone Labs

CB 22: The CB22 features a figure of eight polar pattern that adds to the existing omni and cardioid models in the Pearl Lab CC range. Independent Audio offers a CD featuring recordings of several Pearl mic models. Featured in the newest Pearl Lab CB22 microphone is a rectangular diaphragm capsule, which may seem radical, but Pearl has been making widely respected microphones for more than 60 years, and its capsule design is celebrated worldwide by sound engineers particularly in the classical field.

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

Miniature, illuminated rocker switches
NKK Switches

CWSC Series: The CWSC Series features front panel, snap-in mounting. The series is available with full face, bright LED illumination in red, green or amber to give operators an at-a-glance visible status indication. The illumination is diffused through a matching clear cap to guarantee even color distribution. These switches are uniquely designed to have current ratings of 9A@125Vac or 6A@250Vac in a compact body. The long mechanical life of 30,000 operations minimum is made possible by the quick-make, quick-break characteristic of the contact mechanism which limits arcing. This single-break, snap-acting contact mechanism provides smooth actuation and audible feedback to operators.

480-991-0942; www.nkkswitches.com; sales@nkkswitches.com

Portable recorder wind protection
Rycote Microphone Windshields

Mini Windjammers: The Mini Windjammer range was first launched in 1985 to provide wind-noise protection for video camcorder and other compact microphones, and was widened in 2008 with the appearance of three all-in-one windhields designed for different handheld digital recorders, of the id now widely used by journalists, podcasters and broadcasters. 'cote have now added Mini Windjammers for the Ediral R-09HR, arantz PMD620, Tascam DR-1 and Zoom H2 and H4.

+44 1453 759 338; www.rycote.com; info@rycote.demon.co.uk

Social network platform
Tampa Digital Studios

See Radio: Tampa Digital Studios and Endavo have partnered to deliver See Radio, a branded online video and social networking community designed for radio broadcasters to enhance their listeners' experience and drive new revenue. Combining Tampa Digital's video streaming solutions and the Endavo Media Internet TV Platform, See Radio distributes a social network for radio broadcasters to create on-demand programming. The platform encourages listeners to watch their favorite music videos, exclusive music artist interviews and performances, as well as rate, vote, link, share and chat about the videos. It also supports high-quality live streaming video, user-generated content, contests, as well as on-demand video, audio and photos to also entertain its viewers.

813-241-2012; www.tampadigital.com

UPGRADES and UPDATES

Comrex now offers the BRIC TS server to end users. Userws can build their own or use the service through Comrex. (www.comrex.com)...
Audiofile Engineering has released version 1.3 of Fire, the field recording app for the Apple Iphone and Ipod Touch. This version adds audio effects powered by Izotope, improved overdub mode, the ability to change the playback speed while retaining the pitch, and the ability to compress files in AAC, Apple Lossless, FLAC and Ogg Vorbis formats. (www.audiofile-engineering.com)

Audio and acoustic analyzer
NTi Audio (New Technologies in Audio)

XL2: NTi Audio AG presents its new handheld flagship: the XL2 Audio and Acoustic Analyzer. The XL2 analyzer forms the unique combination of a state-of-the-art sound level meter, a comprehensive acoustical analyzer as well as a powerful audio analyzer. The XL2 provides together with the measurement microphones M4260 (Class 2) or M2210 (Class 1 frequency response) a precise sound level meter for monitoring of live sound events and environmental noise. The instrument generates the 48V phantom power supply for the microphones and reads the included electronic data sheet of the M4260 and M2210 automatically. This promotes faster setup and ensures accurate measurements. Additionally the XL2 logs the calibration data and microphone serial number at each measurement.

503-684-7050; www.nti-audio.com
info@ntiam.com

USB to RS-232 serial adapter
Sealevel

Sealink+232-DB9: The Sealink single-port USB to RS-232 serial adapter utilizes military-grade designs into the new Sealink+232-DB9. This enclosure improves reliability and durability in industrial and mobile applications such as GPS navigation systems, barcode readers, signature input devices, serial printers, scales, and similar applications. The serial port appears as a standard COM port to the host computer enabling easy setup and providing compatibility with legacy software. The USB serial adapter is compatible with all standard PC baud rates and supports high-speed communication to 921.6kb/s. The adapter is powered by the USB port and status LEDs molded into the enclosure indicate serial data activity and connection to the host.

864-843-4343; www.sealevel.com
sales@sealevel.com

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MEMBER ORGANIZATIONS
Sustaining Member of:
• Audio Engineering Society
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Member: American Business Media, The Missouri Association of Publishers

missouri association of publications

A PENTON MEDIA PUBLICATION

Penton Media

Penton Media, Inc.
249 West 17th Street
New York, NY 10011

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POSTMASTER: Send address changes to Radio, P.O. Box 2100, Skokie, IL 60076-7800 USA.

ARCHIVES & MICROFORM: This magazine is available for research and retrieval of selected archived articles from leading electronic databases and online search services, including Factiva, LexisNexis, and Proquest. For microform availability, contact National Archive Publishing Company at 800-521-0600 or 734-761-4700, or search the Serials In Microform listings at napubco.com.

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EDITORIAL and BUSINESS OFFICE: Penton Media, Inc. 9800 Metcalf, Overland Park, KS, 66212; 913-341-1300; RadioMagOnline.com, penton.com.

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Contributor Pro-file

Meet the professionals who write for *Radio* magazine.
This month and every month:
FCC Update, page 12.

Harry Martin
Fletcher, Heald
and Hildreth
Washington, DC

Harry Martin began writing the FCC Update in *Broadcast Engineering* in 1982. When *Radio* magazine was created in 1994, he continued writing for both publications and has done so continuously. Martin is a past president of the Federal Communications Bar Association (FCBA), and has served 10 years as an officer or member of the executive committee. He is also a regular speaker at broadcast conventions and FCBA Consulting Legal Education seminars.

Radio
THE RADIO TECHNOLOGY LEADER

Written by radio professionals
Written for radio professionals

Radio Volume 15 Number 12 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

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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

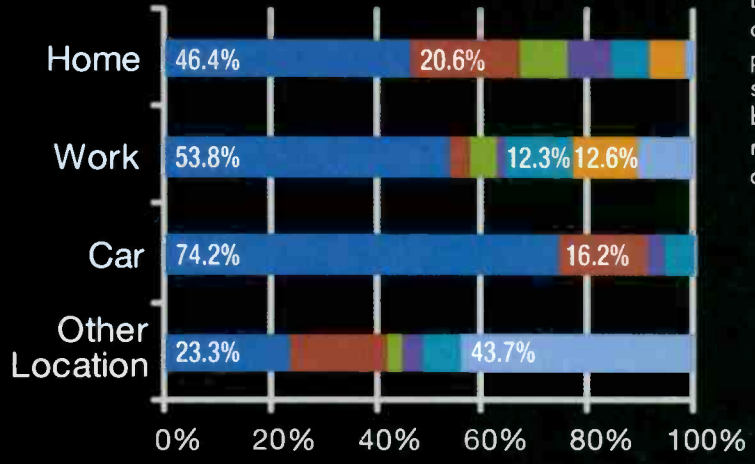
That was then

These 1970s photos of KZUN Opportunity, WA, are by Jerry Anderson, courtesy of Bill Harms. Bill has many old radio photos, so check out his website at spokaneradio.philcobill.com. Photo 1 is Charlie Dee, an announcer doing his show in the FM studio. Photo 2 is a part-time announcer at KZUN whose name is not known. One of our experts has identified a famous Revox A77 reel deck, a Shure M67 Mixer and a Collins board in this photo. Photo 3 is Stompin' Stan Weisbeck in the AM control room. In this photo you can see a Collins or GE board, a Telex/Magnecord reel deck and a Crown reel deck. Photo 4 is an unknown announcer in the FM control room. This photo shows an E/V RE-16 mic, an ITC triple deck cart player and a Cetec board.

Think we identified something incorrectly? Let us know by commenting on this article online. Also, be sure to point out any other equipment you can name.

Sample and Hold

How U.S. Adults Use Audio



According to a study by the Council for Research Excellence and The Nielsen Company, broadcast radio accounts for more than half of all audio media exposure each day. The most time spent listening to broadcast radio is in the car. Broadcast radio was also widely used among users of other forms of audio media. For instance, 81.6 percent of those who used portable audio devices, such as an MP3 player or Ipod, also listened to broadcast radio. Likewise, 90 percent of satellite radio users also listened to broadcast radio for an average of 109 minutes per day.

Source: Council for Research Excellence Video Consumer Mapping Study

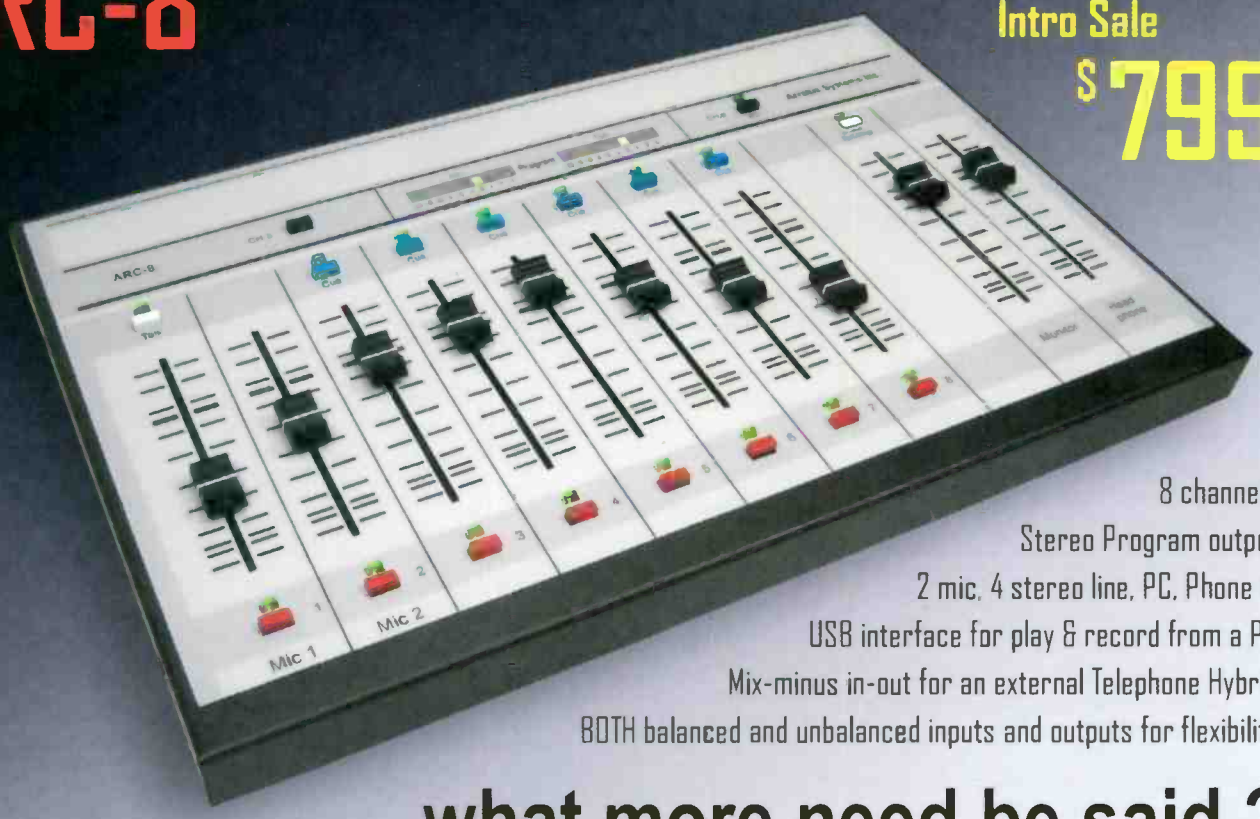
NEW

full featured, professional consoles at amazing prices from ARRAKIS

ARC-8

Intro Sale

$799



8 channels
Stereo Program output
2 mic, 4 stereo line, PC, Phone in
USB interface for play & record from a PC
Mix-minus in-out for an external Telephone Hybrid
BOTH balanced and unbalanced inputs and outputs for flexibility

...what more need be said ?

other members of the ARC family...

Sale

$1,599
ARC-10U

$3,495
ARC-15BP

$5,495
MARC-15-12

www.arrakis-systems.com 970.461.0730

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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