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See these buttons? You can program them (or the button modules available for Element consoles) to perform routing salvos, system-wide scene changes and more. Because great power requires control.

Smarter phones.
Not only are hybrid controls built into iQ for direct-from-the-board control, the iQ6 phone system connects with just one Ethernet cable.

Network everywhere.
No need for cheesy A/V mixers - RAQ lets you put a networked, professional console anywhere, at a price that'll make the even stingiest GM smile.

Double your pleasure.
Did you know that one QOR.16 console engine will power 2 RAQ or DESQ mixing consoles? Makes your money go further on news bullpens, production pods, ingest stations, etc.

Step to the side.
Dirt and liquids: a console's most hated enemy. Element foils 'em with premium, side-loading conductive-plastic faders: dirt drops past, not in.

Who's da boss?
Clients rave about them, talent loves them: over 5,000 on the air makes Axia radio's favorite IP console.

Built to last... and last, and last.
Element modules are machined aluminum with wear-resistant Lexan inserts for long life. We've even designed custom-molded guides to prevent tears around the fader slot. No "ouchies" here.

Unlimited vision.
Some console makers give you "switched meters" to save costs. iQ does away with that annoyance: high-rez OLED displays meter all 4 buses at once.

Available in small, large, and OMG.
Whatever size console you need, Element can handle it, from 4 to 40 faders in single or split frames Huge selection of standard and motorized modules, too.

A low price shouldn't mean "cheap".
Other companies cut corners on their low-cost consoles. Axia packs in as much as possible. Real conductive-plastic faders, machined-aluminum work surfaces, anodized rub-proof markings, aircraft-grade switches. At a price less than some analog "bargain" consoles.

Handsome devil.
Our meters aren't just good-looking; they're designed specifically to convey the most information possible at just a glance. And Axia consoles support VU and PPM metering styles - something you might not find on consoles that cost a lot more.

Big power, small price.
Radius loads you up with 8 faders, 4 mix buses, automatic mix-minus, onboard EQ and voice dynamics and more — for just $5990 USD. Shh... don't tell the accountants.

Rack 'em up.
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Good timing.
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Small but mighty.
DESQ packs big console power into just 18" square. 6 faders, 2 buses, automatic mix-minus, Show Profiles and more. Perfect for standalone or networked studios.

Axia makes the switch.
No "plug-n-pray" unmanaged switches here; Axia builds our own custom zero-config, built-for-broadcast network switch right into our PowerStation and QOR console engines.

Show-off.
Element lets you store up to 99 Show Profiles - "snapshots" that recall channel sources, bus assignments, EQ settings, even fader positions. So every jock can have their own customized console.

Speak your mind.
Element consoles have comprehensive talkback features. You can talk directly to remote codecs, phone callers, adjacent studios... even individual talent's headphone feeds. Even our most cost-effective boards let you talkback to callers and codecs.

CHOOSING AXIA FOR YOUR NEXT CONSOLE IS EASY.

SELECTING ONE MIGHT TAKE AWHILE.

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Who can blame them? Axia fans say that Livewire™ networking is the most intelligent, flexible IP-Audio system in the industry. And that our huge number of partners, with over 75 broadcast products from phones to transmitters that connect to Axia networks, makes life much simpler. They also appreciate our 5-year warranty and 24/7 technical support (not that they need it).

In fact, we calculate that thanks to our huge selection of frame, module and mixing engines, there are at least 32,209,982 different ways to order an Axia console. With that many options, you'd better get started now! Mmm... don't you just love that new-console smell?

AxiaAudio.com

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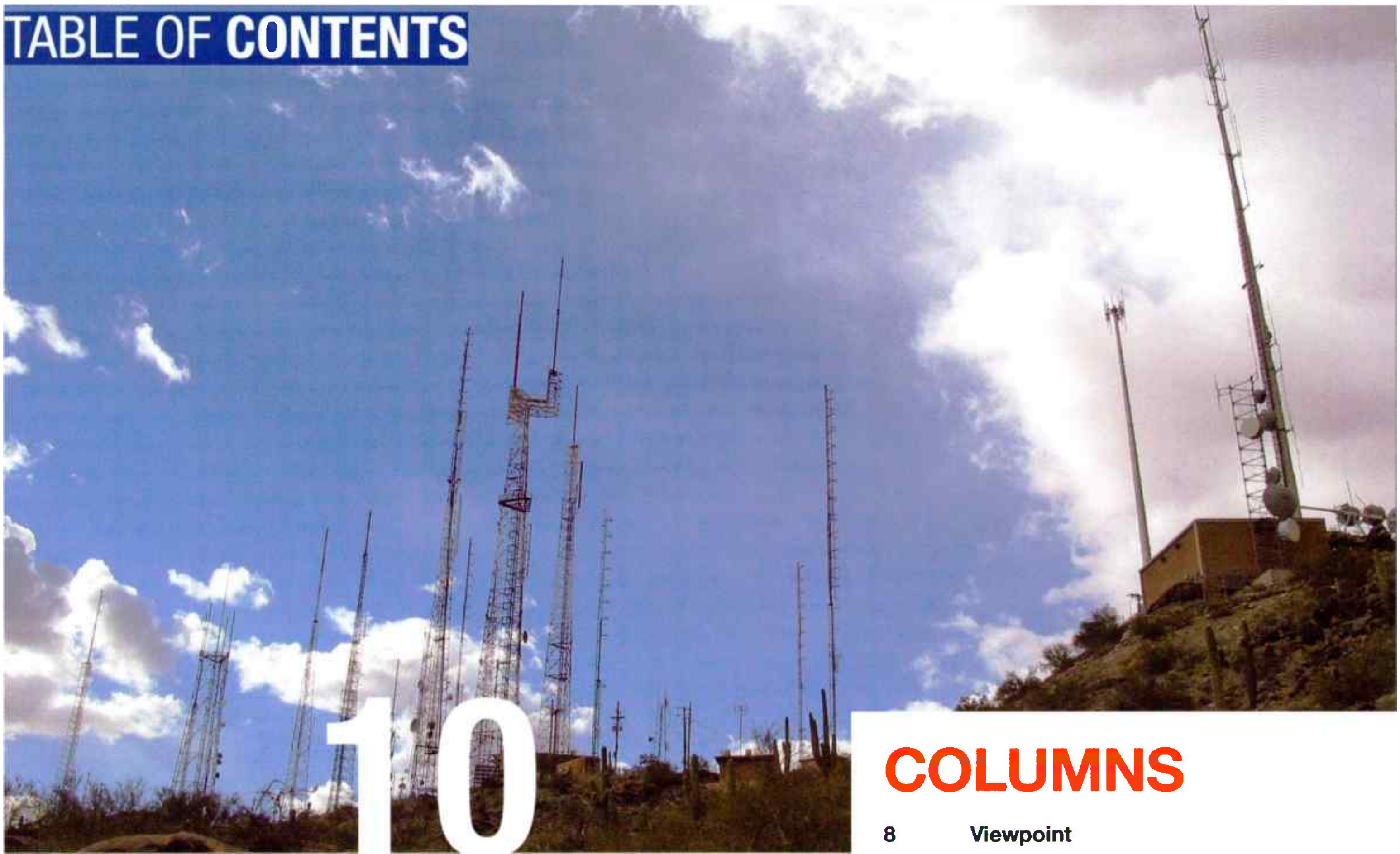
TABLE OF CONTENTS



10

FEATURES

14 **Trends in Technology**
The benefits of prefabricated buildings at the transmitter site

YAMAHA
POCKETRAK
PR7

26

COLUMNS

8 **Viewpoint**
As often happens, radio stands out during a crisis.

10 **Managing Technology**
Tower maintenance isn't something to be ignored.

12 **FCC Update**
Issues in advertising: online gambling and e-cigarettes

24 **Tech Tips**
Rack room wiring: spoke-and-hub vs. point-to-point

DEPARTMENTS

26 **Field Report**
Yamaha Pocketrak PR7

28 **Side By Side**
Handheld testers

30 **New Products**

38 **Sign Off**
An anniversary for ESPN Deportes

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World Radio History

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BIA/Kelsey: 2013 Radio Sales Show Slight Industry Change

About the same number of radio stations switched hands in 2013 as in 2012, making for a slow year for transactions, according to BIA/Kelsey's Media Access Pro, a comprehensive data service and analytical software that tracks the entire radio industry. The largest transaction of the year was the 53 stations sold by Cumulus Media to Townsquare Media in August, estimated to be $238 million.

"The slight change in total sales of radio stations in 2013 is evidenced by the few number of large transactions," said Mark Fratrik, vice president of BIA/Kelsey. "This year we anticipate a slight increase as the economy gathers some strength."

BIA/Kelsey tracks the value of transactions in radio and the number of radio stations sold on a monthly and year-to-date basis on its website.

See the top five radio station deals at RadioMagOnline.com.

Comrex Upgrades Traversal Server Service with Switchboard

Comrex has completed a major upgrade to its popular BRIC Traversal Server (or BRIC-TS) service for the Access and Bric-Link IP audio codecs. The newly retooled service has been rebranded Comrex Switchboard Traversal Server. Switchboard TS for audio is a feature that allows for presence notification, status and connection help (NAT Traversal) via a cloud-based service that is free to use for Comrex Access IP codec customers. The feature is included in all Comrex Access IP audio codecs and can be unlocked on Comrex Bric-Link codecs for a small license unlock fee.

Comrex migrated all existing Bric-TS accounts to the new Switchboard TS on Jan. 28, 2014. The changeover was seamless for existing users. While customers will experience an improved graphical user interface, they should note two main improvements to the management tools in Switchboard. Specifically, Contact Lists and Shares have simplified the task of managing a large fleets of Access and Bric-Link codecs.

3-3-14

Nominations are due on March 3, 2014, for the Association of Public Radio Engineers (APRE) 8th annual Engineering Achievement Award.

The 2015 Hyundai Genesis is the fourth Hyundai vehicle to include HD Radio as a standard feature.

The 2015 Chrysler 200 also adds HD Radio. It is expected to arrive at dealers during 2Q2014.

Radionomy acquired Winamp and Shoutcast from AOL. The company plans to enhance and expand services with the addition of the streaming provider and media player.

4-1-14

Deadline for entries for the 2014 Radio Mercury Awards is April 1, 2014.

2014 CES: iBiquity Notes Further Vehicle Integration

iBiquity Digital announced that all major automakers now offer HD Radio in cars. Five OEMs, Toyota, Lexus, Honda, Mazda, and Mitsubishi, have introduced vehicles that use the digital broadcasts to receive traffic and data information as well. 25 auto brands offer the iTunes Tagging feature and the Artist Experience feature, which brings visuals like album cover art to radio screens, is already offered by 11 auto brands with more on the way. Several carmakers are expanding their commitment to the digital dashboard by including HD Radio: Acura, Audi, Bentley, BMW, Buick, Cadillac, Chevrolet, Dodge, Ford, GMC, Honda, Hyundai, Infiniti, Jaguar, Jeep, Kia, Land Rover, Lexus, Lincoln, Mazda, Mercedes-Benz, Mini, Mitsubishi, Porsche, Ram, Rolls Royce, Scion, SRT (Chrysler), Subaru, Tesla, Toyota, Volkswagen, and Volvo have all extended their commitments to the technology with new announcements, a mix of new vehicle launches, broader application, new services and standardization

Nielsen Report: Connected Cars Drive Consumers to Auto Showrooms

According to Nielsen, about one in five drivers aware of connected cars is already driving a high-tech vehicle. And as car manufacturers continue to introduce new tech at showcases, that number is bound to increase. A new Nielsen report shows how today's car buyers are becoming just as interested in gigabytes and touchscreens as they are in horsepower and transmissions.

FIND THE MIC AND WIN!

Tell us where you think the mic icon is placed on this issue's cover and you could win Hosa UXA-110 USB-to-mic interface. Send your entry to radio@RadioMagOnline.com by March 10. Be sure to include your guess, name, job title, company name, mailing address and phone number. No purchase necessary. For complete rules, go to RadioMagOnline.com

ROC YOUR WORLD

The new ROC console from Logitek

When Logitek introduced its first ROC console back in the 1990s, it marked a revolution in audio console design. One of the industry's first router-based digital consoles, the original ROC boasted simple wiring and access to multiple sources at each fader.

Over the years, the router-plus-console Networked Audio concept has become the standard in console architecture. Although the original ROC was retired years ago, Logitek has continued to develop systems for both TDM and AoIP audio networking. The new ROC takes the best of the original design and pairs it with the latest technology and styling.

Available in multiples of 6 faders (up to 24), the ROC is housed in an attractive tabletop enclosure. Durable Penny & Giles faders, OLED source indication and intuitive controls make the ROC a natural for on-air, production rooms or even in temporary studio setups. Two monitor feeds, front panel headphone connection and user-assignable softkeys will please even your fussiest operators.

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Bad Weather Is an Opportunity for Radio to Shine

Several winter storms hit different parts of the nation during January and February, and while it was only one piece of the overall coverage, the weather that shut down Atlanta was all over the news. Those who are used to ice and snow may have gotten a chuckle from a city coming to a halt with what more northern cities would call a little ice, but the southern areas aren't set up to handle such weather. Regardless of whether or not proper preparation was made, the event is yet another reminder of what radio does best: It's an ideal public information network.

Staying with the Atlanta example, thousands of drivers were stuck in their cars on the road. Children were kept at schools or in school buses on the road. Naturally, most of these people turned to their cell phones to get information. But as often happens in an emergency, the cell networks become overloaded. This is where radio's one-to-many infrastructure stands out. Other cities had similar difficulty with the weather, including Birmingham, AL.

News radio stations went into action to provide as much information as they could during the situation. Even non-news stations carried news and information, with some dropping their regular formats to deliver coverage. Other stations provided information as well, but they also offered some companionship in various ways.

So once again, radio has shown that it can step up during a crisis. The general public—not just regular listeners—knows it can turn on a radio and get information without buffering or network congestion.

People in cars of course had a radio available. Those in other vehicles or in buildings may not have had a radio on hand, but they likely had their cell phones. This is where the on-board radio tuner would be ideal. The on-board radio doesn't use the network bandwidth and uses less battery power. That's a win all around.

And this information delivery doesn't need to be limited to the audio channel. With data capabilities, weather maps and traffic data can be transmitted as well, again without needing the network data capacity.

So even though radio had a chance to stand out again, the downside is that radio can't just simply become an emergency information channel while we wait for the next winter storm, flood, tornado, earthquake or other major event. Radio continues to compete with other forms of entertainment media that still pull listeners away from over-the-air channels.

It's to radio's benefit to remain top-of-mind with all consumers and not just die-hard listeners. The effort to enable tuners in cell phones is part of the equation. Making HD Radio ubiquitous in all receivers (for the data capacity and additional audio channels) is another step in the right direction. But having the technology in place is one part. Radio stations have to provide programming that will attract and keep listeners engaged all the time and not just during an emergency.

Chris Scherer

Chriss Scherer | Editor

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Radio
THE RADIO TECHNOLOGY LEADER
February 2014 | Vol. 20 No. 2

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Member: American Business Media

A NewBay Media Publication

NewBay Media
NewBay Media, LLC
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SUBSCRIPTIONS: Free and controlled circulation to qualified subscribers. Customer Service can be reached at: newbay@computerfulfillment.com or by calling 888-266-5828 (USA only) or 978-667-0352 (Outside US) or write us at Radio Magazine, P.O. Box 282, Lowell, MA 01853, USA. Back issues are available by calling Customer Service.

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Radio, Volume 20, Number 2, (ISSN 1542-0620) is published monthly by NewBay Media LLC, 28 East 28th Street, 12th floor, New York, NY 10016. Periodical postage paid at New York, NY and additional mailing offices. Postmaster: Send address changes to Radio, PO Box 282, Lowell, MA 01853.

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World Radio History

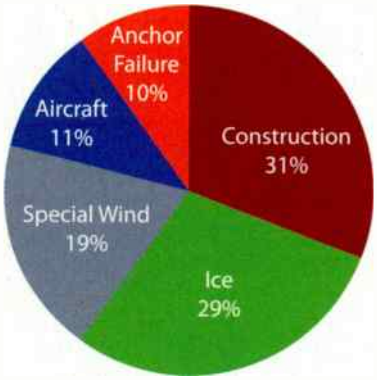
Tower Maintenance: The Best Investment You Can Make

by Kevin McNamara

Do we really need this? That's the question generated every year when we submit operational budgets in regard to one line item: tower maintenance.

Let's face it, most non-technical types see towers every day — some have been there for 50 years or more — so why are we spending all this money? Don't they just stay up there? As engineers, we read about tower failures and many of have experienced it, either your own or perhaps another station in the market.

The fact is that tower failures really don't happen that often. Electronics Research, Inc. gave a presentation a few years ago where it went back to 1960 and determined that all the reported tower failures fell into one of five categories:



A link to the report can be found at sbe.org/sections/documents/TOWERFAILURES.pdf. Take note that most of the failures of existing structures (taking construction out), particularly those caused by ice or wind were triggered by some external event, but perhaps the underlying cause of some of those might be attributable to poor maintenance or overload. In the case of aircraft strikes, they didn't find a clear correlation to tower marking and strikes, however a structure that is not properly marked according to FAA circular AC-70/7460-1K is inviting a fine, or worse, risking a collision with an aircraft.

South Mountain, Phoenix, AZ. Eric Eaglstun/flickr.com

Perhaps the most overlooked parts of a guyed tower are the anchor points. Even in a correctly installed anchor system, the components are subject to some form of deterioration primarily due to galvanic or electrolytic corrosion, which is a result of current flow in the subsurface portions of the anchor system.

Recommendations for maintenance intervals for guyed and self-supporting structures are addressed in TIA/EIA 222-G. This recommends that maintenance and condition assessments are performed at a minimum of every three years for guyed and every five years for self-supporting structures. Further, it recommends that inspections be performed for all structures after a severe wind or ice event. It also recommends these intervals be shortened for structures in coastal areas or for all Class 3 structures. Class 3 towers are used primarily for essential communications such as: civil or national defense; emergency, rescue or disaster operations; military and navigation facilities.

While a qualified professional should perform maintenance, you can learn a lot about the condition of your tower by simple visual inspection (which is recommended to be performed every year for guyed and every three years for self-supporting structures). In my opinion you should perform a visual assessment every time you visit the site, especially in remotes areas that might be subject to attracting the attention of fun-loving locals.

I make it a habit to look at the tower from a short distance to see if everything looks in alignment. Of course the eye won't catch small variations, but once I noticed some sections of the tower looked a little crooked, which turned out to be a guy anchor that apparently was hit by a vehicle. I also recently had an experience with a guyed tower at a not-so-remote location, that happened to be owned by a city, stood next to its E911 call center and was used as a primary microwave link to its other radio sites. Someone unscrewed the turnbuckle on one side and released a level of guy wires. Fortunately it was noticed and addressed before the tower collapsed. You should also take note of the condition of the paint and/or the operation of the lighting system.

CHECK EVERY VISIT

When I arrive at a site I usually check to see if the fence has been breached. It is very common to see openings in the fence, which usually means there is going to be — at the very least — some copper, transmission lines or AC compressor missing; but, it's also not unusual to find the doors open. While this isn't directly addressed in maintenance requirements, a broken ground ring will create problems (and potential safety issues) and should be repaired ASAP. You can also easily check the anchors and foundations for unusual cracking, connections to the guy wires, and rust or corrosion.

For a self-supporting tower, items that seem to get overlooked are the bolts that connect the foundation to the tower legs. These are typically bolted above and below the plate, to allow for some minor adjustments to level the tower base. Normally once the tower is built, they pack the lower bolts with concrete (between the base plate and foundation) to protect them from moisture or water pooling. I have seen many self-supporting towers with these exposed and rusting.

None of this should take the place of a proper full inspection of the tower, which includes:

> Climbing the structure and noting (and hopefully correcting) loose bolts, documenting bent members, rust, improperly attached line and antennas, electrical connections to tower lighting, missing grounds, improperly functioning safety items or anything else unusual. They should take lots of pictures to document the problems that should be included with a comprehensive report.

> They should use a transit to determine the vertical alignment of the tower shaft and guy wires

> The tension of the guy wires should be measured and corrected if needed, every three years.

> The lighting system and tower paint should be inspected annually per FAA Circular AC-70/7460-1K.

> The integrity of a ground system should be inspected and conductivity tests performed annually. You can learn a lot about the performance and deterioration of a ground system by noting the measurements each year. Try to perform them around the same time of year. A poorly functioning ground system can cause deterioration of metals through possible galvanic or electrolytic corrosion.

A properly maintained tower can stand for more than 50 years — that's the best return on investment you can have.

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

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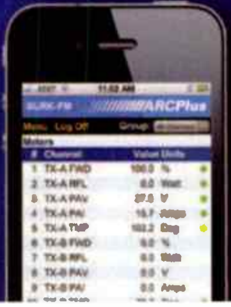

Avoid Advertising Issue Pitfalls

by Lee Petro

Recent advances in technology have led to questions on the legality of broadcast stations taking advertising from new sources. Specifically, several states have now begun permitting online gambling from authorized locations within their state. Further, the popularity of e-cigarettes raises issues as to whether the traditional prohibition on tobacco advertisements apply.

Online Gambling. Since the late 1990s, a frequently asked question has been whether broadcasters can take advertisements from online gambling companies. Initially, the best advice was for broadcasters to avoid taking these advertisements due to the federal government's interpretation that online gambling violated the Interstate Wire Act of 1961. In particular, the Wire Act prohibits the interstate transmission of bets and/or wagers on any sporting event or contest, or a transmission in which the recipient is entitled to receive money or credit.

Because online gambling appeared to involve the transmission of betting information, and the bettor would either earn or lose credit or money based on its success, questions arose whether broadcasters would violate federal law for providing information (i.e., advertisements) regarding these illegal operations. In fact, several broadcasters in the mid-2000s received letters from the U.S. Department of Justice seeking information on the advertisements, and warning the broadcasters that future action may be taken for aiding violators of the Wire Act.

Flash forward to December 2011, when the Department of Justice issued an opinion and memorandum that offered a new interpretation of the Wire Act's applicability to online gambling. Specifically, the DOJ opined that only interstate wagering activity involving sporting events or contests violates the Wire Act. The letter was issued in response to states looking to permit Internet-based lottery activity where state laws permit such actions. The conclusion of the DOJ was that such activities would not violate the Wire Act, but that the states must take affirmative action to make it legal under state law.

For example, New Jersey recently joined Nevada and Delaware to permit online gambling from locations within their respective states. In these states, it would appear there are no regulations that would prohibit a broadcast station taking an advertisement from an Internet gambling service operating in the respective states. However, stations should look very closely to determine if there are other regulations that must be followed. For example, in New Jersey, any gambling advertisement must contain a disclaimer similar to "Gambling Problem? Call 1-800-Gambler." Other states may have similar requirements, so it is best to check with legal counsel before taking advertisements, especially if the station is unsure whether the state has legalized online gambling.

E-Cigarettes. The recent popularity of e-cigarettes also raises advertising issues, since there have been historical restrictions on advertisement of tobacco products. In particular, broadcast stations have been prohibited from advertising cigarettes and little cigars for more than 40 years. More recently, there have been restrictions on advertisement and sponsorship opportunities by tobacco companies in connection with the FDA's rules to limit the exposure of cigarettes and other tobacco products to children.

However, in June 2013, the Consumer Protection Branch of the Department of Justice issued an opinion letter ruling that e-cigarettes do not fall under the restrictions on advertising for cigarettes because e-cigarettes do not contain "rolls of tobacco." On the other hand, the U.S. Court of Appeals had ruled in 2010 that the FDA should regulate them as tobacco products and not as medical devices.

As a result, it would appear that broadcasters could advertise e-cigarettes, since they do not appear to be covered by the decades-long ban on cigarette advertising. However, broadcasters should ensure that the advertisements do not contain false or misleading information that would be difficult for the consumer to verify. The FTC has warned that misleading advertisements ("none of the harmful ingredients of tobacco cigarettes") will likely draw close scrutiny by the FTC. Moreover, states or local governments may also have regulations that prohibit advertising e-cigarettes.

In summary, technological changes may be opening new advertising opportunities. However, the best advice for a broadcaster is to consult with legal counsel before taking the advertisement to ensure they do not run afoul of federal, state or local regulations.

Petro is of counsel at Drinker Biddle & Reath, LLP. Email: lee.petro@dbr.com.

FCC DATELINE

Stations in New Jersey and New York continue running License Renewal Post-Filing Announcements on Feb. 16, March 1 and 16. Stations in Delaware and Pennsylvania continue running License Renewal Pre-Filing Announcements, continue running on Feb. 16, March 1,and 16.

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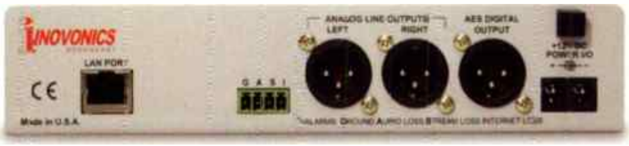
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BUILD OR PRE-BUILT?

Prefabricated structures offer many benefits for a transmitter site.

By Doug Irwin, CPBE DRB AMD

Most of the time when we plan to build a new transmitter site we're referring to the addition of a new transmitter, in an existing space, in an existing building. Rarely does one have the chance to build a new transmitter site from the ground up. If you were to be assigned that project, though, where would you start?

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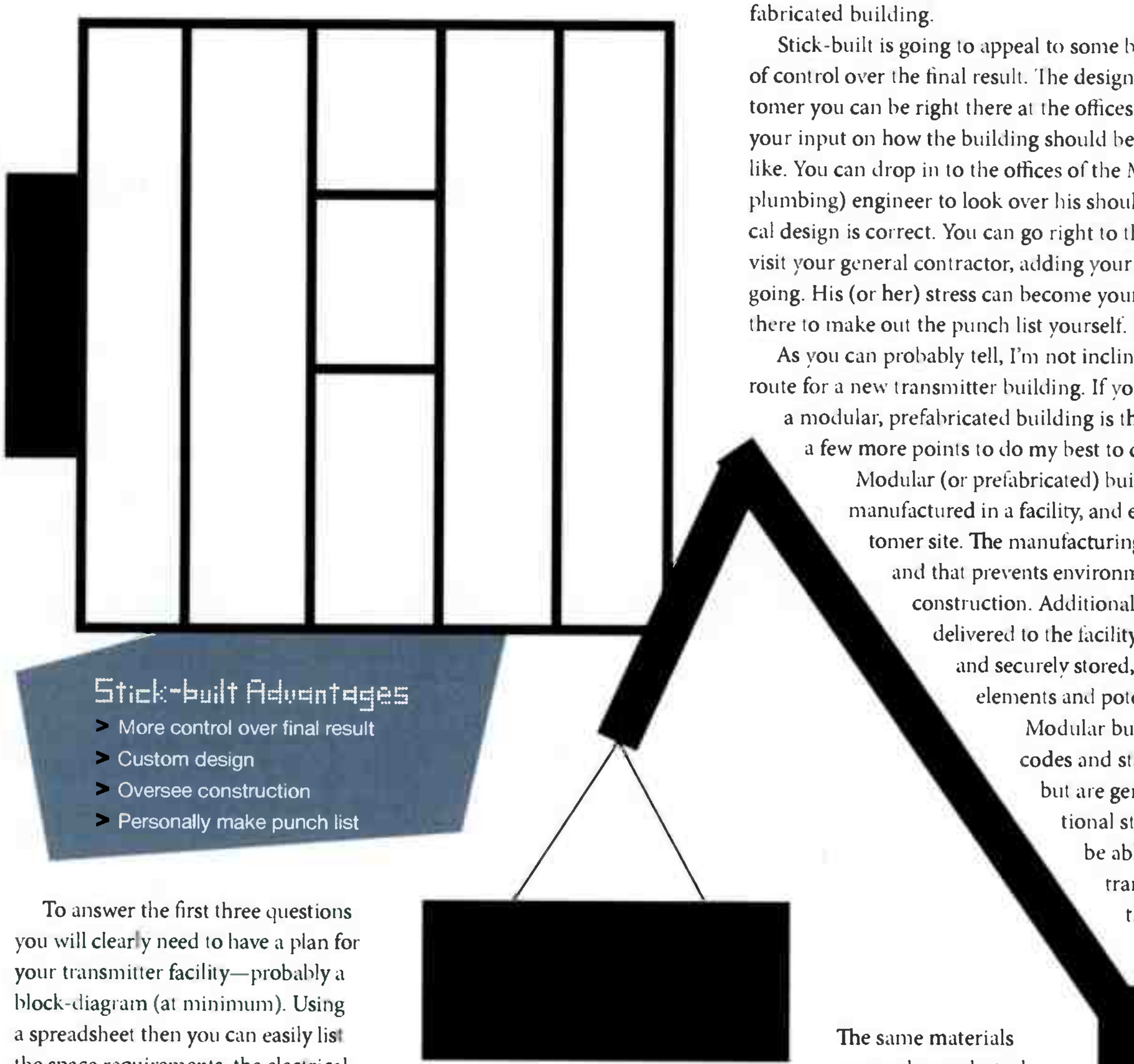
First, let's make the assumption that you already have a spot for the new building, and at this spot there is nothing but a patch of ground. It's a blank slate. Step one would be to make a list of requirements for the proposed structure:

- > What will the building contain?
- > What are the contents' electrical requirements?
- > How much heat do the contents generate?
- > What will the physical environment be like?
- > Will the structure be designed for future expansion of contents?



Stick-built Advantages

- > More control over final result
- > Custom design
- > Oversee construction
- > Personally make punch list

To answer the first three questions you will clearly need to have a plan for your transmitter facility—probably a block-diagram (at minimum). Using a spreadsheet then you can easily list the space requirements, the electrical requirements, and heat generated by all of the proposed equipment.

What about the physical environment? By this I mean will the site be on a mountaintop in the desert, or in a more temperate climate (like northern California) or maybe even Alaska? The structure may have special requirements based on where it is to be located.

Perhaps the most difficult question to answer is the one on future expansion. You may only need 10' by 10' of floor space to accommodate your needs, but what about the possibility of future tenants, or your own expansion? Think about it: if the site is good enough to develop for one tenant (you) then isn't it quite likely someone else will also want to make use of it later on? In the future, expansion is always going to be more expensive (because things don't get cheaper as time moves on) so the time to invest in extra space is really at the outset of the design and construction.

STICK-BUILT OR PRE-FAB?

Once you have answered these questions, the next is whether or not to go with a stick-built structure (that is, built on-site) or with a prefabricated building.

Stick-built is going to appeal to some because there is a greater deal of control over the final result. The design can be custom; and as the customer you can be right there at the offices of the architect to provide all your input on how the building should be designed, and what it will look like. You can drop in to the offices of the MEP (mechanical, electrical, and plumbing) engineer to look over his shoulder to make sure all the electrical design is correct. You can go right to the construction site every day to visit your general contractor, adding your input on how well the process is going. His (or her) stress can become yours! And finally, you can be right there to make out the punch list yourself.

As you can probably tell, I'm not inclined to go with the stick-built route for a new transmitter building. If you still need to be convinced that a modular, prefabricated building is the better option, then let me add a few more points to do my best to change your mind.

Modular (or prefabricated) buildings are structures that are manufactured in a facility, and eventually delivered to the customer site. The manufacturing facilities are enclosed facilities, and that prevents environmental factors from delaying the construction. Additionally, construction materials are delivered to the facility location, where they are safely and securely stored, preventing damage from the elements and potentially even vandalism or theft.

Modular buildings are designed to the same codes and standards as stick-built facilities but are generally stronger than conventional structures because they need to be able to withstand the rigors of transportation and craning on to the foundation upon delivery.

The same materials are used: wood, steel, concrete.

But those factors aside, let's look more closely the project elements, comparing stick-built to pre-fabrication.

Design. One of the few advantages to stick-built previously mentioned is that you, as the customer, will have a higher

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degree of control of the final result if you go with a custom project. On the other hand, you will be paying an architect for a "one-off" design. The cost of the design is spread out over many projects in the case of modular construction, providing an obvious cost advantage. The same goes for the MEP design; there will be some customization for the electrical design, but that will be cheaper than hiring an independent engineer for a one-off.

Building foundation. Your construction time-line can be accelerated somewhat because the foundation can go in while the pre-fab building is being made; no need to wait for the foundation to be finished before construction begins on the building itself. At least one of the modular building manufacturers claims that the schedule can be 30 to 50 percent shorter than that of a stick-built project.

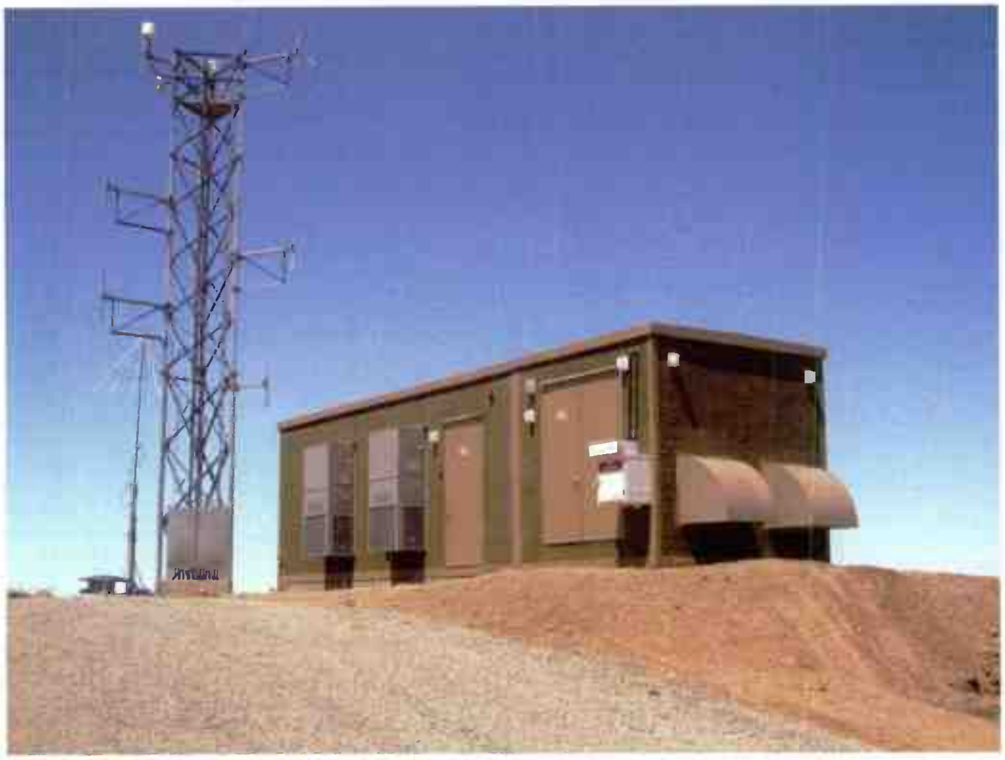
There are a couple of options as far as foundations go for modular buildings. A slab foundation, which is a large concrete pad, is one. The slab layer construction consists of sand or gravel, at the bottom of the pad. Over that is placed a vapor barrier, which is a thin layer of impermeable material (typically polyethylene sheets) used to isolate the concrete from the damp ground. On top of that goes a wire mesh, and then the concrete. The edges of the concrete are then covered with an insulating material.

Another option is the crawlspace foundation; the modular building is placed on piers and therefore permanently raised above ground level. This is certainly a good option if you plan to build in any area that potentially floods.

In either case, in the permitting process you will need to adhere to local building codes and regulations; it's outside the scope of this article but suffice it to say that stick-built buildings will require permitting and adherence to local rules as well.

Mobilization expense. I think it is safe to say that the construction of a given size structure, inside of a factory, is going to use less man-hours than the

A prefabricated building can have all the HVAC and electrical work installed before the unit is delivered.



When a modular structure is delivered, it's move-in ready, which can save time when building a new facility.

equivalent structure at a remote transmitter site (especially a mountain top). There are many possibilities for construction delays at a remote transmitter site. In either case a foundation is going to be necessary, but in the case of the modular building, fewer trips to the site will be required after the foundation is ready.

One of the last steps in a project like this will be the delivery of the modular structure to its intended home. In most cases the structure (or structures) will be delivered by way of a truck and flatbed trailer combo. A crane is used onsite to pick the structure from the flatbed and to set it on the foundation.

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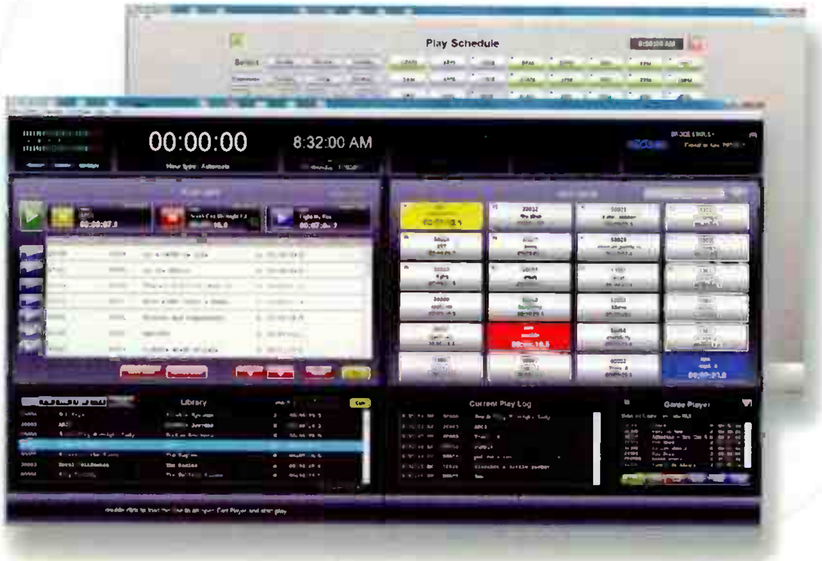

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Knowing that the delivery might very well be difficult (especially to a mountain top) it's wise to study the necessary route and to keep these items in mind:

> Inspect the delivery route for obstructions. Look for 15' of height (minimum) under all obstructions along the way. Of special concern are bridges, power lines, and tree branches.

> Check for steep grades along the way. A gradient in excess of 5 percent (1 foot in height gained along 20 feet horizontally) could add costs to the delivery.

> The pathway should be at least 20' wide all the way along the route.

Part of the process of deciding between modular and stick-built is knowing that delivery and craning of a modular building is even going to be possible (and not excessively expensive) at chosen site.

Aside from those activities, you need to consider your own as well: While taking care of all the day-to-day things that the typical broadcast engineer takes care of, the last thing you want is

RESOURCES

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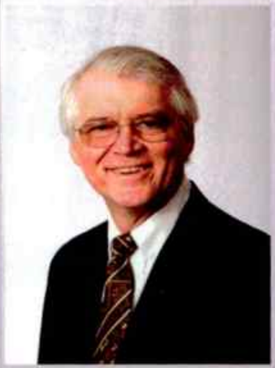
PRE-FAB SUPPLIERS

Probably one of the most well known providers of modular type buildings is **Thermo Bond**. Thermo Bond equipment shelters are constructed to customer's specifications and shipped fully assembled, including lights, outlets, air conditioners, heaters, generators, transfer panels, ventilation systems, cable ladder, and grounding systems. Shelters are available in sizes ranging from 4' width x 6' length to 24' width by 42' length.

Fibrebond provides pre-fabricated structures with 5,000 PSI concrete walls. Its standard design provides 100 PSF roof live-load capacity, 150 PSF floor load (with perimeter foundation) and 500 PSF floor capacity with a slab foundation, in addition to 150 mph wind load (for exposure D, which applies to flat, unobstructed areas and water surfaces outside hurricane-prone regions).

Enviro Buildings interestingly says its shelters can be shipped pre-assembled or in a knock-down, panelized configuration. The modular shelters can be transported by all-terrain vehicle, helicopter or up freight elevators. It also claims that "assembly is so easy a two-man team can easily install an Enviro Building shelter."

Mobile Modular says one of the additional benefits to its concrete construction is that its buildings have a bullet resistance; a 30:06 won't go through the wall at point-blank range. Concrete construction resists all boring insects, such as termites; and lastly, concrete construction resists mold and mildew, which would certainly extend the lifetime of the structure at a mountaintop or a flood plain.



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to add visits to an architect and/or MEP engineer's office. Perhaps more importantly, you will probably want to avoid extra trips to the remote site to make sure your general contractor is on-track. The modular type of building provides an advantage to you here—not as much of your time will be required to get the results you expect.

If you simply consider all the telecom sites that are relatively new (especially cell telephone sites) it's clear that the large telecom providers see the benefits of modular construction. Choosing between stick-built and modular would seem to be fairly straight forward, but clearly there are going to be instances where it just won't work. You must do your research carefully, as the results, good or bad, will last for years to come.

Irwin is RF engineer/project manager for Clear Channel Los Angeles. Contact him at doug@dougirwin.net.

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Rack-Room Wiring: Spoke-and-Hub vs. Point-to-Point

by Doug Irwin
CPBE DRB AMD

I have been involved with several large studio construction projects that were designed and built with the spoke-and-hub philosophy, and I've inherited rack rooms (and studios) that were wired on a point-to-point basis. My experience is that the point-to-point method is inferior in almost every way.

You could make the case that the point-to-point method is superior in one way—it's quicker initially. I know there are instances in which you (the designer and builder) find yourself up against an exceedingly short time line for a build project—and there may not be time or budget to do it right (in other words, the spoke-and-hub way). You slap stuff in a rack and connect the dots with wire. When finished you stand back and say, "Voila."

Now, there is plenty I hate about this. Firstly, when a wire is put in from equipment A to equipment B and they are in different racks, you can bet that before long, you'll need to move item A or item B, and of course the cable won't be long enough then. So, for the second time, you're installing a cable. Oh, and don't forget to remove the old one, right? Is it in a bundle? Have to do wire management all over again?

Secondly, I don't think that the point-to-point method lends itself to documentation well. You can label them in a serial fashion; but when old wires come out, do you re-assign the old number to a new cable, or simply retire that number? If you re-use old numbers, better make sure that any and all old versions of wire-lists are found and deleted.

KEEP IT AT BAY

This may seem a little too old-school for some, but in the rack itself, I still like to use patchbays (even for AES, with the appropriate type of patchbay). This facilitates testing and emergency response. Even the least technical person can usually be talked through inserting a patch cord when it's needed.

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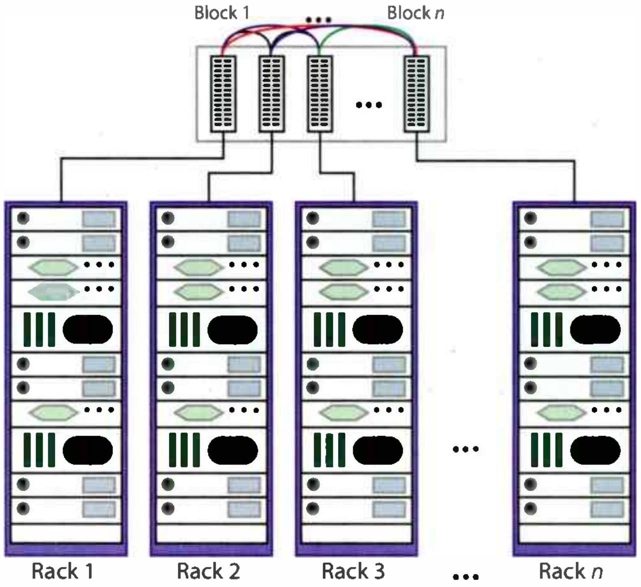

So let's talk now about the spoke-and-hub method. Each rack in your rack room will have an associated punch-block or some type of terminating method. One or more punch-blocks will placed in the rack at some unobtrusive point. I put those in the back of the rack (yes—you must have rear rack rails) at a height that is convenient for use of the punch tool. Too low is hard on your back and knees; too high means you'll be using a ladder all the time. In the rack room will be a backboard upon which are also installed the same type of punch-blocks. Trunk cables are then installed between the punch-block on the backboard, and its complement in the back of the rack.

Now, inside the rack itself, everything is connected by way of the punch-block; and to connect equipment A to equipment B (if they are in different racks) you'll make a cross-connect between the associated punch-blocks on the backboard.

So now what are the advantages to this obviously slower method? Well, they're many-fold. When it's time to move equipment A or equipment B, instead of running yet another cable between racks overhead in a cable tray or under the floor, you will instead just put in a new cross-connect, conveniently, on the backboard. And, when installing new equipment in the rack, instead of having to run cables up and out wherever, now you'll make a connection inside of the rack, to the block; and on the backboard, you'll add a cross-connect. The time you invest in doing it this way will pay you back with time savings, over and over and over again during the life of the rack room.

Documentation using this method makes a lot more sense in my opinion. Instead of just labeling the cables in a serial fashion (1, 2, 3...n) I refer to the punch-block in the documentation because they don't change. In other words: a cable starts off at (as an example) block 1, column 1, pair 1. If you use a spreadsheet program such as excel to keep track of these, it's simple also to put hyperlinks in so that you can bounce over to the document for the other end of the cable in question.

As far as the types of blocks, there are not that many choices. Stay way away from 66 blocks. I like the ADC QPC style of punch blocks myself, mainly because of their capacity for multiple wire punches on the same posts; but, Krone makes great blocks as well. These are nice because you can insert a shoe in to each pair of connectors to facilitate testing.

Irwin is RF engineer/project manager for Clear Channel Los Angeles. Contact him at doug@dougirwin.net.

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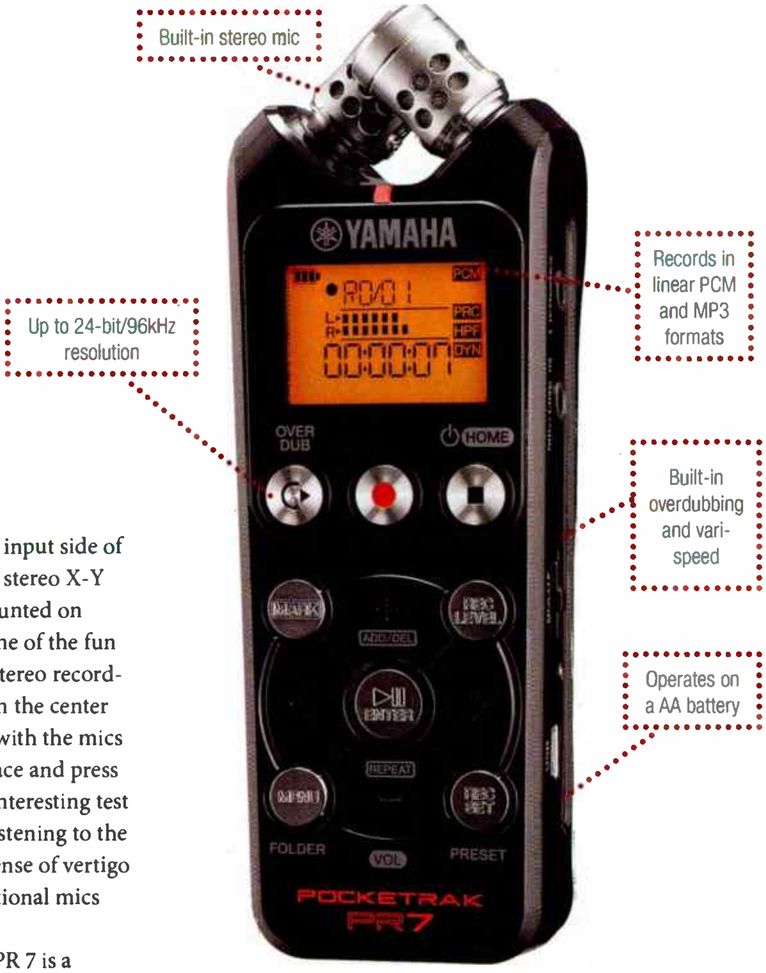
Yamaha Pocketrak PR7

By Gil T. Wilson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Digital recorders can be quite a specialized piece of equipment. Many recorders are inexpensive and do nothing but record voice and allow for playback. Some require playback through a line out and the upload to computer for further editing is done in real time. Some provide a USB port to access the internal memory while others provide a slot for a memory card.

If storage and playback are your only specifications for purchasing a digital recorder, the Yamaha Pocketrak PR7 handles that, but it can do much more. The PR7 has 2GB of built-in memory so you can start recording right out of the box. The storage doesn't stop there; there is also a micro SD/SDHC card slot for up to 32GB of storage allowing you to record approximately 50 hours of linear audio at 16-bit/44.1kHz. That should be plenty of space for the news reporter and field recorder. It's also great for recording impromptu podcasts or station events. Using only a single AA battery, the PR7 can support continuous recording for approximately 44 hours at MP3 and up to 29.5 hours using the PCM 16-bit/44.1kHz format.

The PR7 has both a USB out and a headphone out. The USB connection is perfect for quick link-up to a computer for uploading tracks and even importing tracks to the PR7. With PCM stereo WAV or MP3 file formats available, the recordings are usable by all major audio editing software. The headphone out also doubles as a line out when needed. The PR7 even has a small built-in speaker for immediate listening to recorded files.

Let's move on to the input side of the action. This is where the specialization of this recorder starts to come in.

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CAPTURING AUDIO

The main aspect of the input side of this digital recorder is the stereo X-Y microphone, which is mounted on the top of the recorder. One of the fun things I do when testing stereo recorders is to place the device in the center of some sort of turntable with the mics perpendicular to the surface and press record. This provides an interesting test of the stereo capability. Listening to the recording I nearly got a sense of vertigo from the effect. The directional mics work well on the PR7.

The other input of the PR 7 is a 3.5mm line/mic in connector. If you have a favorite handheld mic you can still use it and keep the appearance of the reporter on the street. I plugged in my trusty 58-like clone and the resulting recording was fabulous.

Use the menu to select between mic and line input levels. While recording, the firmware within the PR7 allows for automatic sound divide. While I didn't use this feature, I think it would be an easy way to convert some of my vinyl and cassette tapes to digital (yes, I still have those).

All the above features would alone make this a desirable unit for most radio professionals, whether for news reporting or production, but this unit starts to get a little more specialized for the musician seeking a lightweight (approx. 3oz) recording unit. The unit also has a tuner and a metronome. The metronome will play through the headphones but is not recorded onto the track for practice or laying down tracks.

What I found interesting was overdub feature. At first I didn't think I would use this feature, but the creative director in me started to come out. I found I could lay down tracks and then using the overdub and leaving enough space do an on-the-fly two-voice (or more) rough spot. I may actually use this to make a spec spot when I'm out of the studio. For grins I tested to see how many overdubs I could create. I got to 24 overdubs before the chaos was just too much. And since it's all-digital, there was no signal loss.

The Yamaha Pocketrak PR7 also comes with a free download of WaveLab LE software, which provides two-track audio editing with professional EQ and dynamics processing for mastering or enhancing your tracks. You can even upload your audio files to the web using the dedicated podcasting function. So if you don't have the full editing software available this can be used to tweak your recordings using this recorder.

Wilson is an announcer, producer, webmaster, business manager and promotions guy at WAKO-AM/FM, Lawrenceville, IL, and an independent producer/voice talent.

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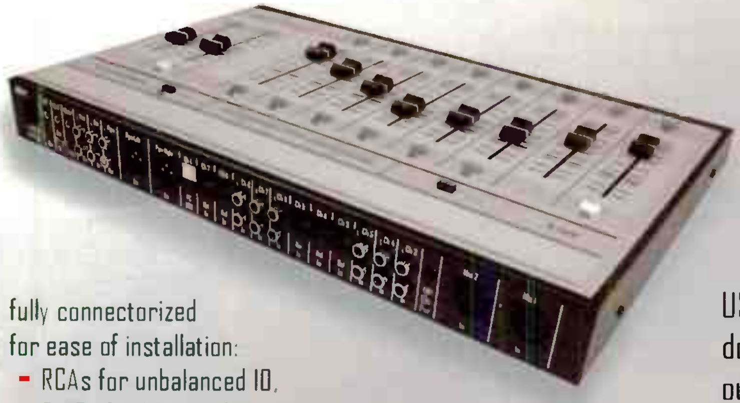

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- BOTH balanced and unbalanced inputs and output for flexibility

The BEST of both analog and digital, the ARC-8 features a built in USB sound card to play and record in digital directly from both Windows & Apple *PCs. With BOTH balanced and unbalanced inputs and outputs, the ARC-8 works out of the box in any Radio application.

list price **$795**

*USB sound card supports USB HID compatible PCs

www.arrakis-systems.com

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Handheld Testers

by Chriss Scherer, editor

When setting up a remote, in-house performance, or any other event where you need to run cables, there's often little time to waste on a bad connection. But rather than run all the leads and try a trial-by-fire test, take a few minutes and check the cables before they are packed and loaded. And to really simplify those tests, get a handheld and very portable tester.

The ability of testers range from very basic continuity tests with a few connectors, to impedance measurements, signal generation, and even more advanced functions. Consider the options you will really use to select the right one for your tool kit.

We found several models that offer a variety of test functions to help troubleshoot cables and installations without breaking the bank. Most of these testers go far beyond XLR connectors for mic cables. USB, Ethernet and many other connector options are common—and so are the assorted tests that can be made. Various types of test signals at varying levels are often available as well. They all operate on batteries, so use in the field is no problem. And the current draw is so small, a set of batteries will last a very long time.

The operation of many testers is usually very simple, so even non-technical staff can diagnose a problem when needed, perhaps saving an engineer some frustration.

Ebtech 6-in-1 Cable Tester

With a comprehensive connection set that includes XLR, ¼", RCA, ⅛", TT and MIDI connectors, this tester clearly shows continuity, opens and shorts, and intermittent shorts. It also features a test-tone generator (1kHz or 440Hz at +10dBu, -10dBv or mic level), phantom power detector (5V or more on pins 2 or 3) and grounded XLR shield detect. The intermittent function holds the display until the unit is reset. Housed in a steel chassis, it operates on two AA batteries.

EBTECH 6-in-1 Cable Tester

ebtechaudio.com

Hosa Technology CBT-500

The compact, handheld unit tests XLR (3-pin and 5-pin), balanced and unbalanced ¼", RCA, Speakon (2-, 4- and 8-pole), DIN, RJ-45 and USB (Type A to Type B). The front-panel rotary knob selects the function, and two rows of eight LEDs provide visual feedback on the cable status. There are also a pair of removable leads for testing additional connectors and jacks. It is housed in a metal chassis and runs on a 9V battery.

hosatech.com

NTI Minirator MR-Pro

This analog audio generator provides a range of analog test signals, including sine waveforms, sweep signals, white noise and pink noise. A set of WAV files is stored in the internal flash memory, and additional files can be added. It features a rotary settings wheel, fast access function keys, a backlit LCD, illuminated mute button, safety hand strap, jack for external dc power supply and a USB interface for firmware updates. Measurement functions include continuous monitoring of impedance, signal balance and phantom power. It also functions as a cable analyzer.

NTi
SINEWAVE

nti-audio.com

RDL PR-AMG2

This tester has an audio oscillator, level meter and speaker. The 700Hz oscillator section features a balanced XLR (mic or line level) and unbalanced output. The audio metering circuit features two inputs, an LED meter and a monitor speaker. The balanced input is front-panel switch selectable for mic or line input. The unbalanced input operates at -10dBV. Either input may be used to feed the metering circuit. It operates from two internal 9V batteries or from an external 12Vdc to 30Vdc supply. Test leads and bench top support bracket are included.

rdlnet.com

SM Pro Audio CT-3

The CT3 tests cables with MIDI (five-pin DIN) BNC, 3.5mm, XLR, DMX, Speakon, ¼" TRS/TS, RCA, RJ-45 and RJ-11 connectors. There are also banana jacks to test continuity. The tester separates into two parts so installed cables can be tested in place. Each half is housed in a metal chassis. Each section uses one 9V battery.

smproaudio.com

Whirlwind MCT-7

This diagnostic cable tester has connectors for analyzing almost any type of cable combination. The convenient rotary switch allows testing of each conductor within the cable and can determine the internal wiring configuration. Tests cables with four-pole Speakon, five-pin DIN, BNC, XLR, TRS, RCA and 3.5 mm connectors. LEDs provide the signal test status. A rotary knob selects which signal wire of a cable is being tested. It operates on a 9V battery.

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Test System

whirlwindusa.com

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ALLEN & HEATH

Broadcast mixer | Allen & Heath

XB-14-2: XB-14-2 incorporates several new features, including a dedicated audition bus, enhanced stereo channel configurations, updated mic preamps, more flexible monitoring, and a new matt paint finish. It is equipped with telco inputs for telephone callers, mic fader start sensing for external connection and internal automatic muting of the speaker outputs, stereo channel start/cue outputs for transport control, multiple headphone outputs, and an additional stereo bus (Mix B). The new model includes a stereo audition bus that allows individual channels to be switched away from the main program bus for off-air monitoring. The telco channel EQ has been replaced with variable high- and low-pass filters for control of the telephone caller feed signal, there is a new external monitor input level control, the pre-amps have been enhanced for lower noise and higher bandwidth, and the stereo inputs have more gain and routing options. Finally, the mixer is finished in matte effect paint to reduce surface reflections.

allen-heath.com/US

Dynamic data exchange between traffic and automation | Myers Information Systems

Live Log: Live Log is an extension of Myers' BXF integration between ProTrack and third-party automation systems. Leveraging the BXF protocols developed by SMPTE, Myers' advanced implementation features dynamic updating of running playlists. Live Log broadens the bi-directional, real-time exchange of data between ProTrack and the facility's play-to-air automation. It provides the ability to edit ProTrack logs and deliver them to automation in real-time. Users may view changes before republishing and receive confirmation receipts when the updates are accepted; and ProTrack will maintain a history of those modifications. Live Log permits users to make and track strategic business decisions within ProTrack. It improves operational efficiency through streamlined processes and enhances sales opportunities by extending log-closing deadlines with the ability to identify, react to and reschedule errant spots.

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AudioScience

Loudspeakers | Mackie

SRM550, SRM650, SRM1850: New SRM models include three 1600W models featuring professional-grade all-wood designs and a host of powerful, but simple tools perfect for modern applications. There are two high-output full-range models: the 12" SRM550 and 15" SRM650 plus the hard-hitting SRM1850 18" powered subwoofer. SRM features Mackie High Definition Audio Processing including patented acoustic correction DSP for high-definition sound plus system optimization tools like application-specific speaker modes and feedback destroyer. SRM's integrated two-channel mixer with Mackie Wide-Z inputs can handle any signal with ease.

mackie.com

X-Y microphone capsules | MicW

iGoMic: The iGoMic comprises an X-Y stereo-matched pair of microphone capsules specially designed for GoPro cameras. Using a matched pair with capsules configured at 90-degree X-Y coincident, the iGoMic provides a wide stereo image with natural depth and is ideal for recording music, sports events and ambient sound. It is small, lightweight and rugged. It also can be used with DSLR and video cameras. Frequency response: 20Hz – 20kHz.

mic-w.com

Firmware update | Nautel

NV 4.0, NX 4.01: A key element to the update for both product lines is new test functionality, which allows real-time measurement of MER (Modulation Error Ratio). The measurements follow the new NRSC FM standard and do not require external equipment. MER metering is accessible from the Nautel Advanced User Interface (AUI) Constellation View display and may be viewed from the front panel 17" LCD touchscreen or via the Internet. Other updates addressed in the new firmware for both series include an updated Flash player; SMTP login capability for e-mail; port forwarding support; NTP (Network Time Protocol); the ability to save meters and critical parameters in memory; the ability to take action on audio loss in a manner similar to other Nautel products; restructured preset and sub-menu structures; SNMP (Simple Network Management Protocol) traps; summary alarms for remote interfacing and remote AUI timeout. NV-specific updates include PA field bias of individual stage amplifiers; a composite power limiter, left and right limiter; Asymmetrical HD Sideband support, HD PowerBoost support via presets and RF turn on delay for generator operation. NX-specific updates include a multi phase PDM cancellation routine, which results in an improved RF spectrum; a redesigned scheduler; USB audio (requires Nautel USB sound card) and playlist controller and Icecast/Shoutcast capability (Nautel USB sound card required).

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On-air processor | Wheatstone

FM-531HD: The FM-531HD is a 1RU on-air processor for FM/HD Radio use. Packaged in a compact, 1RU form factor, this processor brings the multiband capability of the AirAura processor to a budget-friendly price. Its Vorsis ultra high-resolution processing technology delivers on-air sound that's loud, yet detailed. Features include a distortion-managed final clipper, smart stereo enhancement, bass management, and Sweet Spot Technology for consistent sound regardless of density variations in the source material.

wheatstone.com

Radial engineering
USB PRO
USB TO AUDIO DI BOX
24 BIT USB STEREO CONVERTER

High-resolution stereo direct box | Radial Engineering

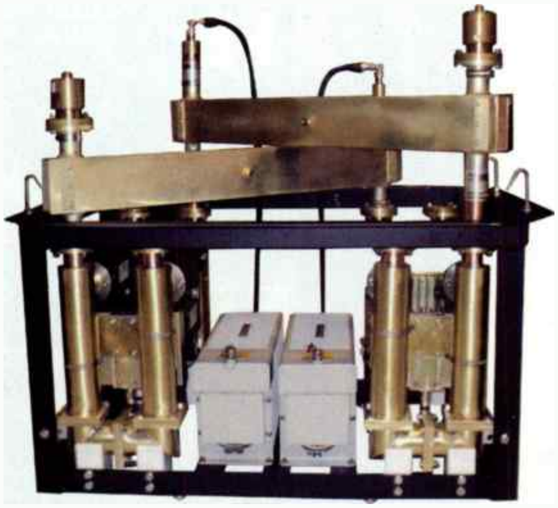
USB-Pro: This direct box is designed to convert sound files from a laptop computer and seamlessly transfer them to a pair of balanced audio outputs to feed a PA, recording or broadcast mixing console. Made to be plug-and-play, easy-to-use, the USB-Pro automatically configures itself for use with all popular operating systems, thus eliminating the need to load special drivers. And unlike devices that are limited with 16-bit, 44.1kHz conversion rates, the USB-Pro elevates the performance with true 24-bit, 96kHz stereo converters to deliver more headroom and greater detail.

radialeng.com

USB stereo audio player | Arrakis

DHD-DAC: The Arrakis DHD-DAC stereo audio player is a play-only USB sound card for use with Windows PCs and USB HID-compatible Apple computers. It is designed for professional audio applications that require +4dBu balanced audio levels. It features a digital to analog converter (0.006 percent THD and 98dB dynamic range typical). With both analog and S/PDIF digital outputs, it also features industry standard XLR and RJ-45 audio connector outputs for ease of installation.

arrakis-systems.com



Constant impedance ganged circulator system | ERI-Electronics Research

995 Series: The 995 Series addresses the need for additional isolation in dual input FM antennas and combining systems with its ganged FM circulator system. The ganged circulator is available to provide additional isolation for either analog or digital FM transmitters with power output levels up to 80kW. The most popular are the model 995-5, which handles up to 5kW of power, analog or digital; and the model 995-3, which handles up to 3kW of power, analog or digital, for a single FM channel. The ganged FM circulator system employs a constant impedance configuration, which provides an input match under all conditions. The system also provides broadband isolation from its output to input ports. The product is modular and can be moved and installed in component parts allowing for placement in crowded locations or sites with limited access. Mounting is floor or ceiling suspended. Frame furnished with J-Bolts facilitates ceiling installations.

eriinc.com

SpeakON connector | Neutrik

NL2FX: The NL2FX uses the latch and strain relief design of Neutrik's acclaimed STX series. The new connector has higher power handling capability (40A RMS per contact versus 30A RMS for the older NL2FC), providing the ability to accommodate an even wider range of amplification sources. It can also handle larger gauge wire, supporting screw termination of 12 AWG wire (versus 14 AWG for NL2FC).

neutrik.com

FIND THE MIC WINNER DECEMBER ISSUE

Gary Nakashima

of Lincoln Fincial Media of Colorado,
Greenwood Village, CO

He won a three-pack of Hosa HMIC-025 mic cables

hosatech.com

The mic icon was in the lower left corner of the monitor on the wall.

The winner is drawn from the correct entries for the issue two months prior. No purchase necessary. For complete rules, go to RadioMagOnline.com.

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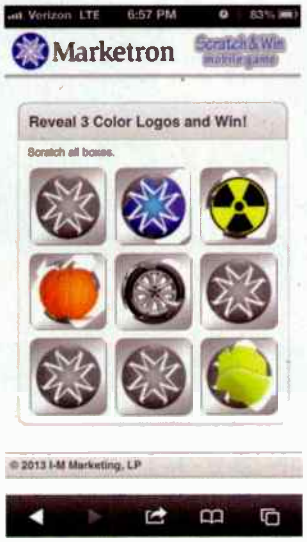
auralex.com

Audio library | The Imaging Cloud

The Imaging Cloud: Featuring more than 10,000 audio clips, The Imaging Cloud provides a wide range of customizable content including music beds, artist drops, sound design, voice-overs, pre-produced power intros, i-dent shells and full news packages. The Imaging Cloud is regularly updated, with new audio clips added on a weekly basis, and subscribers will be kept up-to-date via Twitter and a monthly newsletter.

theimagingcloud.com



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Gaming technology | Marketron

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marketron.com

Test and measurement tool | WorldCast Systems

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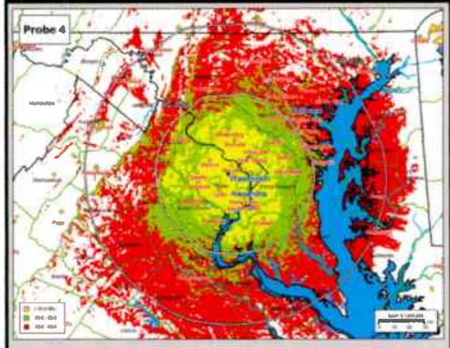

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That Was Then

by Chriss Scherer, editor

On Jan. 7, 2004, ESPN Deportes launched as the Spanish-language outlet for ESPN sports fans in the United States. To commemorate the milestone, ESPN Deportes celebrated with a special production of more than 12 hours of live programming and content from Miami Beach, FL, on Jan. 7.

The celebration in Miami included special content from Adriana Monsalve, David Fiatelson, Jorge Ramos, Rosana Franco and others.

In January of 2004, ESPN Deportes went on-air with Somos ESPN Deportes, a show that previewed key programming and featured an array of Latino sports stars. The special introduction was followed by the inaugural Spanish edition of SportsCenter and a live telecast of the NBA game between the Golden State Warriors and the Dallas Mavericks.

Launched a year after ESPN Deportes television, the radio network has grown from a handful of affiliates to a network reaching more than one million listeners every month with 47 affiliates across the country, covering 80 percent of the U.S. Hispanic market. The radio network currently covers more than 300 live sports events scheduled every year.

Top: Jorge Ramos (left) on the air with ESPN Deportes Radio in 2005. *Bottom*: Jorge Ramos (left) on the air in 2014.

50 SBE. YEARS 1964-2014

This Month in SBE History

2014 Marks the 50th Year of the Society

The Society of Broadcast Engineers was founded with a humble purpose: To serve the interests of the regular station engineer. As the society grew and evolved, it became much more than a loose affiliation of interested engineers. As an organization grows, it requires governance and structure. Such was the case with the SBE, and at the February 1967 meeting of the SBE Executive Committee, led by second SBE President Charlie Hallinan, the plan to incorporate the society began.

As part of the incorporation process, the organization needed to draft a constitution and by-laws. With the concurrence of SBE board members Leo Reetz, Ben Wolfe, Bill Kelly and Joe Risse, the two documents were accepted and the incorporation papers for the SBE were filed.

Also at the February 1967 meeting, Joe Risse was appointed the editor of the SBE *Journal*, replacing John Battison.

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