

# Radio

THE RADIO TECHNOLOGY LEADER



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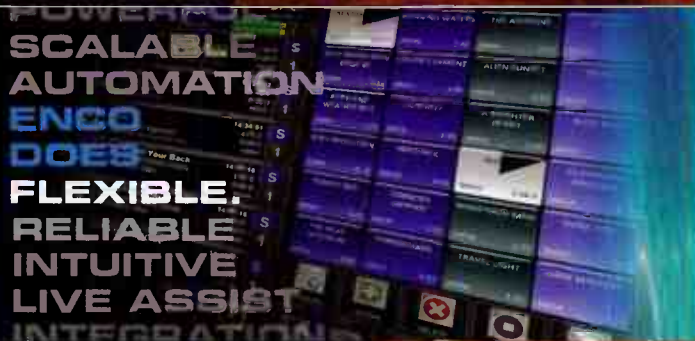
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# The Annual Salary Survey in Review



**E**ven before *Radio* magazine's stand-alone launch in 1994 we have taken a snapshot of the salaries in radio. Once again, we asked for your input to compile data for our annual salary survey. The online form was posted through September, October and November.

The data we collect is only a small sample of those who work in technical roles in the United States. While I would like more people to take the survey, I still think the data we collect is valid for general comparisons and trends. You can see the results in Sign Off (page 46) in this issue.

On the survey, we asked respondents a question at the end: If you could change one thing to improve your current job, what would it be?

This open-ended question yields some interesting replies. There were a few that expressed contentment. All is well in their careers. That's always good to hear, but most of the responses note something could use improvement. Some are small changes. Some are outright visceral complaints.

Among the smaller group of wanted changes are calls for new equipment, improvements in station morale or communication, and a desire for more career-related training. Another smaller group of desired changes calls for new management. One response mentioned that HD Radio should be turned off.

Another respondent recalled when radio used to be fun. He noted station staff events such as barbecues and getting an early release before a holiday weekend. He lamented the extreme focus on running the business and the bottom line without regard for the people who make that happen.


That's important in any work environment.

The topic getting the second-most attention for change related to salaries. To deal with the recent financial crush some businesses cut salaries to stay afloat. Others haven't offered raises in many years. This year's data shows that more people received a raise in the past 12 months (54 percent) than they did in in the 2011 survey (46 percent). That's a good sign for the economy and great news for our respondents.

The largest number of comments related to staffing, and most of these comments related to adding an assistant engineer or an IT specialist. Related to this, some comments also touched on the desire for increased respect of the engineering team among the station staff.

While engineering staffs shrink, either in straight head counts at a facility or by increasing the number of stations in a cluster without adding to the engineering team, it's important to note that radio is a business based on technology. When the technology doesn't work, there's no revenue. And quite often, new or enhanced technology and the engineering team responsible for it can add to the station's bottom line.

Respect is earned and not given. It can seem hopeless when the engineer is treated like a necessary evil. Some of this is our own fault. In general, we who work well with technology are not always the best at office decorum and politics. Whenever possible, make an extra effort with the sales, programming, promotion and management teams. The results are often easy to see.

So next summer when you see a link for the salary survey, please take a few minutes to participate. We want to provide the most useful information we can to radio, and your input makes that possible. 

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## COMPLETE REMOTE STUDIO ON TWO WHEELS



We are pretty sure this is a first – an open-air moving studio broadcast on two wheels (well, six, technically).



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Dan Jackson, engineer for 92.9 FM in Perth, Australia was faced with a unique challenge. Breakfast hosts Paul Hogan and Lisa Fernandez would be cycling for hours in strong winds and pouring rain as part of the 92.9 Kids Appeal for Telethon.

The unique solution was to equip Dan's bike as a mobile production facility. The talent wore wireless mics AND in-the-ear monitors which communicated with receivers and transmitters in a rack bag on Dan's bike.



on-air feed as the trio traversed the winding roads of Perth. How did it all work out? Absolutely flawlessly – the show went on without as much as a speed bump!

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World Radio History



## Social Media Software

by Kevin McNamara

I've heard people say that radio broadcast was perhaps the first form of social networking. While that was probably true 30 years ago. Those of us who have been around long enough to remember the days (pre SS7 switching centers) of figuring out how to access the telephone company conference bridges typically used to establish communications between multiple telco linemen, were usually busy after school with other kids from the area. This was probably the real first instance of social networking in the mid 1960s.

Radio is a medium trying to find its way in the rapidly shifting world of cyber space. Terrestrial radio has been slow to keep up with the offerings of social media-centric Internet radio platforms such as Pandora.

In his blog from a couple of years ago, consultant Mark Ramsey of Ramsey Media summed it up perfectly:

"Your radio station is to a radio network as any one of your listeners is to her network of friends, her 'social network.' And 'social media' describes the content and the pipeline for that content people choose to share with their friends. Where there's no sharing, there are no 'social' and no 'media.' Social media is not a promotional vehicle per se for your station. It is a network of relationships that live outside you—it is a set of connections you can be part of only if the participants in those relationships want you there. It is not 'you push, they consume. It's more 'you join in, and they share.'"

"Do these broadcasters realize that Pandora (as only one example) knows infinitely more about each one of its 60 million consumers than the average radio station knows about any of theirs?"

I think we have made some progress with combining terrestrial radio and social media, largely with the help of a variety of social media software offerings. These systems are no longer just front ends to feed popular social platforms

like Facebook and Twitter. They need to integrate seamlessly with not only desktop PCs, but especially smartphones and even be capable of SMS texting to mobile phones. The capability to work with smartphones is essential going forward, as it is believed that these will ultimately replace the in-dash radio. Some stats as evidence:

- > IDC says 153.9 million smartphones sold worldwide in 2Q2012. Total 2011 sales were 491.4 million units.

- > Gartner estimate sales of smart phones in the same period at some 153.8 million. Estimated total sales across 2011 were 472 million or 31 percent of mobile communication device sales. This compares with figures for 2010 from the same company of 297 million smartphones or 19 percent of the 1.6 billion mobile phones sold that year. So year-on-year Smartphone

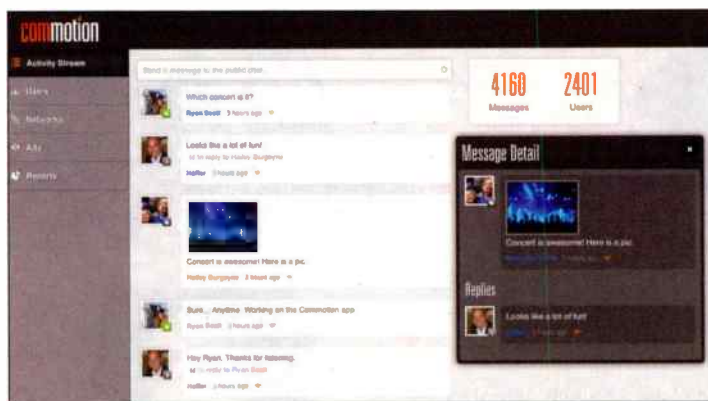
to allow the station to monetize or develop a revenue stream through the use of specific listener habits, buying patterns, etc. and finally it should allow the station to maintain its branding across all the platforms.

### PUT TO USE

Broadcast Electronics Commotion Wall is a system that was developed just for a radio station environment. According to its product description, "The Commotion Wall is the central control center for the Commotion platform. It's what connects you to your listeners whether they are on Facebook, Twitter, SMS, IM, the request line, your website or even your mobile app.

"The concept behind Commotion Wall is to make the communication source transparent to the station. Whether listeners are engaging the

station through Facebook, Twitter, IM or SMS, it all comes into a single interface. And when the station DJ replies, the message is routed back automatically to the originating social media channel. A key difference between Commotion Wall and other social networking aggrega-



sales rose 58 percent.

According to a recent PEW research study titled "State of the News Media 2012." "The vast majority of Americans still report listening to AM/FM radio weekly. But, as many as 40 percent of Americans now listen to audio on digital devices, and that is projected to double by 2015, while interest in traditional radio—even the HD [Radio] option—is on the decline. One of the prime arenas for digital listening was the car, once the domain of AM/FM radio."

The software should also have the ability

tors, is that Commotion is also aggregating the other side of the conversations taking place on the station website and mobile app in the Activity Stream on the Commotion Bar.

"In addition, Commotion Wall supports voice mail as well as photos, which can be helpful for contests and other listener interactions."

In addition, BE offers a tool to manage SMS messaging (SMS Campaign Manager) and a tool to allow listener interaction with music choices (Crowd Control).

There are a lot of choices out there at



RESOURCES

**Broadcast Electronics  
Commotion Wail**  
commotion.com

**Elgg**  
elgg.org

**Lovd by Less**  
lovdbyless.com

**XOOPS**  
xoops.org

**YOGURT**  
galeriayogurt.scurceforge.net

**AROUNDMe**  
barnraiser.org/aroundme

different price points, but how about some open-source solutions? These are free, but if you have some programming skills one of them could be an effective solution to creating your own social media platform. Here are a few.

Elgg is an award-winning open-source social networking engine that provides a robust framework on which to build all kinds of social environments, from a campus wide social network for your university, school or college or an internal collaborative platform for your organization through to a brand-building communications tool for your company and its clients. Elgg was voted best open source social networking platform in 2008.

Elgg requires an Apache-based server environment and uses the PHP scripting language. The open source database language My SQL is

used to store data.


Lovd by Less is among the first and only few open-source social networking platforms built on Ruby on Rails. Some features of Lovd by Less include blogs, photo gallery with captions, site search for friends, activity update and user-to-user messaging. Other things that

are built into the software include Flickr and YouTube integration.

One thing good about Lovd by Less is that it is easy to use and contains most of the applications that you need. For those who prefer Ruby on Rail rather than php, this would be a good alternative. It features the ability to follow a user (mutual following is friending), user-to-user messaging, profile comments, user blogs with comments, a photo gallery with captions, site search for friends, profile bio and information, a user dashboard (recent activity of

friends), emailed activity, Flickr integration and YouTube integration.

XOOPS is a Web application platform written in PHP for the MySQL database. Its object orientation makes it an ideal tool for developing small or large community websites, intracompany and corporate portals, weblogs and much more. Using the YOGURT extension the pair forms a powerful social network platform.

AROUNDMe also uses the PHP script language and operates atop of the Apache based servers. Using AROUNDMe collaboration server you can create multiple collaborative group, webspace, community or social networking websites. Each group can create a multiple page collaborative website. They get social tools such as a guestbook (a wall), a group blog, a forum and a wiki they can drop into Web pages. Each group is fully customizable using xHTML, CSS, Javascript and PHP. Groups can be private or public. 

*McNamara is president of McNamara Associates, Cape Coral, FL.*

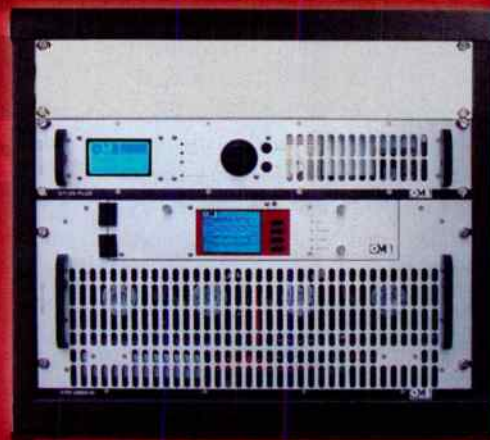
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by Lee Petro

# Wireless News and FM Auction Update

In January 2010, the FCC sought comment on the expanded use of wireless microphones on a secondary basis in the current television bands, channels 2 through 51 (excluding channel 37). Previously these operations were allowed in the 700MHz band, which has now been devoted to broadband development.

Since the release of that Further Notice, there have been new developments that will likely impact the use of wireless mics and other low-power devices in vacant spaces on TV channels, and the FCC has now invited a new round of public comment to refresh the record.

Specifically, the Commission has allowed various new uses and devices in the vacant spaces in the television spectrum in the TV White Spaces proceeding. Therein the Commission generally excluded white space devices from two of the unused channels in the UHF TV band near channel 37 so that they would be available for wireless microphones. Certain Low Power Auxiliary Service licensees and wireless microphone users were permitted to register their operations in the TV band databases so as to be protected from white space devices.


More recently, the Commission proposed an incentive auction that may result in the repacking of television into less spectrum than it now enjoys. The repacking process will likely lead to an overall reduction in the vacant spaces available for secondary uses by white space devices and/or wireless microphones, especially in the urban areas where wireless mics are used more frequently.

In light of these changes in the television spectrum environment, the Commission seeks comment on its proposal to expand the categories of eligible users of licensed wireless microphones in these bands under Part 74 of its rules. Such licenses are generally available to broadcasters, MVPD operators, and motion picture and television producers. Additional eligible licensed uses could occur in connection with large public events and venues, such as theaters, sports arenas, entertainment complexes and venues for religious services. The agency would like to consider whether it would be practical and possible to coordinate the use of frequencies among these users through the TV bands database system used to coordinate white space devices.

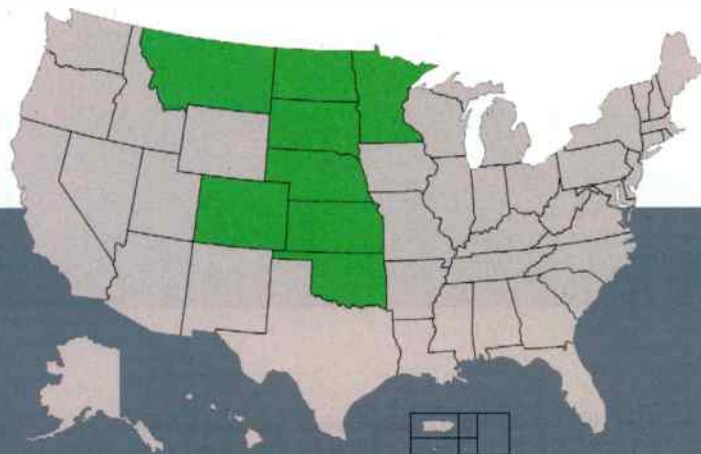
The FCC also wants to know which entities would be the most practical licensees for such microphones. For example, should

the producers or performers of a particular production be required to obtain licenses for their use, or should the proprietors or managers of the venue? Other questions include whether the Commission should establish licensing criteria such as the need for high quality audio production values; a live production with an audience in attendance (as opposed to a mere rehearsal); and/or a certain required minimum seating capacity in the venue?

Perhaps more significant is the Commission's focus on the whether technological developments could lead to more efficient use of the spectrum. The Commission is seeking comment on the usefulness of equipment that utilizes compression techniques to limit its use of spectrum and has requested information on the technology available to accomplish this. Comments are due by Dec. 21, 2012, and replies by Feb. 19, 2013.

*FM Auction Update:* The Commission has set the date for FM Auction 94 to commence on April 23, 2013. There will be 112 FM Allotments up for auction, with upfront bids ranging from \$750 to \$75,000 depending on the projected population to be served. Applications to participate in the auction will be due on Feb. 6, 2013, and a freeze on filing minor change applications will be imposed from Jan. 28, 2013, to Feb. 6, 2013. 

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



## DATELINE

**Dec. 1, 2012:** Stations in Kansas, Nebraska and Oklahoma continue running License Renewal Pre-Filing Announcements, continuing on Jan. 1 and 16.

**Dec. 16, 2012:** Stations in Colorado, Minnesota, Montana, North Dakota, and South Dakota continue running License Renewal Post-Filing Announcements, continuing on Jan. 1 and 16.

# ROC YOUR WORLD



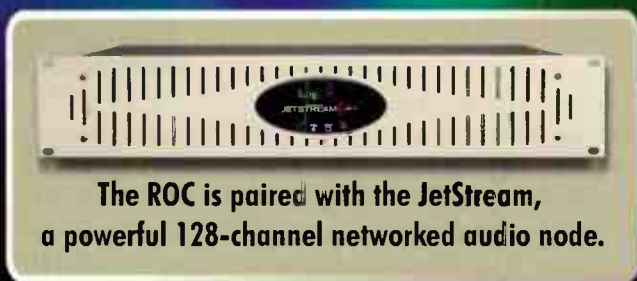
## The new ROC console from Logitek

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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2013

# Test and Measurement Needs for the Shop

By Doug Irwin, CPBE DRB AMD

**T**est equipment needs of the typical broadcast engineer have changed substantially over the last 30 years. Back then your typical engineering shop would have a Simpson 260 and probably some sort of oscilloscope. A good shop would have some sort of audio analyzer (usually Hewlett Packard or Sound Technology). The best shops would have an RF spectrum analyzer as well.

Since all the audio was analog, you were simply able to use your ears (and a set of headphones) to troubleshoot a lot of studio problems. As time went on, and more and more digital audio systems came in to use, the ears simply weren't as useful; having some type of AES generator/decoder became important. Now,

though, that's not even enough; with so much streaming media around the station, new tools have become necessary. If you were to build an engineering shop today, what test equipment is necessary, and what's available?

## DIGITAL MULTI-METERS

If you were stranded on a desert island with only one piece of test equipment, of course you would take a digital multi-meter (DMM). Unlike its ancestors (like the Simpson 260) these don't just measure ac and dc voltage and resistance—optionally many other types of measurements are available.

Perhaps I'm biased, but to me the gold standard of multi-meters has always been Fluke. The company has a page to match desired features with available models. As an example I picked the Fluke 287, which has true RMS measurements for ac and dc and 100kHz bandwidth making it useful for audio measurements. It has a frequency counter built-in (up to 1MHz) along with a capacitance meter. When you're trying to get the most bang for the buck, clearly feature such as this make this device more attractive.

One of the oldest (if not the oldest) test equipment companies has to be Agilent—not in name of course—since its ancestor is the venerable Hewlett-Packard. (After all, those partners started making test equipment in a garage in the 1930s.) Agilent also



Agilent U1252B

makes a series of handheld DMMs. The company has a product guide as well.

As an example I've chosen the U1252B. Like the Fluke 287, it has ac and dc true RMS voltage measurements, and 100kHz bandwidth. Voltage scale is 50mV to 1kV; current range is from 500µA to 10A. Perhaps its most interesting feature is its ability to log data internally or to a PC. For long, continuous measurements, you would use the DMM with an available GUI and data-logging software to automate data recordings to a PC.

## FOR THE TOOLBOX

Another item that allows you to work smarter is a cable tester. Rolls makes

CS1000. It can test 10 different connector types: banana, 4-pt Speakon, 1/4" TRS, 1/8" TRS, XLR male and female, MIDI (up to 7 points), RJ-11 and RJ-45. Aside from its continuity tester it includes a 1kHz tone generator, which is useful for checking inputs to amps, etc. A 9V battery is used for power.

Hosa makes the CBT-500, which can diagnose signal failure in cables terminated with any combination of XLR, phone, phono and Speakon connectors, as well as DIN, Ethernet and USB Type A to Type B cables. It is also equipped with removable leads to verify continuity of additional connectors and jacks.

It operates on a 9V battery.

Although I don't believe that they are quite as necessary as they used to be around the shop, having a good oscilloscope is still important for troubleshooting, especially at component level.

A scope can give you a lot of insight in to what is happening in real time in a circuit—much more so than a DMM.

Also, with a typical two-input scope you can check left channel vs. right channel phase using the lissajous configuration—make sure the scope has X vs. Y on its horizontal mode selector. You can check input vs. output of any circuit under test, which is still useful in the analog realm.



Fluke 287



Hosa  
CBT-500



Rolls CS1000

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Agilent N9340B

testing, you can add the correct 'mask' for measuring IBOC compliance to the display. The unit comes with both USB and LAN (optional) interfaces, and thus can be operated remotely. It has a large internal memory space, and allows you to save screen shots, and to print them out later. Other options include GPIB, a tracking generator, a

return-loss bridge, and 300Hz RBW capability.

Agilent has made spectrum analyzers for decades (up until fairly recently under the HP moniker). Its N9340B handheld spectrum analyzer has some great standard features. Its range is 100kHz to 3GHz, with results shown on a 6.5" TFT color LCD, which (according to Agilent) is bright enough to use outdoors. Its internal battery has four hours of run time. It has one-button measurements for channel power and occupied bandwidth; it even has an AM and FM demodulator audio output. I make mention of this particular unit though because of its IBC option, designed to allow the user to make IBOC proof measurements. The N9430B-IBC (as it is known with the option installed) has a dedicated hard-key called MODE which allows the user to rapidly access to its operating modes (depending

RESOURCE GUIDE

- Agilent selector**  
cp.literature.agilent.com/litweb/pdf/5989-7340EN.pdf
- Fluke selector**  
fluke.com/fluke/user/products/prodse/guide-dmm.htm
- Hosa Technology**  
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- LP Technologies**  
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neutrik.com
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upon all the options purchased) such as spectrum analyzer, tracking generator, demodulation analysis, and of course IBOC measurements. Also, when entering IBOC measurement mode, you are given the choice between AM and FM, and the instrument automatically activates the appropriate internal hardware and software. It has a feature called Auto Tune embedded in the IBOC measurement mode which automatically sets the reference level and center frequency for you. It also comes pre-loaded with limit masks—73.44 for analog AM; 73.317 for analog FM, AM NRSC-5B and FM NRSC-5B.

TO THE NETWORK

Within the context of an article about test equipment for broadcast engineers network analyzer has more than one meaning of course. Even if you can't justify the RF spectrum analyzer for your shop, you may still be able to

get a network analyzer for your LAN. As one example, keeping budget in mind, let's look at the Fluke NetTool Series II inline network tester. This device simply plugs in between a network node (say a switch port) and the host. You then use it to perform testing on that link. For example, you can sniff MAC and IP addresses, subnet and services offered by active servers, routers and printers. You can identify spyware, malware, and viruses, or other unexpected traffic with port monitoring. Analyze frames on the LAN. You can troubleshoot authentication issues with 802.1x log. If you are making use of VoIP phones, insert it inline to test boot-up and call-control issues, or to simply make PoE measurements. And yes—you can use it to do cable testing as well.



Fluke NetTool Series II

Test equipment needs of the typical broadcast engineer have changed over the years, but many remain the same. Analyze your specific needs, know your budget, and make purchases that will allow you to work as efficiently as possible. 0

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

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# Perseverance Pays Off

## WYSO 91.3 FM turns relocation adversity into opportunity

By Jim Stitt

**F**rom its humble beginnings in 1958 as a 10W station located in the student union of Antioch College in Yellow Springs, OH, WYSO 91.3 FM has evolved to become the 50kW NPR flagship station and pre-eminent source of public radio in the Dayton/Springfield, OH, market serving more than 1.1 million people. There were many challenges and hurdles along the way, but station personnel persevered to the benefit of the Miami Valley's public radio audience.

WYSO's most recent accomplishment culminated this year with the relocation of its studios and offices, forced by the sale of the building in which the station was located. After learning of the inevitable loss of the station's space, J. M. Stitt & Associates was retained to manage the project and to design and install the facility. Under the stewardship of General Manager Neenah Ellis, and with essential support from the Antioch University administration and board, we were able to turn this potential adversity into a great opportunity for a much needed facilities upgrade.

The project began by identifying the station's current and anticipated requirements with input from all staff. WYSO's format is a combination of news, information, and an eclectic blend of music from diverse sources that include NPR, Public Radio International, BBC and our own staff. Much of the programming is locally produced, which places unique demands on the WYSO studio facilities when compared to many commercial stations.

### LOCATION, LOCATION...

The next step was a search for potential sites and buildings that could serve as a suitable new home for WYSO, along with preparing budgets for



each scenario. After extensive research, planning, and numerous reviews, the Antioch University Board approved the funds for WYSO to relocate into the former Kettering Laboratories building in Yellow Springs, OH, which was owned by the University. Supplemental funds for equipment were supplied by a grant from the Public Telecommunications Facilities Program.

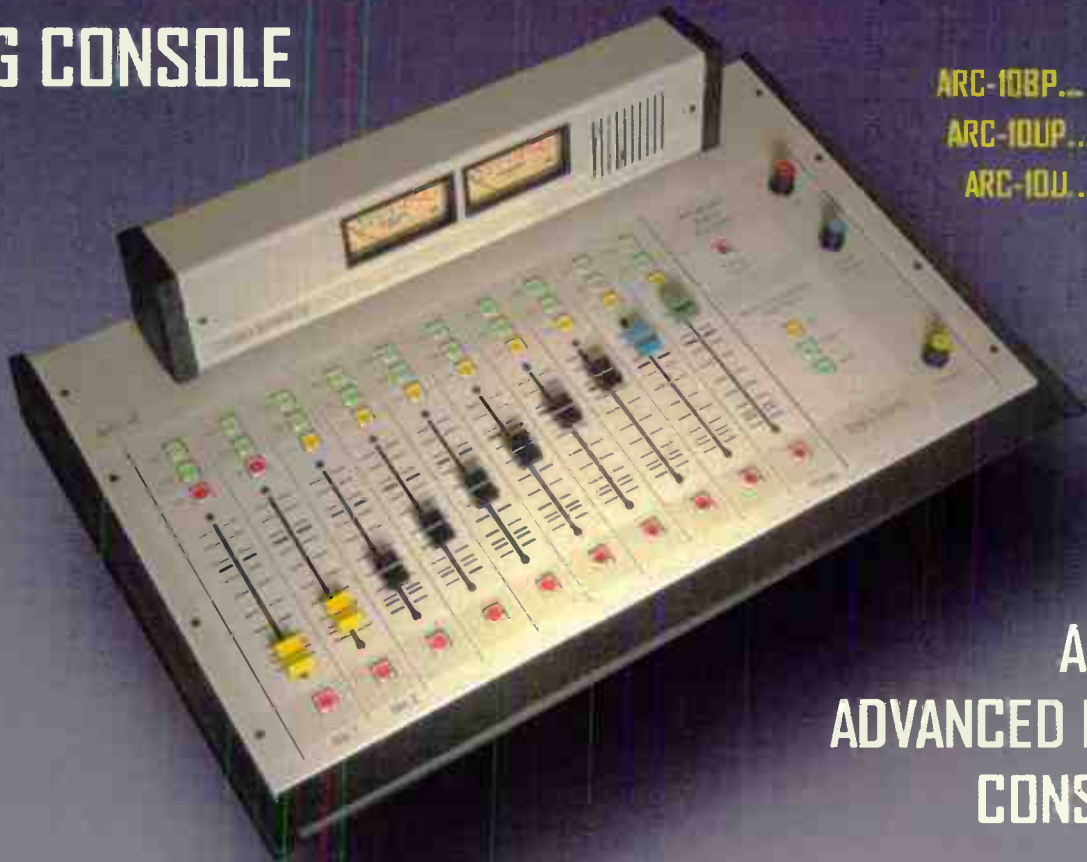
Locating broadcast studios in a multi-story 60-year-old building originally designed as a research laboratory, and for which there were no plans or drawings, was especially challenging. Locations of existing load bearing walls, columns, and beams had to be considered, as well as integrating new and existing electrical and mechanical systems. Demolishing the laboratory infrastructure and mitigating unexpected hazardous materials added to the complexity and cost. We selected Miller Valentine Group as the contractor based on its experience with building other broadcast facilities, as well as its flexibility in dealing with our unique challenges.

The area designated for the studio suite had no suitable existing HVAC system, and there wasn't sufficient space for the large ductwork associated with a conventional system. The solution was a Mitsubishi City Multi system utilizing efficient heat pumps. Each studio has its own dedicated fan coil unit, which permits individual control of each room's temperature. The short duct



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The new studio electrical service is conditioned for surge and EMI/RFI protection. A diesel generator supplies backup emergency power for all studio and other critical systems. An extensive common point ground system connects the building, STL tower, and ac service grounds via low impedance paths. Each studio has a reference ground connection, and every ac circuit utilizes an isolated ground outlet with its own home run

ground connection. The ESD computer carpet and tile flooring are also connected to this ground system.

Lighting in the studios includes incandescent track lights and special wall illumination fluorescent fixtures on dimmers with EMI filtering and remote ballasts. Task lighting in the other operations areas uses fixtures with parabolic lenses and incorporates two different color temperature bulbs on separate switches, allowing the creative staff to alter the lighting to suit their mood.

### SET THE PLANS IN MOTION

The resulting floor plan located the entire station on the 14,000-square-foot first floor with adequate expansion space. The administrative offices are in one area and the operations functions are adjacent to the studio suite, but with multiple traffic routes so as not to segregate the two areas completely. The former offices and studios were located on the basement level, so one goal was to incorporate as much natural light as possible.

The 4,400-square-foot studio suite includes the air, production, and performance studios, three edit booths, newsroom, technical operations center, operations and engineering. Custom studio furniture from the Harris Pacific Design Center was incorporated throughout for optimum functionality, and at a cost no higher than using a local cabinet maker. PR&E NetWave consoles are utilized in each studio, all edit booths, and the newsroom with a VistaMax routing switcher networking everything together.

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Production studio

Envoy HUB also networks all the consoles in the facility so that any source is available in any studio.

The Enco DAD 3TB servers and workstations also live in TOC, with NTI KVM extenders to each studio so there is no fan noise. USB extenders are also utilized so that producers do not have to walk to the TOC in order to ingest a file into a workstation.

The technical operations center (TOC) is the station's central hub. The facility is wired with both Gepco multi-pair AES audio cable and an extensive network of CAT-5 and CAT-6 cabling. Eight Middle Atlantic equipment racks, each with its own UPS, contain the station's terminal equipment.

The TOC is home to the VistaMax Envoy routing switcher, with all analog and AES digital inputs and outputs on ADC patchbays in the event of a failure. The Envoy cards perform the necessary conversions so that any type source (analog or digital) is available in either format at the outputs. The

There is a Gateway workstation setup to scan and remove any viruses from USB thumb drives before files are uploaded into the automation system.

Satellite receivers for 14+ channels and the eTech Ohio network feeds are all distributed and routed in the TOC, as well as other sources such as the Tieline G3 codecs providing VoIP, ISDN, and POTS feeds. Other systems in the TOC include the webcast workstations and processing, Omnia and Optimod on-air audio processing, confidence monitoring, IBOC HD Importer and Exporter, the MCR master clock and its

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World Radio History

## FACILITYSHOWCASE

WYSO TOC

distribution, Moseley Starlink and LanLink STLs, house PA system, ATI and Symmetrix distribution amplifiers, and network printers for the Sage Endec EAS and Burk remote control logs.

### IN THE DETAILS

Great attention was paid to sound isolation and room acoustics in the studios. Walls and ceilings incorporate non-parallel surfaces to minimize flutter echoes and were constructed using multiple layer gypsum board, Armstrong Soundsoak and insulation mounted on Kinetics Isomax strips, and suspension hangars to achieve an STC of 55. All joints were sealed air-tight. The IAC studio doors have double magnetic seals and a clever cam lift hinge system to create a threshold drop seal.

The custom IAC exterior Vision Wall windows and interior Sound-lock windows incorporate tilted panes of different thicknesses of glass to prevent sympathetic vibrations from being transferred. Acoustic design also considered the amount of absorption, refraction and diffusion to achieve optimum reverb times.

The air studio/control room and production studio, each 300 square feet, are mirror images of each other so the staff will be more comfortable with a consistent configuration. The Harris custom furniture accommodates an announcer/host and two to three guests, 24-channel NetWave consoles, equipment pods, and a number of unique features requested by the staff. For



example, WYSO still uses program material from vinyl LPs during some programs, so turntables with proper anti-vibration bases were required.

Other source equipment includes Denon DN-C635 CD players and Tascam SS-CDR200 decks for recording or playing back from USB drives and other digital media. A Telos NX-12 hybrid system handles the studio phones for call-in shows and interfaces well with the Avaya VoIP system. LCD monitors are supported on Yellowtec Mika arms to allow use of a copy stand while still providing line-of-sight into the performance studio.

The air and prod studios share a common 700-square-foot performance studio space used for recording and/or live broadcasts of musicians and programs with large groups. The room is designed to accommodate variable acoustic panels depending on the application.

A custom mobile interview table from Harris Pacific Design Center can be wheeled into place for a large interview or talk show, or wheeled out of the studio for a band. Custom interface panels provide connections for microphones, direct boxes, monitoring, IT, video, and Telos Nx-12 Desktop Director and call screener.

Three edit booths each accommodate an announcer/host and one or two guests. Each is equipped with a 16-channel NetWave console, Enco DAD workstation, Telos hybrids, CD recorders and other studio equipment. The newsroom has three producers' cubicles for collecting and editing stories from AP, state and local sources; and will soon have a PR&E Oasis audio console to complement its Enco DAD workstation. The music library contains more than 30,000 CDs and an archive of rare programs recorded on magnetic tape media.

Any broadcast facility designed for the future must include extensive IT facilities. The station's IT system was dramatically improved with a redundant fiber backbone and 1GB smart switches provided by the University. Our ISP is OARNet

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 Cisco managed Ethernet switches  
 Crown monitor amps  
 Day Sequerra M4.2R  
 Denon DN-C635  
 Enco DAD32  
 EV RE-20, RE-27N/D  
 Gepco cable  
 Harris 3x6 headphone amps, HDE-100  
 Exporter, HDI-200 Importer, Pacific  
 Design Center custom furniture, PR&E  
 Netware, PR&E Vistamax Envoy  
 Intraplex STL HD Plus  
 Henry Matchbox  
 HP managed Ethernet switches  
 IAC studio doors  
 JBL 6332, 4410, Control 5  
 Marantz PMD-660  
 Master Clock MCR1000  
 Middle Atlantic 44Rux36, LCD monitor  
 Moseley 9003Q-2SLAN, HS900D LanLink  
 Nautel Exporter Plus  
 NTI CAT-5 KVV extenders  
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 Orban Optimod 8500 FM/HD  
 Sage Digital Endec  
 Samson monitor amps  
 Sony MDS E11  
 Startech KVM switches  
 Symetrix 304, 528E, 581E  
 Tascam 112B, SS-CDR200  
 Technics SP-10, SP-25  
 Telos 1x6, Desktop Director, NX-12  
 Tieline G3 Commander, Record-IT  
 Wohler AMP1-V2DA  
 Yamaha 2000  
 Yellowtec Milka

equipment funding would allow partially equipping only two studios, and some essential systems such as the STL and satellite terminal. The remainder of the equipment would come from the existing station after signing on at the new studios.

Following construction, the plan was to install and make operational a basic facility that would run in parallel with the existing station as a test. We initially built the TOC, air studio, one edit booth. STL, satellite terminal and a portion of the Enco DAD automation. The Enco systems at both locations were synced together over the IT network so that any changes made at one site would also be performed at the other. We then operated both facilities in parallel for a period to ensure proper operation.


The other studios were pre-wired as much as possible to minimize relocation time. The result was a smooth transition that was seamless to both the audience and staff.

After 50 years, WYSO finally has the state-of-the-art facilities and tools required to realize its full potential of producing the very best public radio



and we also have a fiber connection to MVECA. Secure VPN connections allow staff to access the Enco automation, transmitter, and other systems. Encrypted Wi-fi service is available to staff with the proper codes, plus an open Wi-fi service is available to guests with limited access. The IT network supports our studio functions, office functions and our Allegiance software. The Avaya VoIP phone system interfaced well with the Telos NX-12 system and other studio functions.

Relocating the station was done in phases since

programming for the Dayton/Springfield market and surrounding communities. The next 50 years will certainly contain more challenges for WYSO, as well as broadcasters everywhere. It is said that tribulation begets perseverance; perseverance develops character, and with character comes hope. WYSO has proven it can persevere and has the character to prevail and succeed. 

Additional photos and a floorplan are available online at [RadioMagOnline.com](http://RadioMagOnline.com).

Stitt is president of JMS & Associates, Inc., Cincinnati. [www.jmstittassociates.com](http://www.jmstittassociates.com)

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# In-house Signal Distribution

by Doug Irwin  
CPBE DRB AMD

Last month I described how to use various types of RF filters to combine the outputs of two FM antennas on the roof of a studio facility (as an example). That's not all you can do with them, though.

Again, let's say that you have a cable system running around your offices (GM, PD, etc.) and you're not particularly interested in running other cables. (Work smarter, not harder, right?) We saw last month how to combine multiple FM antenna outputs on that cable. But what if you added say, an AM station? And perhaps reception is a little shaky after dark? Or how about this: You want to add video to a TV channel on that same cable. There must be a way to do that, right? The answer is yes on both accounts.

A very handy device to have in the first case is a simple FM modulator used in CATV systems. There are multiple sources, but Blonder-Tongue and Pico Macom are two common options. Either of these is one RU, with simple analog left and right inputs on the back (-10dBv level).

Of course before using one of these, you'll need to know about the spectrum already on your cable system. Find a hole in that spectrum, make a note of it, and then order up one of the modulators for that channel.

Now again we'll use simple two-way splitters that can also be turned around and used to add signals together, mainly because they have good port-to-port isolation. They also have attenuation in the path. For example, the

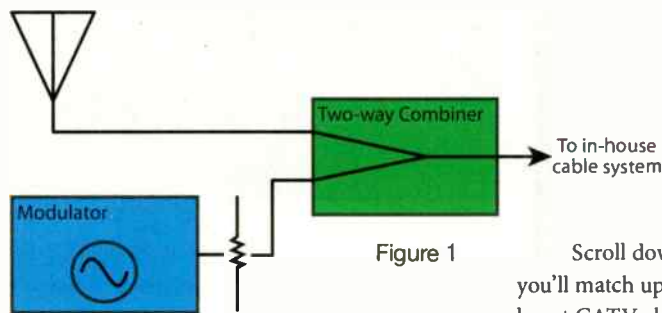


Figure 1

two-way divider generally will have about 4dB of attenuation from input to either output. Likewise, if you run signals into the outputs you'll find the same attenuation as measured on the sum (or input) side. See Figure 1. One on side, we take the CATV system in its original form (with whatever is already on it) and then, using the two-way splitter (turned around) we add our FM modulator, through an attenuator. You'll want to have the level from that device (as measured on the output side of the combiner) to be in the ballpark with other signals already there. There's no need to have it be very much stronger, and you don't want it re-radiating out on the antenna anyway.

Once you have that done, run the new audio in to the modulator. Magically it will appear on all the radios throughout the offices. Don't forget to tell everyone where to listen.

Now let's say you have a cable system running around that has the FM band as well as cable TV channels on it, and you want to add your own video channel (or channels) to it. (Reasons for doing so are many—for example, an IP camera at the transmitter site, or front door.) First thing you need to do is to find a hole in the TV spectrum, to find a spot for your NTSC modulator. A spectrum analyzer

is your best way to do this. Then, refer to this chart that I use for this kind of thing: [csgnetwork.com/tvfreqtable.html](http://csgnetwork.com/tvfreqtable.html).

Scroll down to CATV channels because you'll match up the spectrum hole with the closest CATV channel. When you do that, you'll be able to order an NTSC modulator that will slip in to the available spectrum easily.

You can obtain an NTSC modulator easily enough—again, Blonder-Tongue and Pico Macom are sources.

See Figure 2 for the best way to combine these new sources. Note that I've combined the new sources and then taken that sum, and combined that with the cable system using the two-way

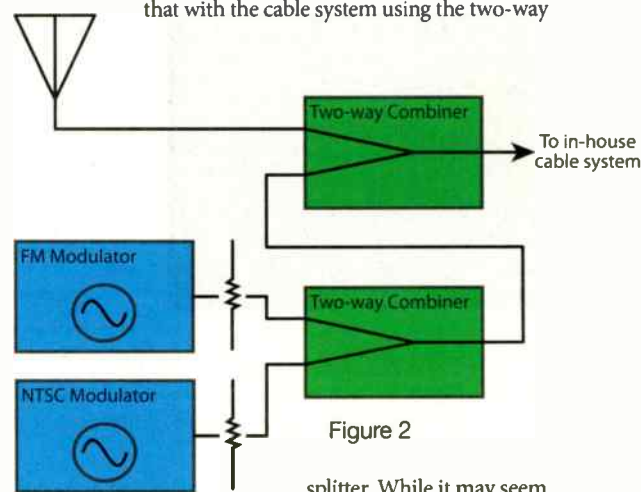


Figure 2

splitter. While it may seem easier to simply use a three- or four-way combiner, remember that

the throughput attenuation goes up when you do that. Doing it the way shown in Figure 2 will provide a higher level (or should I say less-attenuated) version of the combined spectrum coming in from the original sources, as measured on the output side of the combiner. **Q**

*Irwin is transmission systems supervisor for Clear Channel NYC and chief engineer of WKTU, New York. Contact him at [doug@douginwin.net](mailto:doug@douginwin.net).*

## RESOURCES

Blonder-Tongue | [blondertongue.com](http://blondertongue.com)  
Pico Macom | [tonercable.com/picomacom](http://tonercable.com/picomacom)

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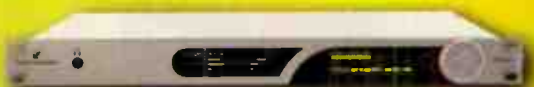
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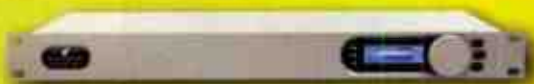
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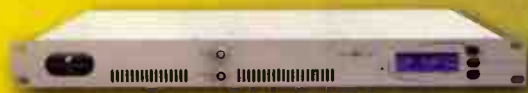
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World Radio History



# Tascam DR-05

by Jason Ornellas, CRO

**B**ecause of high demand, the market for portable recorders has grown immensely in the past few years. Recently, we purchased the Tascam DR-05 linear PCM recorder. We were looking for a true all-in-one recorder with a design for broadcasters. The DR-05 recorder is lightweight and the size is desirable for handheld operation. These are two factors you want in a portable recorder packed with a list of features that separates it from the rest.

It is very easy to operate and takes little to no time for understanding its functionality. It comes with two AA batteries (17.5 hours of continuous record time) and a 2GB (3 hours of recording with default setting) microSD card, which allows it to be used right out of the box. Make sure you have spare AA batteries since this recorder does not come with an ac adapter. The Tascam PS-P515U, which is sold separately, powers the recorder via the USB jack. The design of this recorder allows recording, editing and playback all from the palm of your hand. Broadcasters are always looking toward future

applications when purchasing equipment and the DR-05 gives many possibilities.

## UNDER THE MICROSCOPE

As broadcasters we always want to have the best quality audio. With 16-bit linear PCM audio, the recorder provides the quality broadcasters need. It can be set up to record 16- or 24-bit WAV files at 44.1, 48 or 96kHz.

It can also record MP3 files at 44.1 or 48kHz sampling rates at 32, 64, 96, 128, 192, 256 or 320kb/s bit rates.

A low-cut filter (off by default) can be set to 40Hz, 80Hz or 120Hz. The pre-record feature captures the two seconds prior to the record button being pushed. This can be turned on under the record settings. For musicians, the DR-05 has a built-in tuner. This comes in handy when performers visit the stations and we need to tune various instruments.

## RECORDING

This is a portable recorder after all, so let's discuss the recording process. The DR-05 has built-in stereo condenser, omnidirectional

microphones with sensitivity up to 125dB SPL. When using the built-in microphones, it is recommended to place the unit in a stable position. I take advantage of the built-in tripod screw socket when recording live performances and keep the recorder

on the tripod. The DR-05 also comes with a 3.5mm stereo mic/line input jack for an external source. The DR-05 also supplies plug-in power for those microphones that need it. This recorder comes with a level align feature, which corrects uneven volume during playback.

While trying to find a record level, the recorder gives two options: automatic or manual. The recorder can be set to the level control function (automatic function), which is off as a default. When you use the level control function it allows you to use a peak reduction, auto level and a limiter. The peak reduction reduces the input to achieve correct levels when the input becomes too hot. The auto level element

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disables the user from raising and lowering the record volume. It manages the input levels automatically while increasing and decreasing the input volume depending on its levels. Lastly, there's the limiter to catch any excessive audio peaks.

While recording, you can add markers to a file to point out keywords or highlights and come back to it later. The lucky number 99 is the maximum number of marks you can make in a given file. When files are too long or you want to make that interview two parts for playback while out in the field, the DR-05 delivers yet again. Files can be split into two at a specific position in the original file. The recorder automatically creates a new file name for both new tracks. MP3s cannot be split, so it is necessary to record a WAV file if you're thinking you might want to split a future recording.

Besides recording, this handheld unit comes fully loaded with playback elements. The DR-05 has a playlist option to create

and set files to be ready for playback when at any time. Creating a playlist is easy with just a few buttons, as well as selecting desired files to that list. Each playlist can be edited to delete a file, delete all files or move a file to or from another playlist. The playback control function allows you to play a playlist the way you want: continuous files (default), single file, one repeat and all repeat. In addition, it can boost output audio while playing files back. The playback equalizer (EQ) is set to off as a default, but you have the choice to set the treble, middle and bass that creates a fuller sound coming out of the recorder. Further, the DR-05 allows a factor known as VSA (Variable Speed Audition). This allows the playback speed to increase 50-150 percent without changing its pitch. The integrated built-in speaker (0.3W mono) is on the backside of the recorder. Another way to listen or playback a track is through the 3.5mm headphone/line out jack.

Overall, I am very pleased with the navigation, functionality and performance of the DR-05 linear PCM recorder. Its simplistic approach to making field recording is a hit with me. I really like the fact that the recorder is ready for field use directly out of the box. It gives our radio stations the sound both production and programming departments want from a field recorder. It has been widely used tuning instruments for artists, recording studio performances, interviews and during remote broadcasts. After recording, the recorder can be plugged into a computer (Mac or Windows) with a USB 2.0 recommended port to retrieve the files. I'm positive any end user will enjoy the many features of this recorder for future use inside or outside broadcast studios. 

*Ornellas is a station engineer at Greater Media New Jersey, Cedar Knolls, NJ*

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## NewTek TriCaster

by Robert Chickering

**A**t the nationally syndicated *Kidd Kraddick in the Morning* radio program, we have found live and on demand video to be a game changing addition to our traditional broadcast. Via our website ([www.kiddnation.com](http://www.kiddnation.com)) and Ustream channel, we get to show the action in studio with Kidd and program regulars Kellie Raspberry, JC, Big Al Mack and Jenna Owens in engaging and interactive ways, as well as present many creative segments and bits that are only possible via video. Three years into our video initiative, we have reaped the benefits of a stronger connection with our audience and the creation of new revenue streams.

To bolster our live and archive video production for the program, we chose a multi-camera production system called TriCaster from NewTek. TriCaster is a plug-and-play device that enables even non-technical users to stream, play and record video all at the same time. We remain impressed with its reliability and features that have helped us take our radio program into the video realm.

### BETTER RADIO THROUGH STREAMING

The concept of adding live and archived video into our business model seemed

like a good idea from the outset, but quickly got better and more exciting once we started. Without much of a publicity push, our first streams got hundreds of viewers. This quickly turned into thousands. Now our video offerings regularly exceed 7 million viewers per year.

TriCaster has streamlined our operation, allowing us to record every live segment as they air, and save each to an external hard drive. The show is now replayed all day on our Web site and Ustream channel so fans who may have missed it, or were unable to watch during their drive to work, can see it at any time. We also rerun segments of the show from weeks past during commercial breaks.

To increase interaction and build community with our audience, we integrate a message board where viewers can chat with us, and with each other as they watch the program throughout the day.

TriCaster makes it easy for us to B roll in video pertaining to topics being discussed, as well as funny bits from television or the latest funny Web or music videos. We have a weekly feature called Music That Makes You Cooler, during which we will drop in music videos of artists being played on the air. TriCaster's multiple video playback decks make it easy to alternate between content stacked for these types of segments and any of our live in studio cameras.

### TOP 5 FEATURES

- > Television-style virtual sets, moving backgrounds, effects and graphics
- > Portable device for the field
- > Works with multiple camera shoots
- > Provides broadcast and streaming output video
- > Includes graphics and production switcher

Another key attribute of TriCaster is that it is road-ready. With its compact size, we have been able to place it just about anywhere to create remote video studios on the fly. I have shipped the unit to various locations, and with a simple high-speed wired Internet connection, we're on the air.

Examples of popular video projects we have produced outside of the studio include our annual "Dysfunctional Family Vacation," which follows our whole crew for a weeklong trip each summer (most recently to London during the Olympics). We broadcast and stream our show daily from these remote locations as well as features on their off-air adventures in that locality. During the holidays, we select a local family in need for our "Breaking and Entering" series and provide them with a Christmas makeover, including a decorated tree and presents for everyone. This is set up when the selected family is out of their house, and the footage of their surprise when they return home is always compelling, fun and heart-warming.

For remote broadcasts and special events that we are unable to cover with our video crew, we integrate Skype with our TriCaster. Recently, Kidd dropped in on our affiliate

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station in Houston and we were able to share video of his appearance with our national audience via live stream and video on demand.

TriCaster has also begun to give us a broadcast television sensibility, particularly with its LiveSet effects, for our daily "Show Biz Top 5" videos and other segments, we place talent before a simple green screen, but it appears as if they are in a high gloss studio set. This virtual studio is made possible through NewTek's sophisticated computer graphic wizardry and our audience is none the wiser.

Our powerful TriCaster-based video workstation allows us to do these features, as well as countless spontaneous bits, as we think of them. We have become very attuned to weighing the visual aspect and possibilities of anything we do—which adds an element of excitement for our audience and us.

In addition to the success of our Web site and Ustream channel, the viewership of our YouTube videos has doubled since we have made video a priority. We have also been able to parlay our video content into significant revenue streams from advertising and sponsorships.


**BEHIND THE SCENES**

TriCaster requires only a minimal learning curve to produce broadcast quality video. Once set up, it boots to a standard Windows active desktop with choices to launch or configure the system. The launch screen includes video preview monitors, a vectorscope, program and preview monitors, as well as two video playback decks. There are multiple tabs for video setup, audio mixing, titles, video input configuration and record/streaming settings. The record/stream page's on-screen interface offers many Flash encoding pre-sets and a quick means to conduct a stream through existing services.

The TriCaster's keyboard hot keys allow transitions as well as direct camera or source cuts. Transitions can be automated to play video and then return to the camera setup in the preview window. We use each input's status closures to provide a source tally on each live camera at events.

Our TriCaster has six video inputs and four audio inputs—other models from the company have more or less of each. The audio sources can be linked in stereo or run mono and configured for mic or line level

through the user interface page. The software mixer has pan and EQ on each channel as well as variable level control. Each video playback deck (DDR) has all the normal playback controls and allows users to variable speed play and scroll search to a desired point in a video. The system comes with a complete array of titles and dissolve effects, which gives each video production a clean professional look.

We are extremely happy with what live and on demand video has done for *Kidd Kraddick in the Morning*. Most importantly, it has enhanced our connection with our incredible audience and very satisfied sponsors. We are also big believers in TriCaster, the video solution we found to make it all possible. 

*Chickering is VP operations/engineering, Yea Networks, Kidd Kraddick in the Morning.*

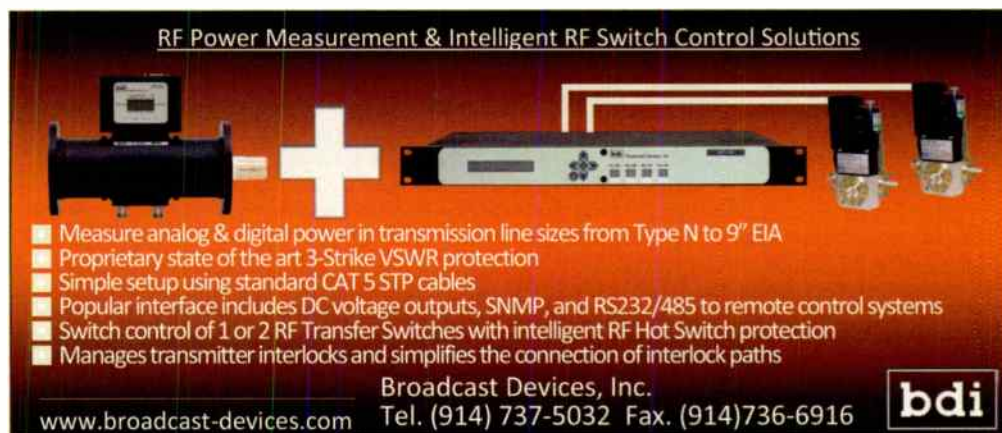


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# On-air Condenser Mics

**D**ynamic mics are everywhere. The EV RE-20 and its cousin the N/D-27 are probably the most ubiquitous dynamic studio mics in use. The Shure SM7 (and still sometimes the SM5) are also common. Heil has made inroads as well. Even Neumann has the BCM 705. But there is another option to the dynamic mic. Perhaps it's time to

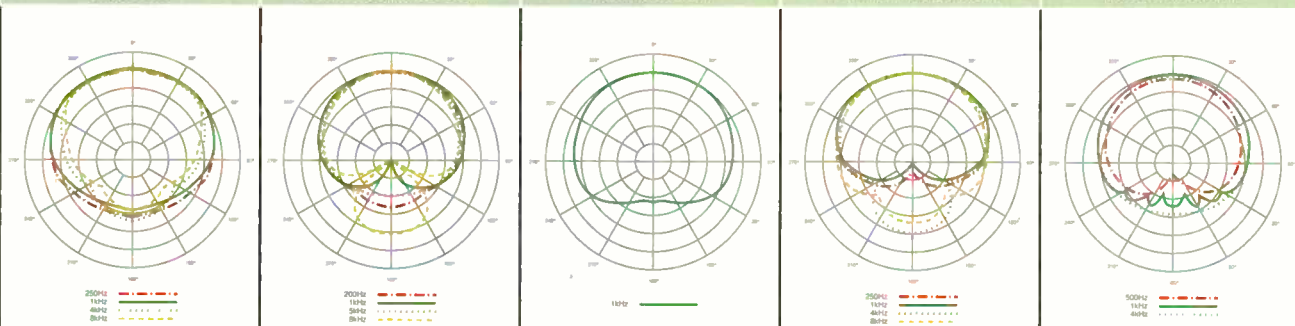
consider a condenser mic in the studio.

There are misconceptions about condenser vs. dynamic mics for on-air use. Some claim condensers aren't rugged enough for jock use. That's not really true any more. The cost of many condensers can be higher than a dynamic, but not by much. Condensers require phantom power, but most preamps and consoles can provide that with no effort.

There are potential benefits for condensers. Condensers usually have a lower self-noise floor and higher sensitivity than dynamics. A condenser's lighter diaphragm (compared to a dynamic) can respond quicker to transient sounds. Condensers typically have a flatter frequency response as well. We selected a few common condenser choices for radio studios. **0**



Model	AKG C4500 BC	Audio-Technica AT4040	MXL BCC-1	Neumann BCM 104	Rode Broadcaster
Pattern	cardioid	cardioid	cardioid	cardioid	cardioid
Frequency Response	30Hz - 20kHz	20Hz - 20kHz	20Hz - 20kHz	20Hz - 20kHz	20Hz - 20kHz
Diaphragm Size	1"	1"	0.87"	1"	1"
Output Impedance	<200Ω	100Ω	150Ω	50Ω	40Ω
Max SPL	145dB	145dB	148dB	140dB	128dB
Sensitivity	-34dB	-32dB	-49dB	-32.4dB	-34dB
S/N A weighted	86dB	82dB	78dB	87dB	80dB
Orientation	end address	side address	end address	side address	end address
Filter	bass-cut	80Hz high-pass	high-pass	100Hz low-cut	high-pass
Pad	-20dB	-10dB	-	-14dB	-
Weight	450g	360g	720g	500g	577g
Notes	-	-	-	changeable headgrilles	LED on-air indicator
MSRP	\$819	\$495	\$350	\$1,080	\$629
URL	akg.com	audio-technica.com	mxlmics.com	neumannusa.com	rodemic.com



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# NEWPRODUCTS



## Olympus | Audio recorders

**LS-12, LS-14:** The Olympus LS-12 and LS-14 capture and playback pristine, better-than-CD quality sound up to 130dB SPL with new on-board directional stereo microphones and amplifier. While the 1 3/4" LCD menu screen is intuitive and easy to follow, recording professional sound is made even easier by the Mode Select Dial and Smart Mode features. The Mode Select Dial, located on the bottom right-hand corner of both recorders, can be set to the following modes: Tuner, Manual, Quick and Smart. Tuner Mode sets the recorder as a Chromatic Tuner for musical in-

struments. In Manual Mode, experienced users can adjust the recording level manually, adjusting the level while playing music or capturing sound. Smart Mode is ideal for anyone from the novice to the seasoned veteran.

[olympusamerica.com](http://olympusamerica.com)

## Altinex | Tabletop interconnect boxes

**TNP151, TNP151C:** Available in both standard and custom configurations, the TNP151 and TNP151C interconnect boxes offer convenient, one-touch access to network and ac power connections, making the tabletop connection point attractive for any boardroom or conference room table.

Finished in matte black, the standard TNP151 provides a single input plate with two network (RJ-45 F-M) input connections in 6' length and two ac power connections in 9'-10' length. The unit can also be customized with different connections and colors. The network signals are passed through the unit with connection to the network system under the table. No signal processing or buffering takes place. The Altinex TNP151C is highly customizable, with more than 25 different connector options, all factory-configured and terminated so installations are quick and effortless.

[altinex.com](http://altinex.com)



## Studer | On-air telephone system

**CMS Lite:** CMS Lite serves from a single studio up to multiple studio installations and integrates with Studer's range of OnAir consoles. It allows the installation of a flexible and scalable phone system. CMS Lite uses off-the-shelf standard IT components, saving cost, requiring less installation labor, less cabling and providing a high return on investment. It includes DJ Self-op, switchboard operator and producer modes, waiting rooms and database support.

[studer.ch](http://studer.ch)



## acouStaCorp | Variable acoustic banner

**acouRoll:** The acouRoll is a variable acoustic banner. A unique motorized roller neatly retracts the banner into its enclosure. It is made from 26oz DRF wool serge in black or custom colors. A seamless fabric surface up to 59" wide mill finish aluminum frame with side panels encloses the motor and fabric tube. The banner is available with a bottom closure panel for millwork attachment, it ships to the site fully tested and assembled, and offers custom lengths, optional manual operation and standard ceiling or wall attachment hardware.

[acoustacorp.com](http://acoustacorp.com)

## Waves Audio | Noise suppressor plugin

**NS1:** A uniquely intuitive professional noise suppression plugin, the NS1 noise suppressor differentiates between dialog and unwanted noise. It instantly analyzes and adapts to a user's signal in real time, bringing the foreground into focus as it eliminates unnecessary background noise. NS1 is controlled by a simple single fader, and features an attenuation meter, which shows users just how much overall energy is being removed from their input signal.

[waves.com](http://waves.com)

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#### Cost Effective

Simian Gateway comes at a very affordable add-on price to Simian 2.2 Pro. Contact BSI Sales for pricing information. Simian Remote clients are completely free. All you need is the Simian Gateway and you can install and run a Simian Remote client on as many devices as you wish. There are Simian Remote client versions for both Windows PC and iPad.



### Simian Gateway runs alongside Simian 2.2 **PRO** to manage TCP/IP communications between Simian Remote clients & Simian 2.2 **PRO**.

## NEWPRODUCTS



### Royer Labs | Active ribbon microphone

**SF-2:** The SF-2 is a phantom-powered version of the original SF-1 ribbon microphone. It has an output level of -38dB, which enables the microphone to be used with a wide variety of mic preamplifiers, regardless of gain characteristics. The SF-2's electronics and custom-designed FET's deliver quiet operation with self-noise of lower than 18dB. The microphone's magnet/pole piece transducer structure provides a wide, uniform frequency response with no substantial peaks or dips, and the 1.8-micron ribbon element delivers excellent transient response. The microphone's off-axis coloration is negligible. These characteristics enable the microphone to deliver rich, full-range sound quality.

[royerlabs.com](http://royerlabs.com)

### Auralex Acoustics | Monitor isolation pad

**ProPAD:** ProPAD has increased durability and structural integrity (compared to the MoPAD), and provides superior isolation from the vibrations and resonant energy created by studio monitors. The ProPAD prevents this energy from being transmitted into the supporting furniture, which would greatly color the monitors' sound and degrade their imaging. The ProPAD is sold in stereo pairs and is designed to work with nearfield monitors employing up to 8" woofers. ProPAD's updated design features a 0.75" layer of laminated black MDF covered with a thick layer of Auralex's proprietary IsoPuck isolation material, which is made of recycled rubber. Six stick-on feet, also made from IsoPuck material, are supplied for flat or angled applications.

[auralex.com](http://auralex.com)



### Sony Creative Software | Digital audio workstation

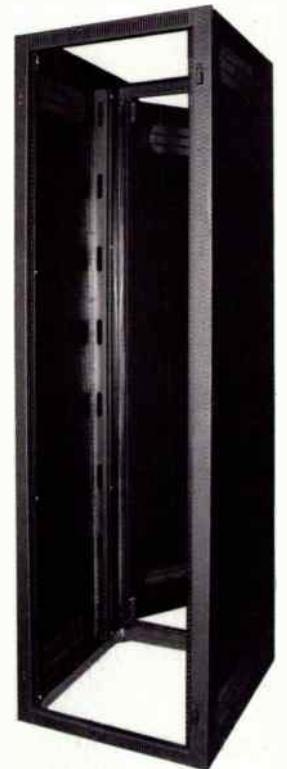
**Sound Forge Pro Mac 1.0:** A multichannel audio recording and editing application, Sound Forge Pro Mac software was developed from the ground up on a clean slate for OS X. The application ships with a full suite of audio mastering and repair plug-ins, making it a comprehensive solution for audio professionals who work on the Mac platform. The software handles up to 64-bit/192kHz audio resolution and can record up to 32 channels simultaneously. It supports AU and VST plugins and includes its own native processing and an iZotope effects bundle and Zplane time-stretching and pitch-shifting.

[sonycreativesoftware.com](http://sonycreativesoftware.com)

### Lowell Manufacturing Company | Rack enclosures

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## NEWPRODUCTS



### Allen & Heath | Audio interface

**ICE-16:** ICE-16 is a 16-in/16-out audio interface that easily captures high quality multi-track recordings direct to a USB drive or interface to a computer. Fitted into a compact 1RU design, ICE-16 is capable of studio quality interfacing, converting and bi-directional streaming of 16 channels over high-speed USB or FireWire at 24-bit, 96kHz resolution. Alternatively, 16 channels can be simultaneously recorded straight to a USB hard drive or memory stick at up to 24-bit 48kHz resolution WAV file. The ICE-16 is expandable; link units together and synchronize recording of many channels. It connects to any audio mixer or analog source using 1/4" jacks for the inputs and RCA phono connectors for the outputs. Signal and peak metering is provided for each channel and can be switched to show input or output. Headphone monitoring is also included and switches on each channel enable checking of individual or multiple.

[allen-heath.com/US](http://allen-heath.com/US)

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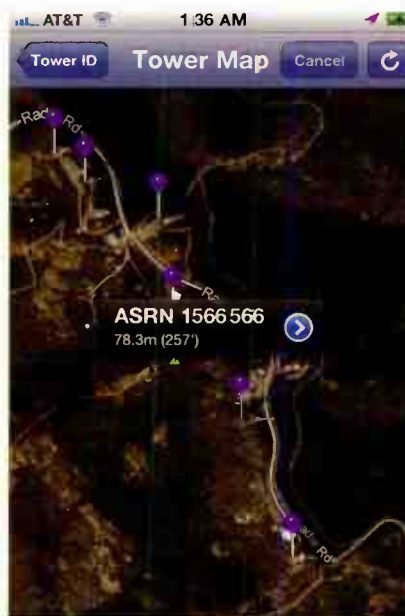


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[fastcap.com](http://fastcap.com)

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[glensound.co.uk](http://glensound.co.uk)

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[grundorf.com](http://grundorf.com)

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[akg.com](http://akg.com)



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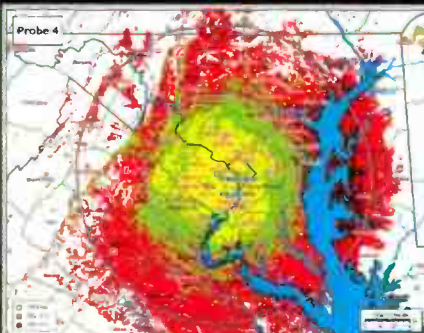


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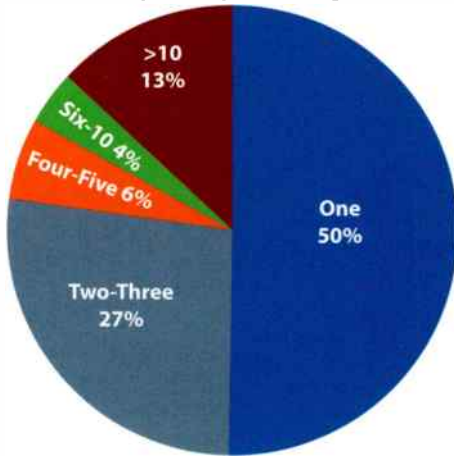
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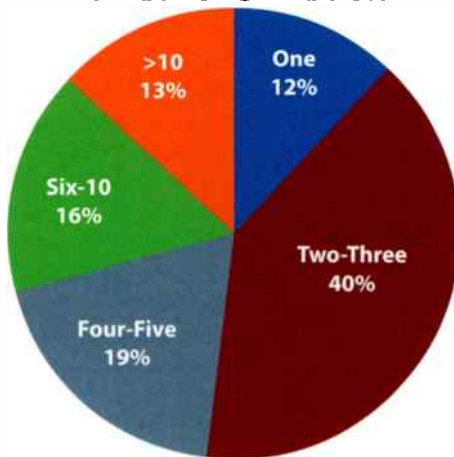
# 2012 Salary Survey

by Chriss Scherer, editor

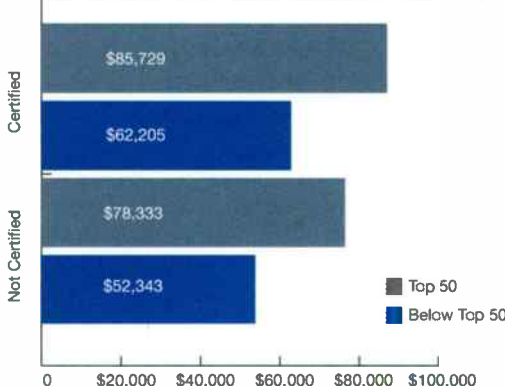
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## SALARY BY SBE CERTIFICATION



## BY THE NUMBERS

**14**

Average years in current position

**30**

Average years in the broadcast engineering field

**21**

Percent belonging to no organizations

### Memberships:

- 69% SBE
- 4% AES
- 7% IEEE
- 3% NARTE
- 27% ARRL
- 4% Other

**54**

Percent who received a raise in the past 12 months. Median increase 12.5%; average 4.4%. (in 2011: 46% received a raise, median raise 3%; average raise 5.11%)

**67**

Percent age 55 and older (55% in 2011)

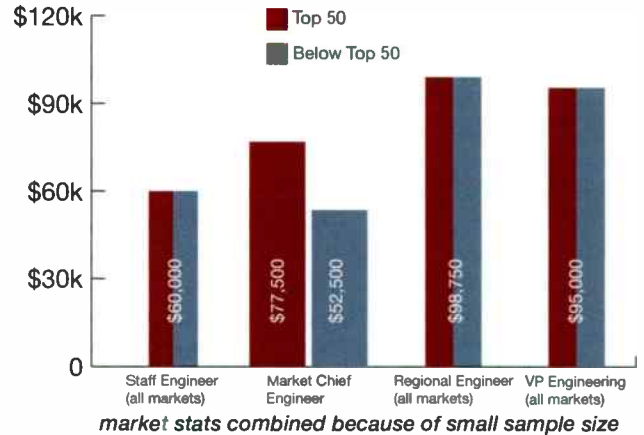
**48**

percent are not certified  
49% are SBE certified  
5% are NARTE certified  
7% are Microsoft certified  
2% are Cisco certified

### SBE Certification stats:

- 18% CEA
- 31% CBNT
- 4% CBNE
- 11% CBT
- 16% CBRE
- 20% CSRE
- 24% CPBE
- 16% AMD
- 4% DRB
- 4% CRO

## ESTIMATED MEDIAN SALARY



## STAFF ENGINEER MEDIAN SALARIES

Year	Top 50	Below Top 50
2002	\$64,999	\$43,749
2003	\$61,428	\$41,250
2004	\$65,333	\$44,249
2005	\$64,999	\$48,000
2006	\$65,833	\$46,111
2007	\$64,999	\$49,999
2008	\$71,250	\$50,714
2009	\$62,500	\$52,500
2010	\$71,250	\$49,166
2011	\$54,999	\$54,999
2012	\$60,000	\$60,000

## CONTRACTING

**23%** Are contractors  
Average hourly rate **\$75**

**18** Hours booked/week (avg)  
Charge emergency rate **67%**  
**\$131** Avg. emergency rate

**Methodology:** From Sept. 12, 2012, to Nov. 23, 2012, Radio magazine solicited responses to an online survey by posting a link at RadioMagOnline.com and noting the link in all its email newsletters.

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