

# RADIOWORLD

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## INSIDE

### INSPECTOR CONFIDENTIAL

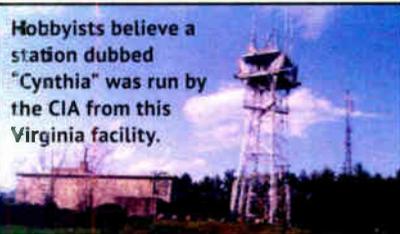
Retired FCC field inspector John Reiser remembers highlights and lowlights from knocking on station doors. — Page 4



### 007 ON THE DIAL

Coded numbers from the Cold War espionage era still offer intrigue to some radio hobbyists. — Page 12

Hobbyists believe a station dubbed "Cynthia" was run by the CIA from this Virginia facility.



### CONDITION CRITICAL

Broadcast's important role in emergency situations; a commentary by NAB Senior Vice President, Technology, Lynn Claudy. — Page 29

## Hadfield Advocates 'Service' Mindset

Clear Channel's Seattle cluster DOE shares tips for efficient station support

### RADIO IT MANAGEMENT

SEATTLE — Marty Hadfield is director of engineering for the Seattle cluster of Clear Channel Media & Entertainment, a position he'll have held three years come June.

As part of our expanded coverage of radio information technology as well as traditional engineering management, Radio World contributor and technical advisor Thomas R. McGinley conversed with Hadfield via email about issues such as IT standards and requirements regarding hardware and software purchases, updated skill sets, organizational tools and cluster support.

In a broadcast engineering career of more than 40 years, Hadfield has had stints at Fisher, Qualcomm and Alpha, among other broadcast groups. He's perhaps best known from a 17-year stint as corporate vice president of engineering for Entercom Communications.

Hadfield, like other group engineers these days, needs to keep up not only with changes in RF needs but with IT issues as well.

Clear Channel has seven stations — five FM and two AM — in the Seattle-Tacoma market, which is ranked by Nielsen Audio as Radio Market 13, with a Metro 12+ population of about 3.6 million people.

RW: Many chief engineers or their designated staff people are responsible for IT operations at their stations.

That often includes not only the audio delivery and automation systems but also the office LAN with all of its servers, workstations and portable devices used in the facility. How is IT support handled in your operation?

Hadfield: Craig Fleek is my local IT (continued on page 6)



Hadfield works on site as trees that fell during a snowstorm in 2012 are cleared from the road to the KKBW(FM) tower.

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World Radio History



# Starling, Loewenstein Move On

Between them, the engineers have a combined 75 years in public radio

BY LESLIE STIMSON

Mike Starling and Pete Loewenstein, two engineers familiar to Radio World readers, have left NPR to begin the next chapter of their lives. They are among employees who opted for a voluntary buyout from the network.

NPR is operating at a deficit. By cutting up to 10 percent of its workforce through voluntary buyouts — potentially up to 80 employees with at least three years seniority — NPR hopes to reach a balanced budget in fiscal year 2015. When it announced the buyout plan in September, NPR had 840 full- and part-time employees.

Early this month, a spokeswoman told me the buyout program has been “helpful” in moving NPR towards its budget goals. There’s not yet a final number of employees taking the buyout, and the network does not intend to share a final figure; but from what I hear, it sounds like NPR feels it is on track to meeting its goal through the buyouts.

I also hear from various sources that the network plans to fill Loewenstein’s position; but it doesn’t sound like Starling’s role will be filled with a new hire.

## IN THE LABS

Starling most recently was executive director of NPR Labs, the organization’s R&D arm, which he helped to establish in 2005. It is based at NPR headquarters in Washington.

In 2009, NPR Labs was put under the wing of NPR’s Technology Research Center, which operates under the auspices of the Public Radio Satellite System. The PRSS is part of NPR’s Distribution Division.

In a note to colleagues that Starling shared with Radio World, he wrote that radio folks need to banish the word “retirement” from our vocabulary.

In addition to his engineering expertise, Starling has a law degree and teaches law part-time at Towson University outside Baltimore. He plans to teach, write, consult, fish, volunteer, dote on both his kids and his new kitten, spend more time with his wife Linda, and read more.

He told me at the Labs’ chili cook-off in December he may also take on some cool, new projects, and that he’s excited about the next phase in his life. Several NPR employees stopped by to wish Mike and Pete farewell, and Labs’ employees used the occasion to explain to other employees what the lab does.

Starling was director of technical operations at NPR and led the network’s transition in 1994 from M Street to a larger building on Massachusetts



Photo by Leslie Stimson

Mike Starling samples goodies from the NPR Labs’ chili cook-off in December.

Avenue. Recently, he arranged for the online auction of thousands of pieces of gear that the network would not take to its new headquarters on North Capitol Street this year.

He became a vice president in 1998 and was named chief technology officer in 2002.

Notable projects on which NPR Labs personnel have worked over the years include testing related to HD Radio multicasts, the FM HD power increase and accessible radio for the deaf and deaf-blind.

Overall, Starling has been in radio 44 years, 33 of them spent in public radio.

He began his broadcasting career in high school as an announcer for WBMD(AM/FM) in Baltimore in 1969. Out of college at the University of Maryland in 1974 he became an engineering supervisor for Mutual Broadcasting. In 1976 Starling moved into management as the founder and manager of commercial WKYY(AM), Amherst, Va. He then became chief engineer for KPBS(FM), San Diego.

Starling is on the board of directors for the Toronto-based North American Broadcasters Association. He proposed that NABA form a radio committee, as we recently reported. For several years Starling also has been a member of the National Radio Systems Committee, the standards body co-managed by NAB and CEA.

He also helped found the Association of Public Radio Engineers, which organizes and runs the annual Public Radio Engineering Conference.

He received Radio World’s Excellence



in Engineering Award in 2005, the same year NPR won a “Cool Stuff” award from RW for the Tomorrow Radio Project involving HD Radio multicast channel testing. Starling was the project leader. He received the C. Stanley Potter Award from the International Association of Audio Information Services in 2004 for NPR’s work on accessible radio projects for the visually-impaired and hard-of-hearing, and a Wondervision award from Stevie Wonder for work on the first “talking radio,” the Dice ITR-100A.

His last official day was to be Jan. 11. Reach out to him at [mikei.starling@gmail.com](mailto:mikei.starling@gmail.com).

## LOEWENSTEIN

Pete Loewenstein was one of the network’s original employees when NPR went on the air in 1971; he was there for

(continued on page 5)

## Tune in to the Future.



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# Confessions of a Retired Field Inspector

John Reiser recalls the days of knocking on station doors for Fox Charlie Charlie

## NEWSMAKER

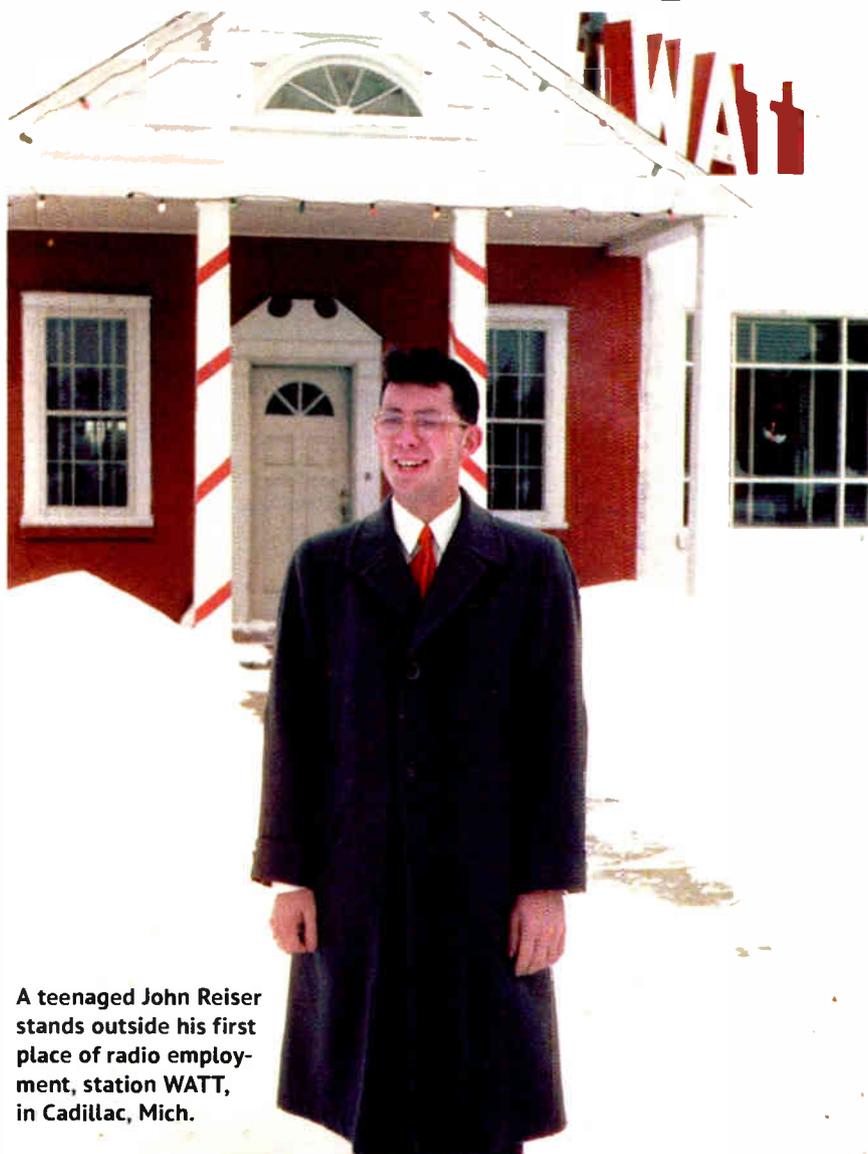
BY JAMES E. O'NEAL

*"I'm the first man they look for and the last they want to meet. It's a chancy job, and it makes a man watchful ... and a little lonely."*

Those words were part of Marshal Matt Dillon's opening soliloquy in the radio version of "Gunsmoke" but could well apply to any of the hundreds of individuals who've served as FCC field inspectors.

No matter how "clean" your station might be, you have a panic response when that federal official unexpectedly shows up for a "visit." It's akin to seeing a blue light flashing in your rearview mirror even though you've done nothing wrong and the officer just wants you to get out of the way so he can pursue someone else.

John Reiser was among those who reviewed station logs and public files, counted spare tubes and tower lights, measured operating frequencies and percentages of modulation, and even carefully scrutinized transmitter meters for signs of a sticky movement.



A teenaged John Reiser stands outside his first place of radio employment, station WATT, in Cadillac, Mich.

## FROM THE EDITOR



*I'll be back next issue. Here, contributor James O'Neal profiles an industry treasure: John Reiser.*

— Paul McLane

For 11 years — 1961 to 1972 — his very appearance in the station parking lot could raise the blood pressure of station managers and operators.

Reiser retired from the commission in 2000 after almost 40 years of service.

Even before retirement, though, he was no longer one of the most feared people in town, because he had stopped knocking on those doors. Now he looks back on his inspecting days with a measure of detachment and doesn't hesitate to relate what life was like on the other side of the citation book.

"The most enjoyable aspect of my work was meeting and working with some of our nation's most talented engineers, who have contributed so much to all aspects of broadcasting and broadcast equipment and standards development," he said.

He was first a broadcaster, getting his start while in high school at 250-watt WATT(AM) in his hometown of Cadillac, Mich.

"I helped form a radio club to produce programs broadcast each week, and I helped with remote broadcasts of school sporting events and music groups."

He obtained the coveted FCC "first phone" license in high school; after graduating he attended Purdue University and worked at the school's station, WBAA(AM). Reiser returned to his home state to enroll at the University of Michigan, eventually receiving an EE degree from that institution. While attending classes, he worked at that school's FM operation, WUOM, and remained on its staff after graduation before eventually seeking employment with the FCC.

His first assignment was with the Detroit field office. In the ensuing years, he inspected virtually all of the stations in Ohio, most of those in eastern Kentucky, two-thirds of the stations in upstate New York, and all of those in western Pennsylvania. While the majority of facilities were "clean" and above-board, others were not.

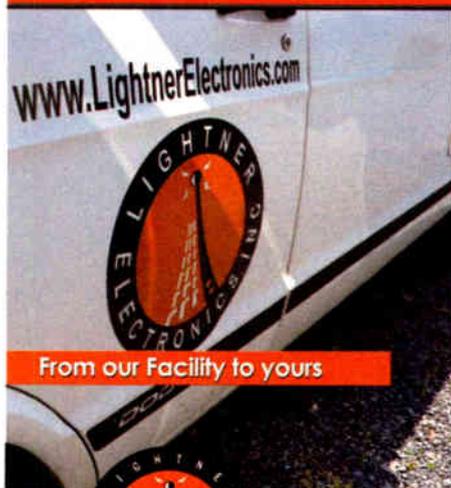
### ROLLING YOUR OWN 'FIRST PHONE'

"We did have stations that pulled some strange shenanigans," said Reiser.

"I inspected one station that was operating with a chief operator who had a forged first class operator's license. He

*(continued on page 18)*

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FEMA/Walt Jennings

**MOVING ON**

(continued from page 3)

the first broadcast of "All things Considered" 43 years ago as a technician in the studio control room.

Loewenstein retired in December as vice president for distribution, a division that oversees the Public Radio Satellite System.

The PRSS' Network Operations Center operates an IP-over-satellite system that enables transmission of programming and other digitized content.

He tells me he's looking forward to having quality time to actually listen to more of the programming he has helped support over the years, and says he's facing a long list of items to fix around the house that have long been put-off.

But Loewenstein will have fun too; he'll have more time for sailing, listening to and playing music, and operating his ham radio gear. He's officially done with full-time work.

He characterizes his NPR career as "phenomenal" and says he's been able to travel and meet people at stations all over the U.S. NPR is also where he met his wife Margaret.

In the late 1980s, Loewenstein led public radio's interconnection system through a complete reorganization of its governance structure and completion of a business plan that yielded long-term financial security for the system, according to NPR. In 2004, he and his team began a major redesign of public radio's program distribution system with the development of the PRSS ContentDepot, which Radio World has covered in several stories.

Taking advantage of innovations in

digital technology, the PRSS Content-Depot streamlines how public radio stations and producers select, send, acquire and automate programming. The system launched in 2006. The PRSS' Content-Depot service is public radio's national program distribution system: it uses a combination of Internet and satellite technologies to offer automated content delivery services to stations.

More recently, Loewenstein helped oversee the move of PRSS' Network Operations Center to the new headquarters on North Capitol Street. He says this is a good time to leave, as the network begins a new planning cycle for infrastructure upgrades.

Loewenstein was awarded the Edward E. Elson Award in 1991. In 2002, CPB awarded him the Edward R. Murrow Award recognizing an "individual whose work has fostered the growth, quality and image of public radio."

His last day on the job was Dec. 27; reach him at [petel22151@aol.com](mailto:petel22151@aol.com).

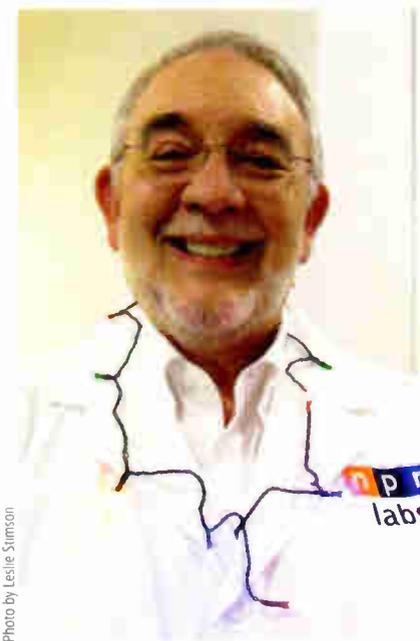


Photo by Leslie Stimson

Pete Loewenstein wears holiday lights at the December event.

**NEWSROUNDUP**

**MOTO G:** Boost Mobile, part of the Sprint Network, debuted a smartphone that comes loaded with the NextRadio app. The Moto G was to be available to consumers in mid-January at [www.boostmobile.com](http://www.boostmobile.com) and some brick-and-mortar stores like BestBuy, RadioShack, Target, Walgreens, Walmart and Sprint retail locations shortly thereafter. The wireless company emphasizes the power-saving angle in its marketing; it said that when compared with streaming, NextRadio consumes far less battery life than other music apps, because the audio is coming through the built-in FM tuner instead of over the Internet. The Moto G comes with no annual contract and features a 4.5-inch HD screen made with Corning's Gorilla Glass, a 1.2 GHz Qualcomm Snapdragon core processor and a 5 megapixel camera. The rechargeable lithium-ion battery, claims Boost Mobile, lasts all day. The Moto G lists for \$129.99.



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## HADFIELD

(continued from page 6)

panel before you first start the engine. If it coughs and sputters, clanks, shows wild voltage variations or whatever, you can share the AV clip with your generator service company and they may be able to trouble shoot the condition remotely and then be able to bring exactly what service items are needed when they visit.

I use Gantt charts and Outlook calendars to help plan and track projects. CCM+E Corporate offers access to many efficiency tools, including an internal Wiki that is fed by the experiences of all of our engineering and IT members.

**RW:** How do you see the role of chief or market engineer changing? To what extent can contractors or corporate based engineering services and regional personnel replace local engineers' technical needs?

**Hadfield:** I think most companies have already seen the duties of their CE/market engineer mature to a point where there are very few aspects of a radio station's operations that are not already touched by them. When the operating budget demands a reduction of local engineering staff, the station general management must face the fact that response and recovery times will be increased and their menu of options for remote broadcasts, studio change requests and other tasks that require physical involvement, will be reduced, too.

In order to efficiently use any form of engineering services, if it hasn't happened already, the chief engineer needs to develop a thorough set of current, descriptive and pictorial plans of the signal paths that exist within their facilities. This guide must include IP, analog and control signal

This 'original radio head' shot was taken outside of the Seattle Teatro ZinZanni dinner theater in November. (The 15-foot tower is for promotional purposes only.)



paths, with equipment models (another good place to insert an image of a device) and the I/O wiring connection descriptions — numbers and a brief to/from description are what I appreciate the most when I look at cables spilling out of an IP switch or and EAS box.

Standardizing and documenting network user drive paths and IP address or machine names will minimize confu-

sion when a PC/server hiccups. This collection becomes a living resource guide to assist in accelerating trouble shooting of the facilities when the CE is unavailable and contractors or other help will have to step in.

**RW:** The ranks of senior engineers are dwindling daily as more of us are retiring or choosing to pursue other

opportunities. How are preparing your stations for the eventual transition to a new cluster chief?

**Hadfield:** I am an advocate and practitioner of cross-training. Both of my IT team members are starting to take basic electronics courses to bridge and broaden their knowledge base to become familiarized with transmitter site equipment operation and maintenance. This method certainly does not bear fruit overnight, but coupled with their on-the-job knowledge of the overall facilities, they will have improved their likelihood of being primary candidates when the position is eventually open.

From the corporate side, earlier this year CCM+E announced the completion of its inaugural Market Engineering Manager Development Program, and we are in the third year of the Electrical Engineering Co-op Program. In addition to looking within my staff and the CCM+E engineering talent pool across the nation, I feel the pulse of potential applicants by staying in touch with smaller market engineers and with students at university and local vocational schools.

**RW:** How did you get into radio?

**Hadfield:** I have lived and worked in Seattle and the great Pacific Northwest my whole career. My first paying job in radio was working at a tower site, logging transmitter readings every hour. It was around 1973 and the DC remote control lines had failed. I held a third Class Operator Permit, so my friend Ernie Opel, chief engineer at KBLE(FM), Seattle — now one of my Seattle stations, KUBE — asked if I could take on the job.

Comment on this or any story. Write to radioworld@nbmedia.com.

## NEWSROUNDUP

**STREAMING AUDIO:** Streaming loudness consistency is becoming more of an issue as consumers listen to more Internet audio. Loudness consistency results in higher listener satisfaction and retention, according to the Consumer Electronics Association. CEA's R7 committee on Home Networking has established a working group to address techniques for maintaining audio program loudness. John Kean, senior technologist of NPR Labs, is chairing the group, which is open to CEA members. The group, "WG15," will focus initially on content that is streamed over the Internet. The working group may develop a target loudness standard and best-practices for producers and distributors of audio content. If you're interested, email [jkean@npr.org](mailto:jkean@npr.org).

**PATENT SUIT 1:** Broadcasters targeted in a patent infringement lawsuit linked to their HD Radio transmissions have received more time to reply. Cox Media received an extension until Jan. 3 for its reply to the suit in court before Judge Gregory Sleet. The other defendants received the judge's approval to

delay responses until Feb. 24. As we've reported, Delaware Radio Technologies and an affiliated company, Wyncomm LLC, sued several radio groups in November, alleging patent infringement over the voice and data transmission technology used by broadcasters for in-band, on-channel digital audio broadcasts. Wyncomm wants a jury trial and seeks damages from broadcasters as well as from 18 automakers named in separate lawsuits. Beasley Broadcast Group, CBS Radio, Clear Channel parent CC Media Holdings, Cox Media Group, Cumulus Media, Entercom, Entravision, Greater Media, Hubbard Radio, Radio Disney, Radio One, Saga, Townsquare Media and Univision are defendants.

**PATENT SUIT 2:** Clear Channel parent CC Media Holdings joined the ranks of broadcasters sued by DigiMedia over studio automation equipment. It has been more than two years since DigiMedia and its affiliated company, Mission Abstract Data, introduced a patent infringement lawsuit targeting CBS Radio, Greater Media, Beasley Broadcasting, Cumulus, Entercom and Cox Radio. CC Media was not named in the original suit but was added in

November. CC Media was to reply by Jan. 17. The federal suit targeting broadcasters was stayed in late 2011. Judge Leonard Stark is still considering when and if the case should resume now that questions of patentability of the technology appear to have been settled by the United States Patent and Trademark Office.

**LPFM:** Two long-time low-power FM advocates want the FCC to reconsider licensing stations at higher power levels in rural areas. Currently LPFMs are authorized to operate at 50 to 100 watts. Don Schellhardt and Nikolaus Leggett petitioned the commission to consider licensing a category LP250 stations, at 101 to 250 watts. Certain existing LP100 stations and new applicants, they write, should be eligible to apply for upgrades. They would require that an LP100 have operated for two years, the applicant's record demonstrates an "adequate or better" level of technical competence and an upgrade would not adversely affect a neighboring station. Higher power would improve signal coverage and visibility as well as make it easier for stations to find underwriting, the two say.

# SIX REMOTES IN EVERY BOX



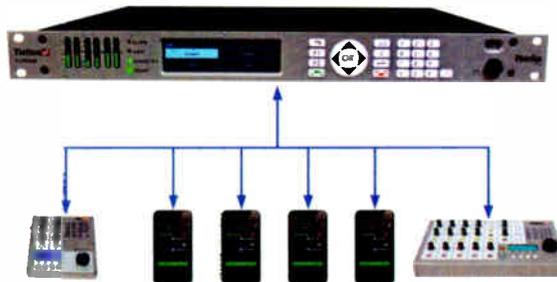
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# Get Hot and Cold With Plastics

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## WORKBENCH

by John Bisset

Read more Workbench articles online at [radioworld.com](http://radioworld.com)

Frequent contributor Charles "Buc" Fitch, P.E., had a client who lost a 24 VDC logic supply at the transmitter site. The power supply loss prevented logic for the backup system from operating. The customer had installed dual 24 VDC power supplies but needed some way of linking the two supplies in a main/standby mode.

Buc came up with the controller schematic shown in Fig. 1. Parts are not critical. The panel has an audible alarm, which can be a Sonalert or a less expensive audible alarm. The only requirement is that the alarm use 24 VDC.

The Electronic Goldmine or Marlin websites have alternative buzzers, though not always in stock. Consistent supply of material is certainly an issue these days for the do-it-yourselfer.

Marlin uses MPJA as an acronym. Their site is [www.mpja.com](http://www.mpja.com).

The two relays are standard 24 VDC DPDT relays. If all you have are 12 VDC relays, you can certainly use a 12 V zener diode ahead of the relay coils to drop the voltage.

The completed project will control two 24 VDC supplies operating in parallel, which provides constant backup. If either supply fails, the audible alarm provides flexible alerting to staff.

Reach Buc Fitch at [fitchpe@comcast.net](mailto:fitchpe@comcast.net).

WTRH(TV)'s Roberta Barmore has been following our discussions about replacement insulators. She's surprised that no one has mentioned an "old standby" replacement for HV/RF insulators: glass soft-drink bottles.

These days, soda pop is more likely to be sold in cans. But there was a time when every radio station worthy of the name had convinced at least one local bottler to install a cola machine at the station. The accompanying rack of emp-

ties was an attractive source of five-cent insulators.

You wash and dry the bottle, then epoxy a bolt in the narrow end, along with some kind of mounting flange or clamp to the wide end. Even without that refinement, they'd work.

Remember the tip of isolating a shorted AM modulation transformer from

the ground, using some sort of insulator? Many a local AM station stayed on the air with a shorted-to-frame modulation reactor or transformer sitting on four empty "shorty" glass soda bottles while waiting for replacement parts to arrive.

Roberta Barmore can be reached at [rbarmore@wthr.com](mailto:rbarmore@wthr.com). Thanks for the

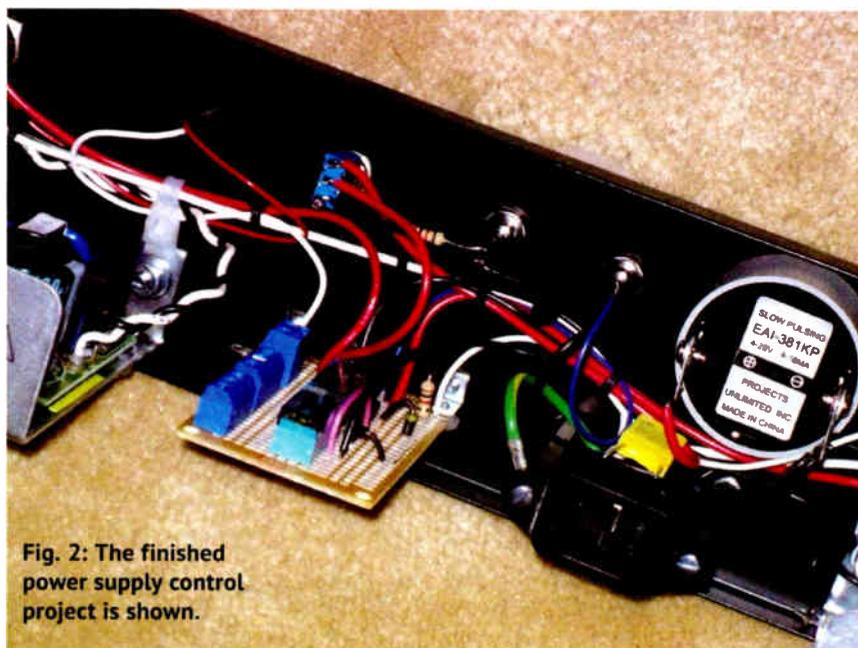
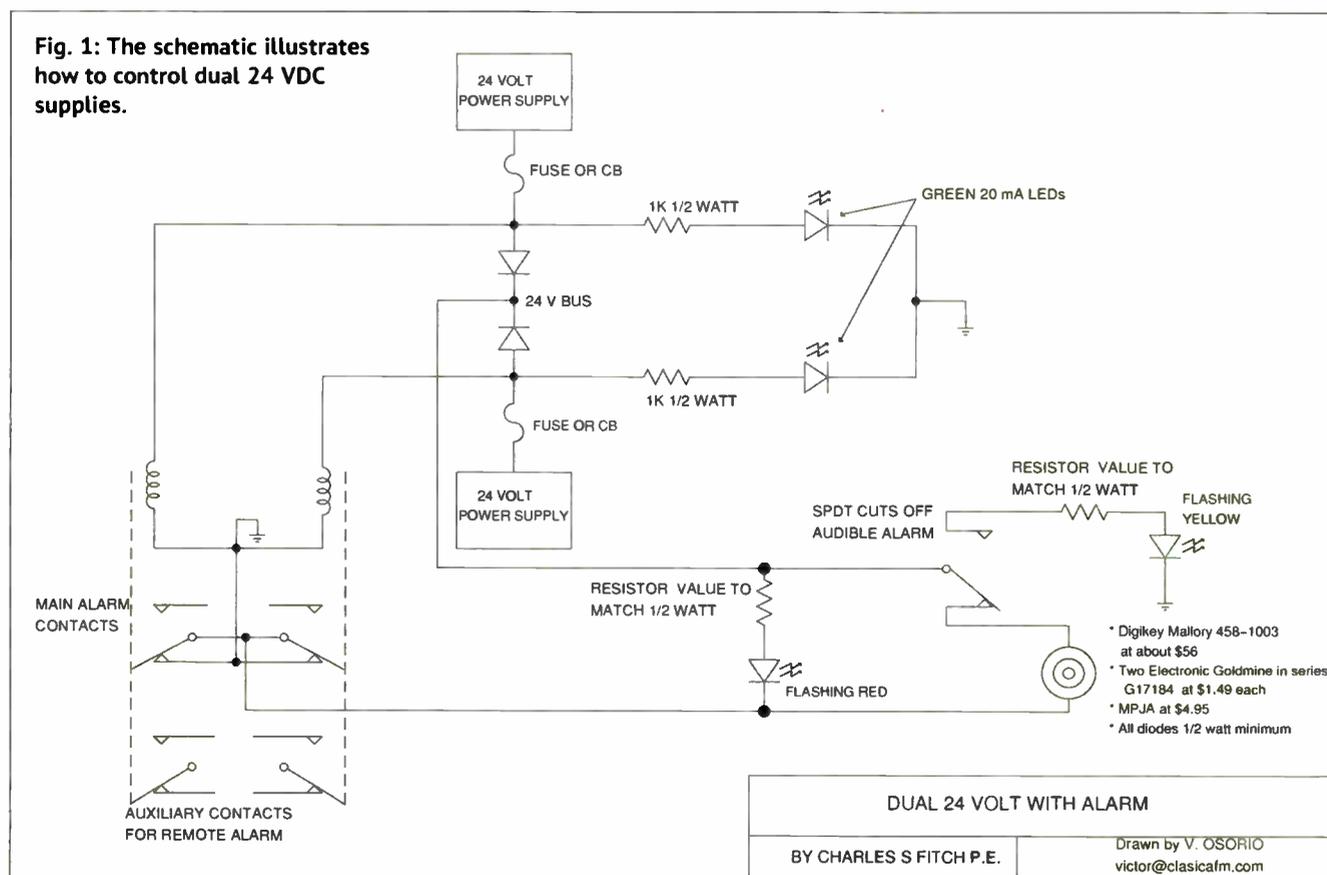
memory, Roberta.

Whether you're using PVC or glass bottles as a temporary insulator, always consider the voltages.

And with that in mind, consider this comment from engineer Henry Downs.

Henry worked with me at Dielectric. After reading our PVC pipe insulator tip, Henry thought readers would be interested in the following: Henry used numerous plastics, such as PEEK and ULTEM, two "low RF loss" materials,

**Fig. 1: The schematic illustrates how to control dual 24 VDC supplies.**



**Fig. 2: The finished power supply control project is shown.**

in his filter and antenna designs while at Dielectric.

He discovered that the plastics were relatively low loss at room temperature, with loss tangents on the order of 0.0014 to 0.002. However, as the temperature rose, the loss tangents rose dramatically, such that a temperature increase from 23 degrees Celcius to 120 C yielded a loss tangent increase of approximately 10 times.

As a result, the application of RF power can, under the right circumstances, cause thermal runaway of the insulating part.

If you feel you have to use a polymer material, Henry recommends Teflon, where this runaway does not seem to occur.

Reach Henry Downs at [hdowns@megaind.com](mailto:hdowns@megaind.com).

(continued on page 12)





# # \$ % !

## The right tool makes all the difference.

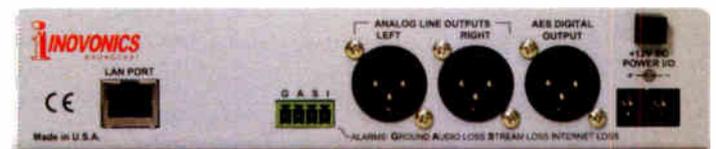
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# Spy 'Numbers Stations' Still Enthrall

Uncovering Bulgarian Betty and the Lincolnshire Poacher's hang out spot

BY CHRISTOPHER FRIESEN

In the early 1990s, at the end of the Cold War and before the onset of the Internet Age, you could tune across the shortwave bands and hear the monotonous drone of an automated woman's voice calling out long strings of numbers in Spanish. "Siete — Quatro — Cinco — Cinco —" the voice would say, pause, and then switch to a new set of numbers.

These transmissions, which had started at the end of the Second World War, weren't always in Spanish, nor were they always female. Other languages were used to broadcast entire strings of numbers, which many believed made up a coded message that could be heard by anyone with a shortwave radio. The consensus view at the time was they were meant for secret agents operating in foreign countries.

"We don't know for sure what types of agents these messages are being sent to," veteran numbers monitor Chris Smolinski told Radio World via email. "We also don't know for sure how the messages are encoded, although we have some theories."

Those theories include the use of "one-time pad" encryption. The one-time pad system is almost impossible to crack. It uses a random key or "pad" to create a cipher text and, once encrypted, the resulting numbers, letters or bits can be transmitted through virtually any media and only deciphered by someone with a matching key pad. Destruction of the key after each use ensures total secrecy.

## THE DEDICATED LISTENERS

Today, with the Internet Age fully mature and the Cold War buried under 20 years of modern history, the numbers are still being transmitted.

"The number of stations decreased rapidly after 1990. The British stopped in 2009 and the Israeli's in 2011. At least they stopped using voice transmissions," Ary Boender writes.

Boender, who lives in the Netherlands, has monitored and documented shortwave numbers stations since 1982. An avid member of the monitoring com-

munity, Boender publishes "Numbers and Oddities," a monthly newsletter that lists loggings of shortwave utility stations. He says the reason the numbers are still broadcast might have a simple answer.

0621UTC 12.5MHz

59	619	23	319	06
39	450	32	379	00 716
47	048	15	732	14 848
76	106	26	276	20 100
52	143	98	924	49 715
27	332	26	211	96 275
18	543	26	754	08 002
76	509	77	508	47 371
90	325	12	302	38 516
18	34	85	634	77 322
33	810	00	053	30 508
31	267	19	181	62 773
59	043	34	365	00 298
53	328	72	606	15 772
13	191	25	127	19 259
91	712	42	004	56 644
56	565	84	819	83 662
77	379	38	365	79 259
10	676	54	318	31 454
72	047	66	721	99 060

A page from the author's SWL Logbook from 1992 showing the date, time, frequency and partial transcript of a numbers station transmission.

## WORKBENCH

(continued from page 10)

We wrote recently about towers "in the crosshairs." Years ago, engineer Jim Appleton and his team were installing two new towers for an AM station to go DA. They had installed 60 feet of the first tower and were up on the structure when they heard a *bang* and a *twang* below them.

Jim and his crew started screaming, looked around and saw a hunter running up over the hill. Gone!

The guy had shot the tower about 20 feet below them — a little too close for comfort!

To make matters worse, during that same project someone stole nine 200-pound rolls of copper ground radial wire!

Jim Appleton can be reached at [jeapple18@gmail.com](mailto:jeapple18@gmail.com).

We've discussed the differences between 50- and 75-ohm Type N connectors, and the fact that 75-ohm is costly and hard to find.

Greg Muir of WolfRam Engineering was building a translator for a client. He thought the antennas terminated in 50 ohms, but once on site, he found the antennas needed 75-ohm connectors, and all he had were 50-ohm Type N connectors.

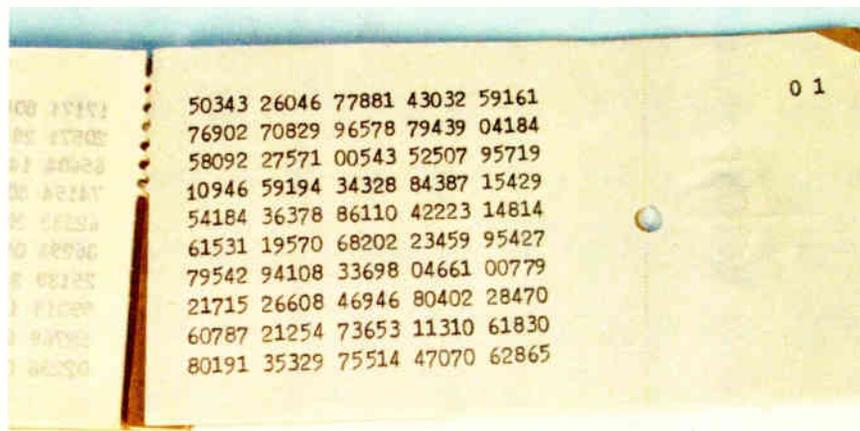
"The best thing about high frequency (HF) transmissions is that you cannot trace them and you can hear them with a simple portable radio."

Since the numbers are still being transmitted, dedicated radio hobbyists

ers versus those who just occasionally tune in."

## THE STATIONS

During the spy numbers heyday there were dozens of stations operating from various parts of the world. Many were based in Europe, but there were also stations suspected to be based in Asia, Cuba and even in the United States of America.



A one-time pad discovered by Detlev Vreisleben after the end of the Cold War. These pads were used to encrypt and decipher numbers station messages.

continue to monitor and report on them.

Chris Smolinski has been listening to shortwave radio and monitoring numbers stations since the late 1970s. He maintains [www.spynumbers.com](http://www.spynumbers.com) and an e-mail list known as "Spooks," both of which track and report loggings of numbers stations. He says he doesn't know exactly how many people are listening.

"I suspect it is in the low thousands at best, with probably very low hundreds for the number of dedicated listen-

Many of these stations had developed nicknames within official military or intelligence organizations and those names often made their way into the hobby lexicon of the day.

"Names were invented by individual listeners, or the military," Boender said. "Bulgarian Betty, for example, was the nickname that was used by the U.S. military in Germany."

Other nicknames for stations derived from pieces of music that played prior to

(continued on page 14)

So Greg got to work.

At the risk of violating the connector's electrical characteristics a bit, Greg — who has machining ability — chucked the 50-ohm center pin in a lathe and took 30-thousandths of an inch off the pin. The result was a 75-ohm connector to mate with the antennas.

The mod worked, even though Greg hasn't yet put one of these modified connectors on his network analyzer.

As with the PVC insulator, when you are in a corner with no connectors and under pressure to get something done, quick fixes can save you. This one seems to work well.

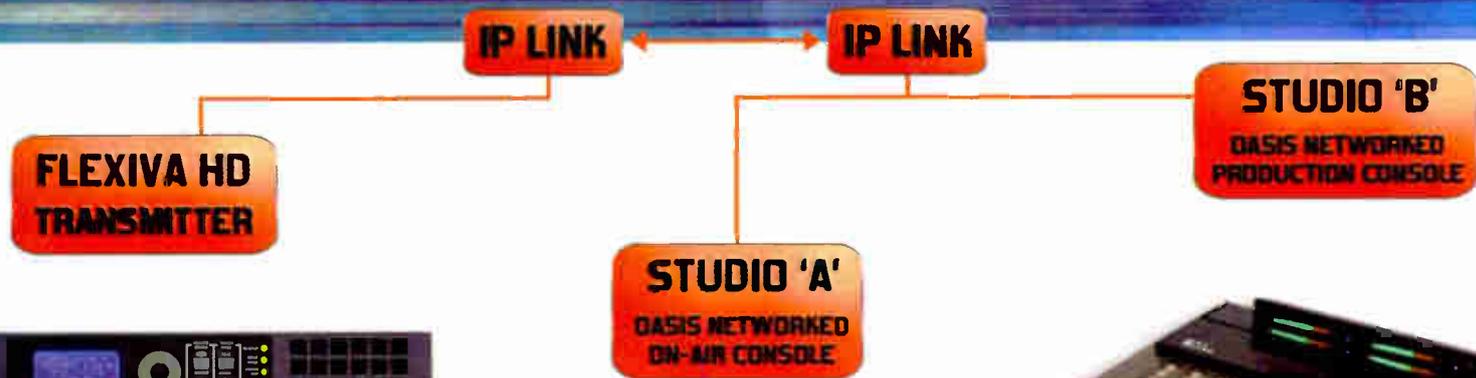
Greg adds that he's out of the captive broadcast employment trenches; he says he prefers to work at his own engineering company where he can help clients in a quality manner.

Thanks, Greg, for a unique temporary solution. Greg Muir can be reached at [engineering@mt.net](mailto:engineering@mt.net).

Contribute to Workbench. You'll help your fellow engineers and qualify for SBE recertification credit. Send Workbench tips to [johnpbisset@gmail.com](mailto:johnpbisset@gmail.com). Fax to (603) 472-4944.

Author John Bisset has spent 44 years in the broadcasting industry and is still learning. He is SBE Certified and is a past recipient of the SBE's Educator of the Year Award.

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World Radio History

## NUMBERS STATIONS

(continued from page 12)

the actual message or from characteristics of the audio that was transmitted. These included the “The Lincolnshire Poacher,” “Swedish Rhapsody” or “The Babbler.”

To help sort through the different stations and to bring some level of coordination to the listening community, a group of European listeners started naming and classifying each station.

“The original ENIGMA group invented the classifications,” Boender said. “The current group ENIGMA 2000 continues this process.”

The results were published in the “ENIGMA Control List” which is still the primary defining document for tracking and reporting these stations among hobbyists. ENIGMA’s classification system divided the languages into four rough groups: E for English, G for German, S for Slavic and V for Various.

Then they assigned a sequential number for each unique style of transmission.

The Spanish-language female voice station became known as “Atención,” due to its repeated use of that phrase at the beginning of each transmission. Using their classification system, they identified it officially as station V02.

Boender, who was a member of ENIGMA, says the listening community has had a big influence on understanding the origin and intent of these stations.



Google Earth view of the supposed antennas for V02a/HM01, the Cuban numbers station that is still active.

be a CIA funded and operated station.

Dubbed “Cynthia,” this station, hobbyists suspect, operated out of the Warrenton Training Center in Virginia.

### MESSAGE RECEIVED

While the hobbyists who monitor these transmissions have always suspected that they were listening to coded spy messages, to date, no government has officially acknowledged their existence — something Boender and Smolinsky would both like to see.

“A confirmation would be nice. The fact is that several Russian and Cuban

**You can still tune in and hear the monotonous drone of a female voice calling out long strings of numbers in Spanish.**

“Most of what we know comes from listening, sharing details of the transmission and schedules, direction finding activities and analyzing all the stuff that is available,” he said.

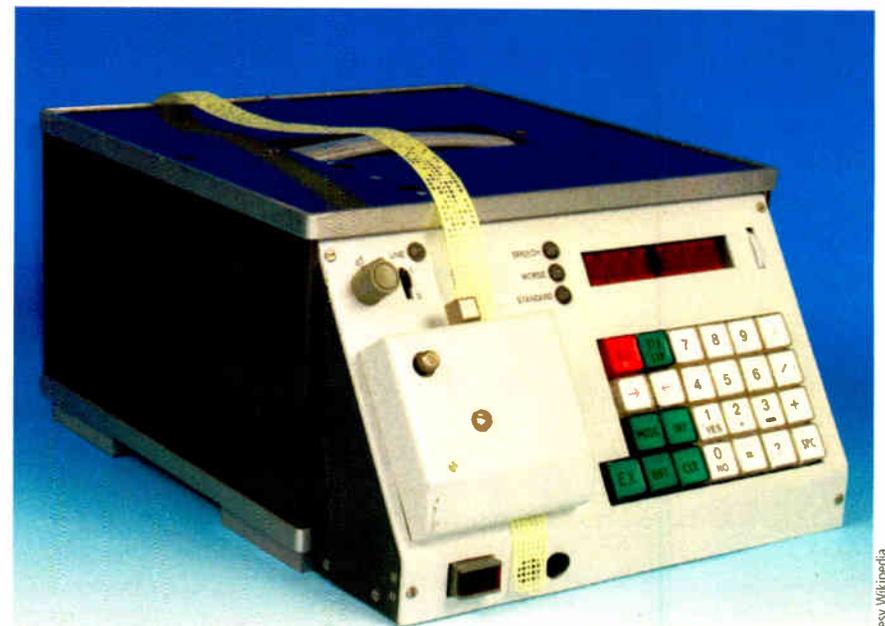
The V02 “Atención” station is believed to be Cuban in origin. Smolinski says this conclusion is based on careful observation by hobbyists who occasionally catch stations broadcasting anomalies, “which the Cuban spy numbers stations are infamous for,” Smolinski said. “Such as accidentally playing Radio Havana audio mixed in with the spy numbers transmissions.”

Hobbyists say the phenomenon of numbers stations isn’t limited to foreign intelligence agencies. ENIGMA designate E05, for example, a station that used to broadcast a female voice reciting groups of numbers in English, was last heard in 2003 and was believed to

spies were caught red-handed while listening to the numbers transmissions,” Boender said, referring to the cases of Ana Belan Montes and Andreas and Heidrun Anschlag.

Montes, a Cuban spy who worked for the U.S. Defense Intelligence Agency, was convicted of espionage in 2002. She had been passing secrets to Cuba for more than 20 years when she was caught. When agents searched her apartment, they found a small shortwave radio and a piece of paper containing a matrix of numbers and letters that they believe was used as a deciphering pad.

The Anschlag case is more recent. In 2011 Andreas and Heidrun Anschlag, who had been living in West Germany for more than 20 years under assumed identities, were arrested. According to media reports, when a Special Forces commando stormed the Anschlag’s



An East German cypher machine discovered by Detlev Vreisleben after the end of the Cold War. These machines are believed to be the voice behind the numbers.

house he caught Heidrun in the act of receiving a coded message on a shortwave radio.

### NASB NOT CONCERNED

The National Association of Shortwave Broadcasters is not concerned about the ongoing use of the shortwave radio spectrum for these transmissions. Jeff White is the secretary-treasurer for NASB and general manager of Radio Miami International, WRMI.

“The NASB doesn’t have an official position on these transmissions,” White wrote in an email. “I’m sure we don’t appreciate unofficial, unlicensed stations encroaching into the out-of-band shortwave spectrum, but we have not been adversely affected by the stations so far. As a practical matter, if these are government-run spy operations, I sincerely doubt that we as the NASB could do anything about them.”

### STILL ACTIVE

Boender says there are still several stations that are very active. Most, he says, are based in Europe — in Poland, Russia and France — which gives him some advantage in monitoring. The active stations still use English, German, Slavic and various other languages including Spanish, but the formats are changing.

“The Cubans are also active but switched to Redundant Digital File Transfer (RDFT),” he said.

The Cuban station still uses a female voice to call out strings of numbers, but the hour-long broadcasts also include digital data bursts. The change in format also changes the ENIGMA classification and, in this case, the V02 “Atención” station has been re-classified as HM01.

Fortunately for listeners in North America, HM01 is easy to hear and, through patient monitoring, a comprehensive schedule of times and frequencies has been determined. The schedule is available in Boender’s “Numbers and Oddities” newsletter.

Thanks to the efforts of these hobbyists, more than 20 years after the end of the Cold War, on just about any day of the week, you can use this schedule to tune in and hear the monotonous drone of a female voice calling out long strings of numbers in Spanish.

“Cinco — Cinco — Quatro — Siete — Ocho ...”

*The author, a technical and freelance writer with a primary interest in radio, has written for Monitoring Times Magazine, Wonka Vision Magazine, The Journal of Commerce, Interlake Spectator, The Winnipeg Free Press and other publications.*

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Read the rest of the story here: [INN6.wheatstone.com](http://INN6.wheatstone.com)



### Budgeting for the Good Stuff

**It's that time of year again when broadcasters everywhere are working the budgets and trying to explain the finer details of audio networking to the Scrooge in charge of the numbers. (Their words. Not ours.)**



We have a few suggestions.

**Go gigabyte.** When raising a modern audio network, our systems engineer Paul Picard says it makes both financial and technical sense to install a Gigabit CAT6 based system that is compatible with current hardware and leaves you bandwidth headroom to grow. Our WheatNet-IP Intelligent Network is a Gigabit Ethernet system for this reason. As a full, end-to-end...

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### It's Just What Wheatstone Folks Do...

**The kind of fan mail we love!**

When you work with some of the best in the industry, sometimes it's easy to forget why they're good at what they do. Then along comes a reminder, like this letter to our VP of Technology Andy Calvanese from Steve Shultis, CTO, NY Public Radio in New York, about our own Mike Erickson during his recent visit to WNYC-AM.



Mike Erickson

Andy,

I don't typically get the opportunity to send a note like this but I'm writing to tell you about an absolutely GREAT customer support visit we had today from Mike Erickson.

First of all I should preface this by saying that 1) We didn't know each other prior to today, even though we each worked in the same market; and 2) Mike initiated the visit as an offer to upgrade the software on our units and field any questions about their operation. The latter point alone is telling about the unique level of support we experienced today.

Mike came in this morning to the TX site, established what was on the air and what was not, explained what he was going to do to upgrade the software on each processor and performed that work.

Then the fun began: he explained how to get the desired processing out of the units, discovered and corrected at least two key engineering items on our side related to the feeds to the units and proceeded to work and show us how to achieve our desired results. At times, upon completion of key steps, he even invited us to listen to the signal in his car and then returned inside to make further adjustments.

When we were happy with the results, he even treated us to lunch and we returned when another host was on the air and made one more adjustment.

Andy, this was a thorough yet efficient and very enjoyable visit. It's not often when you meet someone whose avocation so perfectly matches their vocation - but when they do as witnessed today in Mike, it's a unique and wonderful and very productive experience for which we greatly benefited.

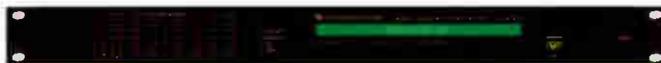
Hats off to Mike and Wheatstone!

Steve Shultis, CTO, NY Public Radio

### BLADE HONING 101

#### Bringing Logic to Ramar

**How BLADES brought a 16-station hybrid network together perfectly...**



When Chris Fleming at Ramar Communications in Lubbock, Texas, told us about an intermittent contact closure issue that plagued his 16-station hybrid routing system, we hoped it wasn't something too out of the ordinary.



The group's two proprietary routing systems for nine television stations and a WheatNet-IP audio system for seven radio stations seemed to talk to one another okay, but there was definitely something missing....

[Read the rest of the story here!](http://INN6.wheatstone.com) INN6.wheatstone.com

### Really Great Gig

Markus Stocker of Media Engineering, Switzerland, wrote to us about one of his recent projects, which he calls the "Great Gig in the Sky." Rebuilding BAY89.7's Studio-1 in Malta with an E-1 console two years ago was fun and rebuilding BAY89.7's Studio-2 more recently with a newer IP-12 console was fun, too. But the really "great gig in the sky" was when we interconnected the two studios together with one single CAT6 cable....



[Read the rest of the story here!](http://INN6.wheatstone.com) INN6.wheatstone.com

## REISER

(continued from page 4)

had taken the license of another operator and inserted the portion with his name that had been cut out of his third class license.

"In talking with the fellow it was obvious that he didn't know much. I recorded the number and checked with commission records. It was a falsified license. Since this was forgery of a federal document, he had to go before a U.S. attorney who decided whether to prosecute or not. The FCC put the operator on a 'barred' list, meaning that he would never be able to get a license after that."

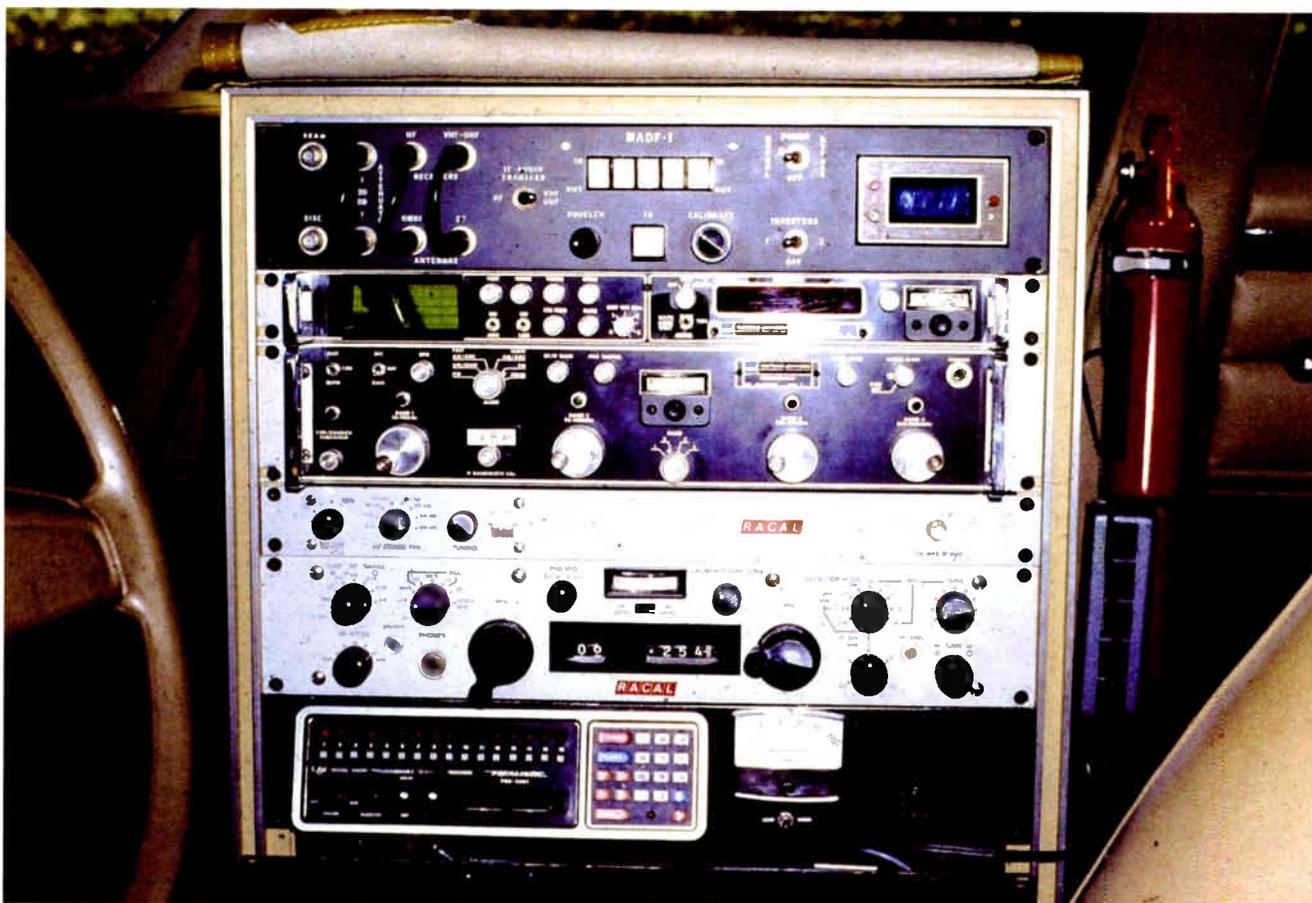
Reiser said the station also racked up a lot of other violations, because the counterfeit first phone operator was "quite incompetent."

This station was neither the first nor last where Reiser found things worthy of citation. A few of his more memorable revelations, some illegal, others just memorable:

- A station that operated a "numbers" racket along with its religious format programming. Frequent citations of certain biblical chapters and verses were made throughout the day, along with promises of "financial blessings" to listeners.
- A television station that was operating a full 6 MHz off-frequency.
- A small-town station that built its own tower — 150 feet in height and 18 inches on a side.
- A church-owned station that had been licensed in the late 1920s and was still using its original homebrew transmitter well into the 1960s. Its license included a special provision to allow it to go silent from noon until 1 p.m. for lunch.
- A station that opted for a low-end tower paint job (it was a tradeout) and wound up with a "school bus orange" and white paint scheme instead of the requisite "aviation orange" and white pattern.
- A small-market Pennsylvania station that had constructed its own FM stereo generator, which worked fine and passed proof of performance tests.



Eat your heart out, Jim Rockford. This is what the monitoring vehicles used by one of the FCC's field offices in the early 1970s looked like.



Shown is the equipment package installed in one of the monitoring vehicles.

- A phone line STL that was somehow picking up NAA, the U.S. Navy's very low frequency/high-power station in Cutler, Maine, and mixing the slow-speed code transmissions with the station's regular programming.
- A "bribe" of sorts that was offered when word got out that Reiser and another field engineer were inspecting stations in a large Midwestern market. The suspected owner of one of the stations sent a couple of "lady companions" to the hotel where Reiser and another inspector were staying. Of course, attempted bribery of federal officials is a big no-no, be it money or services offered.

Reiser admits to feeling a bit sorry for some of the broadcast operations and personnel that were the subject of his inspections (and citations).

"In some cases after completing the inspection, I'd go back and help neutralize the transmitter or refer them to someone who could help out," said Reiser.

### WHAT BECAME OF THAT MONITORING POINT, ANYWAY?

In addition to obvious technical deficiencies, Reiser encountered more than his share of difficulties in connection with inspecting AM stations with directional arrays.

"We frequently ran into situations where monitoring points were no longer available. In one case, one point turned out to be in the middle of a new Sears store. Sometimes I found very vague identification for the points. One of the descriptions mentioned a point with cattle grazing nearby and a bush with red flowers."

Reiser also recalled a directional gone horribly wrong.

"I inspected a new station and found it was having extreme difficulty in meeting the required null measurements. It was a three-tower array and it had been constructed exactly 30 degrees off-axis. I found this out when I went out after dark and sighted the North Star. It seems that the surveyor was wrong in his measurements.

"They ended up having to move one of the towers and I understand that the cost of this bankrupted the surveyor."

### 'GUESS WHO'S IN TOWN TODAY!'

Asked about situations where the operator on duty was lax in keeping his or her operating logs current, Reiser acknowledged that he had encountered this but usually only once during any given market visit.

"Once one station in an area was inspected, the word usually got around

(continued on page 20)

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**REISER***(continued from page 18)*

very quickly that the FCC was inspecting stations," Reiser said. "So you didn't find too many logs falsified at these other stations."

"Probably the most frequent violation that I found was the inability to raise or lower power by remote control—either the motor was frozen or the coupling between the motor and the rheostat it drove had come loose."

Reiser recounted an unusual assignment that didn't involve radio or TV; it took place in the wilds of eastern Kentucky. Commercial airline pilots had been reporting a loss of ground-to-air communications while flying over a certain area. Reiser was sent to investigate and determined the approximate location of an interference source by triangulation.

As it was a small community and his presence was somewhat out of the ordinary, he thought it might be a good idea to check in with the local sheriff before proceeding. After informing the peace officer about his mission, both gentlemen traveled to the source of the interference.

Once there, Reiser identified it as a homebrew "translator" intended to retransmit TV signals into one of the "hollers," where terrain blocked a good signal. The unit was oscillating and creating interference up and down the VHF spectrum. When Reiser informed the sheriff that it had to be shut down, the officer insisted on doing it himself — with the aid of a service revolver.

According to Reiser, the officer did such a good job that there was no way that particular "translator" could ever be brought back to life.

Promising to keep an eye on the situation in case someone decided to construct another such device, the sheriff took Reiser back to his office and insisted on toasting their victory with some of Kentucky's special homebrew high-test beverage.

An Ohio inspection tour took Reiser to Cincinnati's legendary WLW(AM). R.J. Rockwell, its equally legendary director of engineering, was still in charge, and the station was using Rockwell's ultra low distortion one-of-a-kind "Cathode" 50,000 Watt transmitter. WLW billed itself then as the "nation's highest fidelity station."

Unfortunately for Rockwell, the inspection produced some unwanted results.

"I inspected the transmitter and noticed that several of the internal components were supported by heavy strings. There were several things that weren't done in a workmanlike manner. I also cited the station for using a meter without the required number of scale divisions."

**MODERNIZING BROADCAST RULES**

Reiser put away his citation book for good early in 1972 and headed for Washington to head up the FCC's Field Engineering Operator and Licensing Branch. He later moved to a special position in the commission's Broadcast Bureau during Richard Wiley's reign as FCC chairman. Reiser recalls this period as especially rewarding.

"Richard Wiley formed a 're-regulation' task force around 1974 or '75. Administratively we were under the Broadcast Bureau, but we were actually reporting to the chairman. That was a very interesting job. We had carte blanche to go through all of the broadcast rules — reviewing them and proposing to eliminate, rewrite or consolidate them where there were conflicts.

"All of the technical rules calling for good engineering practices were in separate sections for AM, FM and TV," he continued. "We consolidated ... many of the rules that were common to all types of stations.

One of the sections that we eliminated was the one on 'facsimile' broadcasting."

This was a classification intended to allow printed material like newspapers to be sent via radio transmission to a consumer's home on a facsimile receiver. No one was doing so.

"We also modernized the rules to allow digital metering so that phase monitors could have digital readouts instead of analog meters and use current transformers."

The task force also created an alphabetical index of the rules by subject that was incorporated into the regulations. "People had been complaining that they couldn't find a specific rule and were calling the commission to ask where the rule for this or that was. We also indexed all of the written policies dealing with policies that were not in the rules.

"For example, where did the requirement [reside] that said you couldn't manufacture and market a receiver to the general public that had an SCA demodulator? That came from a letter that the office of the chief engineer ... that said they would not approve the marketing of receivers under Part 15 certification that had such a demodulator, as they considered SCA as a private communications service and there was not need to market this to the public.

**'He had taken the [first class] license of another operator and inserted the portion with his name that had been cut out of his third class license.'**

"There were a lot of other policies and public notices that had been issued by the commission over time, so we listed those by source and made them available for reference."

The task force remained in operation for about five years.

"One of the things that we worked on was precision phase monitors for directional arrays," said Reiser. "Also the change in the operator rules — operator licensing requirements were also changed at that time. Automatic transmitter control systems were allowed."

This was around the time when the commission dropped the "first phone" operator license requirement.

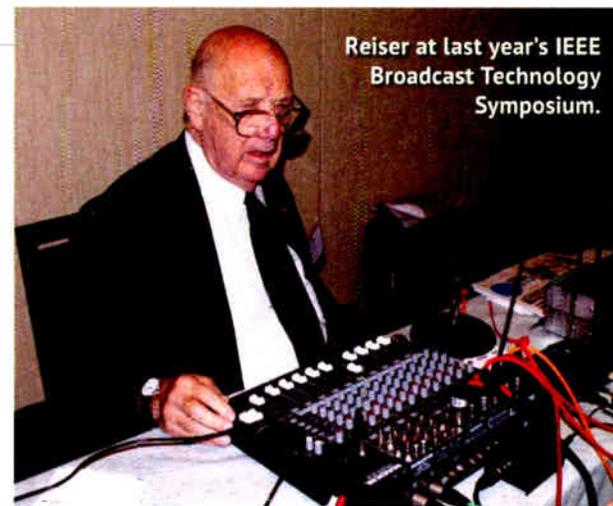
"James McKinney was chief of the Mass Media Bureau," said Reiser. "He was strongly in favor of eliminating the first class operator licensing requirements. It was quite controversial at the time."

This affected several classes of stations. Prior to the change, television stations, high-powered radio stations and directional AMs had to have a first phone operator at the transmitting facility. The revised rules also provided for remote control of such facilities.

A change for which Reiser's task force was responsible was elimination of the particularly onerous requirement to take transmitter readings every half hour.

Another archaic subset of rules involved mandatory program log notations and announcements indicating live vs. recorded commercial announcements and an on-air statement that "some portions of the programming heard on this station are recorded." These too were dropped.

As part of this work, Reiser made numerous presen-



Reiser at last year's IEEE Broadcast Technology Symposium.

tations to state broadcasting groups and SBE meetings. He recalls relaying objections from engineering personnel back to Washington about the dropping of the first phone requirement. Reiser believes that he came close to being pelted with rotten fruit during an SBE Engineering Workshop at Ohio State University.

**OJT**

How could field inspectors have such broad knowledge in all areas of broadcasting?

"We did some serious on-the-job training; and I was fortunate enough to go to NAB conventions and pick up knowledge there," said Reiser. "The fellow that worked on the [FCC] TV truck was well experienced, and I learned a lot about television from him. We also did a lot of bench measurements on a test transmitter to gain this sort of experience."

Oh, about that TV station operating 6 MHz off-frequency: "This was in the Youngstown, Ohio market. When we tried to measure their frequency off-air, we couldn't find it. The station was also having trouble with its filterplexer too — it was tuned to the edge of its range."

It seems that the station had purchased a new frequency counter and in setting up the transmitter had inadvertently picked the operating frequency of an adjacent channel and set things up with the new digital frequency monitor.

"They were right on frequency, but operating on the wrong channel. They told me they had bought a new counter, the same brand as used by the FCC, to make sure they were on frequency." In the early 1960s, virtually all UHF TV sets had continuous tuners without detents, so there were no viewer complaints.

**LIFE AFTER THE FCC**

Reiser later was assigned to the Engineering Branch of the Policy and Rules Division to work on general broadcast rulemaking projects. He represented the FCC at industry conferences held by an alphabet soup of organizations: NAB, SMPTE, EIA, SBE, AFCCE, IEEE.

In 1986 he was asked to chair U.S. preparatory groups for the International Telecommunication Union Study Groups on broadcasting; and when the FCC established the International Bureau, he transferred there, working until retirement in 2000.

Now Reiser enjoys ham radio, doing on-location recording of musical programs, participating in community events and supporting the IEEE's Broadcast Technology Society. He was the 2003 recipient of the NAB's Lifetime Radio Engineering Achievement Award and a 1991 Governor's Award from the Audio Engineering Society. He is a Fellow member of both the SBE and Radio Club of America.

*James O'Neal is technology editor of RW sister publication TV Technology.*

**PEOPLENEWS**

**Tim Bealor** is the new president of equipment company **Broadcast Electronics**. He began his career at the company as a technician in 1975. Since then, he has held technical, support, product management, sales leadership and marketing positions with the company. Most recently, Bealor was executive vice president of product development after being promoted in August. Joe Roark had held the title of president/CEO of BEI Electronics; he has left the company.



**Tim Bealor**

ees. Dwyer is chairman and CEO of Michael Foods. He has been an MPR member since 2010. Taylor is president of strategy and consulting firm **Life Is Now**, and a principal at **Middle A Restaurants**. She also is chair of the board at **eTouchMenu**. Taylor has been an MPR member since 1991 and a Leadership Circle member since 2003.

**Clear Channel Media and Entertainment Syracuse** announced **Rick Yacobush** as market manager; **Barbara Miller** has been named director of sales. **Mark Adams** will join **Clear Channel Portland** from CBS Radio in Houston, where he was vice president of music programming.

In other Clear Channel news, **WHTZ(FM) Z100** Program Director **Sharon Dastur** in New York was nominated for Billboard's "Women in Music" Award for the fourth year running.

**Eric Nadel** is recipient of the 2014 **Ford C. Frick Award**, as voted by the Baseball Hall of Fame's Frick Award Committee. Nadel has been broadcasting Texas Rangers baseball games for 35 years.

**Radio One Inc.** chose **Shawneen Thompson** as vice president and general manager of its Philadelphia stations. Thompson joined Radio One in March of 2010 as manager of the St. Louis radio stations. She was then promoted to vice president and general manager on July 20. Also at Radio One, **Alan Leinwand** has been named vice president and general manager of its Washington stations. Leinwand joined the company in September of 2010 as director of sales for the Washington stations.

**Jeff Sottolano** has been named the new director of pro-

gramming for **CBS Radio**. He will be based in New York. He most recently served as program director of CBS Radio's **WIP(AM/FM)** in Philadelphia. Sottolano began working with CBS Radio in 2001, when he joined **WZNE(FM)** in Rochester, N.Y., as an intern.

**David Waskiewicz** has been promoted to senior vice president of broadcast operations at traffic information and content services provider **Radiate Media**, which recently merged its two broadcast divisions.

**Full Compass Systems** added **Michelle Grabel-Komar** to its executive staff as vice president of product planning and procurement. She worked at Full Compass as national sales pro from 1996 to 2000.



**Michelle Grabel-Komar**

**The National Association of Tower Erectors** released results of its 2014 board election. Reelected were candidates **Pat Cipov**, president of **Cipov Enterprises Inc.** in Sumter, S.C., and **Bryan Lee**, president of **Lee Antenna & Line Service Inc.** in Hellertown, Pa. New members of the board are **John Paul Jones**, president of

**Tower & Turbine Technologies LLC** in Austin, Texas; **Jimmy Miller**, president of **MillerCo Inc.** in Gulfport, Miss.; and **Don Train**, president of **Train's Towers Inc.** in Haddon Heights, N.J.

**Darrell Brown** is now president of **Bonneville International Corp.**, which has radio and television properties. He joined the company four months ago, overseeing the **KSL Broadcast Group**, and had consulted the company prior.

**Prometheus Radio** added **Allan Gomez** as station support director, based in Philadelphia. Gomez was a founder of Chicago-based volunteer group **Radios Populares**. He worked on six Prometheus Radio "barn-raising" in the United States.

Send information to [radioworld@nbmedia.com](mailto:radioworld@nbmedia.com) with *People News* in the subject field.



**Kimberly Sacks**

**Kimberly Sacks**, CBT, was appointed to the national board of directors of the **Society of Broadcast Engineers**. Sacks fills the unexpired director's term of **Andrea Cummis**, CBT, CTO, of **Roseland, N.J.**, who was elected treasurer of the society earlier. Sacks works for **CBS Radio** in Washington, and has been an SBE member since 2007.

**Hal Kneller** is now vice president of global sales and business development at **Geo-Broadcast Solutions**. He was Nautel regional sales manager for Europe, Russia, Israel and Turkey from 2009 until June. Previously, he was director of international business development for **iBiquity Digital Corp.**

**Dr. Frank Wright** has been chosen to lead **Salem Communications** as its president and chief operating officer. He will report to CEO **Edward Atsinger**. Wright has been president and CEO of the **National Religious Broadcasters association** for 11 years.

The **Vermont Association of Broadcasters** says a record crowd attended its December Hall of Fame banquet in Burlington. Radio personality **Louie Manno** and **Hall Communications** Vice President and General Manager **Dan Dubonnet** were inducted during a ceremony.

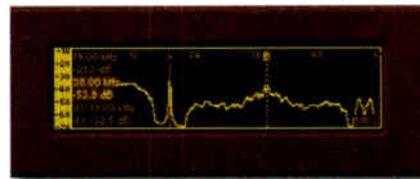
**Minnesota Public Radio** elected **Jim Dwyer** and **Jean Taylor** to its board of trust-



**Louie Manno and Dan Dubonnet**, recent Vermont Association of Broadcasters Hall of Fame Inductees



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# WPOZ Gets Positive Results With Comrex

STAC-VIP system hardware and software backed by exemplary service

## USERREPORT

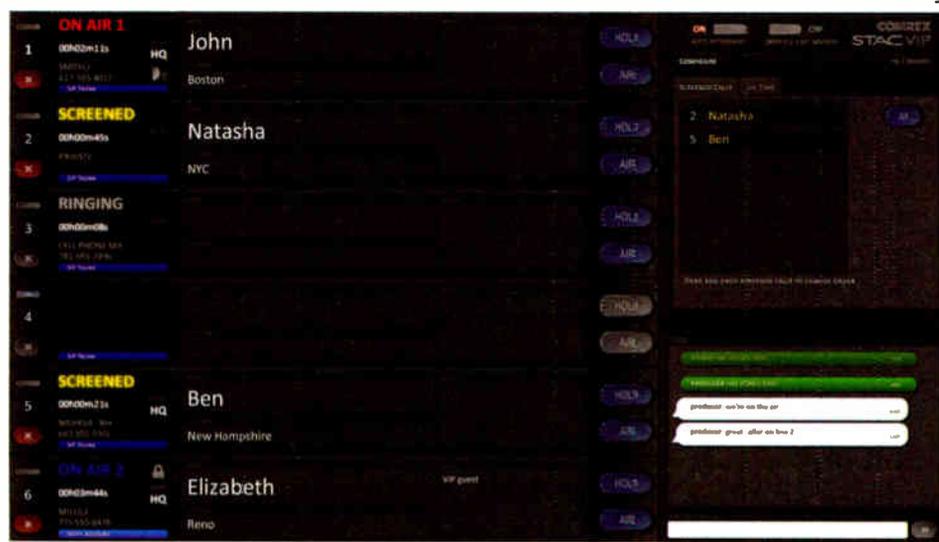
BY RANDY WOODS  
Director of Engineering  
WPOZ(FM)

**ORLANDO, Fla.** — In years past, we at WPOZ(FM) Z88.3 used standard broadcast phone systems such as the Gentner TS-612. While they worked fine, we struggled to get the audio fidelity that we were looking for.

A few years back, I strayed from the norm and installed a “soft phone” solution. It was part of our IP-based, business phone system, a 3Com NBX. This gave us great audio quality, but the NBX soft phone became orphaned by 3Com.

### CUSTOMER SERVICE

Now there are software phone-based systems designed for broadcast, but based on my experience, I wanted a hardware-based solution that would give superior audio quality. The only way to accomplish this was to put in a system directly



STAC-VIP Call Screening and Control Web Browser Interface

connected to a digital phone trunk, such as a PRI, or to digitally integrate with our office system via the IP telephony standard of SIP (Session Initiation Protocol). The second solution allowed us to share our existing PRI and give us integration

with the office system.

When Comrex released the STAC-VIP, I was intrigued. On paper, it looked like what I needed. Since my 3Com office phone system was no longer supported, and given the fact that their SIP support was limited, I was pessimistic that I could get full integration between the STAC-VIP and the 3Com. However, Comrex and Broadcasters General Store ensured me that I could return the system if I could not make it work within 30 days, so we placed the order.

I installed the chassis in the rack room and connected it via AES to our Harris VistaMax system. I connected the STAC's Ethernet port to the dedicated phone VLAN, ensuring the best network speed and lowest latency. I have QoS (Quality of Service) programmed on our network systems. It is beyond the scope of this article, but know that QoS is essential in a shared network environment for good audio quality. I installed the STAC's control surfaces in our main on-air studio, and one in Studio B.

Initially, I was not able to get the STAC to register a SIP session with the 3Com. I went through every option and every document on the subject with no success. I contacted Comrex support. They reviewed logs and tried various settings. With no success, they asked if I could capture a network trace of a successful SIP connection with a third-party soft phone. I gathered one and sent it to them. They made a modification to their software, and after a firmware upgrade in less than 24 hours, the system connected and worked perfectly. Needless to say, I was impressed.

The chassis provides two phone

hybrids, connected via either two analog lines, or a single stereo AES line. The system currently works for a single studio with both hybrids available. Comrex says it will allow the two hybrids to be split between two studios in a future software release.

The STAC allows up to six voice sessions (lines). They can be any combination of SIP connections, to one or more SIP providers, and one session of Skype. I programmed five lines to our 3Com and one Skype instance. The control surfaces can function in “screening” mode or “on-air” mode. We found them to be intuitive. Their six multi-color lights allow the staff to quickly tell the status of the call. You can drop one call at a time or use the “drop all” button to clear all calls, or keep new calls from coming in.

Even more informative is the Web interface. It shows the status of all lines and the caller ID; it allows you to type in notes about the caller and has a chat window. Calls can be answered or placed from this interface. In fact, a studio could function with the Web interface alone and do anything other than talk with a familiar telephone handset.

The Skype integration was easy to configure. I plugged in a user ID and password, and the system registered immediately. I was able to make and receive Skype calls with ease. Our station does a seasonal feature called “Christmas Around the World,” and the ease of making calls anywhere in the world, for this show, along with the superior audio quality, was ideal.

In summary, I am pleased with the system functionality, the audio quality and especially the customer support. All of my goals were met with the Comrex STAC-VIP.

For information, contact Chris Crump at Comrex in Massachusetts at (978) 784-1776 or visit [www.comrex.com](http://www.comrex.com).

## ABOUT BUYER'S GUIDE

Radio World publishes User Reports on products in various equipment classes throughout the year to help potential buyers understand why colleagues chose the equipment they did. A User Report is an unpaid testimonial by a user who has already purchased the gear. A Radio World Product Evaluation, by contrast, is a freelance article by a paid reviewer who typically receives a demo loaner. Do you have a story to tell? Write to [bmoss@nbmedia.com](mailto:bmoss@nbmedia.com).

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# AVT Converts Remote to Main Event

Home setup handles callers just like big-city studio

## USERREPORT

BY NORM AVERY  
Director of Engineering  
Cumulus Media —  
KABC and KLOS

**CHARLOTTE, N.C.** — When Mark Thompson and partner Brian Phelps of KLOS(AM)'s "Mark and Brian Show" retired, ending a 25-year span at the top of Los Angeles market ratings, Mark realized a new opportunity had presented itself. He could continue his passion for talking to and building an already loyal and sizable ever-growing listening audience.

In his new endeavor, he would continue taking listener calls, stating opinions and discussing topical views much as he did from the KLOS success that he was leaving. He recruited his entire family as host participants and with his wife Lynda as his co-host launched a daily family issues podcast presentation.

Mark's studio near Charlotte, N.C., was built to provide a connection with co-host Brian at KLOS' Los Angeles facility. From Mark's home studio he had control of switching and mixing functions and effects, all of which were located remotely in L.A. When the decision was made to convert the studio into a full-functioned recording and distribution center, a plethora of new hardware and services was needed.

One of the first and most concerning questions Mark had was, "How will I be able to take phone calls from my listeners?"

Before answering that question, Mark tried to provide satisfying answers to more questions that immediately followed, such as, "How many callers can be on at the same time?" "Will the callers be able to hear each other?" "Are you sure can I see the screeners comments?" "Can I put the callers on-air myself?" and "Do we need to buy a PBX now?"

It was already determined that AVT's Magic telephone hybrid line of products included a model suitably sized and priced for this application.

Mark had been reassured that AVT had a product that would not require the expense or complexity needed to install a PBX or typical proprietary phone instruments, and that they would deliver a solution for each of the other strategic needs he requested.

I suggested we use AVT's Magic TH6 telephone hybrid system.

The Magic TH6 accommodates up to six caller lines and can be optioned from POTS, ISDN or VoIP services



Mark Thompson is shown taking calls that his producer/call-screener Jordan had prepared using the pre-talk function.

and was the perfect size for Mark's needs. With any of the phone service configurations you choose to use the Magic TH6 does not require a PBX or proprietary and specially configured extension telephones.

The system can be configured to operate without a single phone instrument. All of the telephone interconnects for answering, screening and processing a call — be it on air, on hold, gathering caller data or forwarding to another line — can be accomplished with nothing more than a few simple connections to your mixing console or mixer router engine and an IP connection to your computer.

If you want a private handset or operator's headset the TH6 has jacks already there for you to plug into. Additionally your call-screener handles callers through the call-screening computer and with the "pre-talk" streaming option no audio wiring is needed at the call screening location on the LAN.

The single-rack-space system arrives with individual hybrids, digital echo cancellers, AGC and audio expander stages on every caller line. This processing produces superb and consistent audio even when all lines are conferenced together and every caller can hear the in-studio hosts and all other callers with great clarity.

AVT's software-defined mixing and switching matrix allows the TH6 system to service two independent studios simultaneously. Each studio can be assigned two faders and with a separate caller screening audio channel for each program. Or, if you want, each caller line can be assigned its own audio output into your console.

The TH6 provides plenty of audio

interface, with four digital and two analog I/Os in addition to two wired handset/headset connections. Optionally, up to four pre-talk streaming clients can be used without additional audio cabling.

While we did not use the Magic TH6 as a true two-studio system, we made use of the second studio connections allowing us to configure these I/Os so that the identity of selected caller voices could be disguised by altering them with an external effects generator. Now, we can do this also without external equipment since AVT has added a "Voice Disguise" function, which changes the voice of the caller so that the listeners

cannot recognize who it is.

The system can be configured to auto-answer calls and move those callers to hold so they are able hear the main program, an external hold signal or a prerecorded message stored in the system. Also standard are GPI/GPO connections.

The TH6 arrives with a full-featured call screening software package. Ideal for use with a touch screen, the display is clear and bold for the presenter to easily select a caller on-air and then return to hold, or to drop at the end of the conversation. There is no need to go to another vendor for screening software that does the job you need to accomplish. As many as four workplaces can be optioned for on-air and screening control.

Other available software options include a "game show" DTMF analyzer that can determine which caller has responded first with the correct a DTMF button push.

The optioned VoIP system can further be upgraded to include HD Voice that allows 7 kHz bandwidth to be received and transmitted on calls to and from telephones that are HD Voice-compatible.

We have to admit, our expectations in regard to this product were high — and still the AVT Magic TH6 has exceeded these expectations. We can only recommend the product as well as AVT's fast and competent support before, during and after the installation. If you want quality and sophisticated simplicity, you should go and get some Magic.

For information, contact Ulrike Lauterbach at AVT in Germany at 011-49-911-5271-0 or visit [www.avt-nbg.de](http://www.avt-nbg.de).

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# NeoScreener Dials in WHYY

NeoGroupe provides caller software and services for Philadelphia public station

## USERREPORT

BY JOYCE LIEBERMAN  
Radio Engineering Supervisor  
WHYY(FM)

**PHILADELPHIA** — WHYY(FM) Radio was in the market for database software for our talk-shows. The system needed to work with our new Telos VX call-in/call-out digital telephone system. We needed a database product that producers and reporters could easily use for screening calls and entering caller information for our call-in talk-shows. The system needed to assist with call-outs as well.

NeoScreener, a product from NeoGroupe, was recommended by our tech integrator, Daniel Braverman of Radio Systems. We had tried another product that didn't seem to have the

depth of features that NeoScreener had.

At WHYY, our needs included three positions to see computer views for various elements of the application. These are the three positions in our workflow.

First is the call-screener, "producer view." A producer answers the telephone when folks call in and enters their information into the database. This producer also places call-outs to guests and manages the priority of the calls, telling the talent and engineer which calls to take first, next, etc. Additionally, the producer is able to send messages to the talent (separate from the caller information).

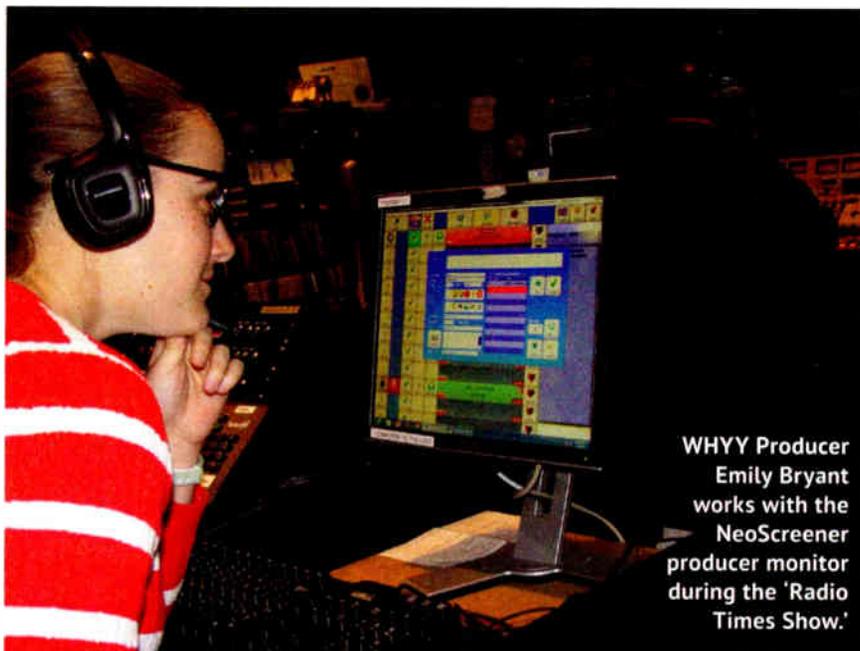
The second position is the "talent view." The talent needs to see who and where a person is calling in from, but he or she does not operate controls. The talent needs to see which call-ins are first, next, etc. Our talent is busy interviewing guests who may be in the

studio, on a call and/or on a high-quality ISDN or T1 circuit. And, of course, the talent talks to the people who call in to the program. Our talent needs to have a system that provides information easily and quickly.

And then there's the "engineer view." The engineer actually puts the calls

NeoScreener's database has the option to include the following information for people who call in: Telephone number, first and last names, topic, age, city, postal code, emoticons that are selected by the call-screener producer, priority — which calls to take and in what order, as selected by the call-screener producer — and a few more helpful items.

When a call comes in, the database



WHYY Producer Emily Bryant works with the NeoScreener producer monitor during the 'Radio Times Show.'



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**NeoScreener** operates on a server for the call-screener producer and engineer interface combined.

on the air from the Telos VX VSet (telephone handset with a detailed screen) and therefore needs to see the NeoScreener screen, which gives more technical information, such as the hybrids and telephone lines. The engineer needs to follow what decisions the call-screener producer is making, as to which telephone line is assigned to which hybrid.

NeoScreener operates on a server for the call-screener producer and engineer interface combined. There are video outputs that distribute separate screen views to those positions. There is another computer that is used for the talent position. The NeoScreener server interfaces with the Telos VX system and the NeoScreener talent computer. NeoScreener may be set up differently than our system depending on a user's needs.

shows if the caller has called previously and how many times the person has called. There is a way to indicate to callers that the call-screener producer would like to be blocked from going on-the-air, or simply give information about the caller. It is possible to set up the database for several different programs.

After a testing phase on less-than-optimal computers, we decided that NeoScreener would meet our needs. We then purchased computers that were dedicated to the task.

Philippe Halin, the owner of NeoGroupe, was generous with his time to help us with the installation of the application on our computers by remote connection. He also trained our producers and engineers over the Internet.

Though NeoGroupe is based in France, the time difference didn't impede progress on making the system work. Additionally, he visited our station and worked on some more aspects of the system during a trip to the states.

Philippe made sure that every aspect was working optimally and that the system would work as we wanted it, and that my questions were answered quickly. We've been using NeoScreener for about a year and the engineers, producers and our talent are pleased with it.

For information, contact Philippe Halin at NeoGroupe at (210) 757-4700 or visit [www.neogroupe.com](http://www.neogroupe.com).

## TECHUPDATES

### TELOS PROVIDES SIX-LINE PHONE SYSTEM

The Hx6 from Telos Systems is a six-line POTS/ISDN telephone system. It comprises VSet6 phone sets and a rack unit controller.

The rack-mountable unit has two hybrids and a suite of audio processing tools, including Digital Dynamic EQ, caller sweetening from Omnia, acoustic echo cancellation and DSP technology fine-tuned to get excellent audio from even cellphone callers, the company says.

The VSet6 phone controllers have VGA color LCD displays. Status symbols provide users with animated icons that visibly communicate line and caller status. The caller ID works with analog and digital connections.

The system includes dual digital hybrids with DSP algorithms optimized for phone lines, including VoIP and mobile callers, and adjustable AGC provide consistent audio. It also features studio adaptation and a pitch shifter prevents feedback in open speaker studio environments. Caller override enables precision audio adjustment.

Supporting on-console control of multiple lines and hybrids from Axia IP-Audio mixing consoles and standard Livewire IP audio port for one-cable connection to Axia networks, the system includes a choice of analog I/O or optional, extra-cost AES/EBU I/O and can be set up and configured via Ethernet.



Three versions of Hx6 are available for use with analog POTS phone lines, ISDN-S (Europe) or ISDN-U (North American) digital phone lines. XScreen Lite call screening software from Broadcast Bionics is included.

For information, contact Telos Systems in Ohio at (216) 241-7225 or visit [www.telos-systems.com](http://www.telos-systems.com).

### BROADCAST BIONICS PHONEBOX 4 DIALS THE RIGHT NUMBER

Broadcast Bionics PhoneBox 4 allows users to manage social media, phones, prizes, codecs, email and SMS from one cross-platform multi-featured software application.

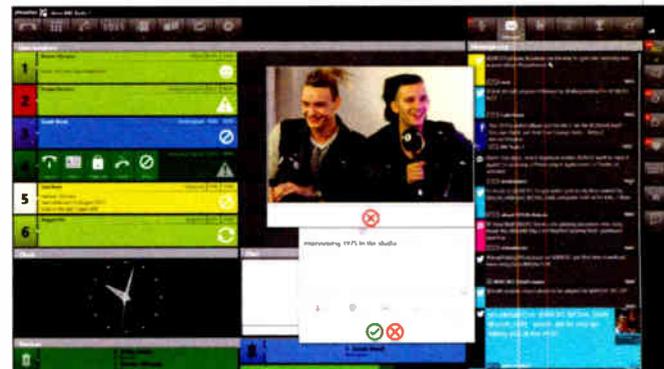
It allows stations to filter, select and queue Facebook posts and tweets. Operators can see a running commentary on chosen subjects and engage with potential new listeners on air. Listeners can tweet back directly to the studio, rate them or add to a VIP list.

Smart cues hook into a playout system to give official artist feeds for the tracks you're playing, or use location co-ordinates to find out who's saying what from an event downtown.

The company says the stylish user interface exploits touchscreen technology to improve workflow and simplify complex tasks. It is scalable to suit any size of enterprise from a single studio/small independent through to national and international broadcasters.

PhoneBox 4 can use SIP, ISDN or analog lines through the company's audio server software or from a Telos VX.

For information, contact Broadcast Bionics in England at 011-44-1444-473999 or visit [www.bionics.co.uk](http://www.bionics.co.uk).



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# JK Audio Phone Systems Keep It Simple

Owner says he's not an engineer but is confident using and configuring system

## USERREPORT

BY JOSE LUIS PEDROZA

Owner  
Lider Media Service

**OXNARD, CALIF.** — I have produced radio talk shows since 1996 on KUNX 1520 AM, and will be doing so on the Internet soon (and online TV as well). I currently produce "Hablando Claro."

Three years ago, I decided to work in a more efficient manner. We could save time and money by building our own studio in our offices, rather than using a third-party studio every day.

I reviewed product catalogs from equipment retailers, such as BSW. More importantly, I attended the 2012 NAB Show where I could personally view and test phone systems from many manufacturers. I could also talk personally with the manufacturer to discuss my needs and options for our talk show.

At the show, I was able to demo the JK Audio Concierge system and supporting equipment. I saw how easy it was to connect and configure it for our show. I could see that more lines could be added when I needed them. In fact, we recently added lines.

We bought the Concierge switcher matrix, innkeeper 1x digital hybrid and

a Guest Module GM2X6 control surface. All have proven to be very functional. We can answer calls automatically, put them on hold directly from the audio console, put them in conference, change from one line to another with a simple push of a button, or make calls from the same keyboard. I like the design of the

**I'm not an engineer but I feel confident that I can install new pieces or move it and reinstall it if needed.**

guest module control surface very much — it's modern, compact and ergonomic, so I can control everything.

I have also been pleased with the innkeeper's automatic gain control. It automatically adjusts the caller volume to an average level, whether it has to lower them or boost them. No more caller-level surprises. It also has a "presence" button that gets a richer sound from the caller's voice when we need it.

It came with auto-answer that answers on the first ring and disconnects at the end of the call.

Though our system has three pieces,

In modern times it is difficult to keep up with the rapid technological advances. One pleasing thing that JK Audio does is keep our system updated with improvements via quick and easy Internet installation. These hands-free updates keep our system working at its peak so I don't



The JK Audio Guest Module GM2X6 control surface is visible to the right of the console at the author's studio.

allowing us to modify one without having to replace everything, the total cost was competitive. It has also proven to be functional and practical. I'm not an engineer but I feel confident that I can install new pieces or move it and reinstall it if needed.

have to think about replacing it.

When I return to the NAB Show this spring I'll see what new equipment JK Audio has. They have worked fine by me.

**For information, contact Joe Klinger at JK Audio in Illinois at (815) 786-2929 or visit [www.jkaudio.com](http://www.jkaudio.com).**

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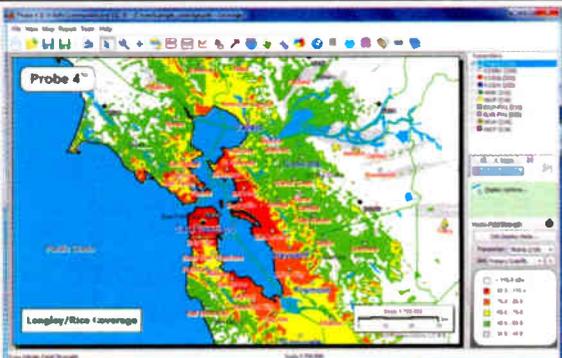
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# Broadcasting Is Key in Emergencies

An agency of the United Nations is taking a critical look at its value and importance

## COMMENTARY

BY LYNN CLAUDY

*The author is senior vice president, technology, of the National Association of Broadcasters.*

“Broadcasting Is Key Communication Medium in Emergencies.”

Doesn't everyone already know that? Or is broadcast coverage of emergencies just taken for granted? Or perhaps forgotten about ... until the next crisis hits? Or maybe a little of all-of-the-above?

In fact, that first sentence is the title of a late November press release from the International Telecommunications Union.

The ITU, the specialized agency of the United Nations dealing with RF spectrum management around the world, is taking a critical look at the value and importance of terrestrial radio and television broadcasting during emergencies. What is emerging out of that effort is the conclusion that broadcasting is an essential and critical part of public warning and information dissemination in times of crisis.

That's no real surprise; but the global nature of the inquiry is yielding some

instructive insights about the strength of broadcasting as an emergency information tool.

### WHAT WE'RE LEARNING

A little background: Based on a contribution from the North American Broadcasters Association, a project for a new ITU Report on the importance of terrestrial radio and television broadcasting was approved at the ITU-R

Study Group 6 (Broadcasting) meeting in April 2013.

I and Gary Stanley from Babcock International Group in the U.K. were assigned as co-rapporteurs for preparing the report; the draft was subsequently made available publicly in November, with the final report expected by April 2014.

*(continued on page 30)*

Broadcasters covering a natural disaster in an image distributed by the Federal Emergency Management Administration.



FEMA/Walt Jennings

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**BROADCASTING***(continued from page 29)*

So what can be learned so far from this project about the importance of broadcasters during emergency situations? As it turns out, quite a lot.

It is well known that broadcasting possesses an optimum set of technical and operational characteristics for providing critical information services during times of crisis:

- *Broadcasting is a highly survivable medium.* With wide area coverage, geographic diversity of stations, lack of intermediate potential points of failure between transmitters and receivers, evolved emergency plans and procedures and local power backups, broadcast services are more likely to survive crisis events than other communication networks. And unlike point-to-point wireless media, the broadcast

## The global nature of the inquiry is yielding some instructive insights about the strength of broadcasting as an emergency information tool.

network never gets congested due to its one-to-many architecture, keeping its system availability high no matter the circumstances.

- *Broadcasters deliver high-quality news.* With the initial role of emergency alerting, broadcasts quickly create public awareness. But alerts are brief and broadcasters then turn to more in-depth coverage of the situation before, during and after the event. Broadcasters are uniquely situated for such coverage, having journalistic credibility, a wide range of professional staff, the ability to aggregate diverse sources of information and established relationships with first responders, emergency agencies and other resources. And all of this has a uniquely local perspective, with broadcasters serving as trusted members of the local community.

- *Broadcast receivers are ubiquitous.* The inexpensive nature of broadcast receivers, especially radio, their portable profile, low battery drain and ubiquity in vehicles and growing prevalence in mobile devices constitute an ideal platform for delivering mass information during emergencies.

The advantageous characteristics of broadcasting are indeed well known; domestically, the role of broadcasting in

emergencies in the U.S. has been amply documented and routinely reported.

These reports, combined with other individual anecdotes and case studies collected in the draft ITU report from around the world, tell a persuasive story about the overall global importance of terrestrial broadcasting.

A few examples from outside the U.S.:

- During the Great East Japan Earthquake in 2011, the media used for getting information soon after the event were radio (51 percent), television (21 percent) and "one seg" mobile TV (19 percent), showing the critically important role of broadcasting, since mobile phone calls and text messages were not available due to traffic congestion and damage to infrastructure.
- Ishinomaki City, badly damaged in the Great East Japan Earthquake, had no electricity for more than two weeks. At

local commercial radio station Radio Ishinomaki, motorists and car show owners donated gasoline from their cars to keep the generator running so the station could stay on the air, reading out names of missing and deceased persons, and sharing experiences from listeners. No commercials were aired for weeks.

- Australia Broadcasting Corp.'s development of evolving procedures for issuing timely and repeated warnings for deadly bushfires via broadcast media, informing citizens and saving lives.
- First Response Radio, a global specialist organization for setting up radio services in disaster areas, describes their goal of putting a "radio station in a suitcase" on-air within 72 hours of a disaster, and some of their experiences with earthquakes in Indonesia and floods in India.

- BBC Media Action, the humanitarian aid arm of the BBC, and their experiences with "lifeline broadcasting," delivering information and providing a voice to those in disaster areas or conflict zones, with examples from Bangladesh, Nepal, Sudan and others, and their finding that radio is usually the best way to reach people affected by a rapid-onset humanitarian crisis, even if the target audience relies on

television or other media as its main source of news and information in normal times.

- The distribution of solar-powered and/or wind-up radios in disaster-affected communities without access to radio receivers. Since 2003, USAID has distributed more 200,000 radios in Sudan, in areas affected by conflict.
- The commitment of broadcasters in Latin America to disseminate life-saving information, to undertake ad campaigns and mobilize the public at crucial moments when other communication technologies fail.
- The shortwave frequency coordination work of the High-Frequency Coordination Conference, its conception of the International Radio for Disaster Relief project, and the usage of shortwave radio broadcasts in severe disaster situations where local and even regional communication networks are destroyed or overloaded.

It's true that sometimes there is a human tendency to not see the forest for the trees. But close inspection of individual trees can help in recognizing common traits and ultimately appreciating that the trees do indeed form a great forest.

Taken together, the individual case studies in the ITU draft report combine to tell a compelling story about the essential services provided by broadcasting during emergencies, remarkably similar throughout the world, irrespective of political and geographic boundaries, with a simple message: broadcasting works!

The ITU press release I mentioned succinctly summarizes the value of broadcasters during emergencies with a quote from Christoph Dosch, chairman of ITU-R Study Group 6 (Broadcasting): "With the number of natural disasters and other large-scale emergency situations on the rise around the world, as we have seen with the devastation caused by the recent Typhoon Haiyan, it is absolutely essential that the public is provided the necessary emergency information quickly, comprehensively and accurately. Terrestrial television and radio broadcasters provide the fastest, reliable and most effective means of delivering information to the public in these critical situations."

Shouldn't everybody know that? Help spread the word.

The ITU draft report and presentations from the affiliated ITU workshop on emergency broadcasting can be accessed at <http://bit.ly/1bLjlay>.

*Comment on this or any story. Write to radioworld@nbmedia.com with "Letter to the Editor" in the subject field.*

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Conferences: April 5–10, 2014 | Exhibits: April 7–10 | Las Vegas Convention Center, Las Vegas, Nevada USA

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