



# RADIO WORLD

MARCH 1, 2012

The News Source for Radio Managers and Engineers

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courtesy The Georgia Radio Museum and Hall of Fame

## STL Paths They Are A-Changin'

Broadcasters Apply For More Bandwidth After FCC Eliminates 'Final Link' Rule

BY RANDY J. STINE

WASHINGTON — Terrestrial broadcasters have greater access to microwave spectrum to use as the final radiofrequency links in their program distribution chains, now that the FCC has adopted updates to Part 101 of its rules.

The changes, finalized late last year, give broadcasters flexibility in planning STL frequency strategies and more bandwidth for data connectivity projects, according to proponents.

The so-called "final mile" rule was considered by broadcasters to be outdated; it prohibited the use

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## DIY Fun

Buc Fitch shares a cost-effective design for a computer mic/headset interface.

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## FM+HD Booster Design Under Review

NPR Labs to Test on KUOW in Seattle

BY LESLIE STIMSON

As manufacturers design both FM analog and HD Radio boosters, NPR Labs wants to get ahead of the game by learning more about booster design.

The lab is working with NPR member station KUOW(FM) in Seattle on a new type of FM+HD booster system

as well as new design methodology. The R&D engineering group says its work could ease the way for stations to employ both FM analog and FM HD Radio boosters to improve coverage in areas where interference may be high due to geographical obstacles or overlapping signals. The study is based on

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```

#####
#BXNNTUJ **AUTO**SCH 3-DIGIT 856
#0009383 #1 #RDM 0009383 E1201 S164M
E17
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World Radio History

# Let's Demystify RDS 'RadioText Plus'

RT+ Can Give Stations an 'MP3 Player Feel'  
By Showing Song, Title, Artist Separately

BY ALAN JURISON

In the past we discussed the promise of the RadioText Plus tagging standard. Now let's dig deeper into some of the technical details of RT+ for engineers.

RT+ is an additive data stream you can add to your RDS encoding that identifies the text that you are encoding in your RadioText (RT). The RT is a 64-character description that you can change anytime.

Some RDS encoders on the market support integrated RT+. If you have one of these encoders, a lot of the work I'm going to describe has been done for you by the manufacturer. In these situations, the software

grated support.

To add RT+ to an existing RDS stream, you need to broadcast two Open Data Application packets in your RDS stream from your RDS encoder. ODAs are part of the regular RDS/RBDS standards and are a way to add additional functionality.

You can have multiple ODAs run-

version 1.0.2.1 recommend avoiding 8A and 9A ODA groups for RT+ because of this issue.

## RT+ IDENTIFICATION PACKET 3A

The first type of packet is the 3A packet, which identifies to an RT+ capable receiver that the station is encoding the RT+ standard. See Fig. 1. This packet must be broadcast once every 10 seconds by the station. Because we're encoding with Application ID (AID) 4BD7, receivers that support RT+ know

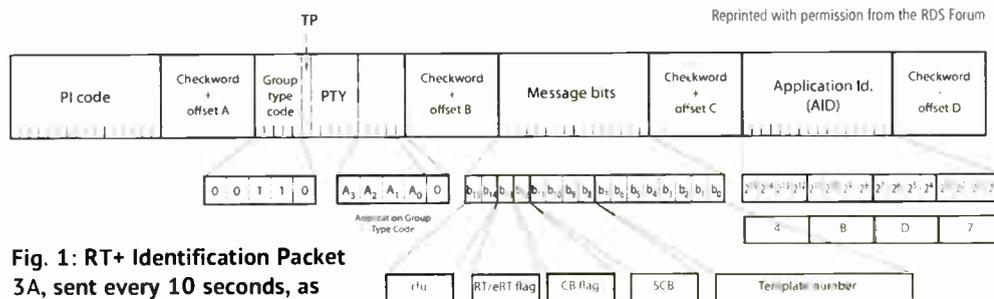


Fig. 1: RT+ Identification Packet 3A, sent every 10 seconds, as defined in the RT+ Standard.



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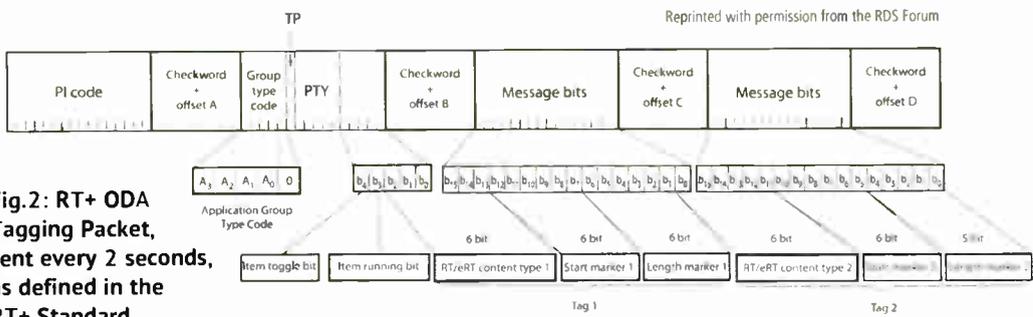


Fig.2: RT+ ODA Tagging Packet, sent every 2 seconds, as defined in the RT+ Standard.

addressing the RDS encoder just needs to supply the content type, start markers and length discussed later. The RDS encoder handles creating the rest of the Open Data Application (ODA) packets and takes care of how frequently they need to be broadcasted.

But many engineers are curious to know more about the details. Perhaps you have your own "home-brew" RDS installation, or you're considering creating your own solution to add RT+ to an older encoder that doesn't have inte-

ning on a single RDS stream, but they must each be in a different "logical" numbered location. In the United States, the NRSC standard specifies valid ODA group locations of 5A, 6A, 7A, 8A, 9A, 11A, 12A, 13A.

Note: Due to a software issue I described back at the beginning of our series (see link to those articles at the bottom of page 6), the initial fifth-generation Apple iPod Nano software release cannot decode RT+ tags in groups 8A and 9A unless it is upgraded to firmware

this station supports the RT+ standard. The contents of this 3A packet have a "pointer" to the ODA group where the actual RT+ tagging packets are located.

Note: If your station is broadcasting any traffic or other leased data applications of RDS, you should check with your corporate engineering staff or your vendor leasing the data to verify what ODA group they are using. RT+ must be put on a different ODA group, or the two will conflict.

## RT+ ODA TAGGING PACKET

The second ODA packet is where the actual RT+ tags reside, and the RT+ standard requires these packets to be sent every two seconds. See Fig. 2. Inside this packet there are several important data fields.

(continued on page 5)

# MDCL Techniques Draw Debate

Algorithms Save Money, It Seems, But Which One Is Best for You?

As *Radio World* has reported, the FCC recently made it easier for AM stations to use modulation-dependent carrier level systems to save money on their transmitter power bills. Our website recently featured some engineering back-and-forth on MDCL, specifically the Amplitude Modulation Companding algorithm, or AMC, although the debate has broader implications. I share the conversation here.

J. Fred Riley was a chief engineer for radio and TV stations, and worked for Continental Electronics for 26 years, primarily in the area of high-power broadcast (100 kW–1 MW). He's now retired and living in Dallas. He wrote:

I can't hold it in any longer. This move to AMC is stunningly wrong.

A careful analysis of the algorithm and results of AMC show that if 3 dB of AMC works for a broadcaster, they're simply licensed for 3 dB too much power. AMC does not preserve the full PEP capability of the transmitter or the listener's signal-to-noise ratio.

MDCL is also called Variable Carrier Power by the International Broadcasting Bureau. AMC is a BBC algorithm to save money at the expense of signal-to-noise ratio. On the other hand, keeping the full PEP of the transmitter can be achieved by a number of variants. And of those, Continental Electronic Corp.'s CCM (Controlled Carrier-Level Modulation) system is the most sophisticated.

Sophisticated means, in this case, power savings without audible artifacts. CCM looks only to keep the carrier high enough to support the negative peak

modulation level; positive peaks are allowed to go to full PEP. And the intersyllabic time delay between carrier level shifts of the CCM system results in a near-perfect power-consumption-reduction system that results in both power savings and preservation of the listener's signal-to-noise ratio.

AMC lowers power consumption the most, no question. But it does so at a great cost to coverage. CCM, on the

able carrier power (see [www.radioworld.com/attachments/CCM\\_020312.pdf](http://www.radioworld.com/attachments/CCM_020312.pdf)).

The conclusion was clear. If AMC works for you, you're running too much power in the first place. But if you need to maintain coverage, you use a technique that maintains the full PEP capability of your transmitter.

Further, because CCM only provides the carrier necessary to support negative peak modulation, if any asymmetry

**Mendenhall says stations will need to experiment with algorithms to determine which gives the best tradeoff in audio quality and coverage for their operating mode and content.**

other hand, may actually increase coverage while saving 22 percent in a talk format or 16 percent in a hard rock format.

And, for those who think this is something new and miraculous, I refer them to January 1935 issue of QST, the ARRL Magazine. This is an amateur-radio version of a technique used by WGY in 1931! It is fair to say, however, that this technique did not become quite so easy to implement until the advent of transmitters coupled to DC. Once that hurdle was met, implementation became simple and elegant.

I delivered a paper to the IEEE Broadcast Technology Symposium some years ago wherein I compared the various power-savings technologies using vari-

survives the processor, that is allowed to raise the PEP even more. And CCM prevents the receiver's AGC from acting as an unwanted compressor by the intersyllabic delay mentioned before.

I am happy to see my recommendation for the use of variable carrier power be put to use in the United States; it has been and is used on almost all HF broadcast stations. What appalls me is the move to use the worst of all possible variable carrier power systems.

It would be wrong not to point out two additional points:

A. The carrier does nothing except demodulate the sidebands. When PLLs and synchronous detection was difficult and costly to implement, there was no

FROM THE  
**EDITOR**

Paul McLane



alternative. But synchronous detection is widely available, solves a host of problems and allows the (truly) useless carrier to be reduced by 20–26 dB while recovering a full-bandwidth AM signal.

B. The average RMS modulation level, despite all the advances in processor technology, has advanced from 30 percent in the 1960s to only 40 percent in 2012. If true power savings is really a major criterion, think how much power could be saved by using synchronous detection. The calculation of power savings is left for the reader.

*Geoff Mendenhall of Harris Corp. expanded on Riley's comments about MDCL deployment. He's vice president of transmission research and technology for Harris Broadcast Communications in Mason, Ohio. Harris offers two kinds of MDCL algorithms for its AM transmitters, one of which is based on AMC:*

Fred's point about the "top down," AMC algorithm reducing the total peak envelope power (PEP) is correct. The carrier is reduced by 3 dB during modulation peaks which does reduce the total PEP of the transmitter, but the full carrier power is restored during lapses in audio, thereby masking the impact on fringe area S/N.

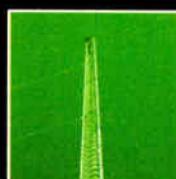
This perceptual masking effect on the audio S/N would not be the same if the transmitter power output was simply reduced by 3 dB with conventional AM modulation. Fringe area listening tests documented by several different broadcasters confirm that there is a negligible

(continued on page 19)



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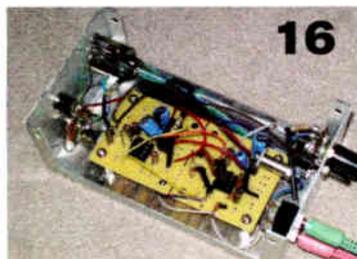
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MARCH 1, 2012

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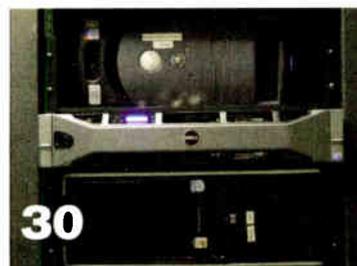
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**RDS RT+**

(continued from page 3)

**Item Toggle Bit** is an important concept in the RT+ standard. Every time a new "Item" changes, this bit should be toggled. It is a single bit, meaning there are only two values for it, 0 and 1.

Essentially, this bit should only change when a programming element is changing. The best way to relate to this is a song. When a song comes on, this bit should be set to 0 for the entire duration of the song.

When the song is over and the next song is aired, the bit should be set to 1. By changing the toggle bit, the receiver purges anything in memory related to ITEM, which as we discussed in the previous part in this series consists of descriptors of the current "Item" that is on the air. This clears content types 1-11, which includes title, artist, album and other song data from the receiver. The new song will have newer content types and start/length markers that it would then apply.

**Item Running Bit** essentially states that the current Item being displayed in the RT+ and RadioText is actually running, or "on the air." In most cases, you would want this always set to 1. (In my opinion, you should not be displaying a song title and artist if the song is not running.)

**CONTENT TYPES AND MARKERS**

Each RT+ ODA tag allows for two "tags." Each consists of a Content Type, Start Marker and Length Marker. The Content type is a number from 0-63 that identifies what type of tag the text is. Looking at Fig. 3 in my April 20, 2011 article, for example (again, see page 6

**First RT+ ODA tagging packet for the example cited in text**

Description	Value	Note
Content Type 1	1	Item.Title Content Type
Start Marker 1	7	We count from left to right, Fireflies starts at character position 8, so subtract 1
Length Marker 1	8	Fireflies is 9 characters long, so subtract 1
Content Type 2	4	Item.Artist Content Type
Start Marker 2	19	Counting left to right, OWL CITY starts at character position 20, subtract 1
Length Marker 2	7	OWL CITY has 8 characters, so subtract 1

**Second RT+ ODA tagging packet for the example cited in text**

Description	Value	Note
Content Type 1	2	Item.Album Content Type
Start Marker 1	34	Counting left to right, Ocean Eyes starts at character position 35, subtract 1
Length Marker 1	9	Ocean Eyes has 10 characters, so subtract 1
Content Type 2	0	No Data - Blank
Start Marker 2	0	No Data - Blank
Length Marker 2	0	No Data - Blank

for the link), "Item.Artist" is Content Type 4.

The Start and Length markers define where in the RadioText that field begins and where it ends. These are both zero-based numbers, so you have to start counting from zero to calculate Start and Length markers. Alternatively, you can just count them and then subtract one.

Let us look at the following example:

Z100 - Fireflies - OWL CITY - CD:  
 Ocean Eyes

We want to tag Title, Artist and Album. Accordingly, we would need two separate ODA packets, because we have three things to tag and each ODA packet supports two RT+ tags each. So, we need to create an RT+ ODA packet for Title and Artist, and then another tag for Album and a blank (null). Because the "Item.Toggle" bit will remain constant, the receiver will cache and cumulatively collect these tags as we interleave the transmission of these ODA packets.

(continued on page 6)

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## STL STRATEGIES

(continued from page 1)

of Part 101 frequencies as the final RF link to the transmitter in programming distribution. The elimination of that rule should benefit stations, especially those in urban areas with highly congested Broadcast Auxiliary Service spectrum, which is licensed under Part 74.

Meanwhile under the Part 101 changes, non-broadcast users do gain some access to BAS and Cable Antenna Relay Service frequencies in the 6875–7125 MHz and 12700–13100 MHz bands, according to the FCC.

Part 101, or Fixed Microwave Services, already was used by radio stations for telemetry control and satellite backhaul in some cases. Observers contacted by Radio World agreed the “final link” rule was overly prohibitive, considering that most broadcasters need bandwidth to support their modern operations.

The preference of broadcasters to keep their digital audio program feeds linear or uncompressed moved the issue forward, one said. Currently most digitized audio is bitrate-reduced so more channels can fit into a 950 STL RF channel and the smaller landline channels.

“The old rules were grounded in an era that predated data connectivity. As the technology has evolved, the rules have not met the demands of that evolution,” said Jim Moody, president of J. Moody and Associates, a broadcast engineering consulting firm.

### MORE BANDWIDTH

The upside for radio broadcasters is access to more bandwidth, a requirement for today’s multiple station cluster environments and HD Radio, Moody said. Often, broadcasters are affected by congestion within the Part 74 frequency allocations. In many cases frequencies within the 950 MHz part of the spectrum are clogged to the point where no options exist, he said. “Broadcasters often have tremendous data bandwidth requirements with RF point-to-point, multiplexed connectivity.”

There are thousands of Private Operational Fixed Service frequencies, but the major bands are in 900 MHz and 2, 2.5, 4, 6, 11, 18 and 23 GHz, Moody said.

The FCC had granted waivers to the final link rule through the years. But that process could take a long time, cost

lots of money and offer no guarantee of a favorable outcome, said Moody. He helped several clients with waiver requests that included asking the FCC for Special Temporary Authority to use Part 101 frequencies as the final STL programming link.

Greater Media and Pappas Broadcasting were among broadcasters who received waivers. Greater Media operated its Part 101 links for its Boston station cluster under STA for several years until it received a permanent waiver in 2009.

“The original spectrum rules, meant to protect broadcasters, essentially limited them in the sense that the bandwidth available in Part 74 no longer met the needs of today’s broadcasters,” Moody said. “Under the old rules, radio broadcasters were eligible for and expected to use Part 74. A prohibition excluded the use of Part 101 as the final link of RF connectivity for circuits carrying programming content.”

Radio broadcasters have been searching for possible solutions for high-bandwidth studio-to-transmitter connectivity problems for years. More modern data connections, such as T1, DS3 (Digital Signal) and OC3 (Optical Carrier), had not been contemplated when the FCC drafted rules that govern STL connectivity.

## RDS RT+

(continued from page 5)

Manufacturers of RDS encoders have implemented various syntaxes to perform RT+ tags.

In the case of the Inovonics 730 and Pira32 (firmware 1.5b or greater), which have integrated RT+ support, the software addressing the RDS encoder would need to send the following line to transmit the first RT+ packet above:

```
RTP=01,07,08,04,19,07
```

Although these encoders don’t support multiple, “interleaved RT+” packets at this point, the second RT+ packet would be transmitted this way:

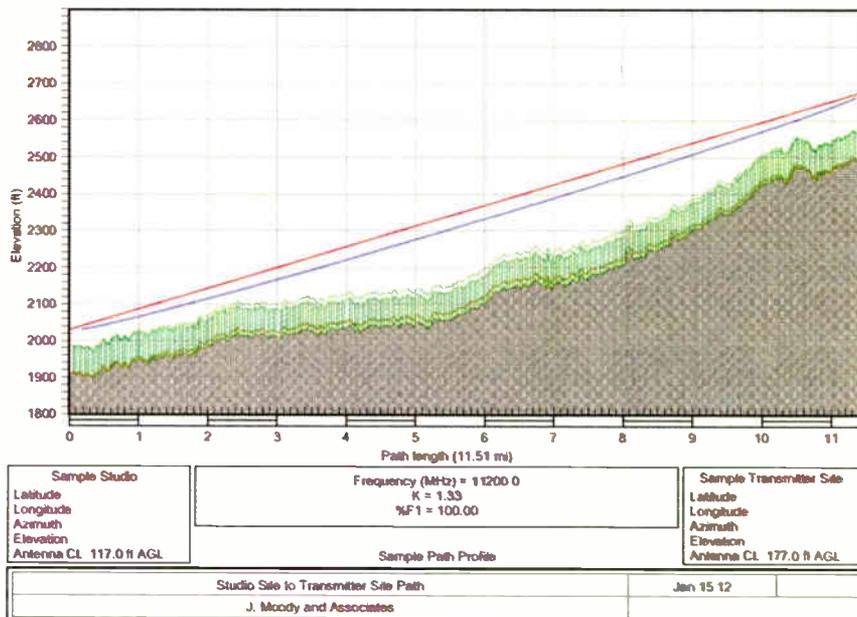
```
RTP=02,34,09,00,00,00
```

Audemat/Worldcast Systems handles its RT+ in a different way in the FMB80 and FMB50 models. (Note, older FMB80 models must be upgraded to a new firmware version to have integrated RT+ support; new models have this integrated.)

Assuming you are using the integrated PS/RT formatting of the encoder, as described in the manual, your automation system just needs to send the fields to the encoder separately, whereas before it may have sent them in one line or in a different format.

```
SONGTITLE=Fireflies
ARTISTNAME=OWL CITY
ALBUMNAME=Ocean Eyes
DURATION=03:37
```

The above is a brief technical analysis of RT+ for people to understand the concept of how RT+ works. There are many details and nuances covered in the official standard document



Sample path profile, courtesy J. Moody & Associates

A T1 line, a high-speed digital connection, is capable of transmitting data at a rate of approximately 1.5 Megabits per second, while a DS3 conveys 45 Mbps and an OC3 conveys 155 Mbps.

The FCC originally set up Part 74 decades ago in an “analog world when there was plenty of space and frequen-

cies,” said Larry Miller, a communications attorney with Schwartz Woods & Miller.

“Greater operational flexibility for broadcasters in urban areas has been a growing issue. Part 74 frequencies in urban areas have mostly been exhausted. Part 74 frequencies, which are allotted in

(continued on page 8)

from the RDS Forum that would be helpful to review if you are developing hardware or software or to understand this standard at the binary level. See Annex P, Pages 151–152 of this document: [www.rds.org.uk/2010/RDS-Specification.htm](http://www.rds.org.uk/2010/RDS-Specification.htm). You must request a password.

Unlike some of the differences between RDS (Europe) and RBDS (United States), RT+ is an international standard, and there are no differences when it comes to encoding RT+. Read the latest National Radio Systems Committee RBDS standard at: [nrscstandards.org/](http://nrscstandards.org/)

While too complicated to cover in this article, performing RT+ operations in binary, hardware/software developers and those who’ve developed their own “homebrew” RDS encoder implementations could implement RT+ on virtually any RDS encoder through their RAW RDS packet transmission command. Most encoders support this.

Next time, we’ll discuss RT+ broadcaster and vendor support.

To comment, write me at: [ajurison@gmail.com](mailto:ajurison@gmail.com)

Alan Jurison is a senior operations engineer for Clear Channel Media and Entertainment’s Engineering and Systems Integration Group in Cincinnati. He holds several SBE certifications including CSRE, AMD, DRB and CBNT. Opinions are the author’s own.

## GET THE MOST OUT OF RDS

Past articles in this series include:

- RDS: What You Need to Know
- RDS: Optimize RadioText Send Rate
- RDS: Optimize PS Scroll
- RDS: Injection & Pilot Synchronization
- RadioText Plus Holds Promise

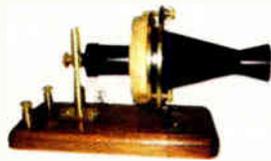
Read them all at:

[www.radioworld.com/article/get-the-most-out-of-rds/3110](http://www.radioworld.com/article/get-the-most-out-of-rds/3110)





1664: Just what it looks like. Two tin cups and a string. But it transmitted sound!



1876: Alexander Graham Bell's commercially viable telephone.



1900: Phones become fixtures in more well-to-do and steam-punk homes.



1920: Every home is working toward having a telephone!



1936: The advent of the dial desk phone. No more asking the operator to connect you.



1963: Push buttons usher in the thoroughly modern world. Touch tones enter pop culture.



1983: The mobile phone is a reality. Plots in all TV shows get a boost!



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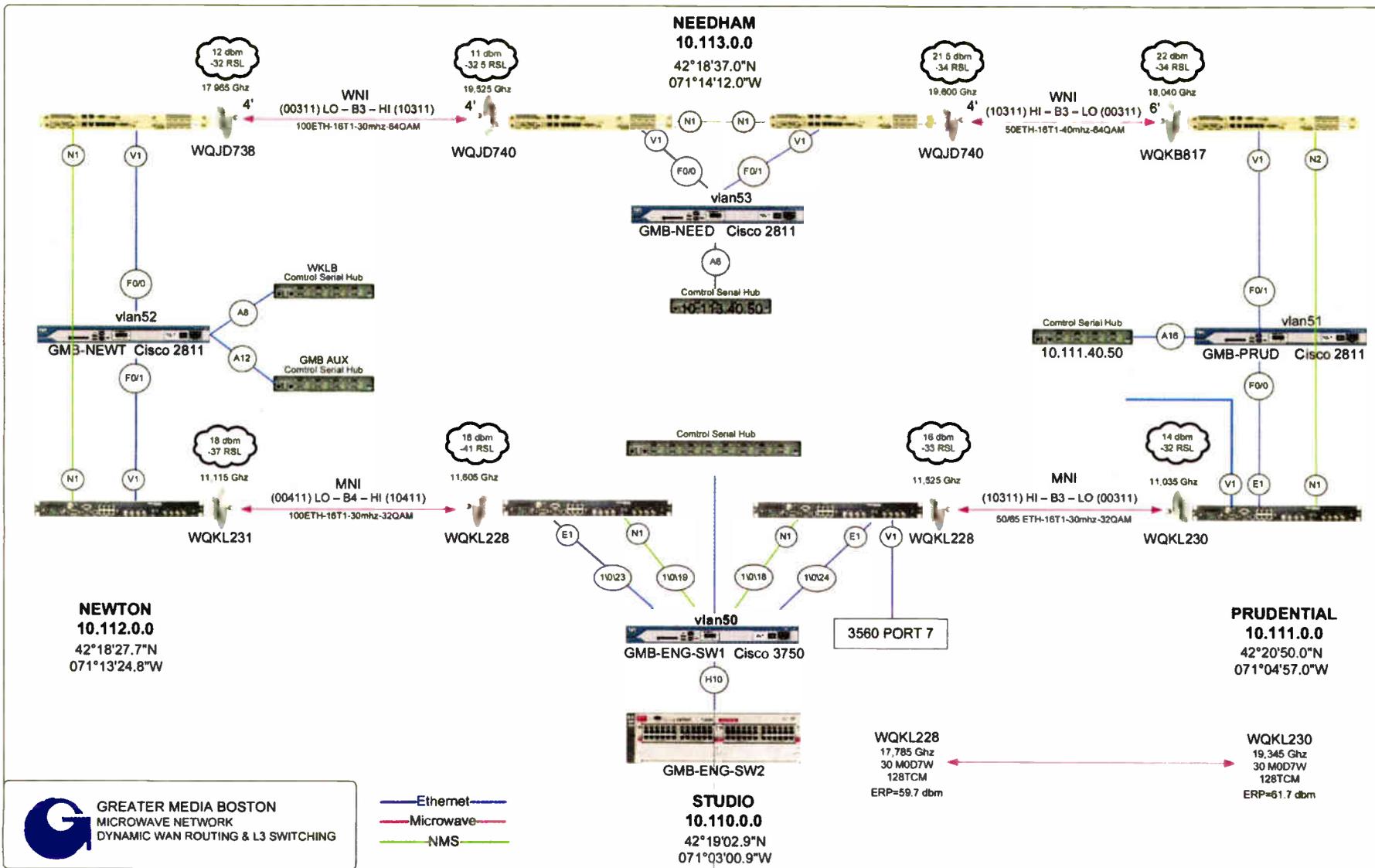


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Greater Media Boston's 11 GHz network microwave network employs dynamic WAN routing and L3 switching. There are a total of five stations split between two sites, plus five auxiliary facilities at a third location.

## STL STRATEGIES

(continued from page 6)

25 kHz portions, are really no longer capable of moving the data needed for multiple station and HD Radio applications."

### HIGHER THROUGHPUT

Congestion and interference in the 2.4, 5.3 and 5.8 GHz ISM unlicensed bands have made them almost unusable to broadcasters in urban areas, most observers said.

Miller, who worked with Greater Media on its Part 101 waiver in Boston, said he has had clients already re-purpose their BAS spectrum at no additional cost using equipment already on hand by moving the final link of their programming from studio to transmitter into their existing Part 101 systems.

"This is a big deal for broadcasters," Miller said.

Corporate directors of engineering for several major broadcast groups concurred with Miller as they prepare to redraw STL plans and paths.

Milford Smith, vice president of

radio engineering for Greater Media, said broadcasters need more throughput for both main analog and digital channels of multiple co-sited stations.

Broadcasters also need more throughput for multiple multicast channels, PAD and other program-related data,

anticipates filing several more.

Support for the aforementioned bandwidth without the use of expensive leased telco data circuits would have been impossible. "In our case, to equal the throughput of the licensed Part 101 links would require use of something

## This is a big deal for broadcasters.

— Larry Miller, Schwartz Woods & Miller

Advanced Application Services (AAS) data, Ethernet network extensions to various sites, satellite return audio from various downlinks as well as video from a remote camera, Smith said.

Greater Media ultimately was successful in obtaining licenses for a number of Part 101 systems in Boston comprising a so-called Synchronous Optical Network link interconnecting all of their facilities. The broadcaster has several additional applications pending and

beyond DS3; likely an optical carrier circuit, probably an OC3, at huge expense," Smith said.

Mike Cooney, vice president of engineering for Beasley Broadcast Group, said the broadcaster has filed Part 101 applications for all of the group's large market signals.

"This change ensures a reliable connection to the transmitter site for HD multicast and data channels, as well as remote controls, phone lines and secu-

rity monitoring," Cooney said.

While Internet connection could provide such services, "those options are unavailable to many remote or mountain sites," he said.

Dane Ericksen of Hammett & Edison Consulting Engineers said broadcasters wishing to use Part 101 for their final STL link will need to file a Prior Coordination Notice. That is the protocol for frequency coordinating both fixed and mobile microwave paths, when applying for a new 900 MHz band facility in the fixed service.

Commercial microwave frequency coordinators such as Comsearch and Micronet typically charge \$800 per path for a PCN, according to Ericksen.

"There will be time and money involved. Probably \$1,800 to \$2,000 for the consulting services, which would include the PCN fee but not the filing fee." The FCC filing fee is \$150 for a link for a commercial radio or TV station, while such filing fees for links for non-coms are waived, according to Ericksen.

Is your organization taking advantage of the change in Part 101 rules? Tell us how. Write to radioworld@nbmedia.com.

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[AxiaAudio.com/Partners](http://AxiaAudio.com/Partners)



## BOOSTERS

(continued from page 1)

a new hybrid FM+HD booster system developed by Harris Broadcast.

The testing is a research and development project for KUOW, supported with funds from the Corporation for Public Broadcasting and the station.

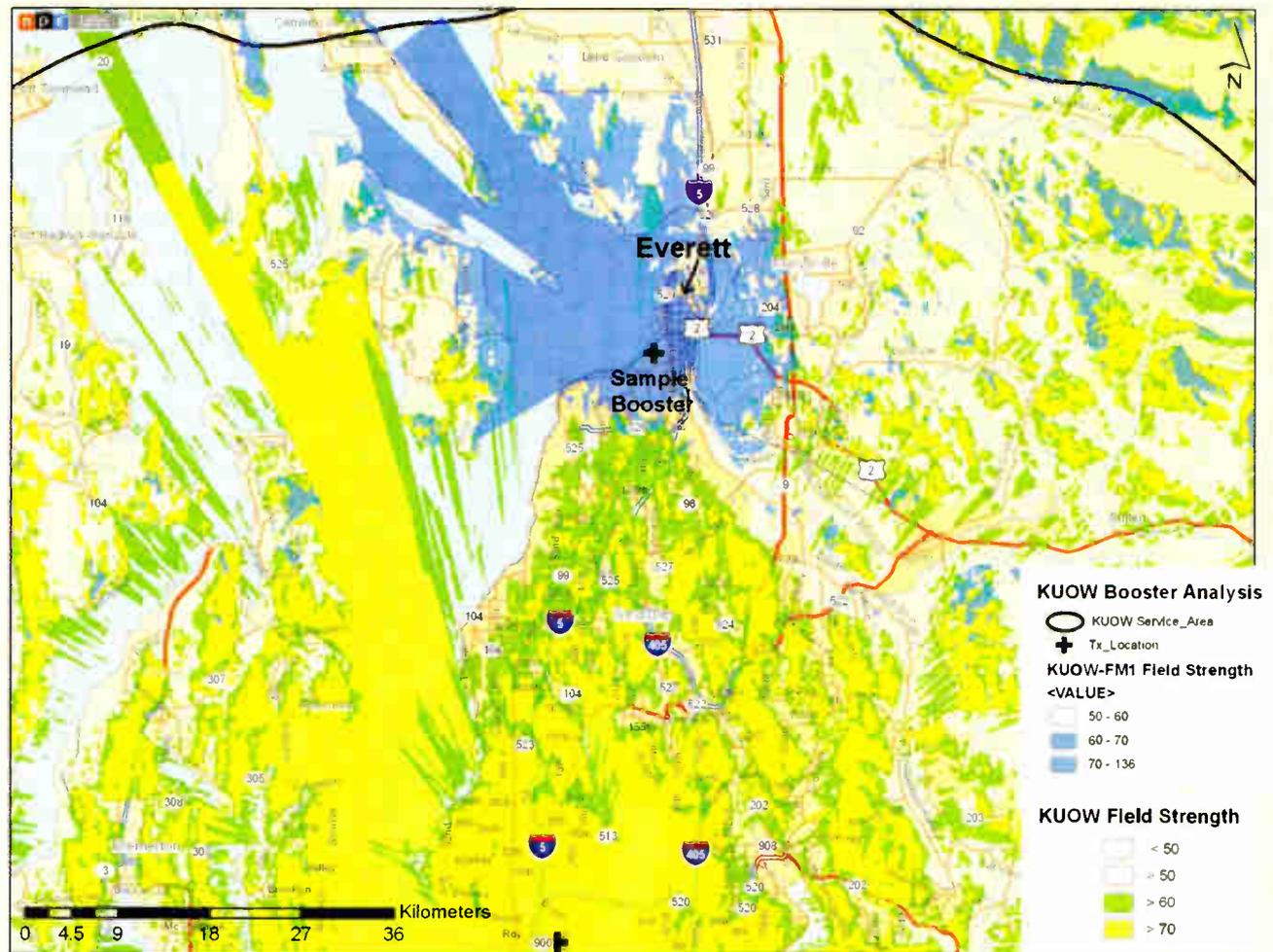
"This study is intended to put an end to the questions about the optimal design of FM boosters," NPR Labs Senior Technologist and Project Lead John Kean told Radio World.

"In the past, engineers have had no hard information on the optimal design criteria for FM boosters. As a result, we've seen boosters that have been designed, built and turned on, but they're ultimately disappointing because they suffer from these multipath distortion effects. What we're hoping is that this study will put an end to that lack of technical information about the parameters for booster design."

The first phase of the project is a study to predict, and avoid, multipath distortion effects that occur with signal boosters. Radio World readers are familiar with multipath distortion that causes FM sound to sound noisy, and with mobile reception multipath adds clicks and pops as the FM signal varies. Listeners can hear the multipath at a stop light, and find that moving the car a few inches restores the signal by moving it out of the point of multipath cancellation, according to Kean.

"This distortion of the received audio occurs because the signal from most boosters must overlap to some degree with the signal of its primary station," Kean said. "As a result, there has been uncertainty over the deployment of FM boosters for many years because the effects of these overlapping signals have been unknown."

To develop accurate data on the allowable signal ratios and modulation timing offsets, NPR Labs and Towson University have performed a series of listener-based tests using controlled simulations of overlapping signals. These tests are to determine the necessary parameter limits for booster location and operation — before construction of the booster begins. These parameters are to be used in advance mapping software developed by NPR Labs to geographically evaluate booster



Signal fill-in analysis for a sample FM booster serving Everett, Wash., for KUOW. The computer-generated map shows the primary station's useful signal, in yellow and green, dropping out in the Everett area, while the booster potential signal, in blue, fills the gap. The primary transmitter site, in Seattle, is shown at the bottom of the map. KUOW's 60 dBu service contour is visible as the black line near the top.

locations and optimize design.

The lab has also been testing HD Radio receivers to verify their Orthogonal Frequency Division Multiplexing "guard band" parameters, outside of which the digital reception may fail. The parameters will be used to ascertain the geographic operating area for KUOW's digital coverage with and without the planned booster, according to Kean.

KUOW's design is challenging because it operates with both FM analog and FM HD Radio transmission. To control more precisely the signal overlaps with hybrid broadcasting, Harris' DSP-based gap filler system was selected. This system provides RF filtering and has the ability to separately control the power of each digital sideband, as well as the analog FM channel, according to Harris.

Another first for this system is the use of over-the-air relay. In comparison with booster designs that regenerate the IBOC signal locally at the booster, the over-the-air relay will reduce construction and operating costs and eliminate the need for a digital circuit from the primary transmitter, according to NPR Labs.

NPR Labs anticipates presenting a report on the design and testing process this spring at the Public Radio Engineering Conference.

## NEWSROUNDUP

**COMMISSION REFORM:** NAB voiced support for FCC reform bills on Capitol Hill. President/CEO Gordon Smith put out a statement that NAB "supports legislative efforts by Chairmen Upton and Walden designed to modernize and reform FCC decision-making."

**SET-ASIDES:** The FCC said no to the Minority Media and Telecommunications Council in a disagreement over who should have been considered qualified for "set-aside" channels on Sirius XM; but it said its earlier decision set no precedent. MMTCC President David Honig told Radio World: "The FCC's eligible entity criteria were incorrectly drawn and we're glad the commission has confirmed that the criteria are non-precedential. Fortunately ... the result in this instance was quite good. Sirius XM's selectees are diverse, high-quality programmers." In 2011 Sirius XM chose Howard University, BYU Radio, Eventus/National Latino Broadcasting, WorldBand Media and KTV Radio.

**ANTENNA NEWS:** Jampro Antennas acquired Alan Dick Broadcast Ltd., an antenna manufacturer and contractor in the United Kingdom. ABDL was part of ADC UK Ltd, a larger telecom systems integrator.

**BBG:** Chairman Walter Isaacson resigned unexpectedly, citing "another big writing project." He recently authored a biography of Steve Jobs. The development came at a time of changes at BBG, as RW has been reporting. The board oversees Voice of America, Radio Free Europe/Radio Liberty, Radio and TV Martí, Radio Free Asia and Radio Sawa (Middle East Broadcasting Networks). Michael Lynton was named interim presiding governor.

**SUPER LISTENING:** Dial Global estimates that 23.1 million people tuned in to Super Bowl XLVI. It used data from Edison Research; a national survey was conducted via phone interviews.



# Easy to use, Easy on the Budget



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In a world of ultra-complex operating systems (just look at your smartphone), sometimes simpler is better. Logitek's **Pilot** brings you the operational features you need with an almost non-existent learning curve.

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**The Pilot is paired with the powerful JetStream audio networking platform.**

operation backed by the power of the Logitek JetStream Mini, a powerful 128-channel user-configurable audio node that handles all console functions as well as IP audio networking. Mixing, routing and processing along with buckets of mix-minus are all contained in a single fanless, convection-cooled 2RU enclosure.

For more information on the Pilot and other Logitek consoles, visit our website or call today.

# Make Cheap Talk Even Cheaper

Here's a Cost-Effective Design for a Computer Mic/Headset Interface

BY CHARLES S. FITCH

When it comes to hardware that is subject to abuses of "guests" and others, none is under duress more than microphones and headsets. Here's an area

## TECHTIPS

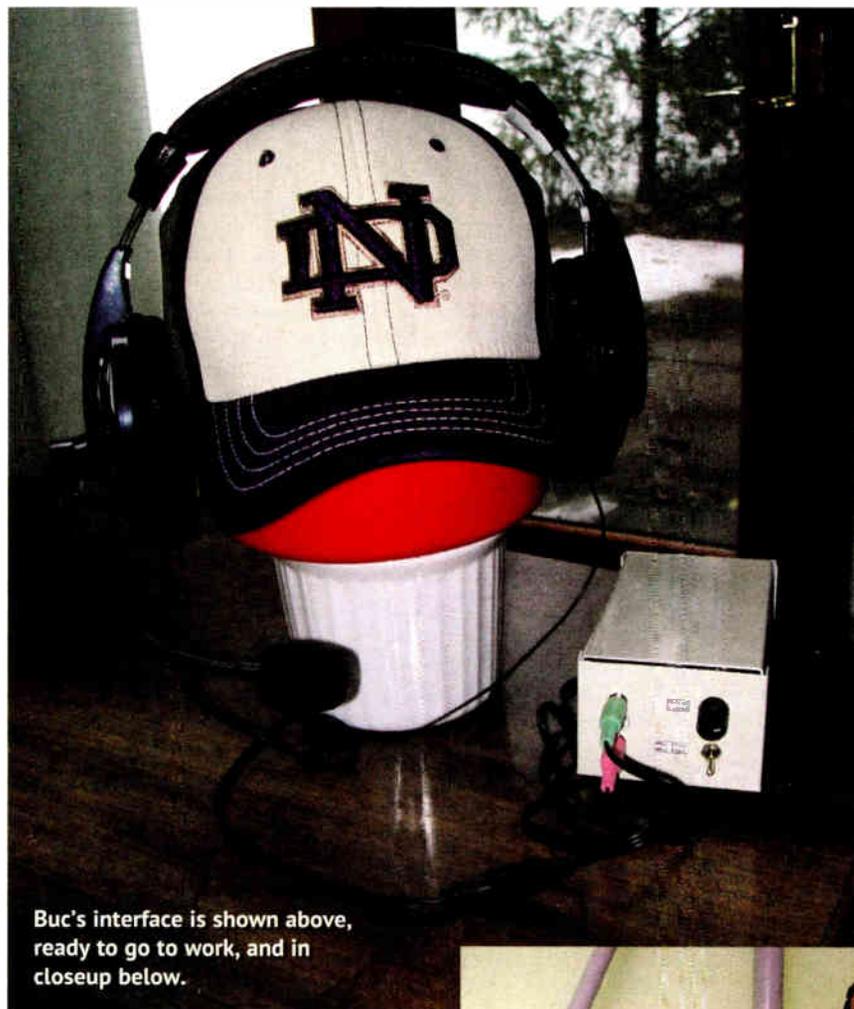
crying out for a cost-effective solution for reliability, guest comfort, ease of use, security/theft control and hygiene.

With the advent of computers, and more specifically the microphone audio interface, an interesting solution has appeared: the computer headset microphone.

These units, predominantly imported, are reminiscent of event location headset mics used in sports reporting, although lighter in gauge and less sophisticated. Light on the head and with a reasonably good sounding mic, they remind us of the benefits of mass production. Costing under \$10, sometimes as cheap as \$7 in bulk, they are available from sources as convenient as RadioShack (at a price premium) and from many national computer discounters. You can even order in case lots.

The only bug-a-boo? Normally you need an interface to provide the operating voltage for the unit's electret mic, and electronically make the conversion from essentially high-impedance unbalanced to a nominal 150 ohm balanced output, to mimic a regular microphone for station use.

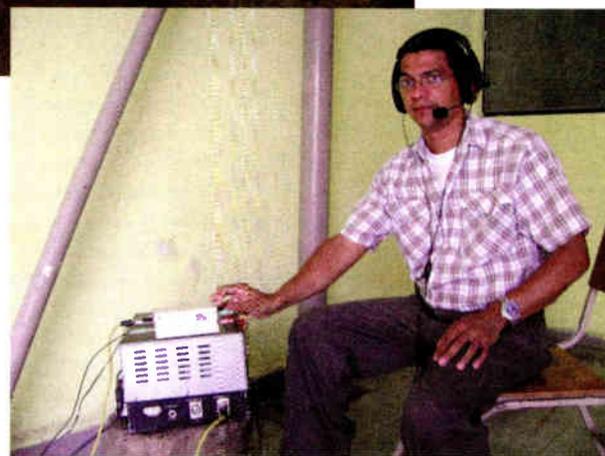
Let's design and build that interface. We'll include desirable extra features such as an individually operated headset level control and simple processing to enhance voice band audio response for



Buc's interface is shown above, ready to go to work, and in closeup below.

increased intelligibility.

I've tried over the years to offer ideas for simple yet valuable gear for your station that can be expensed from petty cash and built on a time-available basis. Call this another such "therapy" project.



The computer headset adapter is shown as used by Victor Osorio of HRRZ(AM/FM) in Honduras.

### DETAILS

The schematic is on page 14. Radio World has posted a larger version on our website at [www.radioworld.com/fitchHeadset](http://www.radioworld.com/fitchHeadset). We've also provided a fairly complete parts list, with as many RadioShack stock numbers as we could match. (As usual, our version is not the only way to build one, nor the ultimate in design optimization; it's just a departure point.)

Mics in these units are DC powered and the computer typically supplies 5 volts (unloaded). The tiny load that is the mic's FET amplifier drops the voltage to about 2.5 volts, and the voltage variation around this axis point is the actual audio from the mic. Most computers use an internal series resistor of about 10 k-ohms; that's what we've used as well.

The design of our "box" is centered on an input power supply of a single DC voltage, nominally between 7 and 15 volts. A 12-volt DC 100 mA wallwart, bought or liberated from your junk box, will work. In a rare situation where the mic is away from all hard power, a good 9 V DC battery will supply power to the box for between 5 and 10 hours of continuous use with a 45 mA or so drain; think Duracell or Energizer 9 volt.

This voltage enters the box through a side connector and immediately is dropped to a regulated 5 volts via a 7805 three-pin regulator. At this point 5 volts is supplied to the mic through that 10 k, 1/2-watt resistor.

The ripple on this 5 volts is low, 3 to 5 mV, which is necessary for a mic of this type.

That regulated 5 volts also is fed to a DC-to-DC converter to develop the 12 volts + and - for the op amps.

One 1458 (essentially a pair of compensated 741s in a single eight-pin DIP) is used as a pair of cascaded filters to shape the audio into the voice band. The other is used as a unity gain cascaded pair to provide

a pair of separate outputs, one plus and one minus polarity. These voltages, from essentially near zero impedance generators, pass through a 68 ohm resistor in each leg, creating a balanced source impedance of 136 ohms, which is close enough to 150 ohms for our matching purposes.

A DPDT switch selects mic audio with or without processing.

Audio for the headset could come from a multiplicity of sources but we expected the program audio to come at speaker level. The audio enters the box in a 1/4-inch mono chassis mount jack. To quiet the audio in the headsets fully, we've chosen a single circuit jack with a normally closed contact on it. When nothing is plugged in, the headset line shorts to ground.

(continued on page 14)

# The future is calling. (It's for you.)



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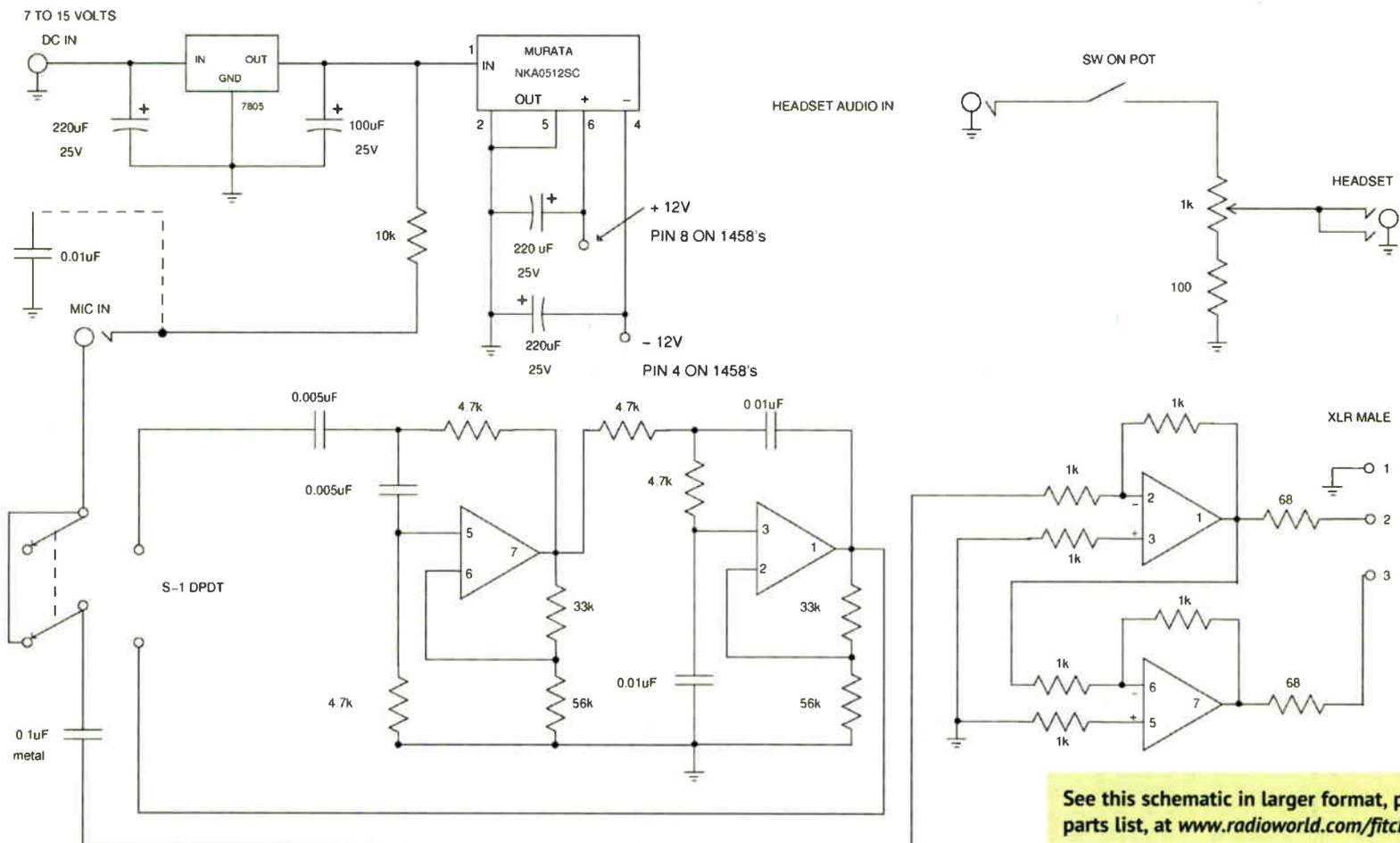


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NOTE: All resistors 1/2 watt.

## PROJECT PARTS LIST

### Computer Headset Adapter

Quan	Description	RadioShack #
2	1458 Dual section op-amps	276-038
2	8 pin PCB DIP sockets	276-1995
1	Printed circuit project board	276-159
4	Standoffs	276-195 (set 4)
1	Project metal box enclosure	270-238
1	DPDT (on-on) miniature toggle switch	275-636
1	12 DC around 100 ma wall wart power supply	273-1773
2	3 wire (stereo) 1/8 inch jacks	274-0249 (set of 2)
1	Coax type chassis mount DC connector	274-1583
2	Matching plugs for above for wallwart and 9 V battery	274-1573 (set of 2)
1	XLR-3 male chassis count connector	*
1	1/4 inch mono chassis mount jack with normal through switch	274-255
2	0.005 µf ceramic capacitors	272-130
2	0.01 µf ceramic capacitors	272-131
1	0.1 µf metal (for audio)	272-1053
3	220 µf 25 volt electrolytic	272-1029 or 272-1017
1	100 µf 10 volt electrolytic	272-1028 or 272-1016
1	7805 5 volt DC three pin regulator	276-1770
1	Murata NKA0512SC DC-DC converter two voltage output (5 V in, ±12 V out)	*
1	100 to 1000 ohm mini variable audio taper pot with on/off switch	*
1	Suitable knob for above pot	*
<b>Resistors</b> (1/2 watt unless noted). RadioShack numbers are sets of five		
2	68 ohm	271-1106
4	4.7 K	271-1124
6	1 K (shown as 470 ohm in schematic but 1 Ks are actually better)	271-1118
1	100 ohm	271-1108
2	33 K	271-1104
1	10 K	271-1126
2	56 K	*
(An odd value; you can get close enough to 56k by series a 22k (RS 271-1128) and a 33k (RS 271-1129))		

Also:  
Miscellaneous construction components such as solder lugs, hook-up wire, bus wire, label material, etc.

RadioShack order numbers shown.

\* Builder may have to sample other sources (Digikay, Mouser etc.) for parts marked (\*).

COMPUTER HEADSET INTERFACE (VER. 4)

BY CHARLES S. FITCH P.E.

DRAWN BY: V. OSORIO  
victor@radiojuitcalpa.com

See this schematic in larger format, plus a printable parts list, at [www.radioworld.com/fitchHeadset](http://www.radioworld.com/fitchHeadset).

## INTERFACE

(continued from page 12)

The headset audio passes to the on/off switch on a 1 k audio tapered pot. When you turn "on" the pot, the audio is connected to the top of the pot. The bottom (ground end) of that pot is connected to a 100-ohm resistor that goes to ground. This prevents the audio from being turned off completely unless you turn off the audio with the switch.

People are people and do strange things. I had a guest turn down her audio and then suddenly go ballistic when she couldn't hear anything. This little bit of audio at the end is helpful in always keeping some audio on.

This interface unit for a single mic was hand-assembled on DIP proto-boards. You can use just about any scheme you want for wiring and assembly. If your talent work in pairs, it might be prudent to build two mic channels into the same box. The DC-DC converter specified should just be able to handle four op-amps.

Early field use has complained that some RF from RPUs or nearby transmitters is getting into the mic appearing as a low sizzle sound. A 0.01 µf ceramic disc capacitor across the mic "high" input to ground eliminates most of this. Several of the various mic/headsets that we've been using have little shielding in the mic cord; this appears to be the most likely entry point. You may find that some brands of mic headsets have less propensity for this (probably more shielding); make these units your first choice.

Now when you have guests in studio or on location, you can make them feel special by taking a new, spiffy clean mic headset for them out of the box. You can even let them take it home as a useful souvenir of their appearing on the radio with you when done. At the least, you've taken a "wear item" and made its maintenance a disposable issue.

Charles S. Fitch, W2IPI, is a registered professional consultant engineer, member of the AFCCE, senior member of the SBE, lifetime CPBE with AMD, licensed electrical contractor, former station owner and former director of engineering of WTIC(TV) in Hartford, Conn., and WSHS(TV) in Boston.

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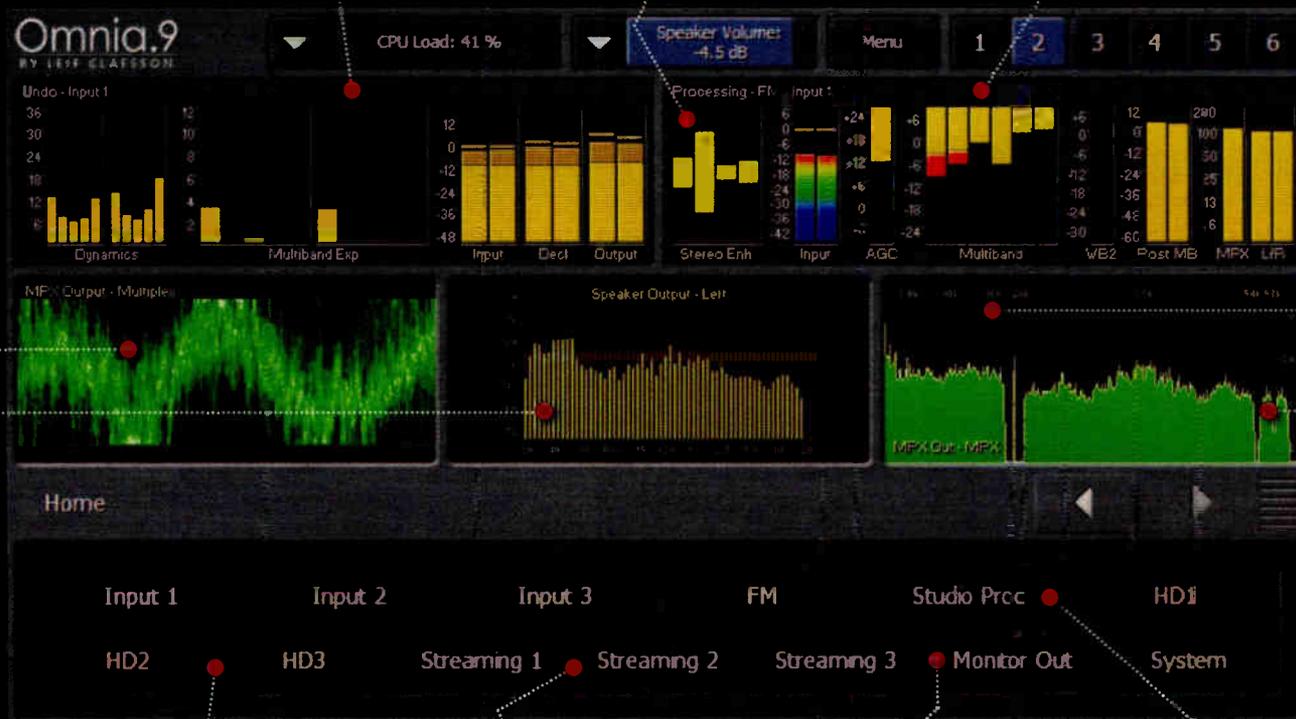
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# Inspect Your Tower After a Windstorm

Also: Frank Hertel Looks at a Glue Stick and Has a 'MacGyver Moment'

## WORKBENCH

by John Bisset

Read more Workbench articles online at radioworld.com

**F**rank Hertel of Newman Kees RF Measurement spied a nearly empty Elmer's Glue Stick and had a "MacGyver moment." Can you guess his use?

**T**im Walker's porcelain insulator replacement adventure at WMVA(AM), described in the Jan. 4 *Workbench*, got the attention of Ben Hill.

Ben is chief engineer of CBS Radio's WIP(AM) in Philadelphia. He wrote, "I have the same flower pots!" And one of the insulators failed on his 300-foot Blaw-Knox tower about two years ago after a bad spring windstorm rocked the tower a bit. See the damage in Figs. 1 and 2.

Skyline Tower Service's Jim Graf and his team replaced the damaged insulator with a spare Ben had in stock. Ben writes that it was the scariest four hours of his career. But the replacement went well, and they sent the damaged insulator back to Lapp Insulators. Although the repair work took about six months, the insulator was returned to Ben in "like-new" condition.

Lapp Insulators LLC in LeRoy, N.Y., builds insulators for high-tension power

lines. Ben says his job was "small potatoes" for them. Call (585) 768-6221.

If you own a tower using this type of insulator, it wouldn't be a bad idea to search for a spare insulator to have on hand, just in case. With a six-month turnaround time on the repair, Ben's spare insulator really saved the day — and his budget.

Ben Hill can be reached at [ben.hill@cbsradio.com](mailto:ben.hill@cbsradio.com).

His experience demonstrates the necessity of thorough routine tower inspections, especially after storms.

**N**ew Hampshire Engineering Technician Chris Tyler sent in Fig. 3 after replacing a drive gear assembly in a copy machine. It was interesting to see how the teeth on the "old" gear assembly (at right in the photo) wore down.

Also of note is Chris' assessment of the factory replacement part. It had obviously been made more cheaply and was not as rugged as the original. Only time will prove how

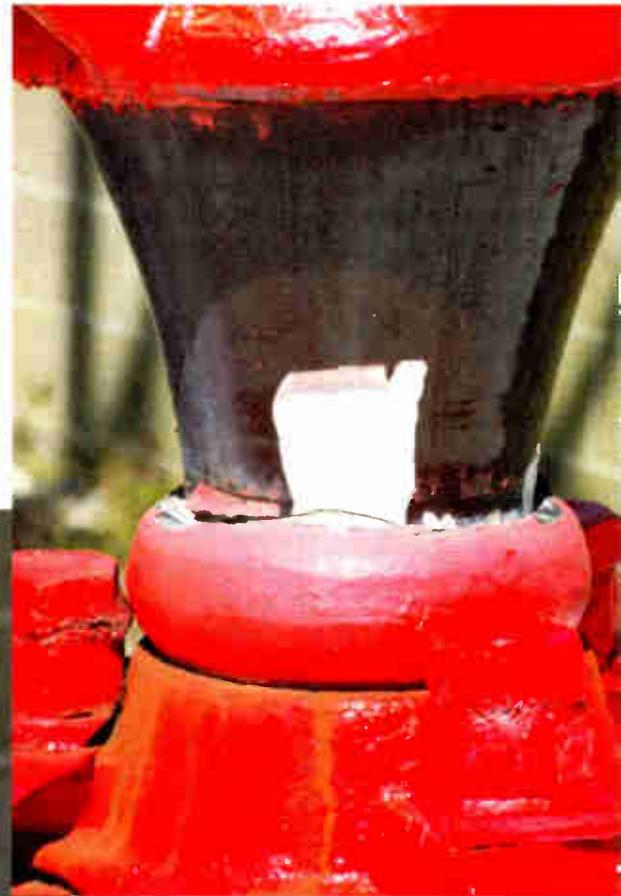


Fig. 2: Stresses fractured the other side of the insulator.

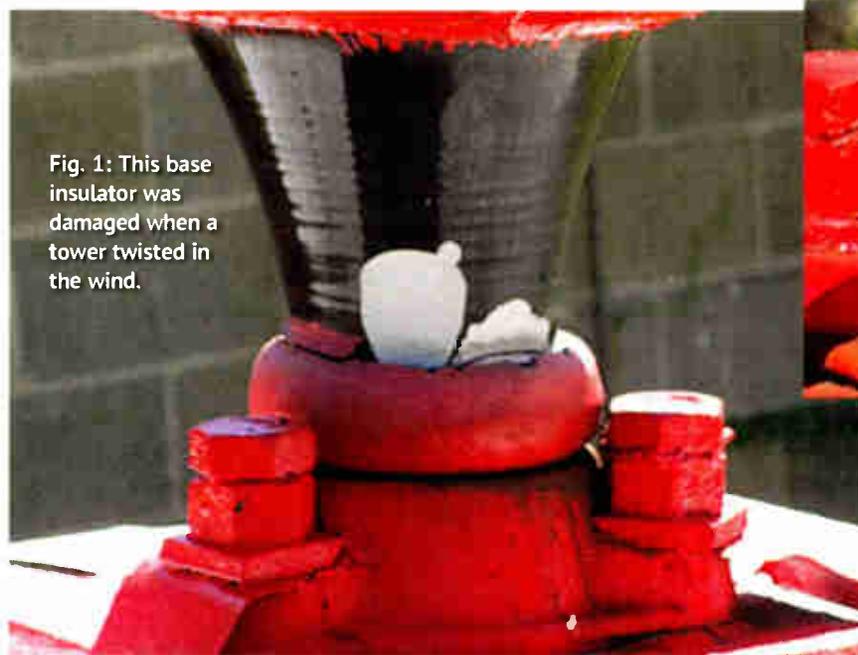


Fig. 1: This base insulator was damaged when a tower twisted in the wind.

long it will last.

Whether you service the station's office equipment or use an outside service specialist, check the warranty on parts being replaced.

Chris can be reached at [cptyler150@gmail.com](mailto:cptyler150@gmail.com).

(continued on page 18)

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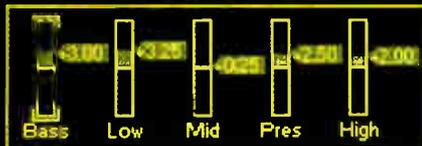
Fig. 3: Check warranty on factory replacement parts. Corners are cut these days.



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# WORKBENCH

(continued from page 16)

**N**ow to Frank Hertel's glue stick. As we disassemble the "stick," shown in Fig. 5, it turns out that the Elmer's product has a weirdly threaded inner plastic piston, which moves in and out but doesn't rotate.

Frank decided to attach a small piece of copper tubing into the black glue well of the movable piston, seen in Fig. 6; he depended on the glue that remained in the well to hold the copper in place. Then he soldered a wire to this small copper tube.

When the glue stick's adjustment knob is turned, the small copper tube will move deeper into the glue stick's body or further out of it. Meanwhile the attached wire moves in and out of the glue stick's main body without rotating.

Then Frank used a larger piece of 3/4-inch copper tube and soldered a wire to it. He slipped the 3/4-inch copper tube over the outer body of the glue stick. The result: a Hertel MacGyver Glue Stick Piston Capacitor!

Frank threw it together in 15 minutes just to see if it would work, but it shows promise. Adjustment is smooth, as is the rate of capacitance change. As built, the Hertel MacGyver Glue Stick Piston Capacitor has a *gigantic* range of 10 pF to 12 pF! It needs to be optimized to make it useful and yield more range of capacitance; but it actually does something. Power handling capabilities, "Q" of the assembly ... who knows?

How to mount it? Well that's for

Fig. 4: Start with an empty glue stick ...



**Frank threw it together in 15 minutes just to see if it would work, but it shows promise.**

another rainy day.

Frank did this just for fun. He sent the photos to a lot of his friends, with no leading information, just to see what response he would get. The feedback has made for good conversation. Frank

also heard that he has too much time on his hands. That may be true, but then it only took him 15 minutes to "throw" it together — a coffee break for a lot of people. And yes, he did drink his coffee while he was building it.

Frank Hertel can be reached at [nkeng@insightbb.com](mailto:nkeng@insightbb.com). Tell *Workbench* about your own MacGyver moment. Write to [johnpbisset@gmail.com](mailto:johnpbisset@gmail.com).

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 43 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.

Fig. 5: Disassemble the glue stick.



Fig. 6: Add a short piece of copper tubing to the glue well (black plastic) of the movable piston.

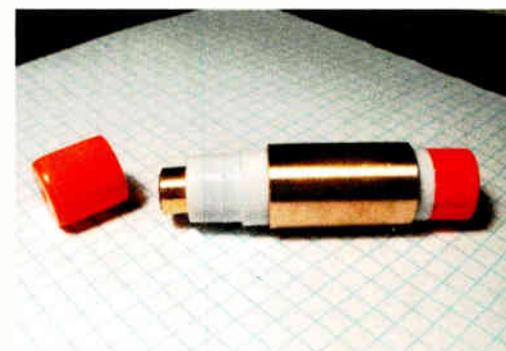


Fig. 7: Add the outer copper tubing, which forms the other capacitor plate.

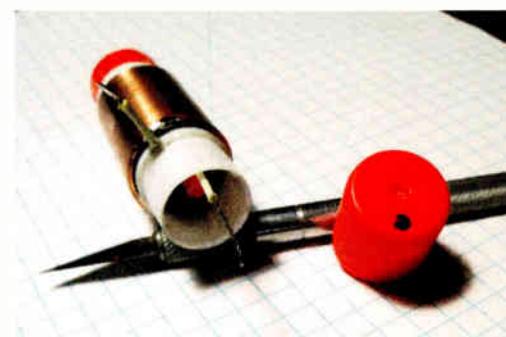


Fig. 8: Add wires to both pieces of tubing.

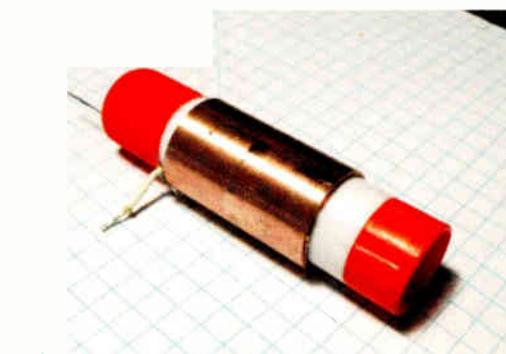


Fig. 9: The finished piston capacitor.

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## AMC

(continued from page 4)

impact on received audio S/N or coverage when using the AMC -3 dB algorithm.

AMC seems to have the least impact on simultaneous IBOC, HD Radio operation, possibly because the AMC algorithm causes less variation in the total integrated power output of the transmitter than the "bottom up" algorithms like ACC or DCC. Less variation in total received power will have less impact on the receiver's AGC/AVC circuit trying to follow the variations in transmitted carrier level. More tests with different receivers are needed to confirm this.

The December 1988 BBC Engineering Report "Implementation of Amplitude Modulation Companding in the BBC MF National Networks" (BBD RD 1988/15) provides a very complete analysis of AMC vs. a fixed reduction of carrier power and the relative impact on coverage.

Fred is also correct in pointing out that AMC gives the greatest power consumption reduction with heavily processed audio that maintains high average AM modulation levels. I have seen up to 37 percent power savings with AMC vs. up to 21 percent with ACC using the same transmitter, audio processing and audio content. If a broadcaster is not operating with HD Radio and wants to maintain the full PEP of the transmitter, the option to use ACC or DCC is available from practically all of the transmitter manufacturers.

Use of any of the MDCL algorithms gives the broadcaster the opportunity to significantly reduce the AM transmitter power consumption without having to accept any significant impact on coverage or audio quality.

The bottom line is that the broadcaster will need to experiment with several different algorithms to determine which one gives the best tradeoff in audio quality and coverage for that particular station's operating mode and audio program content.

*Cris Alexander, director of engineering for Crawford Broadcasting and a contributor to Radio World, then commented:*

Geoff's comments are well stated and spot-on, with the bottom line being the real "bottom line" — one MDCL algorithm does not necessarily fit all and it would be wise for stations to experiment to find the best fit for their individual situations.

I also agree that while the total PEP is reduced with AMC, the power in the sidebands, which carries all the information, remains the same as if there were no companding, and that would not be the case if, as Fred Riley suggests, the power of the station were simply reduced.

The key is indeed the perceptual S/N in the fringe area, which is masked very nicely in the AMC system. In my opinion, this is key in talk formats, which

dominate the AM band.)

*And J. Fred Riley then replied:*

You can't beat the mathematics of AMC vs. CCM; running half-power cuts the signal-to-noise ratio 3 dB. It's as simple as that.

And given that simple fact, a broadcaster might as well file for half power and run that permanently if HD is all you're interested in along with power savings. It is still amazing to me that a defect in the HD system is driving broadcasters to consider a power savings technique that cuts their signal-to-noise

ratio. Is that what's going to drive this, a defective piece of software?

Another simple fact is that HF (short-wave) broadcasters have been using MDCL with a CCM-like algorithm for over 25 years. The AMC system is peculiarly British, developed by Marconi. That Marconi is no longer in the HF and MW business should be proof enough of the failure of that concept.

Even the premier MDCL monitoring instrument used around the world, the Belar AMMA-2, supports CCM, not AMC. (Not that it couldn't with new software; there's just no demand for a

monitor for such a self-defeating system.)

*Share your thoughts and experiences regarding MDCL. Write to me at pmclane@nbmedia.com.*

*Radio World will have more about station experiences with MDCL, effects of the algorithms on AM IBOC and discussion by a subcommittee of the National Radio Standards Systems Committee about developing an MDCL "best practices" guide. Also, the upcoming NAB Show will include a session on MDCL with speakers from Nautel, Harris and the International Broadcasting Bureau.*




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# They Keep Shakespeare Lean & Hungry

Washington Theater Company Performs Live Radio Drama Adaptations of the Bard

BY KEN DEUTSCH

To some purists, changing the slightest detail of a Shakespeare play would be heresy. Setting "Hamlet" in South

## RADIODRAMA

Carolina in the 1800s? Romeo and Juliet hanging out at a party in modern-day California?

Zounds! ("Henry IV.")

"Our mission is educational," said Alex Zavistovich, managing director and co-founder of Lean & Hungry Theater, a non-profit group that creates one-hour versions of Shakespeare plays heard first via live public radio broadcasts in Washington.

"We're trying to make Shakespeare understandable to the widest group of people. An upcoming show, 'The Tempest,' airing March 4, will be set as science fiction, for example."

### STRIPPED AWAY

"We need to strip away the overly stentorian and classical style and make Shakespeare accessible, and these modern settings make the text more manageable," said Zavistovich.

"In Washington, D.C., the public charter schools introduce Shakespeare in the fourth grade. We're dealing with kids who not only have to read 'The Tempest' at a young age, but some don't even have English as a first language or are still learning the language."

"LHT is a full-time job for me," said Jessica Hansen, the company's co-founder and artistic director. "I do the underwriting voice-overs for WAMU(FM), the local National Public Radio affiliate that carries our plays, and I'm a single mom, but I eat, sleep and breathe LHT. It's snowballed, but in a good way."

Hansen has a hard time quantifying the hours she spends.

"I help realize the creative vision of

the company. That involves hiring actors, stage managers and directors, shaping the adaptation of the plays, going to functions and being the face of the company, and generally getting other people excited and

director, whose primary chores involve the music and sound effects. (See sidebar.) Radio World editor Paul McLane has acted and directed in past LHT productions.

Whenever the script calls for a fight, it will sound quite real. Zavistovich and Hansen have



Jessica Hansen, left, co-founded Lean & Hungry. 'We like to find performers who are able to create unique character voices and bring something magical,' she says of actors like Jason MacIntosh, seen at mic.

involved. Alex and I have grown this company together, and we're always involved in business development. Then we have the actual rehearsing of the plays."

Zavistovich juggles two other careers: acting as a business communications consultant and serving as managing director of the horror-oriented Molotov Theater Group, also based in Washington. He is also a former Radio World editor.

A third party who shares in the creative process is Gregg Martin, technical

been certified as actor/combatants in the Society of American Fight Directors.

"In 'Hamlet' there is a huge swordfight at the end," said Zavistovich. "We are proficient with rapiers and daggers, and we know our parries from our thrusts and reposts. We choreograph each sound in advance so actors can react authentically. This is a great alternative to using a digital sound effects library."

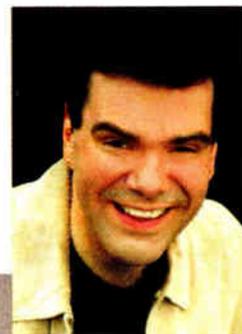
## THE TECHNICAL SIDE OF LHT

Each play begins with a read-through about six weeks before the live performance. Then the actors polish their deliveries during several rehearsals until the week before air, when the cast typically works together every night.

At airtime, the productions are recorded live to a digital 24-track machine, using perhaps 12 to 16 tracks, according to Zavistovich. There are two audio products: the live broadcast, which also is streamed in real time on WAMU's website, and a post-produced version made available via Public Radio Exchange (PRX) for syndication.

LHT also sells MP3 downloads of the final versions on its website. Some plays also are available on CD, and LHT has donated recordings to local schools.

Most of the music is composed by Gregg Martin; it generally is pre-recorded and then flown in while the actors are performing. Certain songs are performed live with guitar



Alex Zavistovich. We're trying to make Shakespeare understandable to the widest group of people.'

### YEARNING FOR CULTURE

"I really want to work more with Lean & Hungry in the future," said Mark McDonald, director of programs at WAMU and broadcast journalist in residence at American University.

"One of the missions of public radio is to partner with some of the non-profits in our city, including the smaller grassroots organizations that have minimal resources. There's so little live drama outside of Garrison Keillor (Minnesota Public



Andreu Honeycutt played the characters Fleance and MacDuff in a recent production of 'Macbeth.' WAMU's Andrew Chadwick works the control room in the background.

(continued on page 25)

accompaniment.

Rockville Music ([www.rockville-music.com](http://www.rockville-music.com)) provides live sound reinforcement and multitrack recording. WAMU's engineers handle the broadcast audio.

Martin begins working on the sound effects about two months before each broadcast. Some are performed live in the process known as Foley; others are recorded. For the latter, Martin builds a master cue track that also includes the musical underscore, working with two computers.

During the broadcasts, the actors are given time cues and there are also countdown clocks. The stage manager is responsible for making sure there's no time left over at the end of the play. "If we end up a little short," said Hansen, "we just ask the audience to keep clapping!"

Zavistovich prepared a guide for his new actors outlining the best techniques for emoting on the radio, a set of skills sometimes different from those required for a stage play. It is posted in PDF form at <http://radioworld.com/L&H>.

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## PROMO POWER

Mark Lapidus



After a long bike ride this weekend, my friends were quizzing each other about the music they'd been listening

to during the journey. The conversation was fairly pedestrian until the conversation transitioned to concerts. That's when the passion began pouring out them. The detail they remembered from shows that they had seen in now-distant decades was astounding.

During a dinner conversation a few hours later, my teenager hit me up for money for a spring concert. He

described the show as a potentially life-altering event.

It's clear that attendance at concerts touches a part of people that recorded music can't reach. How does radio in 2012 tap into this emotional reservoir, and compel us to inject ourselves with the concert experience well enough to print positive memories and induce vivid nostalgia?



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### PART OF THE EXPERIENCE

Connecting to concerts means much more than just promoting an upcoming show. While information is important — your audience relies on you for it — this simply meets their minimal expectation. To connect, you've got to become part of the conversation and experience.

Fifteen years ago, this meant covering the on-sale date by sending out the station van and doing call-ins from the main box office. Hundreds and sometimes thousands of fans would be in line to purchase tickets. Since lines are now virtual, the best way to be a part of the conversation is by using Twitter and your own airwaves.

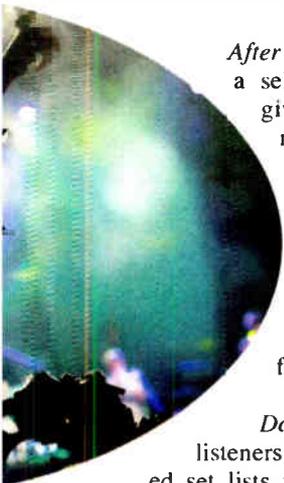
First, do a search to see if people are already tweeting about the show. If they are, that's great news because it means the established hashtag connects you to those interested. If there isn't a clear hashtag, create one — like #TobyKeithConcert — and start mentioning that hashtag on-air via your website and Facebook accounts. Your station personalities should be the ones interacting with those tweeting on a regular basis by offering opinions; memories of that artist's shows; links to special interviews on your website; times to listen to the station to win tickets; links to videos, trivia and polls.

This conversation on Twitter will come and go during the initial sale weeks, and then just before the show there will be another burst of activity, so remember to keep checking the pulse of the people tweeting.

### IDEAS

While ticket booths are so last century, there are many tried-and-true on-air angles to concerts.

*Pre-sale:* Feature the artist for an hour leading up to sale time. Could be all you play; could be every third song. Pre-record and air a short interview with the artist counting down the rush to purchase. Give away a pair of tickets every 10 minutes for an hour.



*After the sellout:* Have a sellout celebration by giving away a large number of downloads corresponding to your station frequency. “The next 99 people to text me at 68678 win an iTunes gift card for the latest from Foo Fighters.”

*Day of the show:* Have listeners email their suggested set lists for the band. While you can’t make any promises the band will use the list, you do promise to publish the best set list on your website, and give the winner an experiential prize they can’t buy, like a visit backstage to meet the band, an autographed lyric sheet or a special on-stage photo pass for one song.

It’s still wonderful to see a station’s DJs bring on a band; if you have the muscle to pull this off regularly, it’s worth the investment in time for your air personalities.

Live broadcasts in a visible part of a large venue continue to work well not just for the people who see you there, but for the audience who for whatever reason can’t attend.

*After the show is over:* Your station recreates the first 60 minutes of the concert by playing back each song performed at the show. While live versions match nicely, feel free to use studio versions if they’re better.

The key to this one is to pre-promote it properly so that as many concertgoers as possible know you’re doing it; they’ll listen while they’re stuck in the parking lot or on their way home. I worked at a station that did this after-show playback for so long that we built up a reputation with listeners as the station that replayed concerts.

To create next day tune-in, tell people to save their ticket stubs. Advise them to listen the next morning for stuff they can get for free. This could be free toppings on a pizza; 50 percent off another concert ticket or movie ticket; free desert at a restaurant; free admission to an amusement park — or something else from a client who wants to drive substantial traffic to their business.

Make it *your* business to put together your summer concert plan now. With this much lead time, there’s a good chance your sales department might be able to turn your plan into concert cash.

*Mark Lapidus is president of Lapidus Media. Email marklapidus@verizon.net.*

## LEAN & HUNGRY

(continued from page 22)

Radio’s ‘A Prairie Home Companion’), and I see a yearning for more culture in programming. LHT has a unique take on it.”

McDonald envisioned these plays being performed before an audience from the start.

“We broadcast ‘A Midsummer Night’s Dream’ outdoors live,” he said. “Fortunately I’m blessed with versatile and creative technicians who can carry

this off. So much in the commercial world has to be profit-driven, and my listeners tell me that they want us to try things outside of the box.”

For Hansen, the excitement comes as the plays are performed.

“We like to find performers who are able to create unique character voices and bring something magical,” she said. “You hear the theme song start up and the actors making Shakespeare come alive. It’s fresh and modern and the adrenaline is going. It never feels like an hour. Later, I’ll listen back and be surprised again by the beauty of Juliet’s

speech, or how funny ‘The Merchant of Venice’ was.”

As with any non-profit, fundraising is an important component of its work. Support is solicited via the website [www.leanandhungrytheater.com](http://www.leanandhungrytheater.com). Lean & Hungry Theater recently received its first large donation, \$10,000 from immixGroup, a company that helps other businesses work with government.

As old Will himself put it in “Hamlet” about 300 years before radio was invented, “the play’s the thing.”

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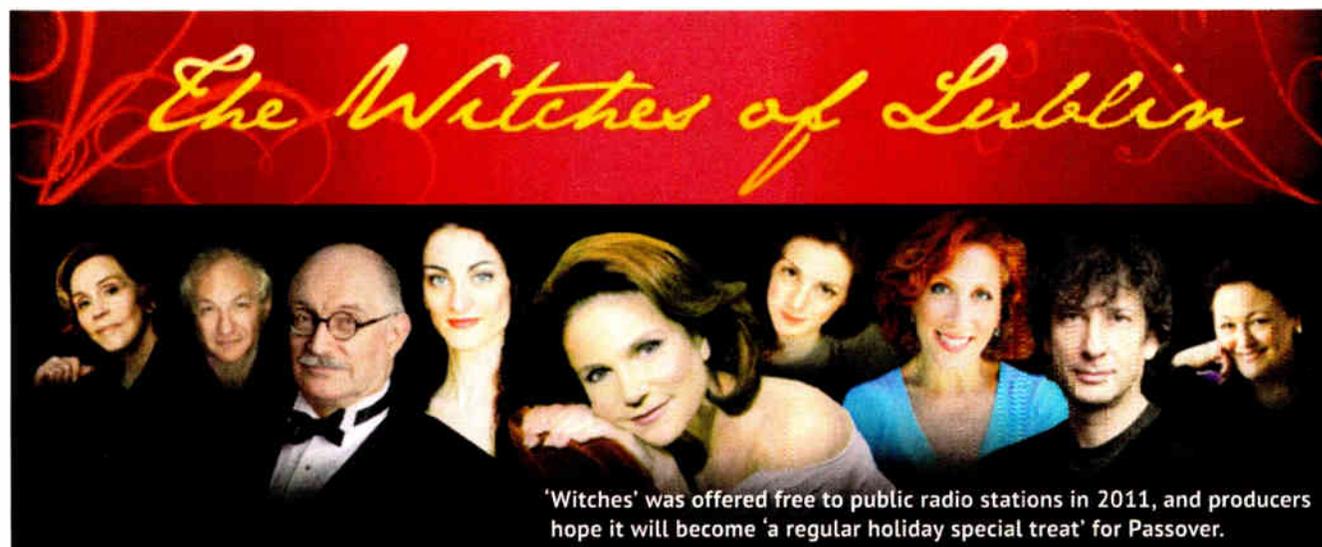


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# Recording 'The Witches of Lublin'

Audio Play Creates Sonic Portrait of an 18th Century Community



BY SUE ZIZZA

*The author is owner of SueMedia Productions.*

In producing the original audio drama "The Witches of Lublin" for the broadcast market, I wanted to create

## RADIODRAMA

a contemporary sound for the modern listening audience. I felt lucky to have had this moving and well-crafted play entrusted to me by its authors, and wanted to be sure that the sound served the story.

This meant considering the individual elements of the play, its voices, sound effects and music, and the best ways to record and mix them, so that they would transport listeners to 1797 Lublin, Poland, during the time of the Passover holiday, while engaging an audience used to the "cinematic sound" they hear in movie theaters.

"The Witches of Lublin" is based on research by ethnographer Yale Strom on the social history of klezmer music from the 14th century to the present day. In preparing his authoritative ethno-history "The Book of Klezmer," Yale found references to women who played at large market fairs, an extremely rare occurrence. This was the seed from which he and his writing partners, Elizabeth Schwartz and Ellen Kushner, took their inspiration.

As executive producer and director, I began to work with the play in June 2010 for release by April 2011. I first worked with co-authors Ellen, Elizabeth and Yale on fine-tuning their play so that the dialogue and sound design best served their story, while fitting into a one-hour broadcast window.

We then began considering the chorus of voices that was to make up the cast. I wanted to record the actors in the same studio to maintain the overall sound; I needed to cast from the talent available to me (and our non-profit budget) in the New York area.

We began with the powerful dramatic actress Tovah Feldshuh (Tony nominated for "Golda's Balcony") in the lead as Rivke. We then auditioned many talented voice actors until we found the

**I felt lucky to have had this moving and well-crafted play entrusted to me by its authors.**

right mix to represent both the Jewish and Polish communities. Among our featured cast are the gifted Simon Jones ("Hitchhiker's Guide to the Galaxy"), Barbara Rosenblat (Audie Winner for "Anne Frank Remembered") and Neil Gaiman ("American Gods").

By the end of September I was sure we had everything we needed to record, and that all I was waiting for was the recording date later in the fall.

### SONIC STORYTELLING

That is, I was sure until late October of 2010, when I attended Prix Europa in Berlin. Participating in its Audio Fiction Festival, I heard a somewhat different sound being produced by today's

actress was brought to a small private home, overlooking the shore, where she moved around the "set" performing the story while being recorded. The ways in which the house creaked and moaned as the actress moved added a layer of texture that brought the play to life for my ears in a new way.

When I got back I began to discuss with my recording engineer, David Shinn of SueMedia Productions, the fact that I did not want "The Witches" to have the typical close-mic flat studio sound heard in most American voice recordings; I wanted to capture the feeling of the place where these "Lublin" voices were, especially because some of the scenes take place in outdoor markets and large castle halls, with multiple characters and live music.

We agreed it would be best to record the actors at once in a large space, and to record the musicians in that same space in a live concert feel and not "wild



Elizabeth Bodsky works on 'Witches' in the studios of WRHU.

European-based audio dramatists.

Abroad, the art is still vital. At Prix Europa, producers from all over the continent gather for a week of intense listening, sharing and critique of contemporary work. What I heard was a kind of sonic storytelling that drew the listener right into the space with the performers. You could hear the "room" and even the world around the recording space, as some of these dramas had been recorded outside the studio and on-location. Those recorded in the studio seemed to pay special attention to keeping the sound open and alive.

The piece that won the Audio Fiction competition, "Shadow House" from the Finnish Broadcast Company, featured the story of a woman going through her late mother's home and packing up her belongings. For this play an

track" them — all so that the actors and musicians could see each other while performing and to maintain sonic consistency. We would still isolate individual tracks of the multi-track recordings of the voices and musicians, but that was for flexibility in post-production and not to separate them in the recording space.

This meant finding a space large enough to host nearly a dozen actors and five musicians. Thrown into this mix was the fact that one of our featured actors, Neil Gaiman, could not record on the same day (or even in the same city) as everyone else. Also our vocalist needed to be isolated from the musicians so that her tracks could be switched out when the actors needed to be the singers.

*(continued on page 28)*



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## WITCHES

(continued from page 26)

Hofstra University station WRHU (FM) has a series of recording spaces that can be linked together if needed. Being an alumna of the station as well as a former administrative and academic member of the School of Communication, I spoke with Station Operations Manager John Mullin, who was able to work out a studio schedule.

### SENSE OF CLOSENESS

In recording the actors David used large-diaphragm condenser microphones in a semi-circle in the largest studio, set up a minimum of three feet apart, keeping each microphone's polar pattern in mind to reduce coloration. Among the mics used for voice were Neumann U 47, U 67, TLM 193, TLM 103 and TLM 102, set up so that the actors, who had only had a quick table read together the day before, could see each other.

This is a story about a small Jewish community that has lived together for generations, and the Polish nobles who rule over them. The performances needed to convey a sense of community. Actors were given headphones so they could hear themselves and each other as they performed.

The exception was the actor who substituted for Gaiman. In order to maintain the overall performances, Lucien Dodge was recorded in an isolation booth with headphones so that he could hear the rest of the cast and they could hear him as he performed the character of Bogdan. This allowed us to replace his temporary tracks for the final ones recorded a few weeks later via ISDN lines from Minneapolis Public Radio studios to a studio in New York City.

David brought our Mac tower with ProTools recording software, and a separate dedicated backup multi-

track recorder, to capture all tracks. He recorded multi-track sessions so he could maintain whatever separation he was able to create with the placement of the microphones.

Because of budgets and schedules, the dialogue had to be recorded out of order in one nine-hour day. A production assistant, Eric Pahlke, notated each take on a master editing script, allowing us to reference recorded material for editing later.

The next day we set up for the musicians. As the story is about a small band



**Tovah Feldshuh played the lead character Rivke.**

**Simon Jones**

of female klezmer musicians (a vocalist, and players of the tsimbl — similar to a hammered dulcimer — bass and violin), our composer, musical director and violinist Yale Strom hired tsimbl and bass players (Alexander Fedoriouk and Sprocket, respectively).

In an audio drama it is rare that any song is heard in its entirety. I discussed with Yale the idea of recording each song in full and maybe even adding a few related tunes, for a companion program. That way an audience could hear the entire song, with Yale's original arrangements, and we could add a narrator to give historical information.

Yale oversaw the selection of musi-



We decided that we could blend commercially released sound effects with on-location sounds that we recorded in an almost 100-year-old house. Listening for trains, planes, automobiles and other sounds of 21st century life, David and I found we could record "house sounds" beginning at 1 a.m. Sound effects artists Silvana Pinto and Butch D'Ambrosio

were willing to work late at night to record the sounds we needed. David baffled the house with moving blankets, thick sheets of foam over windows and exhaust vents, and turned off noisy electronics (oil burners, fluorescent lights and refrigerators).

Using a Neumann TLM 193 and TLM 102 David was able to capture the many doors, chairs, footsteps, table pounding and more that were needed. These were then brought into the multi-track session which was mixed down to stereo for broadcast and CD replication and release.

In the spring of 2011, the program was offered free to stations through the Public Radio Exchange and PRSS ContentDepot, as well as on CD. It was heard on some 80 stations nationally as well as in Spain. For 2012 we are offering the program again for broadcast, hoping it will become a regular holiday special treat on many of our initial stations, and that new stations will want to pick up the one-hour audio drama "The Witches of Lublin" or the narrated musical special "The Devil's Brides" (or both) as a Passover holiday special. We also created five short (3:30–10 minute) music features from "The Devil's Brides," which stations are invited to use through the spring holiday season. "The Witches of Lublin," with its strong female cast and narrative, also makes a great International Women's Day special for March.

In December, AudioFile Magazine counted "The Witches of Lublin" among The Best Full Cast Productions for 2011. In February the Audio Publisher's Association nominated "Witches" for Audie Awards for Best Original Work and Best Package Design.

We're hoping this coming Passover could be the "best time for radio drama."

Sue Zizza is an award-winning audio drama director and producer. Projects include producing audiobooks and audio drama programming. She's a member of the faculty at NYU, where she teaches audio recording and sound design to film students at the Tisch School of the Arts.

Learn about the program at [www.thewitchesoflublin.com](http://www.thewitchesoflublin.com).

cal elements for the drama and for what became our second program, "The Devil's Brides." Elizabeth, Yale and Ellen collaborated on audio liner notes read by our narrator, British actress Miriam Margolyes. Since Miriam was in London, we worked with a studio in the U.K. to record her while I directed over the phone; the studio sent us the audio tracks via the Internet using FTP. Elizabeth Boskey performed vocals for the character of Sofia in "The Witches of Lublin." Vocals for "The Devil's Brides" were by Elizabeth Schwartz, a renowned klezmer vocalist.

For the musicians, David used a matched pair of AKG C 414s for the tsimbl, one for the treble side and one for the bass, and a TLM 193 capturing the sound overhead. The bass was recorded using a U 47 and U 67. For the violin he used the TLM 103. The singer was captured using a TLM 102. For the secondary tunes an accordion was added, played by Peter Stan. David used a Samson ribbon VR88 for the bass side of the accordion, with a TLM 193 capturing the treble side.

### OVERNIGHT RECORDING

After the primary voice and music tracks were completed, we turned to the sound effects needed to finish the sonic portrait of this 18th century community. Again I referred David to the recordings from Prix Europa, ones from Ireland and Britain in particular, in which the space played as much a character as any of the actors.

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*Telos*

[Telos-Systems.com/ProStream/](http://Telos-Systems.com/ProStream/)

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[OmniaAudio.com/AXE/](http://OmniaAudio.com/AXE/)

World Radio History

# Server Swap May Save You Grief

A Preemptive Move Can Be (Relatively) Stress-Free

BY AMANDA ALEXANDER

I don't know about you, but when I think of a server move, I think "Headache."

## RADIO IT MANAGEMENT

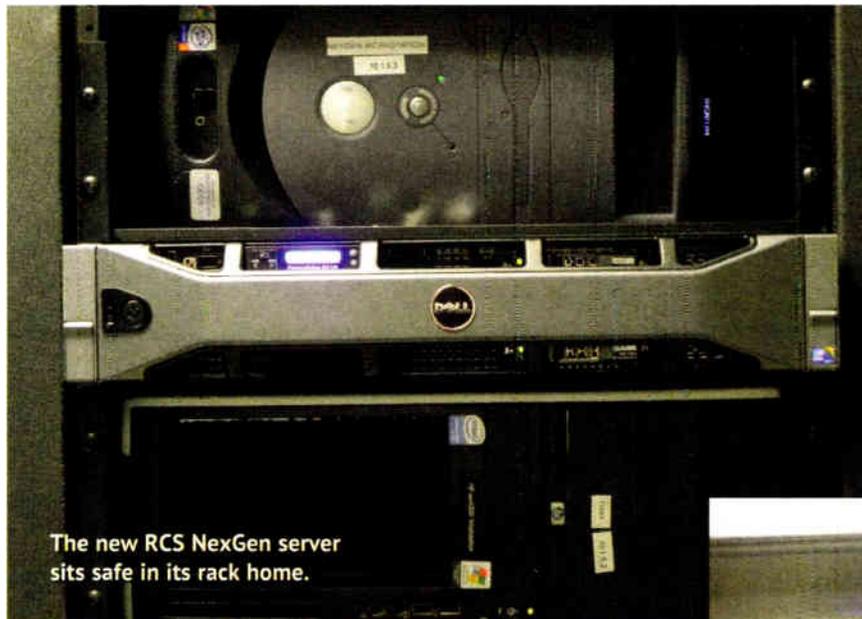
So many things can go wrong, especially if there is no real backup somewhere. If you have ever replaced a file server for a broadcast digital media system and only had one server to begin with, you might know my predicament.

At our Denver studio facility, a hub for four local stations, we operate with the RCS NexGen automation system, which in our case uses a single RAID-equipped file server.

To begin the process of preparing for the server move, I installed a second hard drive in one of our NexGen workstations. I then mapped the drive to all the NexGen computers so the board ops

and producers could begin transferring files they needed to keep, many of them sound files that are not necessarily part

of the NexGen database or library but are stored on the server nonetheless. In our setup, they save file pieces to the R drive, a mapped folder on the NexGen server. Over the years, files were forgot-



The new RCS NexGen server sits safe in its rack home.

have to put any control rooms that run live shows in emergency control room mode ("ECR," in NexGen parlance), and everything else in local database mode. What this meant for us was that we had to have two of our stations in ECR and the others in local database mode.

Because RCS informed us to expect two full days for this move, we had decided that in order to minimize the effect on paid programming, we would do the move over the weekend. We let everyone know when the move would take place so they could help us plan. One of our stations tends to air satellite programming as well as live programming on the weekends, and some of our weekend shows are church-oriented programs provided to us shortly after the services on Sundays. Accommodating the satellite programming and church programs would take some planning.

Saturday came and Director of Engineering for Crawford Broadcasting Cris Alexander and I headed to the



The last moments for the old RCS NexGen server as its files are copied over to a portable hard drive.



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ten and the amount of material on our NexGen server grew. We started off at just over a terabyte on the server.

### NEW DRIVE

After a week, the board ops and producers had deleted everything they did not need. I then copied over all of their files to the new drive. This brought the amount of material stored on our server down to 500 GB.

Next, I sent an email out and told our board ops and producers I'd begin deleting production files that had not been played or modified in a year. It took me nearly a full work week to get through all of our audio files, but in the end, I cleared out another 300 GB of space.

Then I started on the scheduling of the move. This involved several calls to RCS, mainly to check and double- and triple-check I was prepared. We discussed what to expect. They informed me that because we use a single server, in order to change out that server you

office to begin the process. While he was making sure everything on the file server was ready to go, I went around and began switching the control room workstations to either ECR or local database mode. I also switched the audio servers to local database mode. Then began the copy process.

We turned off the database on the old server and changed the IP address so we could avoid any mishap. We then moved the old server over to our office network so I could monitor the progress from home. We have an external hard drive that I use periodically to do a utility backup of NexGen. I cleaned off all the data and we used that to copy our database over. We were expecting a 6-8 hour transfer. As I monitored the progress from home, I was surprised. It only took five hours to transfer everything to the external hard drive.

Back to the office and we turned off the old server, took it out of the rack and

(continued on page 32)

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World Radio History

**SWAP***(continued from page 30)*

put the new server in. We plugged it in, made sure it was on the office network and then began to copy the database over to it. We were planning five hours based on how long the transfer took from the old server to the external hard drive, and that's about how long it took.

**FOLLOWING THE SCRIPT**

With that done, we headed back yet again and began the fun process.

We had to make sure the proper folders were shared on the network. Once we did this, we decided to bring the server up by itself on a switch connected only to a NexGen utility workstation. The idea was to make sure that everything was working before we put the server on the NexGen network. We didn't want to risk any type of corruption of the new server, which could happen if something was not configured properly.

Not surprisingly, it did not work. In Denver, we have some VB scripts that run on each NexGen computer. These scripts were around before my time at Crawford Broadcasting. They unmap the shared NexGen folders and then remap them, also checking for any updates to the NexGen system on boot-up. It was that script which didn't work, although it appeared to be running.

We had been working with the help of Stephen Poole from our Birmingham, Ala., cluster, who had done a server swap himself recently and created a cheat sheet of sorts for us. He was at a loss and was digging for answers.

I am an impatient person, so I decid-

ed to go to the source, RCS. I called up tech support and after a little while, we found that a VB script must run on the server for everything to work. We also found that the VB script caused a login. What this means is we needed to create another user account on the server (in addition to the admin user). So we did this based on the script and then proceeded to run the script on the server and the workstation.

BAM! There it was, all except for the Update folder. RCS tech support didn't really change anything. He edited the script to just change the name a little and it worked. He changed it back and it continued working. This is good enough for me. I am all for things working the way we want.

Now for the fun, putting the server back on the NexGen network and switching things back over. We were mainly worried about KLZ(AM), which is the flagship station for Colorado State University football and basketball, and there was a game being aired on this particular Saturday night.

In the past, when switching a station back to normal from ECR, we have always seemed to have trouble with things starting playing back again, usually from an hour earlier. So we decided to do KLZ last. We began with KLTT(AM) as it was in normal programming, with no live shows. That switch went seamlessly.

Then we did KLDC(AM) and it too was flawless. Finally, KLZ. We had to wait for when we knew there wouldn't be a break. We switched everything back and what happened? NexGen reloaded every spot from the beginning of the

**LESSONS LEARNED**

*Contemplating a server replacement in your digital media system? Here are thoughts that may help:*

**Clean House** — Board ops and producers are really good at forgetting about files and not cleaning them out, even with significant warning. Set aside enough time to get through all of your files. I recommend one full week, which may include working remotely from home or just longer hours, because as we all know, other problems tend to come up when we are trying to work on something else that is important. Remember, the less material on the server, the faster the swap will go.

**Pick Your Time** — Plan the server swap during a time when few people are at the controls. The fewer people around, the less you have to worry about.

**Don't Stress** — Do what you have to do to get the swap done. People will be unhappy about it; but they will get over it, especially when the move is over. And in our case, we doubled the amount of available storage and provided for full redundancy in the RAID array (RAID 10). That's bound to make everyone a little happier.

**Just Do It** — Server swaps are never fun. Someone always seems to scream about it because, let's face it, servers are used for a reason: storage. When one goes down, it affects someone. Don't let this keep you from replacing a server.

— Amanda Alexander

game! And we were near the end of the game when this happened! Thankfully, our board op had time to delete everything before the last spot block aired.

So the entire server swap took place in just 11 hours. No programming or air time was lost as a result. If it had not been for the help of my colleague Stephen Poole or the support folks at RCS this move would have been a bust. I definitely recommend never doing a server move for an automation system

without first contacting the provider and discussing in detail what to expect and to make sure someone will be around to help if need arises.

It is better to replace a server before something happens such as a power supply going out. If you can control when it goes down, you can minimize the interruption to other people using that server.

*Amanda Alexander, CBRE, is the chief engineer for Crawford Broadcasting Co.'s Denver cluster.*

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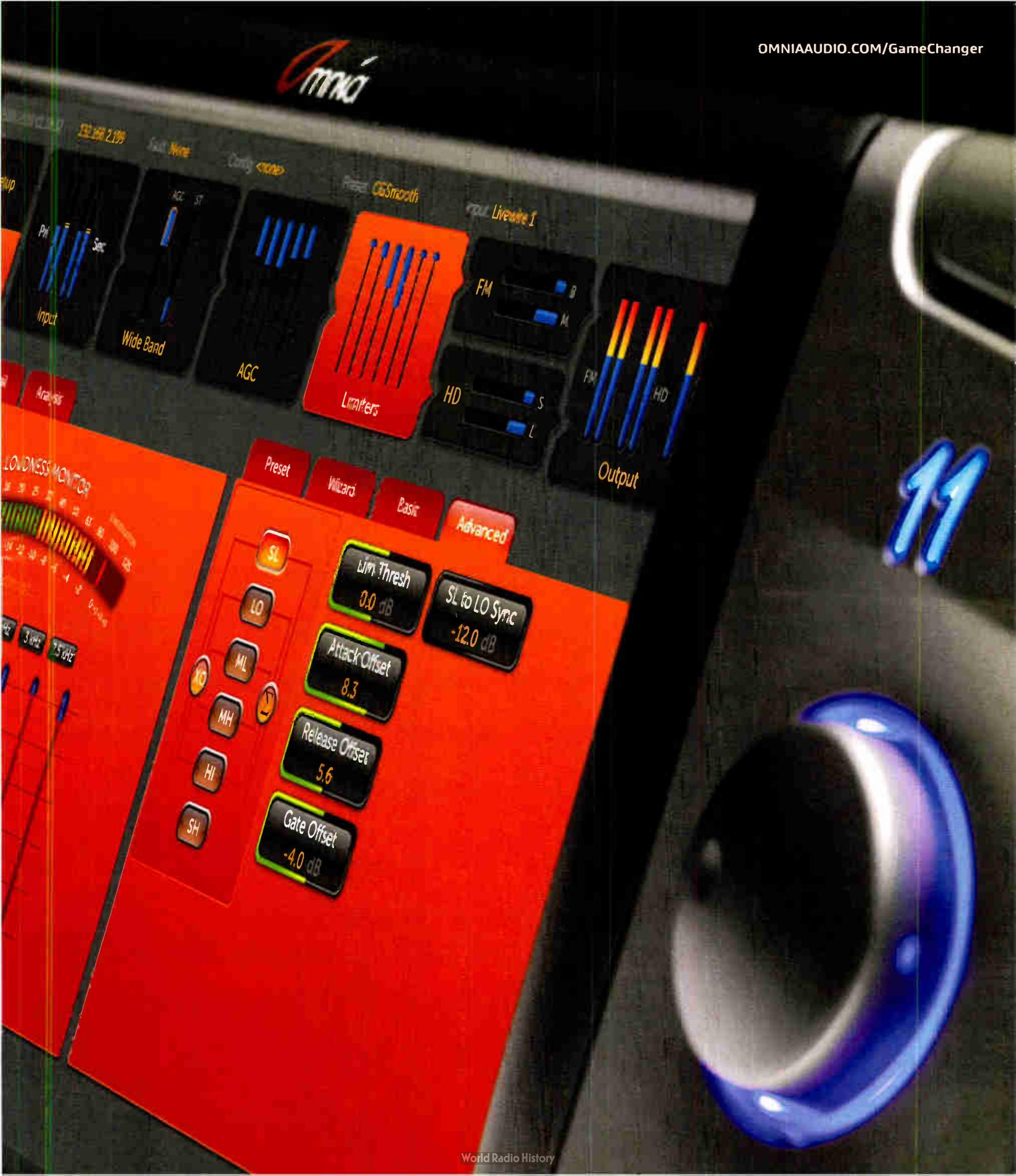
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# MARKET PLACE

**DYNAMIC MICS:** Audio-Technica, celebrating its 50th year, debuted a pair of handheld dynamic microphones, the ATM510 (left) and ATM610a (right).

These mics are designed for heavy duty live use, with beefed-up internal shock-mounting and metal construction. A multistage grille is aimed at knocking down sibilants and plosives. Inside A-T uses its Hi-Energy neodymium magnets.

The ATM510 is a cardioid mic. The ATM610a has a slightly better response curve and a hypercardioid pattern.

Both ship with a Quiet-Flex stand clamp, stand adapter and a protective carrying pouch.

Prices: ATM510 — \$169 (MSRP), \$99 (MAP); ATM610a — \$259 (MSRP), \$149 (MAP)

Info: [www.audio-technica.com](http://www.audio-technica.com)

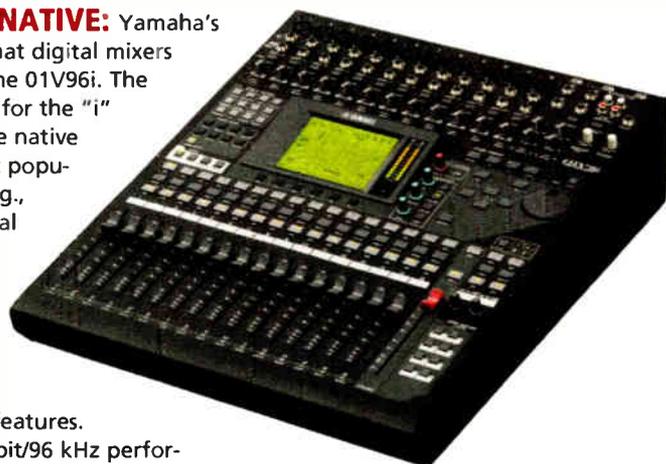


**YAMAHA GOES NATIVE:**

Yamaha's 01V line of small-format digital mixers has a new member, the 01V96i. The defining new feature for the "i" model is a single-cable native integration with most popular DAW programs (e.g., Pro Tools, Logic, Digital Performer). Yamaha includes Cubase AI6 installed in the 01V96i. Also new is USB 2.0 streaming and additional multitrack recording features.

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Info: [usa.yamaha.com](http://usa.yamaha.com)



**AES TO EAS:**

Looking to interface with older EAS systems that do not support AES and facilities wishing to add digital streams, Digital Alert Systems has developed the R198. The single RU R198 is an analog stereo in/four AES digital audio out A-D converter and distribution amp.

The rear has XLR ins and outs for each of four channels along with a master channel. Each channel sports a block connector as well. The R198 is remote controllable via built-in Web server. It is compatible with the DAS DASDEC emergency messaging platform.

Vice President of Business Development for Digital Alert Systems and Monroe Electronics Bill Robertson said the R198 "replaces numerous discrete components; reduces the cost and complexity of installation; and offers a simple, easy-to-use



solution for converting to AES audio and switching digital audio streams." Price: \$2,295.

Info: [www.digitalalertsystems.com](http://www.digitalalertsystems.com)

**MONITOR RECEIVED:** A new HD Radio monitor receiver is shipping. Inovonics said it received certification from iBiquity Digital Radio for the INOmini 632 HD Radio Monitor Receiver.



The \$850 box is described as a professional-grade FM and FM/HD-Radio receiver for off-air monitoring at stations multicasting FM and HD Radio aux channels 1-8. Analog FM and HD Radio digital programs are accompanied by digitized text and "housekeeping" data. FM RDS and HD Radio PAD are shown on the front LCD display, along with read-outs of signal quality information.

A notable feature is "no-blend." If the HD Radio signal is lost, the receiver will not revert back to analog FM mode.

Info: [www.inovonicsbroadcast.com](http://www.inovonicsbroadcast.com)

**RDL REPEATS:**

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Info: [www.rdlnet.com](http://www.rdlnet.com)



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Photographs of old KOMA-AM radio station building located at 820 S.W. 4th in Moore, Oklahoma circa 1970 until date of demolition. [kentverbeck1@yahoo.com](mailto:kentverbeck1@yahoo.com).

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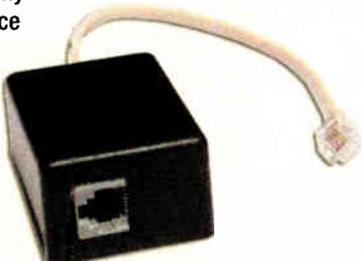
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READER'S FORUM

THE LUCK OF THE COOK

Wonderful photo and accompanying history ("KSFO Staff Photo, 1942," Jan. 18). I was born in '42. My dad served in the South Pacific aboard the Navy refrigeration ship Delphinus (AF-24) as radioman.

He tells how one of his duties was transcribing news headlines picked from stateside AM broadcasts, and delivering them to the ship's captain. KWID might very well have been one of those stateside stations.

He adds that late-breaking stateside sports scores were like currency. He regularly gave them to one of the ship's cooks in exchange for hand-delivered coffee and sandwiches (the radio shack was at the top level of the ship). Evidently there was a bit of wagering on sporting events among the crew, and this particular cook had an amazing run of luck ...

René White  
LIZMAR

Redwood City, Calif.

Author John Schneider replies: Thanks for the comments. I loved your dad's story about the cook! If you want to know more about KWID and other wartime shortwave stations, you may find my article on the subject interesting: [www.theradiohistorian.org/wcsw/wcsw.htm](http://www.theradiohistorian.org/wcsw/wcsw.htm).

A DIM RADIO OUTLOOK

Mr. Jurison, why have you wasted your time reviewing a radio using technology the public does not care about ("Insignia: A Glimpse of Artist Experience," Jan. 4)?

IBiquity continues to attempt to resuscitate IBOC

through ploys like "Artist Experience" but it is all for naught.

I believe the failure of HD Radio to gain any traction in the marketplace is a great example of what happens when a company tries to force an unwanted (and unnecessary) technology into the market.

I find it more than interesting, too, that this radio is made by Best Buy. Have you read the recent report in Forbes that predicts they will go down the same path as did Circuit City a few years back?

Terrestrial radio no longer has relevance to most people, when they can go to Pandora or MOG and virtually build their own programming. What, did you say I can't get weather reports or local news? Sorry, Mr. Jurison: These are pushed to my smartphone and my desktop simultaneously. And traffic alerts pop up on the GPS I use in my smartphone. Can your HD Radio station do all this?

I'm glad I do not own any radio stocks. Just as the birth of TV severely reduced at-home listening to radio, the birth of services like Pandora, MOG and others will kill off what is left of the commercial radio stations. I suspect the last ones standing will be the public radio and college stations at the low end of the spectrum.

Tim Britt  
Washington

The author moderates [www.fmtunerinfo.com](http://www.fmtunerinfo.com), a site that serves FM tuner enthusiasts.

FIELD LENGTH MATTERS

Big thanks to Al Jurison on his article about RDS text standards ("When It Comes to Text, Concise Display Is Best," Jan. 18). I standardized this with my announcers and programmers about four years ago.

With the WideOrbit SS32 V6.2.2 DSM32, you can get these nice professional-length fields; however it's

dependent on what goes into the cart labels and how the DSM as well as the SS32 is set up to make it all happen.

I will be sharing with my boss about field lengths. I set the field limits per artist and title fields a long time ago and it's been working pretty well.

We're one of the few stations in Michigan using RBDS to a fuller degree, more than most. I view everything on a standard eight-character display. If it shows well this way, then cars with big, full displays should show things better and more completely (like in the Yukon or Escalade).

Also, you might want to keep in mind how your field lengths work on your Web page. A lot of pages and apps use site applications like TuneGenie to put title and artist on a station's page via your RBDS data via an IP pass-through.

Making RBDS work with cars, home stereos, phone apps and Web pages definitely has set the bar higher for programming and engineering in today's multimedia environment.

Marvin Walther  
Chief Engineer  
Carroll Broadcasting  
Tawas City, Mich.

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# Happy 90th to WSB Atlanta

## Anniversary Recalls a Bustling Period of AM Licensing Activity

**BY JOHN LONG**

A number of legendary radio stations this spring are noting their 90th anniversaries, recalling a boom period in licensing in the year 1922. Among them is WSB(AM).

Radio in Atlanta, the South's regional railroad hub, was known mostly to ham operators at the time. But Maj. John Cohen, editor and publisher of The Atlanta Journal, had heard of the rapidly developing medium. Walter Tison, a young veteran who had been a wireless operator in the Navy during the recent world war, was looking for a job and met with a subordinate of Cohen's, John Paschall, at the paper. Tison shared his idea of building a radio station. Paschall became excited and recommended to Cohen that the newspaper build the south's first radio station.

Meanwhile, Tison, needing a job, signed on as a radio operator on a merchant ship. A few months later Cohen heard that the Journal's competition, the Atlanta Constitution, was planning to put a radio station on the air. In 1922 he ordered equipment and requested a license from the Commerce Department.

Using a transmitter hurriedly purchased from a ham operator, WSB signed on March 15, 1922, with 100 watts of power. The Commerce Department authorized the station to use radio call letters W S B and broadcast weather reports at 485 meters. It required them to hire a second class or higher licensed radio operator. Tison finally got the job for which he had applied a year before.

WSB was hailed as a "giant" then

and has never looked back. Even today on the crowded Atlanta radio dial, WSB, a Cox Radio station, consistently is on or near the top of audience ratings. For more, visit [www.wsbhistory.com](http://www.wsbhistory.com).

*John Long is retired after nearly 50 years in radio. He is co-founder and president of the Georgia Radio Museum and Hall of Fame. Visit [www.grhof.com](http://www.grhof.com).*



Henry Ford, seated, inspects WSB equipment at the Atlanta Journal building in 1922. Station founder Maj. John S. Cohen is at far right. The others from left are Montgomery Haynes, Ford district manager; Mercer Lee, secretary to Atlanta Mayor James L. Key; and L.W. (Chip) Robert, architect and civic leader.

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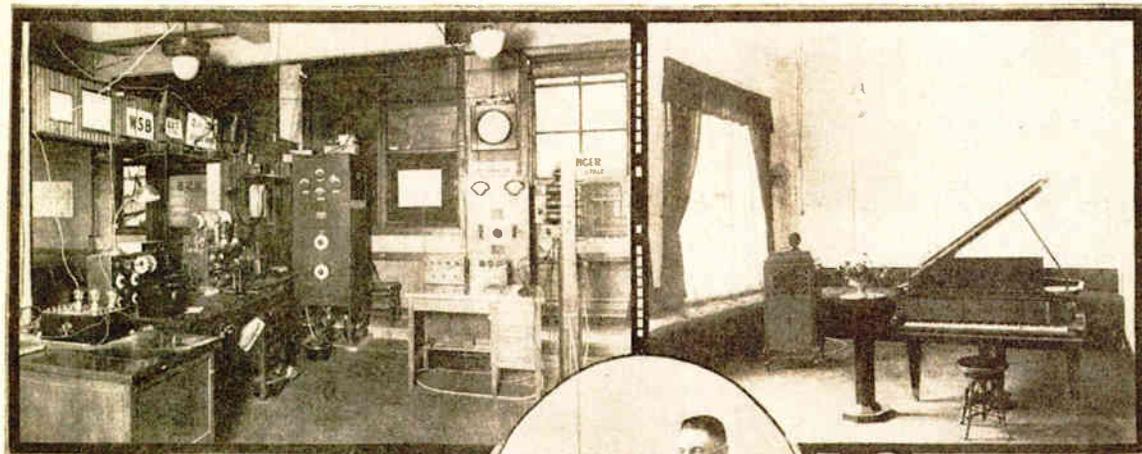
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Radio News for September, 1922

427

## A Southern Broadcasting Station W. S. B.



The New Transmitter at WSB, the Broadcasting Station of the Atlanta "Journal." The Station is Now Completely Installed with One of the Most Powerful Transmitters in the Country.

**T**HE Atlanta Journal, one of the leading newspapers of the South, was the first southern newspaper to recognize the significance of radio in the development of modern methods of communi-



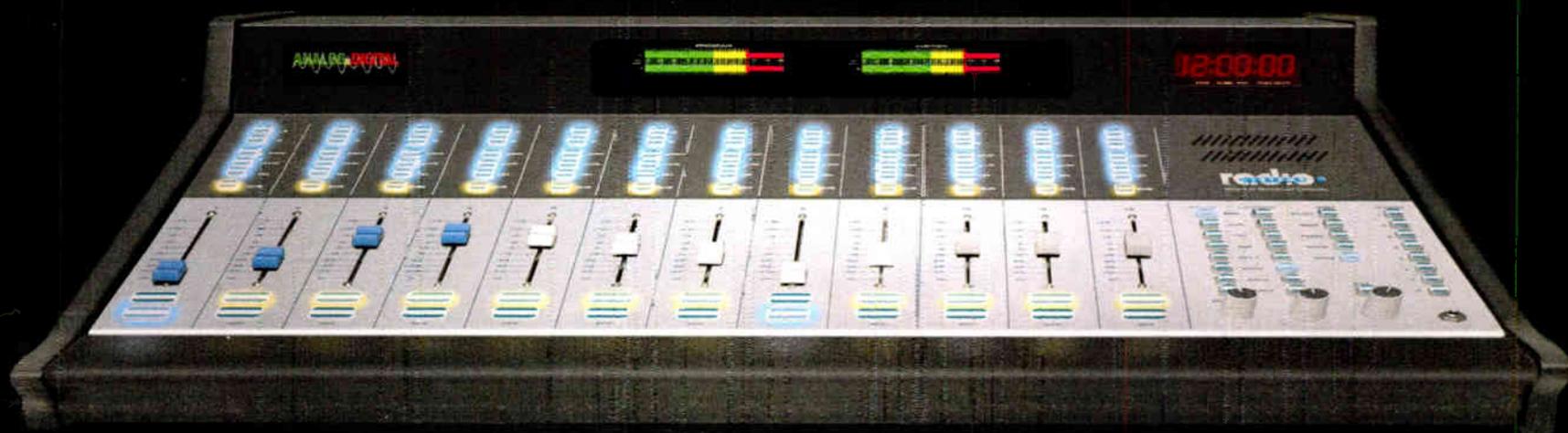
The Studio at WSB from Which Speech and Music is Broadcast. Note the Microphone on Top of the Phonograph.

bulletins, baseball returns, daily bedtime stories and recorded music are sent out on the ether waves. The principal program of the day is given at seven o'clock, consisting

Owl logo and Radio News courtesy The Georgia Radio Museum and Hall of Fame ([wsbhistory.com](http://www.wsbhistory.com))

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People say it's never been tougher to be in radio. We look at it a little differently. We think, while the challenges are great, there have never been more opportunities for radio than there are today. First, though, you need solutions that can handle ideas you haven't even thought of yet. Solutions that can enable your creativity without limitations. That's WheatNet-IP's Intelligent Network. With it, you're ready to drive your listeners to places they've always wanted to go but never knew how to find.



## THE WHEATNET-IP ENVIRONMENT



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