

*****3-DIGIT 85?
 S117298 DOB 9903
 TOM MILLER 892
 ASST CHIEF ENGINEER
 KTZR
 2033 S AUGUSTA PL
 TUCSON AZ 85710 7905

Who's Really Listening?

Radio researchers continue to hold out hopes for passive monitoring technology.

See Page 3

Transition to Digital

Radio Voyager Network moves into a landmark facility in Washington, D.C.

See Page 29

Radio World®

The Newspaper for Radio Managers and Engineers

July 7, 1999



INSIDE

NEWS

▼ The low-power debate rages on, and RW readers are in the middle of it.

See Page 5

▼ FCC Commissioner Gloria Tristani speaks about low-power, auctions and Littleton, Colo.

See Page 7



ENGINEERING

▼ Bob Henry's PVC AM Antenna for EAS is simple to build, and takes up a very small space.

See Page 21

▼ We dip into the NAB's new "Tower Site Regulation Handbook."

See Page 22

GM JOURNAL

▼ Laurie Cebula talks to Charles Osgood, winner of the Radio-Mercury Lifetime Achievement Award, about his career in radio.



See Page 39

▼ The Internet is a treasure trove of news sources for your radio station.

See Page 41

STUDIO SESSIONS

▼ The dbx 1086 microphone processor: affordable power.



See Page 49

NEWS ANALYSIS

GM, Ford, Clear Channel Boost Satellite Efforts

by Leslie Stimson

Will satellite radio succeed?

At least two of the nation's top automakers and one of the top 10 radio groups are taking the technology seriously enough to invest in satellite-DAB technology. Analysts said the alliances and investments improve the chances that pay radio services will successfully penetrate where consumers listen to traditional radio most — in the car.

works in some markets.

And a third potential supplier of pay radio service, WCS Radio Inc., has abandoned its plans to enter the market.

On the carmaker front, General Motors Corp. and Ford Motor Co. said they plan to include SDARS receivers in some car models roughly in the 2001 time frame. Ford has an agreement with CD Radio; GM's agreement is with XM Satellite Radio.



A Conceptual CD Radio in a Ford Lincoln

Technical hurdles remain, including receiver interoperability. But analysts believe these issues should not prevent satellite radio from launching in 2001.

Meanwhile, the proponents are proceeding with installation of repeater net-

GM and broadcast owner Clear Channel Communications Inc. are investing in XM, \$50 million and \$75 million respectively. Other announced investors in XM are DirectTV (\$50 million) and a private

See SDARS, page 10 ▶

Public Radio: An Eye to The Sky

Public System Debates Satellite Distribution Amid Changing Demands in Programming, Technology And Competition

by Eric Hoehn

WASHINGTON Public radio engineers and other executives face having to replace core transmission capability for satellite distribution of programming by January 2000 — three years early — because of last year's failure of the Galaxy IV satellite. The public radio system continues to debate how to best change the satellite program distribution system to limit the consequences should such a failure happen again.

At the same time, engineers and executives are looking at how to best allocate transponder space in the future as the number of program hours increases and the system is preparing to compete with and complement new

See SATELLITE, page 14 ▶

AM/FM

DTV

DAB

HIGH POWER

CEC

CONTINENTAL ELECTRONICS CORPORATION

EXCELLENCE IN BROADCAST TECHNOLOGY.

www.contelec.com

Visit RW Online at www.rwonline.com



◆ NEWSWATCH ◆

Sinclair to Sell Off Radio?

BALTIMORE Sinclair Broadcast Group Inc. has put its radio stations on the block. Sinclair is considering either selling the 51-station radio group outright, or selling the radio station's assets in a stock offering and still operating the stations. Sinclair hopes to raise \$175 million to \$200 million in the stock sale and use the proceeds to pay down debt. Sinclair also owns 58 TV stations. Sinclair trades on the NASDAQ stock exchange under the symbol SBGI.

Chancellor: Sell Outdoor Unit

After being in the billboard business for one year, Chancellor Media Corp. now wants to sell its outdoor advertising displays. Lamar Advertising Company has agreed to purchase Chancellor's outdoor unit for about \$1.6 billion in stock and cash. The cash portion of the deal is \$700 million. Chancellor owns about 42,500 billboards.

Chancellor's CEO of its AMFM Radio Group, James de Castro, said, "By further reducing debt through the sale of the outdoor assets, we are creating a more flexible finan-

cial structure, positioning the company to take advantage of growth opportunities in our core radio operations."

If regulators and Lamar stockholders approve, the deal is expected to close by the fourth quarter.

Infinity to Buy Outdoor Systems

NEW YORK The radio arm of CBS Corp., Infinity Broadcasting Corp., is getting further into billboards. Infinity has agreed to buy Outdoor Systems Inc. for \$6.5 billion in

stock. Infinity agreed to assume \$1.8 billion of Outdoor Systems' debt.

CBS and Infinity Chief Executive Officer Mel Karmazin stated, "The customers ... are going to be listening to the radio while they're driving to the mall, hearing the promotionals. Then they park the car and see the advertising in the mall just before the purchase. That's a whole lot more compelling a sales pitch than somebody getting ink on their hands from reading a newspaper."

If it receives regulatory approval, the deal would make Infinity the number one

See NEWSWATCH page 3 ►

DIGITAL TECHNOLOGY FROM THE COMPANY YOU CAN COUNT ON



AUDIOARTS
RD-12
DIGITAL RADIO CONSOLE
ENGINEERING

INTRODUCING THE LATEST RADIO CONSOLE FROM AUDIOARTS: three stereo outs, two caller superphone module, full-feature control room and studio modules, three VUs, clock, timer, optional intercom, preselect, tape remote panels—and it's **DIGITAL**. That's right, both digital and analog inputs and outputs! **INTERESTED? GET IN TOUCH**—with AUDIOARTS!

AUDIOARTS® ENGINEERING – 600 Industrial Drive, New Bern, North Carolina 28562
(tel 252-638-7000/fax 252-637-1285/email: sales@wheatstone.com)

FEATURES

Workbench: Tips to Limit Lightning Damage

by John Bisset

16

Our First Load: Tower Lighting

by Charles S. Fitch

19

The PVC AM Antenna for EAS

by Bob Henry

21

Know Your Antenna Site Inside and Out

by Ed Montgomery

21

Book Helps Manage Tower Sites

by W.C. Alexander

22

RVN Moves Into D.C. Landmark

by Alan R. Peterson

29

Answers to Your DAT Questions

by Jeff Johnson

30

GM JOURNAL

Osgood: A Life of Achievement

by Laurie Cebula

39

Agency Earns \$100K Prize

by Paul J. McLane

39

Janoff, Seeking a New Level

by Laurie Cebula

40

News Sources Available Online

by Kim Komando

41

KING Still at Home in Cyberspace

by Alan Haber

46

STUDIO SESSIONS

A Processor With the Right Stuff

by Michael Parks

49

Recording and Equalization Hints

by Bruce Bartlett

49

From Radio to the Simpsons

by Ken R.

50

A Library to Shake the Foundation

by Sallie Schneider Sauber

55

BUYER'S GUIDE

Enco Sends its DAD to Orlando

by Dennis Sloatman

57

Nome Turns to the Wizard

by Tom Busch

57

Opening the Vault at WTLC

by Dave Hood

58

Auto-Mate Provides Alternative

by Scott Bailey

58

Rapidfire Performs for Trombo

by Ray Reich

59

Nassau Loves Scott Studios

by Tony Gervasi

60

Holland Broadcast Loads the Music

by Hank Landsberg

60

CartWorks Serves WKXS(FM)

by Johnny Boswell

61

A New Universe from CBSI

by Troy Richards

63

Passive Monitoring Aids Ratings

Will New Technology Help Radio Broadcasters Ensure More Accurate Listenership Figures?

by Michael Hedges

GENEVA, Switzerland Television has used it for years, and now technology has advanced to the point where radio stations too can benefit from passive monitoring.

Two companies, one from the United States and one from Switzerland, are offering new ways to solve the age-old problem of finding out more about listeners. Advances in both miniaturization and data processing make the two systems practical.

There is still some question, however, as to what extent broadcasters and media buyers will accept this new way of surveying audience listening habits.

Since 1992, Arbitron has invested \$13 million in developing its Personal

data biased by perceptions and not reflective of true behavior. In addition, critics charge, the coding and editing processes potentially can create additional errors.

Passive measurement, which does not require the active participation of survey subjects, is the dream of researchers, broadcasters and media buyers. And it has the added advantage of measuring other consumer behavior at the same time.

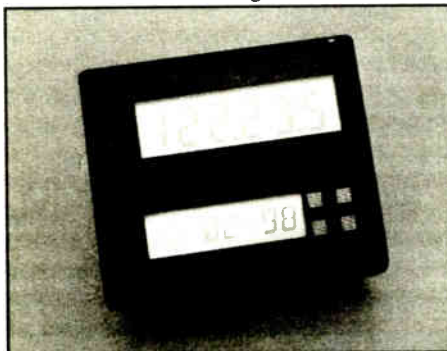
The two systems that have emerged are similar in that they both use sophisticated technology unavailable a decade ago. Companies on the leading edge of technology, including U.S.-based Martin Marietta and Leicht AG of Lausanne, Switzerland, were tapped to develop both software and hardware for the systems.

The Radio Control system from Swiss

100 bytes, Dähler said.

PublicaData has a centralized tracking station that records uncompressed samples of area radio stations throughout the day. Then a computer takes the 4 seconds of audio recorded by the watch and searches all the radio station data looking for some correlation between the music played by the stations and that heard by the person wearing the watch.

The PPM from Arbitron is an 82-cubic-centimeters pager-like device. It records an encoded signal, an inaudible



The PPM Monitor From Arbitron

code that is broadcast by the station.

Data from the PPM is downloaded daily via a docking station in the home of the participant.

Arbitron rejected the idea of a watch or other jewelry-like devices because focus

group studies indicated that women tended to resist wearing such an item all the time.

Arbitron chose encoding because it allows for any signal — FM, AM, Webcast, etc. — to carry the codes that provide the discrete identification data. However, PPM does require the participation of the broadcaster, who must install an encoding device at the transmitter site. Radio Control requires no such intervention by the broadcaster.

Dähler also said that because the Radio Control system compresses the data so thoroughly, and in a manner that discards a good deal of information, the original 4-second audio snippets cannot be reconstructed.

This design decision was made to calm fears of some critics who view Radio Control, and all-passive measurement devices, as a means of monitoring personal activities.

More accurate audience measurements are a hot commodity for both broadcasters and advertisers, because advertising rates and spending depend on audience levels.

With the technical ability at hand to better measure radio listenership, particularly listeners on the move, media buyers will be able to view radio audiences more accurately and in greater depth.

However, providing greater audience details means increasing costs.

"It is not just a research question," said Guyther, "it is economics. It is harder and harder to get high-quality surveys."

See ARBITRON, page 8 ▶

With the PPM, radio and TV will be measured through the same device concurrently.

— Jay Guyther

Portable Meter.

"TV has passive measurement," said Jay Guyther, Arbitron vice president in charge of PPM development. "With the PPM, radio and television will be measured through the same device concurrently."

Industry specialists have long criticized diaries and telephone surveys as flawed techniques for audience research. The critics say these methods rely too much on the memory and active participation of survey respondents and yield

firm PublicaData uses a watch-like device that samples audio digitally, compacts the data and then stores it.

Manuel Dähler, head of radio research for the Swiss Broadcasting Corp., parent company of PublicaData, said that the watch can track listening habits for an entire week.

The watch opens its built-in microphone for 4 seconds at pre-set times during the day. The recorded audio is then compressed from about 12 kilobytes to

NEWSWATCH

▶ NEWSWATCH, continued from page 2
outdoor ad company in the U.S. as measured by revenue, according to The Wall Street Journal.

Westwood One, Metro to Merge

NEW YORK Westwood One Inc. has agreed to acquire Metro Networks Inc. for about \$900 million in Westwood One common stock. Under the agreement, each share of Metro common stock will be converted into the right to receive 1.5 shares of Westwood One common stock. Westwood will issue about 26 million shares valued at \$900 million, based on a Westwood share price of \$35. Metro has no outstanding debt.

Joel Hollander, Westwood One president and chief executive officer, said that combining Westwood's news resources and affiliate distribution base with Westwood's Shadow Traffic and now Metro Traffic's resources and distribution system would further serve affiliates as well as providing "new and improved plat-

forms" for Westwood's advertisers.

The deal, subject to regulatory and shareholder approval, is expected to close this fall.

Public File Papers Eased

WASHINGTON The FCC has again modified its main studio and public file rules in response to broadcasters' requests. The rules were revamped last year to give stations more flexibility in locating their main studios. Now, stations that locate their main studios within the city limits of their communities of license will not have to mail their public files to listeners who request them by telephone. Stations also now do not have to mail the files outside their protected service contours, nor do they have to mail political files requested by candidates by telephone during election cycles.

The FCC has also clarified what e-mails must be kept in the public files; only those relating to station operations need to be retained.

SATELLITE SYSTEMS



Satellite Equipment for Radio

In need of thorough, reliable repair service?

Rely on Us!

Satellite Systems is respected industry-wide for prompt, accurate service to radio stations and networks.

Pre- and post-service technical support along with a 6 month warranty.

Turn to the leader in repair, upgrades, new equipment, used equipment and accessories. We can answer all of your questions.

Check out our Web Site!

www.satsyst.com

SATELLITE SYSTEMS

-Celebrating 8 Years Of Excellence-

615 East Brookside St.
Phone: (719) 634-6319

Colorado Springs, CO 80906
Fax: (719) 635-8151

Circle (3) On Reader Service Card

ARMA Learns the Ropes in A.C.

More than 500 people turned up to enjoy the sun, slots and sessions in Atlantic City for the 53rd Annual Convention and Mid-Atlantic States Expo, held by the New Jersey and the Maryland-District of Columbia-Delaware Broadcasters Associations.

Managers packed informative sessions about alcohol advertising, Web page revenue, branding and other important topics.

This regional show was of special interest because the American Radio Manufacturers Association managed the exhibit floor and organized the technical sessions. ARMA was formed last year by equipment makers, who feel they deserve a voice in industry issues and a chance to hold affordable regional conventions for their clients.

For ARMA, the results of this show were mixed. While show attendance was

solid, the technical sessions were not crowded, and some were almost empty. And although the organizers put together a very good exhibit floor for a show of this size, booth visits were few.

These issues should not be interpreted as a failure on the part of ARMA. These are growing pains, part of the process of learning to be an effective association and show organizer.

Last year, when it held its own show in Atlantic City, ARMA drew a relatively small crowd, mostly engineers. This year, the crowd was much bigger, but they were literally downstairs. Sessions were held one floor down from the booths, and attendee traffic did not move through the exhibit floor frequently. That's a problem that can be solved easily in the future.

Organizers also should understand what type of manager comes to a show like this.

In general, GMs, programmers and account executives will not be attracted to a session track with the word "technical" in the title. But the underlying topics are important to them, and sessions could easily be revised to fit that audience. Why should I spend money on digital automation? How can technology help me sell better? When will satellite radio affect my audience? What is the FCC doing about digital radio?

ARMA has a future. The association has almost 30 member companies. Spokesman Vince Fiola, a steering committee member, said several exhibitors spoke up at the end of the show to express support for ARMA and the show concept.

The association board agreed to continue ARMA as an entity, and is making plans for the next regional show. The steering committee hopes to hold an election for officers soon.

"We're learning from our mistakes," Fiola said.

ARMA is finding that it takes a lot of work and maybe a few bruised elbows and knees to really make an association succeed. But its goals are worthy. I hope the organizers will take the lessons of Atlantic City to heart, and apply them again to another regional show soon.

Exhibitors at the Mid-Atlantic States Expo:

Armstrong Transmitter
Audio Broadcast Group
Belar Electronics
Broadcasters General Store
CBSI Custom Business Systems Inc.
Continental Airlines
Continental Electronics
Davicom Technologies
Dielectric Communications
Energy-Onix
Fidelipac
Geode Electronics
Gorman Redlich Mfg. Co.
Lucent Technologies
Maryland Army National Guard
Media Touch
NJ Div of Highway Safety
NJ Div of Travel & Tourism
NJ National Guard
New Jersey Broadcasters Assn.
Potomac Instruments
Prophet Systems Innovations
QEI Corporation
Radio Computing Service (RCS)
Radio Concepts Inc.
Radio Systems
Scott Studios
Shadow Broadcast Services
Solid Electronics Laboratories
Systems With Reliability (SWR)
UPS
Wheatstone

From the Editor



Paul J. McLane

the industry must change with it or fall by the wayside. Thanks for leading the charge; we all need this wakeup call!"

What do you think the industry can do to improve our technical fluency? Send me an e-mail at pmclane@imaspub.com

Bill Ashley, a radio engineer and my former coworker at Bradley Broadcast Sales, dropped me a note about my comments in the June 9 issue, in which I called for an industry commitment to technical fluency.

"You're right on target," Bill wrote. "I was over at WFAX last night to fix a satellite demod card knocked out by lightning the other day, when their engineer Henry Stewart and I got into a discussion on how our duties have changed. Rarely anymore do we troubleshoot to the component level. Rather, we now work on systems and do board swaps, etc. Few radio stations today have the test equipment or expertise to troubleshoot the digital stuff down to the component level."

"It's a changing world, Paul, and we in

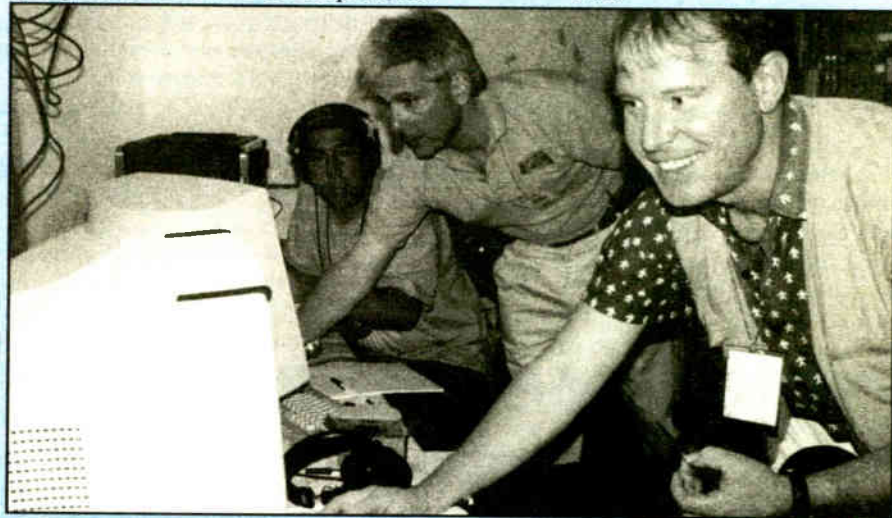
That's Not Steven Tyler!

Congratulations to the staff of Chancellor station KISS 108 FM, who pulled off "KISS Concert 20: The Big One" at the Tweeter Center in Boston last month to celebrate 20 years of playing hit music.

Sure, all the attention went to the likes of Elton John, Steven Tyler, Barenaked Ladies, Run DMC, Rod Stewart, Britney Spears and Donna Summer at the annual spring blowout. But at our request, the

WXKS-FM camera caught some other stars of the event, including station engineers Jeff Berlin, right, and Don Albanese, working behind the scenes.

The sellout concert raised an estimated \$50,000 for The Genesis Fund, a nonprofit organization that provides funding for the care and treatment of New England area children born with birth defects, genetic diseases and mental retardation.



**Relax...
AutoPilot[®]
is Engaged**

Burk's AutoPilot provides the SOLUTION to your transmitter remote control needs.

"It's almost like standing in front of the transmitter!"

BURK
TECHNOLOGY

1-800-255-8090 ■ Web Site: www.burk.com

The Low-Power Debate Rages on

RW recently published a sampling of opinions on the LPFM issue in the United States ("Readers Speak Up on Low Power." *RW*, April 28).

We have received an overwhelming amount of letters and e-mails. Here's a second sampling of opinions on this important topic.

Dear *RW*,

I feel my comment on LPFM is justified by my early successful establishment of an FM station (WKLS in Atlanta, on air Dec. 2, 1960) when most others were either shutting their FMs down or running automated out of a closet. We regret that many AMs are now relegated to automated closet operation.

Perhaps it's a lack of knowledge about digital broadcasting, but the LPFM and the AM problem, plus the attendant problem of community service could be solved if a separate digital band was established, and all AM and FM licensees were switched to that band over a period of time, possibly five to seven years.

They could, in that switch-over period, establish simulcasts of their services, eventually abandoning the FM and AM band. This would give both time and incentive for receiver and transmitter manufacturers to develop the equipment, and fix a definite time to work toward, engendering public interest and establishing fixed industry goals.

Most important, the opening of a new digital band would erase public confusion, make available considerable additional digital signals for use by smaller broadcasters, make the most economic use of the spectrum and expand the potential for community service.

I fully realize the investment by big-city FM broadcasters would be a dominant question, and broadcast associations would fight to retain the "traditional" FM band. In-band digital broadcasting seems to me to make poor use of the spectrum, adding to public confusion by placing two or three systems of broadcasting for public choice, and, worst of all, restricting the band to those already established through massive investment.

There could be an argument that the 50 kW stations would lose their wide broadcast area, but it's evident that the Internet, direct satellite and technical services yet to be introduced will take care of national information needs. Community needs in the form of local information and varied programming would be addressed by the FCC taking the initiative in establishing a separate digital broadcasting band, thereby making available scores of potential frequencies for use by not only the current FM licensees, but broadcasters willing to reach out to smaller audiences to provide specific music and informational services not always deemed profitable by the corporate giants.

LPFM raises interference questions, questions of coverage limiting service to widely distributed populations and the problem of holding onto traditional methods of broadcasting which will, in a short time after digital is at long last fixed in its final form and introduced, be considered excess baggage, as many AMs are today. We tend to forget that AM was king in years past and FM was an expensive, non-sponsored adjunct only barely tolerated by AM broadcasters. Such will

be the case with FM when digital is introduced. In-band may preserve FM and AM for a time, but at the expense of spectrum and service to the public that would be afforded with an exclusive digital band.

The FCC must, in my opinion, take the lead in this direction.

Don Kennedy
Atlanta, Ga.

'NAB's fear of the interference problem to be caused by the new stations is merely a smokescreen.'

Dear *RW*,

I am very pro-pirate radio. I wasn't until recently. I am not for all kinds of signals interfering with each other. I am for licensed pirates. I have turned in a few of the pirate operators in my area, but the FCC has turned its head.

America is a democracy, and the people speak out by putting on stations — illegal as they may be — because the licensed ones no longer fill the bill. You cannot stifle the right to free enterprise. Anyone can publish a newspaper, because there's no spectrum involved.

But as we now know, radio is mainly comprised of big conglomerates, which, because of their money and manpower, are hard to compete against. I tell you, with enough pressure, the FCC will drop its pants even more and allow the big boys to control entire markets — as they just about do today, as it is.

Conglomerates are just out to make a profit, which is certainly acceptable, but because they want it all, that kind of destructive greed is *not* acceptable. Soon, Arbitron ratings won't matter, when conglomerates own half or three-quarters of the stations in a given area, because advertisers will have little choice. Quality of programming won't matter as much, either, because no matter which station one listens to, it may belong to the same owners.

It's time for pirates to speak up. Since the politicians won't listen to those without big money, you'll have to speak in a language they will have to understand ... make your protest by civil disobedience ... on the air!

Shel Swartz
West Palm Beach, Fla.

Dear *RW*,

Bravo and all kinds of cheers for John David, NAB executive vice president, radio ("NAB: Low Power Is Dangerous," *RW*, March 31).

Radio World had better take another look — sure glad someone has the guts to tell it like it is. Thanks, John.

If they keep putting on more and more stations, *RW* and NAB won't need an office, they will need to be in the field to straighten out this wormy mess.

Ken Bryant
Operations Manager
WSLW(AM), WKCJ(FM)
White Sulphur Springs/Lewisburg, W.V.

Dear *RW*,

Glenn Finney's letter in the April 28 issue had the right idea, but he's thinking too small. Sure, new low-power FM stations could share a frequency — alternately going dark for 60 days and then resuming broadcasting for 30 days. But why stop there?

Let's do the same for talk stations, all-news AMs, Christian radio, country

Don't forget!
Readers Forum is now
on the last inside page
of *RW*.

tearing up the studio — a win-win situation for sure.

Yes! Bring it on. Surf the tuner; it will be changing every day.

Bill Moffett
Program Host
WDVR(FM)
Philadelphia, Pa.

Dear *RW*,

After reading viewpoints on low-power broadcasting from both *Radio World* and the NAB, I would like to say "Thanks!" to *RW* for its stunning endorsement of low-power stations.

To the NAB, I say, "Shame on you." The only "frontal attack" there is, is on the poor programming of corporate stations, more music and no-personality formats, and the "let's automate to get rich and who cares about the local listeners and radio personalities" attitude of today's radio gurus.

RW was right on track, pointing out that finally, the local market will be served and not ignored. Remember when radio stations didn't play the same songs over and over again? Remember

See LOW POWER, page 6 ▶

Expect The Best...

- Everything from Mics to Transmitters
- Exclusive non-factory source for PR&E products
- "One On One" personalized sales & service
- Fast FedEx shipping on all orders
- 39 years of equipping radio facilities nationwide

Your single source solution.



MAIN/MIDWEST OFFICE

Grand Rapids, Michigan
Voice: 800-999-9281
Fax: 616-452-1652
E-mail: support@abg.com

NORTH CENTRAL OFFICE

Duluth, Minnesota
Voice: 800-788-8759
Fax: 218-525-0455
E-mail: cgrace@abg.com

SOUTHEAST OFFICES

Mountain Home, North Carolina
Voice: 800-369-7623
Fax: 828-687-2601
E-mail: cindy_edwards@abg.com

Lexington, South Carolina
Voice: 800-951-7443
Fax: 803-951-3123
E-mail: jgeorge@abg.com

SOUTHWEST OFFICE

Palmdale, California
Voice: 800-858-9008
Fax: 805-273-3321
E-mail: tmezay@abg.com

www.abg.com

Circle (5) On Reader Service Card

Taking Sides on Low Power

► **LOW POWER**, continued from page 5
requests, dedications, playing songs not on the charts? Well, low-power stations will give the fun back to the listeners and the personalities.

The NAB's claim of interference is totally bogus. There are plenty of frequencies on the dial in most markets with enough separation from the big boys to not interfere. The NAB is simply lobbying for the corporations who are afraid of competition from the little guy.

*Jon Arthur
General Manager
X-Static Enterprises
Pensacola, Fla.*

Dear RW,

I thought it was time that someone from the programming side of the busi-

center. Present AM/FM simulcast owners would have a year to program those facilities separately or offer them to a pool of available facilities and auctioned to the broadcasters who would presently be candidates for the low-power stations. The result would be better utilization of existing frequencies, no new construction necessary, and coverage greater than the low-power FMs.

We really do have enough radio stations. Let's use all of them before building more.

*Steve Warren
Programming Consultant
MOR Media International Inc.
West Palm Beach, Fla.*

Dear RW,

I read with interest the comments in

vent, have either sold the FM side or kept it and are wanting to get rid of the AM because of limited daypart coverage. There is a special need in these areas for LPFM. The LPFM could, even at 1 kW, give coverage to the community of license and provide the owner with enough revenue to "make ends meet."

The second need of LPFM is in the area of education. Many private and small colleges would like to serve the community in which they are based, providing not only information for the community, but also serving as an important training ground for the future broadcaster, now limited to major universities.

The interference in metro areas would be a big problem, especially if the LPFM stations are in the hands of "wanna bees" that don't have the resources, or the desire to do commercial radio (such as the pirates do now). I certainly can foresee, with the help of the FCC, the FM band and the CB band becoming equals.

*Mike Seaver
Chief Engineer, KHQA-TV
President, Seaver Consulting Service
Hannibal, Mo.*

Dear RW,

I agree strongly with the editorial which conditionally endorses the LPFM concept. Sadly, it's gotten to the point where most commercial FM interests in this country either haven't got a clue or simply don't give a damn about providing programming which reflects the specific news and interests of their communities. This unfortunate fact amply demonstrates that FCC progress on a viable LPFM proposal is long overdue.

Rep. Tauzin's ludicrously overblown reaction to the commission's announcement of a LPFM rulemaking merely illustrates where the current problem lies: U.S. legislators and regulators long-corrupted by the overweening influence of a selectively regulated, fantastically lucrative industry.

It's useful to note that each adult in this

country pays, on the average, around \$75 a year in hidden "taxes" on various goods and services which are advertised on U.S. commercial radio stations. It's about time we received at least a modicum of broadcast program diversity and public service in return for our involuntary contributions to the industry's welfare.

*Curt Dunnam
President
Linear Research Associates
Trumansburg, N.Y.*

Dear RW,

It's a shame to hear NAB — "the voice of professional broadcasters" — call LPFM "chaos" and the FCC's proposal "dangerous." I've been in broadcasting for over 20 years — from electrical engineering to programming and sales — and have always admired the NAB until now.

The NAB is claiming that "radio program diversity has never been greater!" I find that very difficult to swallow, living in a town with a population of less than 200,000 yet having five FM rock stations.

My town has exactly zero channels available today. Even if my town had every channel available, on the FM band, it still wouldn't allow the church community to start a radio station. For over 15 years my town's church community has been trying to create a contemporary Christian radio station; however, the church community has continually been forced to sell out to large corporations (already owning many radio stations) with more money, because it's the law. Whoever has the most money wins.

You would think that if someone were to start a radio project by petitioning the FCC to allocate a frequency and have it granted, that they would be awarded for their efforts. Not today. Regardless of who spends all the money, time and effort to allocate a frequency in the beginning, anyone or any entity with more money will take it away in the end. It's the law.

I congratulate the FCC for wanting to change that law via LPFM. The current NPRM truly brings about "America's free, locally based communications medium" by not allowing a person or entity with an attributable interest in a full-power broadcast station, i.e. a large radio conglomerate, to have any ownership interest in any LPFM station in any market. LPFM offers my community some renewed hope for diversity and for creating a contemporary Christian radio station.

NAB claims LPFM will cause interference. There have been 460 full-power FM stations (grandfathered short-spaced stations) operating on second- and third-adjacent channels for many years, nationwide, with no interference complaints. If these more powerful full-power FM stations don't cause interference using the second- and third-adjacent channels, then LPFM stations certainly will not cause interference either.

*Mike Hoyer
President
DeForest Broadcasting Company Inc.
Madison, Wis.*

Dear RW,

I am in favor of the low-power FM proposal. I'm so sick of all the local stations broadcasting rock and roll music all the time, that I literally get sick when I turn on the radio, so I turn it off!

I happen to be 68 years old. My age group is increasing in numbers by the day. As a significant segment of the general population, our kind of music is increasingly being ignored by the huge corporate

See **LOW POWER**, page 8 ►

'LPFM offers my community some renewed hope for diversity and for creating a contemporary Christian radio station.'

ness weighed in on the subject of micro-radio/low-power stations being proposed.

There is another answer. No simulcasting. Once great and proud, AM radio stations are now being relegated to simulcasting the programming of their sister FMs. There are hundreds (if not thousands) of such stations providing absolutely no useful or unique programming to the markets they are licensed to serve. Often they only add a fraction of a share point to the "combo."

The FCC should eliminate simulcasting except in cases where the AM station provides no less than 20 percent of the combo share and is a separate revenue

RW concerning the "to-do" over LPFM.

Both sides have legitimate points, but both take the extreme. The NAB's argument reminds me much of the reasons given to the FCC for the need of spectrum for HDTV (yet to be invented); however, the concerns of local broadcasters to be able to cover ADI interference-free is very important.

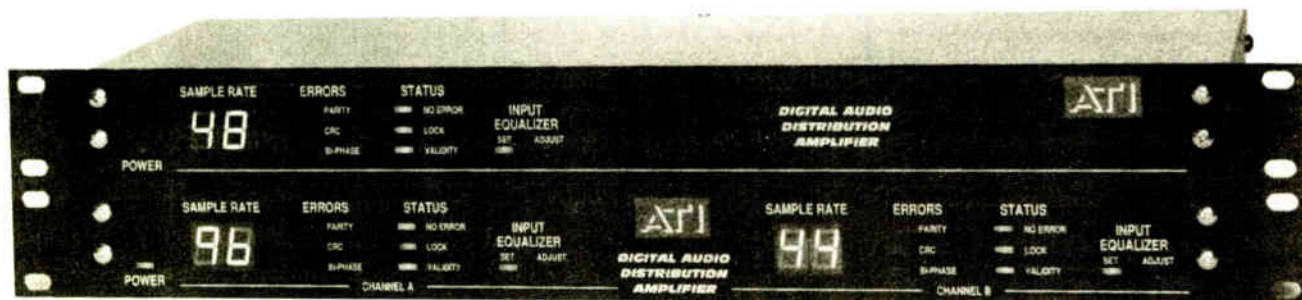
As a full-time television engineer and a part-time radio consultant, the need for additional channels is very evident, especially in rural America.

Out here, there are many 1 kW AM stations that are limited to daytime-only operation. Many, to stay financially sol-

AES/EBU DIGITAL AUDIO DISTRIBUTION AMPLIFIERS

**DDA106-XLR (1X6)
DDA112-XLR (1X12)
DDA206-XLR (Dual 1X6)**

**DDA112-BNC (1X12)
DDA124-BNC (1X24)
DDA212-BNC (Dual 1X12)**



- Accepts sample rates from 27 to 96kHz
- Data reclocking and regeneration
- Loop-thru inputs with switchable terminations
- Transformer balanced inputs
- Adjustable Input cable equalization
- Sample rate, Status and Error indicators
- Up to 12 XLR or 24 BNC outputs



**AUDIO
TECHNOLOGIES
INCORPORATED**

Dedicated to sound engineering
ATJ • 328 W. Maple Avenue • Horsham, PA 19044
800-959-0307 • 215-443-0330 • Fax: 215-443-0394
<http://www.atiguys.com>
Free Brochure Available Upon Request

NEWS MAKER

Tristani: LPFM Only a Proposal

ALBUQUERQUE, N.M. FCC Commissioner Gloria Tristani spoke before the New Mexico Broadcasters Association on several issues, including the commission's proposal to create a new low-power FM service. Before her nomination as an FCC commissioner by President Clinton and subsequent Senate confirmation, Tristani began serving on the New Mexico State Corporation Commission in 1994 and became chairman in 1996. At the same time, she helped to implement the 1996 Telecommunications Act at the state level.

The following are excerpts from her April 30 speech in New Mexico.

Littleton, Colo., aftermath:

One of the realities that this tragedy has focused our attention on is our violent culture. When you hear about these kids playing first-person killing games like Doom for hours on end, the studies about how our kids have become desensitized by media violence take on a new immediacy. That's why I am so pleased that the V-chip is finally becoming available.

'At this point, the whole idea of low-power radio is only a proposal.'

By July 1, half of all TVs sold in the U.S. must have V-chips installed; by January 1, 2000, all (TV) sets must have V-chips. Up to now, parents could not control their kids' viewing when they were not at home. Now they can.

The V-chip:

The V-chip is not a cure-all. By itself, it's not going to prevent another Littleton. But while it's not the whole answer, it might be a part of the answer — at least for some kids. It will give parents a modern tool for limiting the amount of violence and other objectionable material that their kids are exposed to.

The V-chip won't be a substitute for parents. It will empower parents to raise their children the way they see fit in today's world.

Broadcast auction rules:

As you know, Congress now requires us to auction broadcast channels — except noncommercial channels — when broadcasters file mutually exclusive applications. I'm glad that we have final rules so we can get these auctions going, and that we'll be able to start assigning new translator licenses again.

As you may know, there haven't been any filing windows for new translators since 1994. Now that the auction rules are in place, we can and should begin planning for a filing window that

will permit small rural communities to receive additional programming services — like some of the emerging networks — that are commonly available in larger communities.

... We have strict anti-collusion rules for most broadcasters who file mutually exclusive applications. That means that, in order to preserve the integrity of the auction process, broadcasters are generally prohibited from settling with one another or using engineering solutions to remove the mutual exclusivity once applications have been filed. But our recent order gave translators some relief from that rule, giving them a

period of time to try and find engineering solutions to mutually exclusive applications and thus avoid an auction. This is the effort that the mutually exclusive applicants who filed on June 1 are going through right now.

Low-power radio:

The radio business has undergone tremendous consolidation over the past few years. Since the 1996 (Telecommunications) Act was passed, the number of radio station owners is down about 12 percent, even though the total number of stations has actually increased by almost 4 percent. As



FCC Commissioner Gloria Tristani

the business becomes more and more consolidated, it gets harder and harder

See TRISTANI, page 12 ▶

ISDN Simplicity.



Broadcasting on ISDN doesn't have to be complicated or expensive.

The Nexus has everything you need for full-fidelity, low delay, mono audio on ISDN. And it is extremely easy to use. With a list price of only **\$2,300**, there's no need to wait any longer to sound great.

(800) 237-1776

Comrex Corporation, 65 Nonset Path, Acton, MA 01720
 Fax: (978) 635-0401 Fax-on-demand: (978) 264-9973
 Email: info@comrex.com

COMREX
 www.comrex.com

LPFM Opinions

► **LOW POWER**, continued from page 6
conglomerates that are gobbling up all the locally owned radio stations. Shareholders who live far away from the stations have no idea what's really being broadcast over the stations in which they have stock. In most cases, they don't know a note from a crash.

I say it's high time for a change in what's available on the radio. Since profit is the only motive that apparently motivates the majority of broadcasting stations these days, I submit that it's time to let someone else take over, and provide the kind of broadcast service to the public that will be pleasing to the listener.

Since low-power broadcasting does not require a huge budget on which to operate, and since there are those out there who are ready and willing to broadcast the kind of beautiful ballroom music to which we older folks prefer to listen, then I must say that I'm all in favor of the new low-power FM stations proposed by Mr. Kennard, and I applaud him for his courage in advancing this idea.

Furthermore, I feel that this idea should be extended to the AM broadcast band, as well, for the very same reason.

The central reason for any kind of radio broadcasting, as defined by the FCC, is public service. It seems as though the big conglomerates have forgotten this fact.

As far as interference potential is concerned, I reject this "old saw" that is used by the fat cats to justify their opposition to this proposal. If properly set up and regulat-

ed, interference to other stations can be completely eliminated. Low-power stations should be told, in advance, that a condition of holding their broadcasting license is that they not interfere with other stations; if they do, then their license should be revoked.

Ed Bolton
Harrisburg, Pa.

Dear RW,

Paul McLane's April 14 April Fool editorial, "Everybody Take a Deep Breath" was hysterical! I laughed until I cried.

Low-power radio will never benefit the urban folks who crave their own outlet (and who are driving this movement), because there are no frequencies available. In any case, the powerful broadcast operators who dominate the urban areas are strong enough to crush these fly-by-night dreamers and fringe elements.

The only effect of this proposal, if it is implemented, will be the destruction of local, hometown radio in small rural communities like the one we have served for the past 20 years. These communities can generally support only one local radio station. Adding a bunch of new radio stations in a town of 5,000 (such as we serve) can only have one possible outcome: the destruction of local broadcasting.

Again, your editorial was very funny. Hopefully, nobody will take it seriously.

Ed Stokes
President
Stokes Communications Corp.
Randolph Center, Vt.

Dear RW,

Regarding NAB's response to **Radio World's** opinion of LPFM:

Naturally, an organization whose charter is to protect the monopoly enjoyed by its members would find overwhelming reason to oppose any force that would endanger such monopoly. Until a protected commercial high-power major-market station sports an all-bluegrass format, I can't help but agree with the concept of LPFM — even to the extent that current stations lower their power in order that they don't interfere with the new stations.

Don Leaman
Gettysburg, Pa.

Dear RW,

As a retired radio station owner, I am in favor of LPFM if it will bring some diversity to our FM airwaves. FM has basically turned into a jukebox with commercials, and maybe a hint of news and weather.

Writers say the average person tunes in over three hours a day. Not me. At home I'm on satellite and in the pickup, I listen to CDs. My stations were local, serving the community, and I don't think you can say that now about most of our FM stations, so why listen? AM really isn't much better with mostly canned music and canned talk shows. If LPFM can change this, I'm all for it.

Ted Storck,
President
Storck Communications
Stevensville, Mont.

Dear RW,

The March 31 letter from the NAB's John David decrying the proposed advent of low-power radio stations, simultaneously decrying RW's support of the

FCC's proposal, is exactly what we've come to expect from the mighty NAB.

In the 1960s, the NAB was against FM stations that were not owned by AMers, to such extent that the indie FM broadcasters were compelled to form the National Association of FM Broadcasters (NAFMB) for the safety in numbers that could be derived from such, as well as for the advocacy of advertisers' use of FM radio when all the while the AM broadcasters were telling the advertisers that there was no benefit for them to place spots on indie FM.

The NAB hates competition. That is why it embraced the consolidations that have brought about the FCC's realization that it did America a disservice in creating the present situation where stations are no longer community-owned or -oriented. Programming is done from thousands of miles away, program diversity has been reduced, independent stations can't get advertising dollars and no individual can enter the field as an owner.

NAB's fear of the interference problem to be caused by the new stations is merely a smokescreen — a red herring with just enough of a basis upon which the NAB can hang its hat.

Oliver Berliner
General Manager
teleaudio centre
Beverly Hills, Calif.

The FCC has extended the comment period on its LPFM proceeding. Comments now are due Aug. 2 and replies by Sept. 1.

Send us your opinions on this or any radio issue. Send e-mail to radioworld@imaspub.com or write to **Radio World Readers Forum**, P.O. Box 1214, Falls Church, VA 22041.

The Replicator.
Digital Audio Delay Systems

System 6
RDS 2000
Traffic and Billing Systems.



The PHANTOM
Digital Audio Automation

Dependable, Affordable and
Available through S.C.M.S.--

With over 23 years experience serving the broadcast industry.

For more information or demonstration,
Call the S.C.M.S. **Phantom** specialists today!
Bernie O'Brien or Bob Cauthen
1-800-438-6040

1691 Forsyth St., Macon Georgia
Phone 912-745-5500
Fax 912-745-0500



New Ratings Research Tools

► **ARBITRON**, continued from page 3

Managing the research process is becoming more expensive, said Guyther, noting that the incentives Arbitron uses to encourage diary returns in the U.S. and other costs of data management are always increasing.

PublicaData currently surveys media use with comprehensive personal interviews. While survey participation in Switzerland continues to be high, passive measurement promises to be a



Manuel Dähler displays one of the PublicaData passive monitors.

cost-effective way of ensuring accurate listenership figures.

Although advertisers are interested in the future of passive measurement, many programmers are not yet paying attention to the new technologies.

In Germany, for example, Antenne Bayern Programmer Stephen Offierowski is more interested in the immediate change from one-to-one interviews to telephone interviews based on a diary planned by the German audience survey firm Media-Analyse e.V. (MA).

"This is the first thing on my mind.

MA is changing to a telephone interview," he said.

Neither Offierowski nor Rolf Mothil, program director of RS2 in Berlin, had heard of plans for passive measurement in Germany. But both were intrigued by the concept and prospects.

"This kind of (passive) system would be perfect," said Offierowski. "It would be brutal, though. Every program director would appreciate having real minute-to-minute information, but the sales people might not be amused."

Objective data

Mothil is enthusiastic about the prospect of more objective data and believes that anything that improves upon the current methodology is good.

"Measuring the ratings by technical means is the right way for the future. MA reflects image more than real usage," said Mothil. "It is pretty much the same thing as eating at McDonald's but not confessing it. The difference is that the guys at McDonald's do not care because they can count the number of sold burgers."

Radio Control testing is underway in Berne, Switzerland. Parallel measurement using both active and passive systems begins in Switzerland at mid-year with a total conversion to passive measurement in the year 2000.

The Arbitron pilot project in Manchester, England, with a panel of 300, started in June 1998.

Michael Hedges, a media consultant, reports on the industry for **Radio World** from Geneva, Switzerland.

ONE LOVES TO TRAVEL, THE OTHER PREFERS TO STAY HOME



ZEPHYR IS EVERYWHERE.

The irreplaceable Telos Zephyr has earned a hard and fast place in the hearts of broadcasters, engineers, and recording professionals around the world. Why? With its integrated ISDN terminal adapter, MPEG Layer 3 and Layer 2 compression technology, optional AES/EBU digital I/O, and an intuitive user interface, the Zephyr was designed by Telos specifically for broadcast audio applications over ISDN. It's the ideal solution for remote mixing and broadcasts, ad hoc networks, recording sessions, voiceovers, distribution of commercials, backup to satellite and microwave links, and nearly any other application you can imagine. How could anyone function in today's world without one?



ZEPHYR EXPRESS IS EVERYWHERE ELSE.



With its ground-breaking design and capabilities, the amazing new ZephyrExpress takes Zephyr's industry-leading operation wherever you need to go, and combines a full-featured ISDN codec and three digitally-controlled stereo mixers in a single, road-worthy chassis. With an unprecedented, easy-to-use interface and specs that blow away most studio codecs, the ZephyrExpress is like nothing you've ever experienced. Now you can hit the road without having to leave your Zephyr behind.



The Best Way to Hear from There™



Telos Systems • 2101 Superior Avenue • Cleveland, OH 44114 • Tel: +1.216.241.7225 • Fax: +1.216.241.4103
E-mail: info@telos-systems.com • www.telos-systems.com

Telos Systems, the Telos logo, Zephyr, and The Best Way To Hear From There are trademarks of TLS Corp.
Other trademarks are the property of their respective holders.

Circle (9) On Reader Service Card
World Radio History

Digital Satellite Radio Update

► SDARS, continued from page 1
investment group comprised of Columbia Capital, Telcom Ventures L.L.C., and Madison Dearborn Partners (\$75 million).

The total investment by the new partners is \$250 million in the form of convertible debt.

DirecTV is a unit of Hughes Electronics Corp. and a satellite TV service provider. General Motors Corp. is the parent company of Hughes.

In a related announcement, American Mobile Satellite Corp. agreed to acquire all of WorldSpace Inc.'s debt and equity interests in XM, to return XM to its previous status as a wholly-owned subsidiary of American Mobile. XM agreed to pay \$75 million in cash to retire additional debt.

The transactions were expected to close by the end of June.

Wall Street analysts said the announcements bolstered the viability for the pay radio services.

"Both companies are targeting to launch at the end of year 2000 and the first part of 2001," said Riyad Said, senior analyst, Friedman, Billings, Ramsey & Co., who covers the communications industry.

"It's a business that can support two players. They both have strong partners on the satellite side ... and other infrastructure components. (SDARS) represents an attractive distribution channel for content providers."

Analysts said XM's announcements have put that company into a better posi-

tion to raise the additional capital it needs to make its service operational. XM Vice President of Sales and Marketing Steve Cook estimated that figure at \$650 million to \$700 million.

CD Radio has raised \$1 billion so far and needs to raise about \$140 million more, said CEO David Margolese.



Computer Artist's Rendition of an XM Satellite Receiver

"For a development-phase company, CD Radio has been successful in raising capital," said Vijay Jayant, managing director, Bear Stearns & Co.

Wall Street sources and CD and XM expect more automakers to sign on with SDARS developers. Indeed, XM said it was in discussions with Ford.

Clear Channel is among those broadcast groups that have invested in USA Digital Radio, which seeks a terrestrial, in-band digital radio system. One source close to IBOC development said Clear Channel was "hedging its bets" with its XM investment.

RW was unable to compare Clear Channel's \$75 million investment in XM with its investment in USADR. Clear Channel officials did not return calls for this article.

XM would not comment on whether it is seeking investments by other broadcasters.

In the announcement, Clear Channel Chairman and Chief Executive Officer Lowry Mays stated, "We are always exploring ways of complementing our existing assets to produce value for our shareholders. Examples of this include our ongoing

Internet strategy, our investment in USA Digital and now our investment in XM Radio. ... We will soon have the further ability to serve entirely new categories of listeners and advertisers through this new, truly national distribution platform."

Clear Channel will provide XM with programming, but exactly what and how much had yet to be determined. Cook said Clear Channel would provide XM with programming and operational expertise but would not rebroadcast Clear Channel's 625 stations.

"We will work with them in generating unique content," Cook said.

A third potential rival for the pay radio service, WCS Radio Inc., has abandoned plans to enter the SDARS market. In its formal request to the FCC to withdraw its application to provide SDARS, WCS stated that the company "discovered more obstacles to launching SDARS than anticipated" and would use its spectrum for wireless services.

Sources said WCS could not get agreement from several of its spectrum holders to combine that spectrum to offer a nationwide SDARS service. Even if that were possible, WCS would have entered the market at least two years after the other SDARS developers, and possibly longer, thus hurting its chances of success, they said.

The car deals were announced within a week of each other. With people spending 75 percent of their driving time listening to radio, Ford is excited about the possibilities of reaching that audience, a spokesman said.

The automakers also hope to use some of the data channel for "telematics/infotronics," using the satellite link to deliver other information to the car such as traffic and weather information.

GM has signed an exclusive agreement with XM to equip its new cars and trucks with AM/FM/XM receivers starting in late 2001.

Ford plans to include AM/FM/CD receivers in all seven Ford brands: Ford, Lincoln, Mercury, Mazda, Jaguar, Aston Martin and Volvo. Mike Ledford, executive director of telematics at Ford, said the company would offer receivers on a few models first to test consumer interest.

Ledford said the receivers likely will

be standard in some models and offered as options in others. Ford expects to use existing receiver manufacturers for this project. Visteon manufactures receivers under the Ford brand name, as Delphi-Delco does for GM.

CD has announced receiver deals with Recoton, Jensen and Delphi-Delco. XM has receiver deals with Pioneer, Alpine, Sharp and Delphi-Delco.

Ledford said the first generation of original equipment manufacturer receivers would be stand-alones, with a "black box" containing the digital signal processing chip in the trunk.

Ford hopes to have those receivers ready in concert with CD's planned service launch in early 2001.

"The second generation will be completely integrated into the existing radio infrastructure, and there will be no separate boxes or any differentiation," Ledford said.

Margolese and Ledford said consumers should not notice the difference between the generations.

Ford's deal with CD is exclusive until March 2002.

Sources said both GM and Ford would receive a share of the monthly subscription fees levied by XM and CD, and both of those companies would help cover the added cost of receiver installation in the cars.

Antenna configurations for both have evolved in recent months. Both CD and XM are trying to make the car antenna less obtrusive.

XM is talking to automakers about how to integrate a 4 to 5 inch antenna into the receiver. CD has abandoned the early idea of a small silver-dollar dish in favor of seamless solutions. Margolese said the antenna could be integrated into the trunk area for OEM receivers, and he was "cautiously optimistic" the antenna would be invisible to consumers.

In after-market radios, the antenna "might look like a little patch, like a GPS antenna" that would be trunk-mounted.

CD claims it has a "meaningful first to market" advantage over XM, because CD plans to launch the first of three Loral satellites on Jan. 17, 2000, and become operational in early 2001. Margolese said that was almost a full year before XM's first planned launch at the end of 2000.

Cook said CD's "proposed launch timetable is sooner than ours. But you also have to have receivers built before people can start listening to it. We've targeted our satellite launch to more closely coincide with the availability of the radios from the equipment manufacturers."

Hughes and Alcatel are building the two XM satellites.

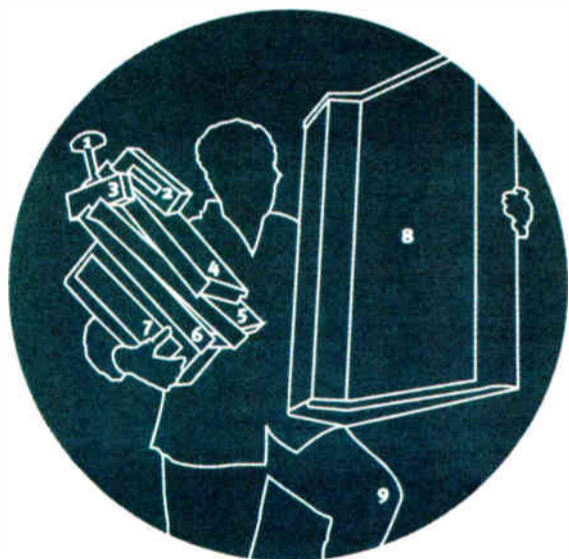
Retailers will offer so-called "plug-and-play" adapters for both services that can be used for existing radios, but manufacturers and XM and CD have said the bigger retail market will be the new receivers.

Margolese said 200 million cars and light trucks are on the road, and an additional 4 million new cars added every year. "Every 1 percent of that market we penetrate is a quarter billion dollars in revenue ... With two companies (offering SDARS) that's a pretty big market."

A source close to Wall Street cautioned that the companies' projections that they can break even with about 1.5 million subscribers each may not hold.

Traditionally, he said, the subscriber acquisition costs for subscription-based entertainment services such as cable and direct broadcast satellite services are higher than first anticipated. Typically, those services need to give incentives and discounts

See SDARS, page 15 ►



radio SYSTEMS

radio systems millenium products

- 1 CT-6 satellite receiver
- 2 CT-6 desktop clock / timer
- 3 CT-6 thin clock / timer
- 4 DI-1000 telephone hybrid
- 5 DI-2000 telephone hybrid
- 6 DA-4x4a distribution amplifier
- 7 CT-6 large clock / timer
- 8 RS-12a millenium console
- 9 MRS BRAVERMAN, company spokesmodel



601 Heron Drive, Bridgeport, New Jersey 08014, (609) 467-8000 voice, (609) 467-3044 fax, www.radiosystems.com

Circle (8) On Reader Service Card



STACK THE DECK IN YOUR FAVOR WITH NETIA'S RADIO ASSIST.®

From automating your incoming feeds to Windows-based traffic systems, Netia's Radio Assist® is the industry standard for station automation. So, if you didn't see us in Las Vegas, you can still win big. Call us toll free at

1-877-730-2616 or visit our website at www.netia-broadcast.com.



Circle (11) On Reader Service Card
World Radio History

Tristani on LPFM, Auctions

► TRISTANI, continued from page 7
for new people to get into the radio business and more tempting for existing owners to cash in and get out.

My colleagues and I have heard from hundreds of Americans who would like to use the airwaves to speak to their communities, but can't under our current rules.

Most of the people I hear from are not pirates or extremists. They're groups like churches, community groups and universities. Creating an outlet for those voices is what motivates this proposal.

The question then is this: Is this proposal the right way to advance that

goal? I can't stress this enough — at this point the whole idea of low-power radio is only a proposal. No decisions have been made. We are in the process of gathering the facts. ... I will not vote to do anything that compromises the technical integrity of the FM spectrum.

To me, proven interference and hindering the transition to digital would be valid reasons not to proceed with low-power.'

Protecting the integrity of the spectrum is one of the FCC's core functions. It is the foundation of the superior FM service that consumers enjoy in this country.

But, again, we need the facts. We need to know what the impact would be of not requiring low-power stations to protect stations operating on the second- and third-adjacent channels. We need to know about possible interference. We need to know about how this could affect your transition to digital. We're doing tests, and the industry is doing tests, right now. Let's see what the facts say before we draw any final conclusions.

To me, proven interference and hindering the transition to digital would be valid reasons not to proceed with low-power. But I've heard other objections to the proposal that I'm not as comfortable with.

For example, I've heard some people inside and outside the commission say that low-power isn't a good idea because we already have "enough" broadcasters. They say that there are already enough different formats out there to serve the public. They worry that additional stations competing for ad dollars will just make it harder for existing stations to survive.

"Enough" diversity:

On the point that there's already "enough" diversity out there, I'm very uncomfortable with the government making that judgment. I don't think the government should be in the business of rationing speech, deciding that we've got enough of one kind of speech and telling other speakers to go elsewhere.

... The issue of additional economic competition for existing broadcasters is a difficult one and one I struggle with. My staff and I have heard from many, many small broadcasters ... who worry that low-power broadcasters could siphon off ad dollars, making it difficult for them to survive.

Generally, I have a lot of faith in the market to produce the best results for the public. Free and open competition is what the 1996 Telecommunications Act is all about. But — and this is a big but — I believe that that competition must be fair. Many of you have said that you are willing to compete, but want to make sure that it's a level playing field.

I think anyone who's competing with you for ad dollars ought to play by the same rules that you do. That's why we proposed that 1,000-watt low-power stations generally would have to comply with the same Part 73 rules that you do. That means, for example, that 1,000-watt stations would have to comply with the public file rule, the main studio rule, political programming rules and the ownership reporting requirements.

We also proposed to require those stations to maintain the same operating hours as full-power stations, have the same EAS responsibilities, and follow the same license terms and renewal procedures.

Another way to get at this problem would be to make all low-power stations non-commercial. We asked about that option as well in the notice.

(Comment deadlines for MM 99-25 were extended to Aug. 2 and replies by Sept. 1.)



BSW
BROADCAST SUPPLY WORLDWIDE
Advantage

Audio Equipment for Broadcasters

- Best Price Guarantee
- Same Day Shipping
- Extended Hours
- Knowledgeable Sales Professionals
- Flexible Payment Terms

Great Sounding Telephone Audio

24-bit Processing for Crystal Clear Audio

Gentner's newest digital telephone hybrid provides the highest quality audio interface between your telephone line and audio equipment. With its state-of-the-art 24-bit digital signal processing, it's absolutely the finest hybrid for use with your digital or analog console.

Features:

- Three remote-accessible presets
- Auto mix-minus
- Adjustable compressor and expander
- Acoustic echo cancellation
- Balanced XLR inputs and outputs; AES/EBU inputs and outputs
- 3-band digital EQ

DH30 Digital Hybrid List \$1,995.00
SALE \$1,839.00





The Easiest Way to Get Calls on the Air



Telehybrid turns your phone system into a "broadcast-ready" telephone system.

Features:

- Installs to any phone set (analog, digital or multiple line) with a detachable modular plug
- Quality digital nulling for full duplex audio without echo
- Easy operation for on-air, off-air and disconnect

Telehybrid Telephone Hybrid List \$749.00
SALE \$679.00

Quality Telephone Audio at Low Cost

Interfacing your audio equipment to a telephone line has never been easier and more affordable. Gentner's analog and digital telephone hybrids are reliable and offer excellent audio quality. Choose between the SPH10 analog hybrid and two digital hybrids, the DH20 single and DH22 dual, each with 16-bit digital signal processing.

Features:

- Built-in monitor amp allows monitoring of calls without headset
- Balanced XLR inputs and outputs
- SPH10 auto filtering and equalization makes callers sound great
- DH20/DH22 with auto mix-minus, selectable AGC & caller ducking

SPH10 Analog Hybrid	List \$499.00	SALE \$459.00
DH20 Digital Hybrid	List \$995.00	SALE \$899.00
DH22 Dual Digital Hybrid	List \$1,595.00	SALE \$1,469.00



To Order Call 1-800-426-8434 Or Visit www.bswusa.com

The BSW Advantage

BSW guarantees to beat any competitor's printed advertised price within 30 days of purchase date.
BSW will ship in-stock items the same day if your order is received by 5:00 PM EST.
BSW is open 12 hours daily (M-F) - 9:00 AM to 9:00 PM Eastern Time; 6:00 AM to 6:00 PM Pacific Time.
BSW sales professionals have real-world broadcast experience to offer expert help with your purchase.
BSW offers a variety of payment methods including open net 30-day account to qualified businesses.



FREE 176-page 1999 catalog

DECIDE

To build a successful station and stay on top of the ratings, one decision is clear: The Omnia[®]fm from Cutting Edge. It's the processor of choice all over the world. Why? Because the Omnia.fm's 48kHz sampled operation, combined with a unique anti-aliasing final limiter, gives you audio quality that's more like the source and far superior to yesterday's 32kHz sampled

systems. And the Omnia provides rock-solid peak control, awesome loudness and unlike the outdated processors, absolutely *no digital grunge*.

But when the Omnia.fm is incorporated into transmission systems sampled at 32kHz, overshoots can result from sample-rate-conversions and their attendant low-pass filtering. Until yesterday's systems catch up to the Omnia.fm, the unit's built-in Prediction Analysis Clipper will predict and eliminate overshoots. The result? All the benefits of the Omnia.fm,

without the inevitable flaws of 32kHz systems. Check out the oscilloscope graphs to the left and see the results for yourself.

And to make your decision even easier, contact your Omnia.fm dealer for a no-risk, sixty-day demo and money-back guarantee*.

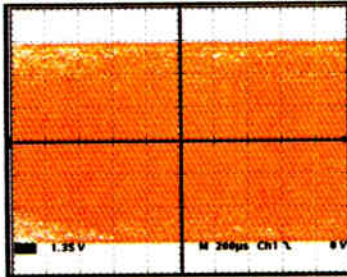
Here's how: Using program material, the Omnia.fm was set to process aggressively. Programming with substantial low frequencies and clean high frequencies was used to provide a good challenge for the control of overshoots. The analog Left Channel output was connected to a Tektronix TDS-744A digital storage oscilloscope, which was set to the infinite persistence mode. Each waveform was stored for at least one minute so that the display "fills in" with traces of audio waveforms.

The "flat" lines along the top and bottom of the filled in section represent clipper performance. Any "dots" that exceed the reference level of 0.650 volts are overshoots. The lower left graph shows "blips" representing overshoots 15 to 20 percent beyond the reference peak level of

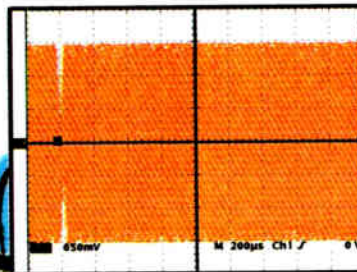
± 0.650 volts. The Prediction Analysis Clipper reduces overshoots in the sample-rate-converted signal path to an insignificant three percent.

For more information on the technical background of overshoot mechanisms, call us for a copy of our paper entitled "Omnia.fm: An Engineering Study." Or visit our web site: www.nogrunge.com.

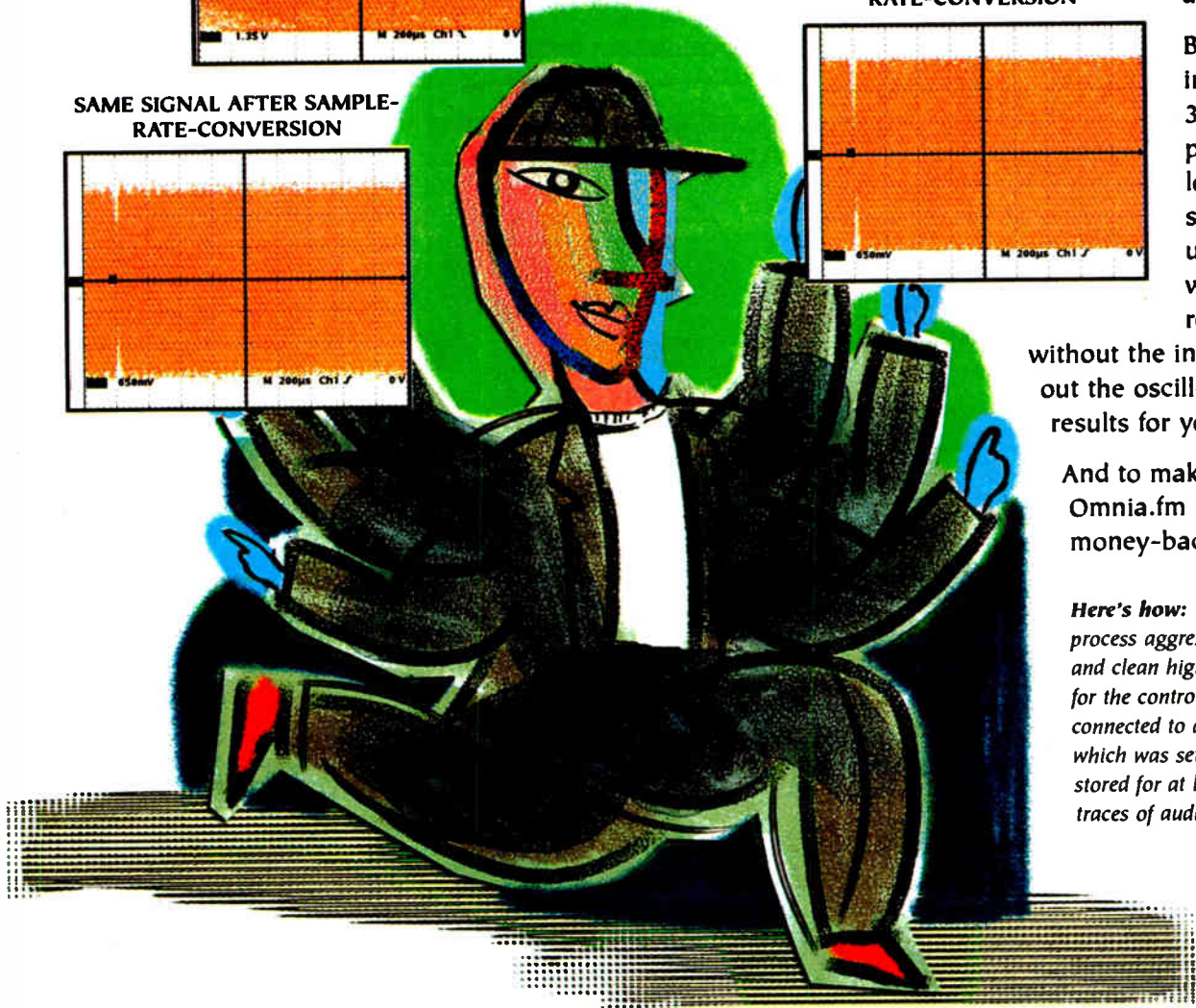
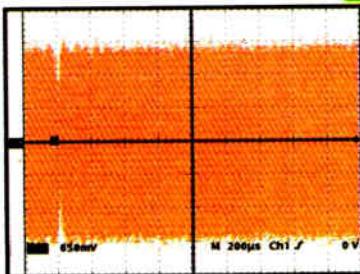
LEFT CHANNEL OUTPUT OF OMNIA.FM



LEFT CHANNEL OUTPUT WITH PREDICTION ANALYSIS CLIPPING AND SAMPLE-RATE-CONVERSION



SAME SIGNAL AFTER SAMPLE-RATE-CONVERSION



CUTTINGEDGE

2101 SUPERIOR AVENUE CLEVELAND, OH 44114 TEL: +1 (216) 241-3343 FAX: +1 (216) 241-4103 E-MAIL: INFO@NOGRUNGE.COM WWW.NOGRUNGE.COM

*Contact your dealer for details on this demo program. Demo requests must be accompanied by a purchase order so our dealers know you're really serious about some serious sound.

■ Audio Broadcast Group 3685 Roger B. Chaffee Blvd. Grand Rapids, MI 49548 Tel: +1 (800) 999-9281 Fax: +1 (616) 452-1652 e-mail: support@abg.com
 ■ Bradley Broadcast Sales 7313G Grove Road Frederick, MD 21704 Tel: +1 (800) 732-7665 Fax: +1 (301) 682-8377 e-mail: info@bradleybroadcast.com
 ■ Broadcasters General Store 2480 SE 52nd Street Ocala, FL 34480 Tel: +1 (352) 622-7700 Fax: +1 (352) 629-7000 e-mail: bgs@mercury.net
 ■ Broadcast Supply Worldwide 7012 27th Street West Tacoma, WA 98466 Tel: +1 (800) 426-8434 Fax: +1 (800) 231-7055 e-mail: info@bswusa.com
 ■ Crouse-Kimzey Company P.O. Box 155999 Fort Worth, TX 76155 Tel: +1 (800) 433-2105 Fax: +1 (972) 623-2800 e-mail: sales@proaudio.com
 ■ Radio Communications Unlimited 5509 Barrington Ooltewah, TN 37363 Tel/Fax: +1 (423) 396-3743
 ■ Caveco 1121 Bellamy Road, North Unit #10 Scarborough, ONT M1H 3B9 Tel: +1 (416) 438-6230 Fax: +1 (416) 438-1065 e-mail: bob@caveco.com
 ■ Marketing Marc Vallée 1067 Chemin St. Lambert St. Sauveur de Monts, QE J0R 1R1 Tel: +1 (450) 227-1828 Fax: +1 (450) 227-8394 e-mail: marc@vallee.com
 ■ All Electric 487 Cariboo Crescent Coquitlam, BC V3C 4X7 Tel: +1 (604) 945-5651 Fax: +1 (604) 945-5652 e-mail: allelec@dowco.com

Circle (13) On Reader Service Card

World Radio History

PRSS Acts in Wake of Failure

► SATELLITE, continued from page 1 technologies that have more options for program delivery and broadband connectivity.

Planning sessions

About 40 attendees met this spring to plan the future of the Public Radio Satellite System in a Public Radio Conference session titled, "When Galaxy IV Failed — One Year Later."

A year earlier at that very conference, many attendees were still recovering from the havoc caused by the failure of Galaxy IV on May 19, 1998.

National Public Radio operates the

PRSS on behalf of all public radio. The PRSS carries programming for about 425 downlink stations and another 200 to 300 repeater or associate stations that feed off those downlinks. Commercial radio customers also buy satellite time from PRSS.

Even before last year's conference, the PRSS had initiated planning based on the assumption that Galaxy IV would last until 2003. But because Galaxy IV failed, its replacement, Galaxy VI, will be retired in 2000 when a replacement satellite is launched. This means the PRSS now must replace its satellite link three years before it originally intended, by January 2000.

PRSS offers full-time space segment

on Galaxy VI, Transponders 1 and 3. The transmission method is Single Channel Per Carrier.

PanAmSat gave NPR transponder space on Galaxy VI to replace the two lost C-band transponders aboard Galaxy IV. The replacement satellite, Galaxy VI, was moved to the 99 degree orbital position within days of Galaxy IV's failure. This interim service arrangement is only good until a permanent replacement for Galaxy IV is on line, and that is expected in January.

Replacement funding was requested as a supplemental appropriation of \$48 million over two fiscal years from Congress.



NPR's Pete Loewenstein

The president signed the bill in May.

In June, NPR announced a programming deal with CD Radio, one of two license-holders to provide satellite-delivered digital audio programming services (see story, page 1). As part of the agreement, NPR would have several available channels that would be activated in an emergency to send a limited schedule to NPR downlink sites. These would be for NPR-only programming on the satellite managed by PRSS.

Planners must accommodate not only present use, but expected growth. PRSS expects to acquire replacement C-band capacity as well as some Ku-band capacity to replenish the loss of Galaxy IV and prepare for the third decade of operation.

The Distribution and Interconnection Committee of the NPR board and the NPR staff have been holding a series of meetings with station representatives to discuss issues related to the loss of Galaxy IV and models of how a future system might look.

While most stations recovered quickly from the failure of the old satellite, station engineers and the PRSS said it was

Get Better Jocks for Less Money

Decrease costs, *increase profits* and run your station more efficiently. Outside of drive time, why pay your talent to sit around *waiting* to talk? A Scott digital System can put all your songs, spots and prerecorded Voice Trax together smoothly and easily—without anybody in the air studio!

For years, Scott Studios' client stations have been successfully pre-recording incredibly live sounding fully localized 4 hour music shows in just 10-20 minutes. If you have a hub and spoke cluster of stations with similar formats and names (like Mix, Magic, Kiss or Kicker), you can sound great and save even more.

Scott Breakthrough: Free Software!

Thanks to Scott Studios' new *free* Voice Trax Via Internet (VTVI) software, announcers can phone in shows with studio quality from anywhere. All they need is a good microphone, mic pre-amp and processor, Internet connection, any Windows® computer with sound card and Scott Studios' *free* VTVI!

Simply schedule your station's music. With the touch of a button, your log and latest local copy points are automatically e-mailed to your announcers. And Scott's VTVI works seamlessly with all music schedulers and traffic/billing programs.

Live tags, trivia and copy are displayed automatically on the screen. Announcers don't need a clumsy copy book or liner cards. They can talk as early as they want before songs fade and over intros or in the clear. VTVI is so simple to use: a touch of the space bar triggers the next song or the next spot. Voice Trax are recorded with the computer's regular sound card with exceptional digital quality.

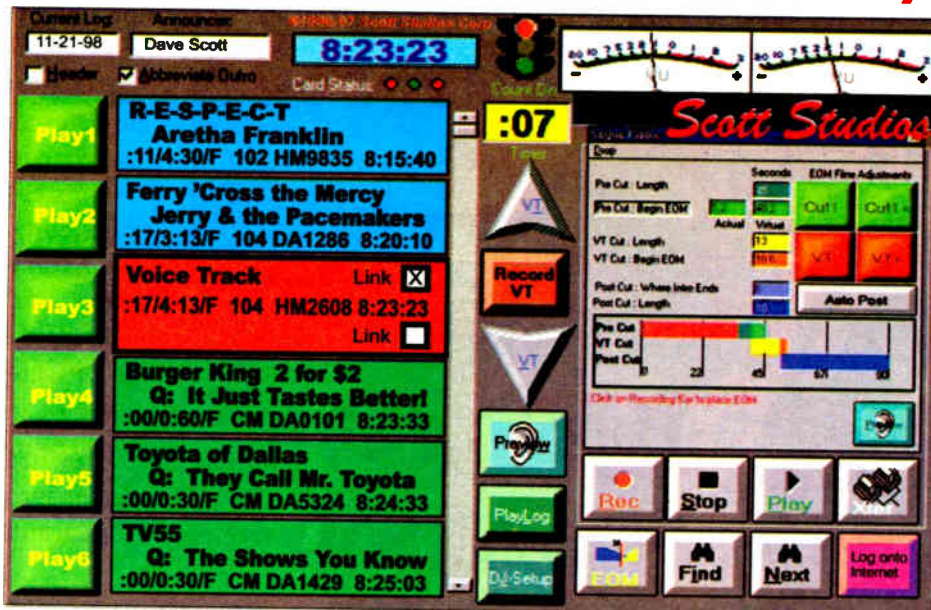
Unlike live radio, any or all of the Trax can be reviewed and possibly improved by re-recording. With the VTVI's Segue Editor, announcers can fine-tune their timing of song intros, back sells and donut spots without re-recording.

VTVI is Goof Proof!

VTVI includes Scott Studios' exclusive Voice/Music Synchronizer. Whenever the announcer mentions song title or artist, he or she turns on the link so the back sell or intro plays *only* with the correct song.

You Can Even Do Time & Temp!

Scott's VTVI lets you record every possible time check, or do a range of alternate recordings mentioning the time in any Voice Trax. The Scott NT System picks the right one at air time. You can also record all the seasonal temperatures and let Scott's optional temperature announce equipment play the right one at air time.



Here's Scott Studios' Voice Trax Via Internet (VTVI) software, shown with the optional Segue Editor. VTVI allows a distant announcer to pre-record a 4 hour show in about 15-20 minutes with nothing more than a Windows computer with an ordinary sound card, an Internet connection and a good microphone.

\$10,000 a Year Cheaper than WANs

When the announcer is done, a click on the VTVI Auto-Send button dials the Internet over a standard phone line and uploads the entire show to your Scott Studios digital audio system automatically. Transfer does take a long time, but your announcer can be answering e-mail, writing copy or creating promos on the VTVI computer while the show transfers.

VTVI isn't limited to music announcements. It gives high quality audio to recorded spots, remotes, weather, stock reports, news and election returns.

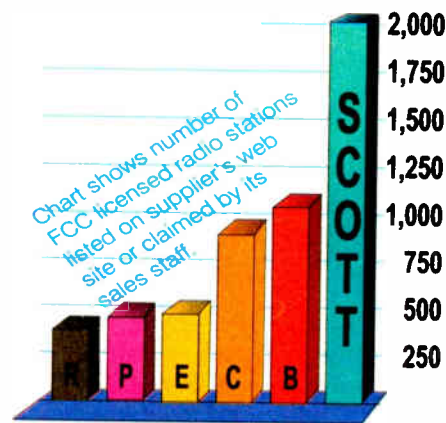
Your station will sound great with Scott VTVI! The only thing you need is an Internet connection on each end, a \$29 a month FTP transfer site and the Scott NT System with Remote Recording Router.

Voice Trax play seamlessly without anyone back at the station. And if the announcer forgets to record something, or if songs or spots get changed at the last minute, Scott's Voice/Music Synchronizer automatically substitutes a generic Voice Trax with the same voice for the day and hour of that break.

3 VTVI Models: Good, Better, Best

Scott Studios also offers a \$500 VTVI+ that sends your distant announcer telescoped song intros and endings via the Internet. With VTVI+, a telescoped aircheck can be previewed and fine-tuned in the context of starts and ends of songs and spots.

Or with VTVI Deluxe, your announcers record their Voice Trax *while listening to song and spot intros and endings* in context!



VTVI is just one of several ways Scott Studios digital systems can improve your sound *and* your bottom line.

It's a fact: More U.S. stations use Scott Studios than *any* other major digital audio system. 2,000 radio stations use 4,400 Scott digital workstations, including *major* groups like CBS, Chancellor, Disney/ABC, Clear Channel, Emmis, Citadel and many more. Last year, 418 U.S. stations bought new Scott Systems. That's more than chose some other "major" digital systems in several years! Call 800 SCOTT-77 to find out why Scott Studios are chosen the most.

Scott Studios corp.
 13375 Stemmons Freeway, Suite 400
 Dallas, Texas 75234 USA
 (972) 620-2211 FAX: (972) 620-8811
 Internet: www.scottstudios.com
 (800) SCOTT-77

NPR is meeting with stations to discuss the Galaxy IV loss and how a future system might look.

clear that more emergency preparedness is needed. The "space segment" can no longer be taken for granted by anyone.

Station engineers asked PRSS for several changes in satellite service in the aftermath of the satellite failure. The first change has been implemented. The NPR-to-station and station-to-station electronic contact, the so-called "DACs" text and data that is sent to stations via satellite, is now also delivered to the World Wide Web. Should another satellite outage occur, users would be able to get emergency information through their web browsers.

Audio restoration in the event of another satellite outage is a more complicated issue. The fastest restoration would be POTS telephone conference bridges, which can be activated immediately. While a POTS line does not provide the high-quality audio the stations are used to, it is "the least common denominator,"

See SATELLITE, page 15 ►

► **SATELLITE**, continued from page 14 said NPR Vice President, Distribution, Pete Loewenstein. He said almost every station should be able to get a POTS call on the air fairly quickly.

ISDN bridges, alternate satellites and other delivery systems that could be pressed into service were discussed, but attendees felt these alternatives would take longer to come online in an emergency.

New delivery system

An Internet-based delivery system was explored, but the cost of sufficient bandwidth to deliver all programs to all stations would be more than \$1 million per year, according to session speakers Loewenstein and James Paluzzi, general manager of the Boise State University Radio Network and chairman of the Distribution and Interconnection Committee of the NPR board.

Loewenstein also said that Internet delivery could not be guaranteed to be "glitch free."

PRSS is making plans for disaster preparedness and recovery for both earth-bound and space-based emergencies.

Y2K remediation is ongoing. PRSS is having all of the software that runs the system checked. Hardware is being tested and assurances from satellite vendor PanAmSat are in place. The stations have been surveyed about their Y2K status but PRSS is not responsible for correcting problems at the stations beyond the scope of the satellite system.

Satellite program distribution for the future was discussed. While the present "program pipeline" system has worked well, it may not be the best or only way to distribute programming in the future.



For programs that are not aired live, a different system might deliver those programs at a lower cost, or allow for easier make-goods if a station misses a feed.

In the so-called "program pipeline" system, programs are sent out as a continuous stream, which is recorded by stations for playback as needed.

Attendees said that one program distribution system that may save stations money is a "content depot" consisting of digital storage and audio delivery on demand for programs not needed in real time. A station's digital storage and delivery system would request a program from the "depot," then record it for later playback.

Leslie Stimson contributed to this story.
Eric Hoehn is chief engineer of radio for WETA(FM) in Washington, D.C.

Automakers Join Satellite Radio Push

► **SDARS**, continued from page 10 to keep steady growth, he said.

A technical hurdle remains before that money will start rolling in. The FCC has mandated that the receivers sold for SDARS must receive the signals of both companies so that consumers can have more choice. CD and XM are using different satellite configurations and methods of transmitting and receiving the satellite signal.

For that reason, in order to achieve interoperability, the companies would need two chips in each receiver, making the product more expensive. In general, the companies, automakers and receiver manufacturers believe the incremental price of the receiver must be well below \$200.

Lucent Technologies is designing and manufacturing the chips for CD Radio and S.T. Microelectronics is doing the same for XM.

Because of the interoperability requirement, CD and XM must cooperate. They said it will not happen in the first generation of receivers, but is more likely for the next. Both companies said they expect to achieve interoperability, but cannot now predict how and when.

How this would satisfy the FCC requirement is unclear. Several commission sources said interoperability is a condition of the SDARS license.

"We expect that they are going to comply with that or file a waiver and say why it's not possible," said one source.

When asked if cost would be an acceptable reason for delaying interoperability, the source said that, in general, when deciding whether to grant or deny a waiver, the commission looks at whether the waiver would undermine the policy and it also weighs the benefits to the public.

No waiver requests are before the commission, the sources said.

CD and XM plan to deploy terrestrial repeater networks so their signal can be heard in areas where the signal may be blocked by tall buildings or foliage.

CD plans to install about 100 repeaters and has completed deployment in San Francisco and is now working on Houston. XM has extended its agreement with LCC International to deploy 2,000 repeaters. Cooke said XM does not plan to build free-standing towers, but rather four- to five-foot fiberglass sticks that can be mounted on roof tops.

The patent infringement suit that CD filed against XM earlier this year remains undecided.

CD was installing equipment in new studios in New York. XM has yet to pick a site for its studios. Both plan to hire air talent and programmers.

CD also plans to devote \$100 million to an advertising and marketing campaign once its service is launched. Margolese said some of that money will be spent on traditional radio. "They'll take it, just as traditional TV has taken the DBS (direct broadcast satellite) industry advertisements."

PRSS Goals for Future Satellite Service

These are some of the key findings of the long-range planning efforts for PRSS:

- 1) A shared national system is still desirable to maintain control, reliability and convenience for the system users.
- 2) New methods of delivery including the 'content depot' should be developed.
- 3) Any new system should be 'automation friendly' since more and more stations are automated for all or part of their day.
- 4) Any future developments must be affordable for the suppliers and users of the system.
- 5) One size no longer fits all. Different types of users, and suppliers have different needs for level of service. There will be increasing use of custom solutions.
- 6) There will be a need for on demand access to content in addition to real-time broadcast.
- 7) More options for the 'first mile' and 'last mile' of delivery are coming on-line, but satellite still has the best point to multi-point model.
- 8) Program hours have tripled in the last decade and are predicted to continue increasing.
- 9) The system must remain competitive for quality and price.
- 10) The system must prepare for new technologies with more options for program delivery, broadband connectivity and remain flexible for changing technologies.
- 11) There is a changing dynamic between stations and producers. The present PRSS is 'station-centric' and as options evolve for content providers, the system needs to evolve with it.

Simple Connection

Simply connect to Broadcast Richmond for 200+ product lines integrated to your exact needs - from input to output.

As a leader in the supply of prewired program racks for AM, FM, & TV - and prewired console and mixer harnesses for air and production studios, our daily mission is to make your job simpler.

Our product expertise and equipment integration will save you time and money.

Simply Connect to the Turnkey Distributor...

BROADCAST RICHMOND

Tel 765-966-6468 Fax 765-966-5505 E broadcast@infocom.com
PO Box 1423, 1821 West Main, Richmond, Indiana 47375 USA
Connect to www.broadcast-richmond.com



Workbench

Radio World, July 7, 1999

Tips to Limit Lightning Damage

John Bisset

I remember studying about EMP, or electro-magnetic pulse, in school. It was hard to conceive that a pulse of energy could be that destructive without vaporizing everything in its path.

There's the old saying, "A picture is worth a thousand words." Figures 1 and 2 will curl any engineer's hair, and with

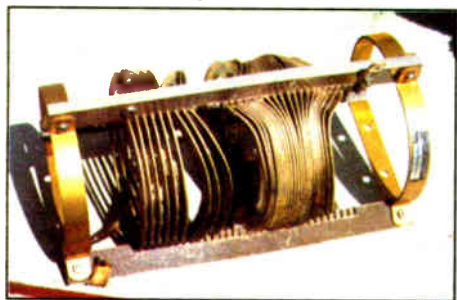


Figure 1: Coil-Crushing Power of a Lightning Strike

thunderstorm season upon us, they are good reminders to check our tower grounding. EMP is alive and well!

John Tiedeck, a contract engineer in Wilmington, Del., shares these pictures with *Workbench* readers. Called to a station that was off the air following a severe storm, he tried to restart the transmitter but kept getting a VSWR fault. Figure 1 was the reason. Apparently the tower took a direct hit, and the instantaneous pulse of energy took over from there.

Figure 2 is what's left of the static drain choke. In showing the photos to another engineer, he told me of a similar, less severe strike. In this case, he was fortunate enough to spread the coil windings apart by using a large screwdriver as a pry-bar to achieve some inductance. This allowed the station to get back on the air at low power until a replacement coil arrived.

For anyone who has worked with rib-

bon coils, you know how strong those ribbon windings are. The photos are a reminder that series-fed AM towers need some form of static discharge and the path should not go through your coupling network components.

Take a look at your spark or ball gaps at the tower base. Set them just beyond the point of arcing when the station is heavily modulated (this is a two-person job, requiring two-ways or cellular phones to coordinate when the transmitter is on or off). The surfaces of the gap should be clean, not pitted. Crocus cloth works well to achieve this.

The feed to the ATU from the tower should have the customary "one turn loop" of inductance, to further retard lightning. Check to make sure the ATU box or wall panel is grounded with at least 3-inch copper ground strap. That ground should be preferably silver-soldered into the tower ground strap. I've seen connections using a couple of bolts — this is probably better than nothing — but the silver-soldered connection is best.

There are some things to check at the ATU, too, but before you head down there, here's a shopping list of items to bring with you:

- Some canned foam sealant or RTV to plug any holes in the cabinet (keeps rain, insects, and vermin out of the box);
- A few moth balls to lay in the floor (which will deter any insects that somehow squeeze in);

of the cabinet so it will be there when you need it.

Your inspection will take place while the station is off the air. With the longer



Figure 2: The static drain choke also collapses.

daylight hours in the evening, this is an ideal time to do this work. Inside the ATU, use the trouble lamp to help you look for signs of overheating (discoloration of metal, especially at points where connections are made). Use the wrenches and screwdrivers to firmly tighten all connections. Use a little less "elbow grease" on insulators; too firm a hand will crack them. Use both a wrench and a screwdriver to keep from twisting or bending the thin copper ribbons that tap the coils.

Radio's Most Wanted

PROFILE: Ernie Hopseker

Partner, Bedrock & Associates
Seattle, Washington
Radio World reader since its inception (1977)

Hometown: Corvallis, Montana
School: University Of Montana
Favorite format: Oldies
Favorite place to listen to radio: Alone in the car
Coffee: Regular double tall mocha, with whip
Favorite piece of equipment: Cutting Edge Omnia
Hobbies: Antique radios and classic blues
Favorite color: Blue
Proudest moment: The lockoff of the ill-fated BRS satellite network
Favorite Section in Radio World: GM Journal
Reads RW because: Radio World gives thoughtful insight into the business with every issue, and provides a wealth of information which is useful for daily operations, along with many handy tips and tidbits of information which are so essential in today's environment. I rely on it, and read every issue from cover to cover. Radio World is the most comprehensive and complete radio periodical I have gotten my hands on.



Here at Radio World, we strive to deliver the information that helps you, our readers, deliver the goods that make you the most wanted people in the industry. We salute you all, and thank you for reading Radio World.

Tell us why YOU read RadioWorld!

Send your answers to the above questions and anything else you'd like to share to: hharris@maspub.com, or fax us at 703-998-2966 attn: H.Harris. Include your contact information, and we'll get back to you.

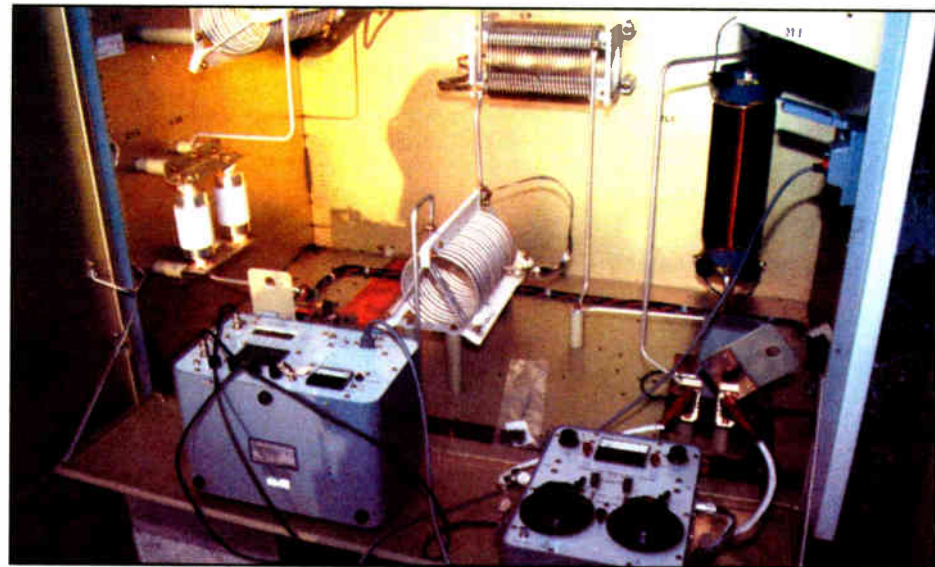


Figure 3: Inside an ATU, with Impedance Measuring Gear Set Up

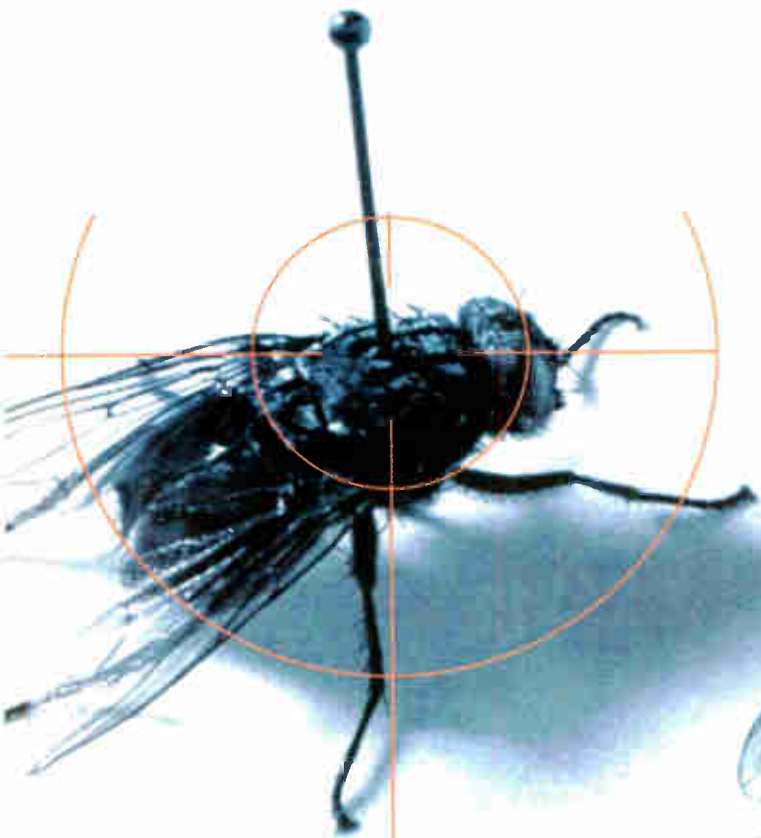
- Some wrenches and screwdrivers (to make sure all connections are tight);
- A trouble lamp, even if you make your inspection during the daytime.

One last thing to take along is a spare light bulb! Nothing is more frustrating than walking to the ATU and finding the bulb burned out. Put a spare on the floor

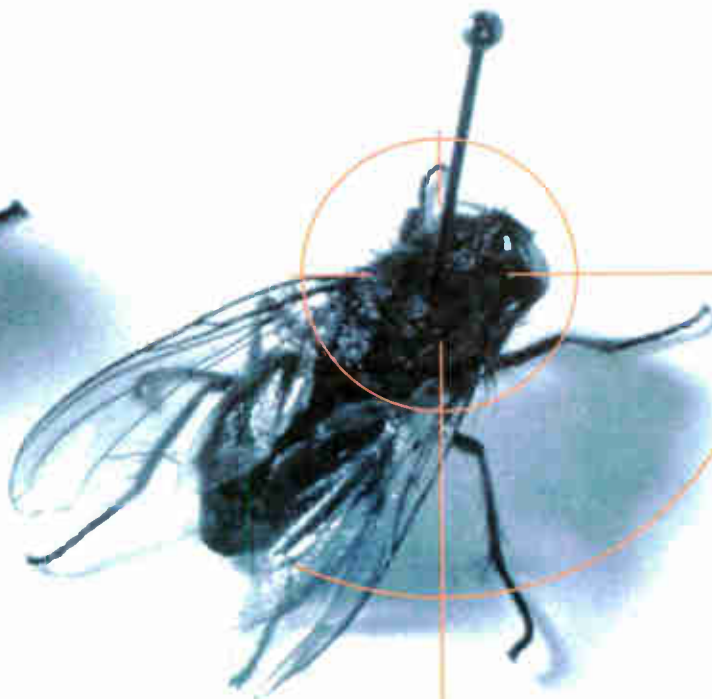
Make a note of any cracked or broken insulators, and check coil clips for tightness on each coil. If variable rotary coils are used, inspect the little roller wheel for arcs or pitting. Order the replacement parts for the broken or missing items you find.

Clean the inside of the bowl insulator, See WORKBENCH, page 33 ►

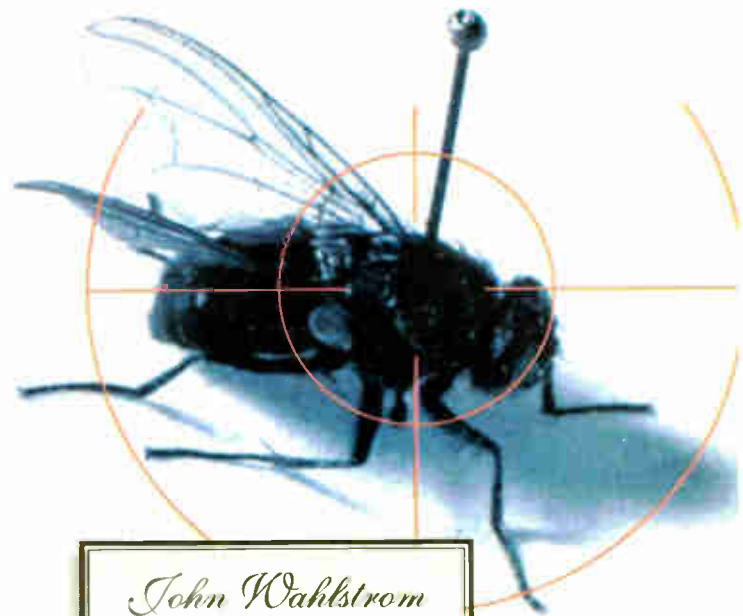
Their biggest regret was not talking with Dalet...



Bruce Wodder
General Manager 1998-99



Steve McAllister
Program Director 1997-98



John Wahlstrom
Engineer 1996-97

Don't make the same mistake they made: you need to consider Dalet

Move your stations to the next level with Dalet

Dalet is the World Standard in Digital Audio, Automation and Group Solutions. Dalet systems are reliable, affordable and proven.

The performance challenge has never been greater

Maximize revenue and make the most of your group's portfolio. Generate cost saving and improve productivity without sacrificing quality.

Choose Dalet to get the job done

Dalet offers integrated tools for managing clusters and groups - every aspect of your business, from on-air and production to sales, traffic, financial reporting and more.

Partnership with long-term leaders in the computer industry helps us remain at the forefront of technological innovation.

Microsoft Certified Solution Provider

COMPAQ

Digigram POWERED

Circle (17) On Reader Service Card
World Radio History

The World Standard in Digital Audio

Live Assist and Walk Away Automation
Voice Tracking
Sales Tools for 2000
Group Connectivity
Newsroom Solutions
Web Publishing

Major broadcasters worldwide choose Dalet more than any other system. Among our references: Emmis, Journal, ABC, Radio Unica, Sinclair, Crawford, CNN Radio, BBC (UK), CBC (Canada) etc.

Call (212) 825-3322
or visit www.dalet.com

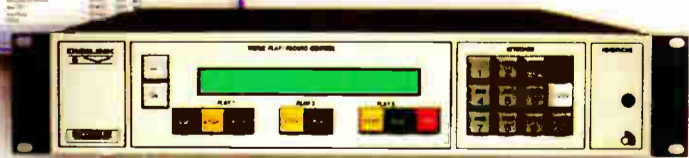
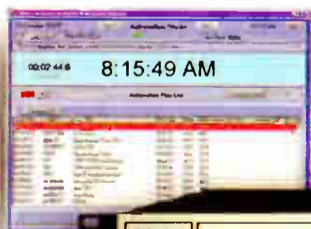


dalet



Tired of **JUGGLING**
too many on-air sources?

Replace and automate
with the Arrakis DigiLink IV.



Forget having to patch together on-air programming from multiple feeds and audio players. Arrakis DigiLink IV allows you to store programming on hard disk and to automate audio playback as well as control satellite feeds and live broadcasts with the help of your PC computer. DigiLink IV's modular design allows you to configure a system that works best for you – from live assist to full-blown automation, from stand alone to multiple studio shared audio systems.

Call BSW today 1 · 800 · 426 · 8434

Let BSW Work To Your Advantage When You Buy Arrakis.

BSW's extensive Arrakis inventory BSW's convenient parts fulfillment
BSW's factory-certified sales representatives BSW's priority factory support

Circle (18) On Reader Service Card

BSW
BROADCAST SUPPLY WORLDWIDE

Our First Load: Tower Lighting

Charles S. Fitch

This is one in a series of articles about the National Electrical Code. The articles and supporting materials are available online at www.rwonline.com in the reference section.

In previous episodes we have brought electric power from the utility connection (aerial feeds from nearby poles or underground service) through the meter, into the building, through the main breaker and finally to the individual circuit breakers (CBs) or fuses that feed the various downstream devices and loads in your station.

It's been quite a journey through the details of the National Electrical Code, but finally we have progressed to the actual panel loads.

In this case, we have decided to start with your station's tower lighting system because it is one of the few safety devices that is important to the safety of both aviation and your license.

Regulated business

People in other industries often ask me if broadcasting is much of a regulated business. If you include the ancillary business equipment, broadcasting has at least 13 tiers of regulation, and your tower is a prime example of the regulatory complexity we face.

Just to brush slightly upon these dueling regulations and standards, the design, fabrication, construction and maintenance of the tower is covered in the BOCA, wherein the current EIA-222 standard is taken in whole form as the foundation text. Elsewhere, the physical electrical wiring is covered by the NEC; the design of lighting fixtures on the tower are covered by the FAA and UL, the arrangement of lights and impressed voltages is covered by the FCC/FAA, the rigging maintenance of it is covered by OSHA, and the paint standards (if paint is used as a marker) are in the Federal Bureau of Standards FED-STD-595 (drafted from an old Naval Bureau standard).

Furthermore, not only does the FCC mandate what the lighting and markings on the tower should be (based on FAA recommendations), but they also tell you when the lights should be on.

You have the choice of letting them run continuously, which is not considered earth-friendly or politically correct, or using a photocell or equivalent to turn them on and off with the action of the sun.

Amazingly, the FAA regulations also allow the use of timers to control the lights. I am sure that this was left over from the time when sites were manned and photocells were very, very expensive. Mechanical clock timers, which adjusted their turn-on, turn-off times each day to match the local solar activity, were much cheaper in the distant past.

In my mind, these timers should be *verboten* as they do not make allowances for overcast winter days, heavy rain, snow whiteouts, daylight savings time or even solar eclipses. The last site I visited that used a timer (a water-pump timer, no less) had the lights scheduled to come on at 11 p.m.,

as the clock was four hours slow. Tell the FCC/FAA we want timers out of the regulations.

In the most fundamental and normal arrangement for a poetic and pristine quarter-wave AM tower in the studio backyard for your classic Class IV AM station on 1230 kHz, this is probably the most ordinary electrical arrangement.

The tower is marked with paint by day and red lights at night. The lights comprise one set of steady side lights and a flashing 300-millimeter beacon on the tower top.

At an absolute minimum, these lights could be supplied by a single-pole, 120-volt, 20-amp "tower lights" CB. The supply wiring would travel out to the tower where it would be wise to have some sort of local disconnect — as simple as a light switch protected from the elements that was rated for 20 amps. The next stop is the photocell control.

Somewhere in here we will also need a control to "override the control system" and manually turn on the lighting system.

Let us digress a little from the NEC path. There is absolutely no functional relationship between an FAA standard photocell and your normal photocell bought at the local hardware store or electrical supply house. The powers that be want those red tower lights to turn on at a light level of (no less than) 35 foot candles (FC). This light level is a lot higher than the point where most street-light controllers turn on the parking lot lights (about one to five FC). With a properly calibrated and aimed FAA standard photocell, I have actually witnessed the tower lights turn on in the winter when the sun goes behind a cloud.

Additionally, the FAA/FCC want the red-light-system photocell to be designed so if it fails, it will fail while on, so that the lights will run continuously until repaired. Many ordinary photocell controllers don't have this feature.

Operative levels

My most recent hard copy of the FAA regulations is FAA circular AC 70/7460-1H (with Change 1). Chapter 5, paragraph 52, details these operative levels. Once again, the turn-off point is completely different from an off-the-shelf controller at a whopping 60 FC. This notable differential between On and Off levels is to avoid control oscillation, but the 60 FC requirement means that it's almost noon in South Bend, Ind., before the tower lights go off in the winter.

The selection of these low light levels is further compounded by the fact that the photocell has to have an unobstructed view of the northern sky (in the northern hemisphere) where naturally it is darker. If you must use an off-the-shelf photocell on an emergency basis, then you should tape three-quarters of the exposed photocell window such that it turns on when you shade the input with your hand. Get an FAA lab standard photocell as soon as you can so that you can verify via second party that your operation is legal as far as control from light levels goes.

Just to put a finer edge on matters, this requisite laboratory-grade photocell (or sensing device using the FAA moniker) shall — if practical — face the northern sky which, as noted, is the darkest part of

the sky in the northern hemisphere. I emphasize the phrase "if practical," as sometimes it is just impossible to get an unimpeded view of the northern sky at the horizon anywhere reasonably close to ground level.

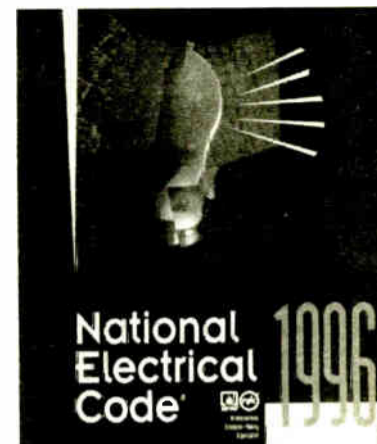
Does this mean that you can just spin the photocell anyway you want? Absolutely not! It means if you can't see the northern sky, your sensing system has to turn the lights on and off *as if it were looking at the northern sky based on the light levels it receives from whatever direction it can see.*

Tuned in

In the first episode, I mentioned that many electrical contractors might not be tuned in to your specific needs.

An example: Your light control system, if aimed in an errant direction, will need some sort of electrical or mechanical weighing/compensation system that will turn your lights on when there is 35 FC of light in the northern sky. Many contractors either do not know (or possibly don't care, as they view your tower lights as parking lot lights in the sky) about these regulations or have access to the test equipment needed to set up the necessary compensation.

If you or your contractor are not completely sure of what you're doing, find someone with the proper knowledge and experience.

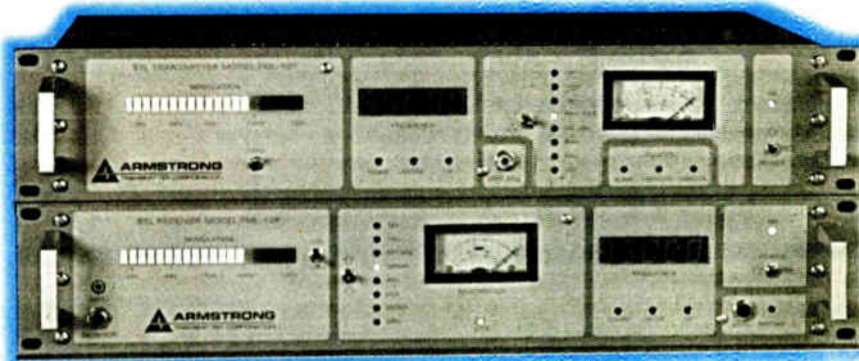


A tip: For a plethora of reasons, these photocells have a limited life. It is wise to install one that is easy to change. Use a NEMA male, three-pin, polarized, twist-lock arrangement for connection and a gasket to keep out the water and moisture. This makes for a fast and simple change-out, especially if the photocell has to be on the tower and your rigger charges by the hour. It also allows you to use an off-the-shelf street light type in an emergency. Additionally, if the mounting arrangement for the female side is properly installed, this warrants that the photocell, when replaced, will again point in the correct direction.

One big cause of photocell failure occurs when the photocell is in line with the bulbs it controls and they have a common voltage supply. Induced high voltage from either inductive lightning strikes or static

See NEC, page 25 ▶

Frequency Agile STL Systems



▲ If you are looking to deliver clean, crisp audio to your transmitter via microwave, Armstrong FML-10 STL system offers unsurpassed audio purity in a rock-solid, feature-packed package.

▲ Built to tough manufacturing standards throughout, FML-10 system features microprocessor controllers, advanced PLL circuitry, ultra linear VCO and front panel frequency programmability with digital frequency readout.

▲ Currently in service at over 300 stations in 21 countries, this field proven design is a "rock-solid" STL choice for any station.

Complete System Under \$5500.00
Same Day Shipping
30 Day Money Back Guarantee



ARMSTRONG

TRANSMITTER CORPORATION

4835 N. Street • Marcellus, NY 13108 • PH: 315/673-1269 • Fax: 315/673-9972
E-mail: info@armstrongtx.com • www.armstrongtx.com

Circle (16) On Reader Service Card

Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No. (s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

Headphone Amplifiers Designed to Deliver



Drive virtually any headphone load, even small speakers. Two front panel 1/4" jacks and one in the rear for extra headsets. Balanced or unbalanced operation with sensitivity from -10 dBm to +8 dBm. Short circuit protected discrete outputs. Comes with heavy duty power supply. Panel mount also available.

Broadcast Devices, Inc.



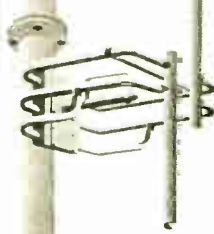
5 Crestview Avenue
Cortlandt Manor, NY 10567
Tel. (914) 737-5032 Fax. (914) 736-6916
Website: www.Broadcast-Devices.com

READER SERVICE NO. 60

Shively Labs

Reach for Ratings!

Shively Antennas Deliver Coverage!



- Superior Engineering
- Multistation Solutions
- Filters & Combiners
- Translators
- Reliable Pattern Studies

FM & TV Antennas and Related RF Equipment

because ... it pays to be heard!

P.O. Box 389, Bridgton, ME 04009 USA
Tel.: (207) 647-3327 FAX: (207) 647-8273
1-888-SHIVELY e-mail: sales@shively.com
Web: www.shively.com
- An Employee-Owned Company -

READER SERVICE NO. 70

NEW! A2D-1, D2A-1 Digital Audio Converters



- 20-bit Low Noise Analog to Digital and Digital to Analog Converters
- S/PDIF or AES/EBU Digital Format
- XLR AES/EBU Digital Connections
- Coaxial (RCA) S/PDIF Connections
- Gain Controls, Clip LEDs (A2D-1)
- Sampling Rate Indicators (D2A-1)

Call for a Videoquip products catalog or visit our web site.

VIDEOQUIP Phone: (416) 293-1042
RESEARCH LIMITED Toll Free: 1-888-293-1071
Fax: (416) 297-4757
Internet: www.videoquip.com

READER SERVICE NO. 80

You found what you've been looking for...



The finest in Modular Studio Furniture

Endless combinations...
precision quality...
attractive design...
and a GREAT PRICE!

Advanced Furniture Systems

1545 N. Washington Ave., Loveland, CO 80538
Phone: 970-663-4123 Fax: 970-663-6338
Email: afs@mail.omn.com
Website: www.omn.com/afs

READER SERVICE NO. 90

SIX MILLION THUNDERSTORMS HIT PLANET EARTH EVERY YEAR! IT TAKES ONLY ONE TO PUT YOU OFF THE AIR!



The STATI-CAT LIGHTNING PREVENTION SYSTEM provides a continuous, low-resistance discharge path for the static electric charge on tall structures. Dissipation points are 1/8" stainless steel rods.

This affordable and rugged system has proven itself in the field for over 15 years.



Write or call for a free brochure and design
P.O. Box 2548, Farmington, N.M. 87499-2548
Ph: 888-325-5336 • Fax: 550-326-2337

READER SERVICE NO. 59

WEATHER RADIO

Model CRW



Price \$540.00

Sensitivity .28 microvolts for 12 dB quieting. All 3 frequencies. Alert tone demutes receiver, closes relay and gates audio to 600 ohm rear terminals. Another set of rear terminals has continuous 600 ohm audio output. Double conversion crystal controlled, crystal filter in first I.F., ceramic filter in second I.F. Dual gate MOS FET front end. 50 ohm coaxial input. Adjacent channel (± 25 kHz) down to 70 dB. 19" rack mount, 3.5" H, all metal enclosure. In stock—available for immediate delivery.

GORMAN REDLICH MFG. CO

257 W. Union St. • Athens, Ohio 45701
Phone 740-593-3150 • FAX 740-592-3898

READER SERVICE NO. 69

CUT Studio Project Time Up To 50%

Call the independent experts, for your next expansion, consolidation, or upgrade project.

TECHNICAL LEADERSHIP IN AN INDUSTRY OF CHANGE



(888) 616-7980, or
(314) 872-8222

www.rdasystems.com

Rick Dearborn, President
Sheri Luster, Sales Executive

READER SERVICE NO. 79



Silicon Valley POWER AMPLIFIERS

The RF People

FM Broadcast Power Amplifiers

Designed for reliability, durability, & efficiency.



Models from 165 watts to 2.4 KW

- | | |
|---------------------|-----------------------|
| Solid state. | Frequency agile. |
| VSWR foldback. | Digital display. |
| Remote operation. | Easy installation. |
| Full documentation. | Modular construction. |

1-800-986-9700

www.svpa.com e-mail: sales@svpa.com Fax 1-408-986-1438

READER SERVICE NO. 89

The CircuitWerkes HC-3 Autocoupler



More Features. Better Price.

- Auto-connect and disconnect.
- Two-Year limited warranty.
- LED Indicators for incoming rings/on-line status & power.
- Answers on user selectable number of rings.
- Momentary or latching dry contacts at pickup.
- Audio, control and power connections on screw terms.
- Metal case can be wall/desk or, optionally, rack mounted.
- Dual rack mount available.
- Optional ComboLok provides password security.
- Suggested list only \$229.
- Simple, active hybrid with unbalanced, In/Out for simultaneous send & receive communications.
- Remote connections include: aux. relay closure, pickup-enable, remote pick up trigger, call end sink, & Ring / Online sink.

CircuitWerkes

3716 SW 3rd Place
Gainesville, Florida 32607
(352) 335-6555 / fax 380-0230
e-mail sales@circuitwerkes.com
<http://www.circuitwerkes.com>



READER SERVICE NO. 99

The PVC AM Antenna for EAS

Bob Henry

If you've been in radio any length of time, you know that setting up an antenna for your EAS (or the former EBS) receiver can present quite a hassle.

This is especially true for the AM EAS receiver, since these antennas are generally some form of long-wire antenna, which takes up a large amount of space to get any kind of appreciable gain for the receiver. Yet,

they are necessary.

Different antenna designs have been used in an effort to make them smaller, but still required some clever physical designing in an attempt to keep them small in size while maintaining a reasonable amount of signal gain for the receiver. Still, these are subject to wind-loading problems along with the erosion caused by the elements of weather.

An indoor AM antenna is usually out

of the question, due to the signal degradation caused by attenuation and elec-

Silicone rubber or hot glue can be used to fix the loop stick in place. Silicone rubber can also be used to seal off any openings or parts that can be exposed to weather.

A compression-type variable capacitor

Know Your Antenna Site Inside and Out

Ed Montgomery

This is one in a series of articles on the basics of AM radio. The previous part appeared June 9.

Loudspeakers and their design play a big role in reproducing the audio processed through an amplifier. If the speakers are deteriorating, the output will not come close to the quality of audio produced by the amplifier.

The speaker is the load or the transducer converting the electrical current variations to sound waves, and has a standardized impedance that matches the output of the amplifier. This has been standardized by the electronic manufacturers, permitting maximum amount of power from the amplifier to the speaker.

Similar principles apply to radio. The load for the transmitter is the antenna. Electric current flowing back and forth through the transmission line and antenna create a load impedance. Manufacturers design transmitters with a specific output impedance and consulting engineers design their antenna system to match it. All of this is illustrated and described in a report that is filed with the FCC and should be in the files of the broadcasting station.

This antenna proof of performances is an extremely important document because it explains how the antenna is supposed to operate. It contains the design of the system, the ground conductivity of the area and field intensity readings taken at prescribed radials indicating where nulls and lobes of the radio signal occur. If you do not have this document at hand, request a copy of it from the FCC.

The AM antenna site is large due to the frequency band it operates in. An FM antenna is quite small and requires much less attention. It will run for years without any noticeable change as long as it does not corrode.

The FM antenna is rather simple to replace; typically it is attached to a tower or other elevated structure; whereas the AM antenna is the tower. As the AM antenna site ages, several things can affect how the system functions. Large structures built adjacent to an AM antenna site can cause big problems with the radiated pattern.

If someone were to construct a large stadium within a few miles of an AM transmitter, for example, the broadcaster might see the directional pattern change radically, exceeding the limits the FCC approved. A nondirectional system may find a significant loss of energy in the direction of the new stadium. This requires

engineering work to either change or justify the new shape of the pattern.

The addition of radio towers within two miles of an AM station require that the owner of that tower protect the station's pattern. This has become quite an issue recently with the upsurge of cellular telephone towers erected almost everywhere.

FCC Rule 47CFR22.371 was written to protect the broadcaster. It is the owner of the new tower's responsibility to make sure the AM station's pattern is not altered. The broadcaster has the right to use his or her own consulting engineer to perform the work, which usually requires that the new tower be wired with a coil and capacitor to detune it so that it does not absorb or reradiate the broadcast station's energy.

There are times when the new tower builder is either unaware of 47CFR22.371 or elects to ignore it. The transmitter site and the area around it should be visited often to view what is going on. If there are no accurate records of how the system was working before new towers are erected, it is difficult to justify the expense to restore the system. If you see structures being erected or you read about proposals to erect structures in your area, contact the engineering personnel responsible for the technical operation of your station.

The load impedance of the antenna must remain constant. There are several factors that can change it. As the years pass, the copper radials will corrode and break. There have been occasions where some industrious thieves have actually stolen them, selling them for scrap.

As the ground system deteriorates, the antenna impedance will change, resulting in narrower sidebands and loss of power. Power is determined in AM by periodically measuring the antenna current or common point current in a directional antenna system. The common point is located before the radio energy is divided and phased for the various towers. When reading this current, one is assuming that the antenna impedance is correct. For example, if the antenna current is 10 amperes and the antenna was designed to have an impedance of 50 ohms, the transmitted power is calculated as follows:

$$P = I^2R$$

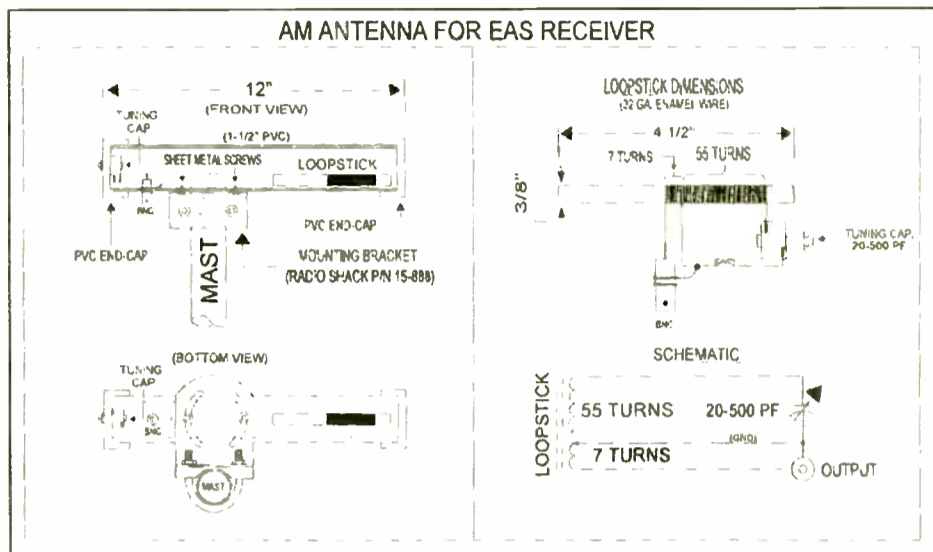
Where:

P = Power in Watts

I = Antenna Current in Amperes

R = Antenna Impedance in Ohms

See AM, page 33 ▶



trical noise, unless your station is located very close to the source EAS station. The antenna is generally set up outside to prevent such problems.

Here's an AM antenna for your EAS AM receiver that is simple to construct, yet takes up a very small space compared to the long-wire and big-loop antennas that are in current fashion for this purpose.

'Loop stick'

The PVC uses a "loop stick," like those found in most consumer AM radios. The loop stick is a long ferrite rod with multiple turns of wire, with a small tuning capacitor that gives it the signal gain necessary for the receiver. When built, it requires very little space, is sturdy and offers great performance. Measuring only 12 inches long and about three inches wide, it can mount on a simple TV antenna mast, with very little wind loading.

A small piece of PVC (about 12 inches) is used to house the loop stick and the tuning capacitor (see diagram).

was originally used, although practically any type of variable of similar value will work. Even though a PVC is used as the enclosure, anything that is nonmetallic could be used as an enclosure for the antenna parts.

RG-6 coax cable was used from the antenna to the receiver. However, just about any type coax cable should suffice.

Basically, to tune the antenna, simply adjust the tuning cap for peak RF to the receiver. The signal level can be observed if the receiver has a signal level test point. Most receivers have this option.

It should be noted that the loop stick should be mounted horizontally. The broad side of the loop stick should be facing the RF signal source for the best signal gain. While it may not outperform a long-wire, it should at least give satisfactory results for proper EAS performance.

Bob Henry can be reached at KNME-TV in Albuquerque at (505) 277-1247 or via e-mail at Bobh@knnel.unm.edu

Instant RDS Analysis

Inovonics' 510 is a self-contained and comprehensive RDS Decoder/Reader. Connect it to your Modulation Monitor or off-air receiver to read data from all the common RDS groups. Get an instant data readout on the front-panel LCD screen, or feed data to the serial port of any PC for a more detailed analysis and message archiving.

- Supports both CENELEC and NSRC standards.
- Easy-to-read 80-character lighted display.
- Identifies which groups are being transmitted.
- RS-232 computer interface; analysis software provided.
- Built-in "glossary" defines RDS terms.
- Precise digital readout of RDS subcarrier injection level.

MODEL 510 RDS DECODER / READER — \$1950

Inovonics www.inovon.com
1305 Fair Ave. • Santa Cruz, CA 95060
TEL: (831) 458-0552 • FAX: (831) 458-0554

BOOK REVIEW

Book Helps Tower Site Managers

W.C. Alexander

Despite deregulation, there are more rules and regulations that apply to broadcast tower sites than ever before. Not only must we answer to the FCC, but to the Federal Aviation Administration (FAA), Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) as well.

Legal requirements can be difficult to keep up with, and most broadcasters are ill-equipped to do so. A tower owner would have to maintain a current copy of the applicable sections of the FCC,

OSHA and EPA rules as well as the current applicable FAA advisory circulars just to know what is required.

NAB Science and Technology has recently made the job of keeping a site legal and safe a lot easier. With the publication of its Tower Site Regulation Handbook, the pertinent rules and regulations, as well as a good narrative of the broad requirements, have been brought together in a single volume. The tower owner needs reach no further than this book to stay abreast of his obligations.

The book is divided into two sections: a regulatory overview and appendices. The overview is a brief digest of what the

regulatory requirements are in the areas of FCC, FAA, OSHA and EPA. The appendices contain the actual rules as well as many other helpful documents.

Overview

In the overview, FCC requirements are discussed without a great deal of detail, but enough information is given so that a tower owner will understand his general obligations. Topics discussed include tower registration, painting and lighting requirements, RF exposure requirements, fencing and signage, blanketing interference and AM reradiation. Painting and lighting thresholds are tabulated, and

both aviation red and high-intensity white lighting are discussed along with the pros and cons of each. Also discussed are photocontrol requirements, flash rates and system configurations.

RF radiation exposure is a topic that has gotten a lot of attention, much of it unwanted, in recent years. In the narrative, the Handbook discusses the tower owner's and licensees' obligations regarding RF radiation, including controlled and uncontrolled environments, hot spots, fencing requirements and signage. Minimum antenna heights to achieve uncontrolled environment compliance for FM and TV are tabulated, as are minimum fence distances for AM. Reradiation, the bane of the licensees of directional AM facilities, is briefly discussed along with the obligations of those constructing towers nearby to run proof measurements and install detuning apparatus when necessary.

Did you know that the tower structure painting and marking requirements that

NAB Science and Technology has made the job of keeping a site legal and safe a lot easier.

have long been included in Part 17 of the FCC's rules have been deleted? They have been replaced with a reference to an FAA Advisory Circular for the purpose of bringing FCC and FAA rules into agreement. This is addressed in the Handbook.

It would seem on the surface that the FAA would be more concerned with towers protruding into the airspace than the FCC, and this is true. The reality for broadcasters, however, is that the FCC looks after the FAA's interests by way of rule enforcement once a communications tower has been built. Prior to construction, the FAA must often be consulted, and if a proposed tower exceeds the 200-foot threshold or lies within the protected airspace around an airport or heliport, a determination of "no hazard" must be obtained before an FCC construction permit will be issued and the structure can be built. The Handbook provides a good overview of the cases in which the FAA must be notified and the procedures which must be followed.

RF emissions have been a sticking point with the FAA for years, particularly those on 107.5, 107.7 and 107.9 MHz, which are immediately adjacent to the VHF aircraft navigation and communication band. The Handbook gives some good pointers on ways to avoid triggering an FAA hazard determination based on RF emissions.

Many changes

Who can keep up with the OSHA rules regarding the telecommunications workplace? In recent years, there have been a number of changes which affect the way tower crews must operate and the way tower owners must

See BOOK, page 32 ►

Crown Broadcast

We've got you covered

Crown Broadcast transmitters are designed and carefully engineered to the same reliable high performance standards known worldwide as the hallmarks of Crown products.

Enjoy on-air confidence with compact stand-alone transmitter designs that integrate audio processing, stereo generation and RF amplification. Or choose from custom configurations for versatile solutions to meet your unique broadcast needs. And be confident in your choice, with a three-year warranty backed with service from some of the finest talent in the industry. *Ask us, we can help!*

Call us, visit our web site, or send us e-mail for more information about the versatile transmitters from Crown Broadcast. Crown International, 1718 W. Mishawaka Road, PO Box 1000, Elkhart, Indiana, U.S.A. 46515-1000
Phone: 800-294-8050 or 219-294-8050; Fax: 219-294-8222 Email: broadcast@crowntnl.com
www.crownbroadcast.com

**Crown Broadcast...
making a world of difference**

Truth in Advertising



The hype for digital audio has been deafening. While digital offers advantages for storage and control, it has severe limitations for dynamics processing. Indeed, Cutting Edge® claims their Omnia unit sounds almost as good as analog.

The Aphex 2020 FM Pro offers the purity of an all analog signal path with the power of digital control. Through its use of 11 patented circuits, the 2020

achieves the greatest possible loudness while retaining musicality and naturalness.

No digital grunge, no aliasing, no overshoot. No subcarrier artifacts from composite clipping. Just the loudest, cleanest FM processing with the greatest possible coverage area.

Contact Aphex today for a demonstration, and we'll show you there *is* truth in advertising.



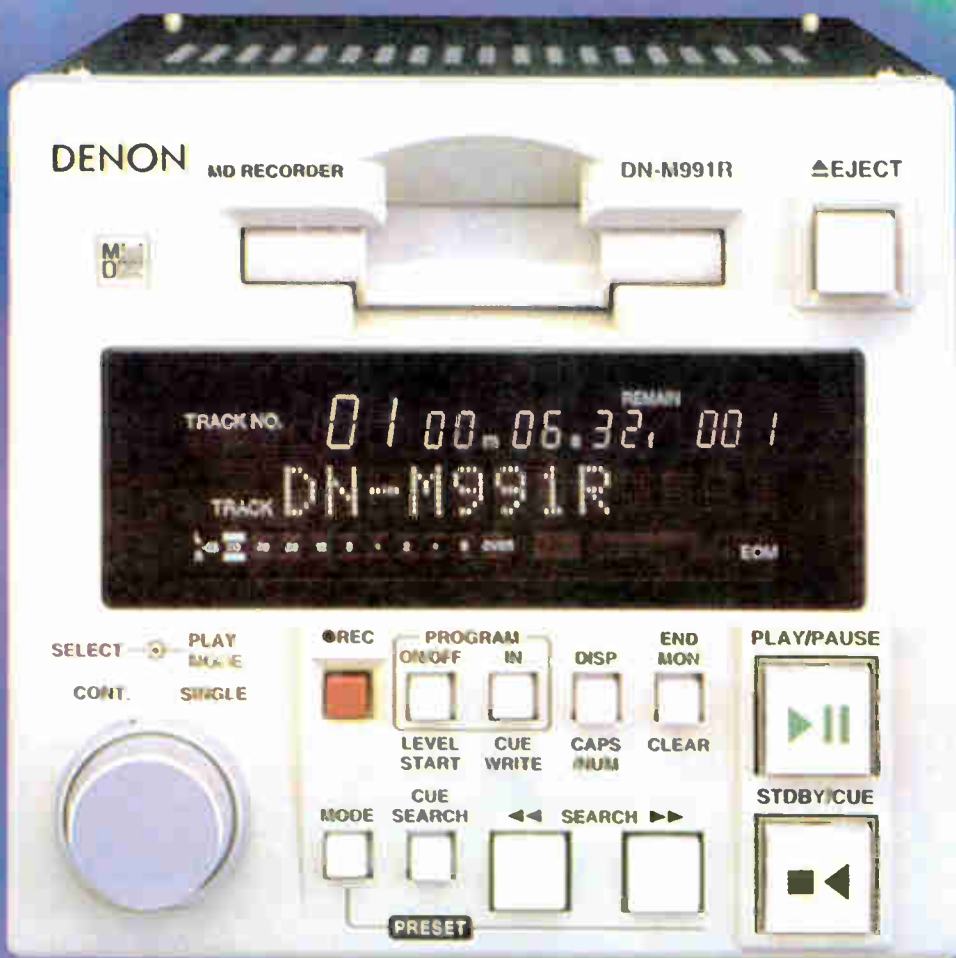
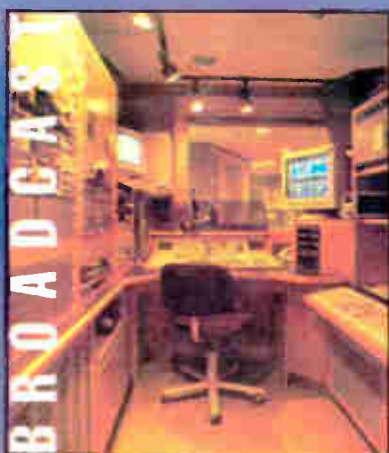
APHEX SYSTEMS

Improving the way the world soundsSM

11068 Randall Street, Sun Valley, CA 91352 U.S.A.
818-767-2929 Fax: 818-767-2641 <http://www.aphexsys.com>

Cutting Edge and Omnia are registered trademarks of TLS Corporation. Orban and Optimod are registered trademarks of Harman International.

The Versatility Of MiniDisc



Introducing the new Denon DN-M991R MiniDisc recorder/player. MiniDisc is the most versatile media available for archiving program material for playback in a variety of applications including broadcast, theme parks, theatres and shopping malls, among others. The DN-M991R offers all the features and functions that



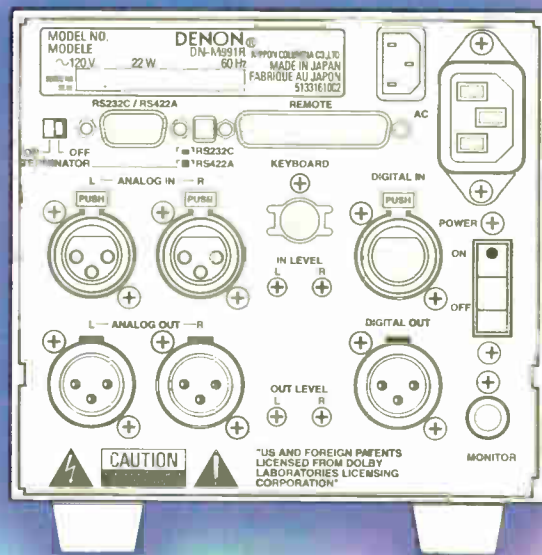
engineers have asked for, such as a large and easy-to-read florescent tube display with multiple readouts, Hot Start, keyboard entry, seamless Sleep mode,



front-panel Program Play and a variety of control terminals including RS-232C, RS-422A, D-Sub 25 pin and PC-compatible Mini Din keyboard connector. For additional information, contact our broadcast products specialist at (973) 396-7492.



- 10 Hot Starts
- Instant Start
- Auto Cue
- Multiple Display
- Seamless Sleep Mode
- +/- 8% Playback Speed Control
- Program Up To 25 Tracks
- Multiple Editing Functions
- Rotary Track Selector
- Relay Recording
- Auto Level Rec Start
- Optional Wired Remote RC-650



Denon Electronics Division of Denon Corporation (USA), 222 New Rd., Parsippany, NJ 07054, (973) 396-0810
 Denon Canada, Inc., 17 Denison St., Markham, Ontario, Canada L3R 1B5, (905) 475-4085
 Labrador, S.A. de C.V., Zamora No. 154, 06140 Mexico, D.F., (52-5) 286-5509

Visit our web site: www.del.denon.com

Circle (20) On Reader Service Card

World Radio History

DENON

The First Name In Digital Audio

Limited Lives for Photocells

► NEC, continued from page 19 discharges on the tower — although too low to blow the bulbs — often blow the photocell.

The best way to isolate and protect the photocell is to let the photocell control a relay and let the relay switch the supply to the bulbs. By placing the photocell's AC supply on a different circuit (such as the outlet feed in the doghouse), any lightning or static potential on the line has to go back to the breaker panel and then all the way back out to the doghouse before it gets to the photocell. This long run normally means that it is dissipated or, at the least, the peak voltage is lower. (See insert drawings.) The long runs essentially act as chokes. You can enhance this protection by putting the two circuits on different phase legs.

Red-light

These red-light systems use incandescent bulbs and, as we all know, the light output of an incandescent bulb is very nonlinear as a function of impressed voltage. For example, a classic tungsten filament incandescent bulb with 92 percent of rated voltage impressed on it puts out only 74 percent of its rated output. For this reason, the FAA regulations, in the old par 53 (see below), require that the voltage supplied to these bulbs be between plus and minus 3 percent of the bulb's rated voltage for the requisite light output, measured at the socket under load (the lamp operating).

The same regulations also require that the responsible party replace bulbs at 75 percent of rated life or immediately upon failure. If you opt for the former replacement cycle, it is a good idea to have a running time meter downstream from the photocell for an exact hour count.

Let's return to the NEC. The NEC has a standard for supplied voltage and the allowable voltage drop. An absolute maximum drop of 5 percent from the input into your system (normally viewed as the first place you can measure it safely which is the meter socket) to the point of use at any load is annotated at NEC 210-19 FPN (Fine Print Note) No. 4.

However, this FPN also indicates that no more than three-fifths of that drop can occur in the branch circuit if a reasonable efficiency is to be preserved.

Now, are we going to just install this lighting and then measure it when running to see if we made NEC and FCC/FAA voltage standards? Not if we want to keep our jobs! We are engineers and we know which end of our pencil has lead. We can calculate the wire sizes we need to limit the loss numbers and stay in spec.

The first item you need to ascertain

Induced high voltage from inductive lightning strikes or static discharges often blow the photocell.

is the normal line voltage into your building. If you haven't replaced a side light in seven years, that's a good hint that your line voltage is really low. If your low line voltage is 114 volts or less most of the time at the utility meter, you'd better get the utility in to find out why you're down 5 percent from the nominal 120 volts even before you address your tower lights.

Read on ...

If your line voltage measured at the CB is 120 volts, and the bulb's rated voltage is the same, read on. The breaker panel is in the transmitter room at the back of the building. It's 250 feet to the doghouse and 220 feet up the tower to the beacon. Our total run is 940 feet (470 feet times two) of wire. Peak current on the line is around 13 amps.

Temperature plays a role in wire resistance. The following calculations are based on a correction factor of one at an ambient 68 degrees Fahrenheit.

If we ran it in #12 all the way, which you might think you could from the ampacity charts of the NEC, our wire resistance would be 1.493 ohms and our loss would be 19.4 volts using Dr. Key's AWG tables.

Bulbs would last forever using #12 wire, albeit not brightly, and definitely would not make NEC/FAA spec.

Similarly, #10 would give us 12.2 volts of drop, #8 would give us 7.67 volts of drop, #6 would give us 4.8 volts and #4 would give us 3.03667 volts drop. The #4 wire then will make our NEC 5 percent and FAA/FCC 3 percent standards handily.

Because we're engineers, by experience and deduction, we should actually feel comfortable to make our 3 percent FAA standard using #6 wires. Why? The feed to the tower is directly buried and much lower in ambient temperature. At 24 inches below the surface, the ground is ordinarily about 54 degrees Fahrenheit. This lowers the ambient temperature around the wire by 14 degrees from the value of 68 degrees. Theoretically, we should see a reduction in resistance of 2 percent on this run.

Additionally, since the wire primarily serves a variable load that averages less than 13 amps, there is low cumulative wire heating, hence overall loss.

Another point to consider: Modern wire usually has slightly less resistance per length than the AWG tables, so we pick up some margin. Actually, the #6 wire is only needed to the junction point just ahead of the flasher. Going up the tower could be a #6 common neutral line but the separate, always-running two-amp load of the single set of side lights should best be run in a pair of

#12 wires as it is only halfway up the tower. You'll also be spared seeing the ever-so-slight IR drop in the sidelights when the beacon turns on.

The beacon phase-wire after the flasher should still be a #6 under GEP, but if you work for one of those bean-counting mega-groups, you probably could get away with a #8 phase-wire beacon run.

You might actually save \$10! That's the first 10 seconds of an overnight spot.

What do you do if your tower isolator or Austin transformer has dynamic regulation or static IR problems and you suffer notable voltage loss through these and/or the distance or final wire size is just too big to deal with? The usual alternative is a boost transformer, which will raise the supply voltage by "boosting" the line.

Solutions

Essentially an autotransformer that adds its voltage to the line, these boost transformers are the solution of last resort as there will be regulation problems with large varying loads such as flashing beacons. If you need to use boost transformers, buy two sets: one for the beacons and one for the side lights. The side lights then won't wax and wane so luminously in sympathy with the beacons turning on and off.

Ideally, one could also use just a standard tapped transformer, but we're talking real dollars now.

One more tip: If your tower is tough to maintain because of multiple users or locally high rigging charges or rigger scheduling is difficult in your part of the country, use 6,000-hour bulbs for the beacons with boost transformers to make the needed increased voltage. Side lights are already rated normally at 6,000 hours.

■ ■ ■

Charles S. Fitch is a registered professional consultant engineer based in Connecticut.

COMING SOON

Coming in

Radio World

-  Tom & Darryl
-  Tower Vandals
-  FCC Inspections

Only in


Radio World

The playlist editor is just part of our picture.

10:27:39A			
Mon, Oct 12			
10:05	You Belong To The City	Frey, Glenn	05/04/10/03
10:05	I Can't Hold Back	Survivor	14/03/51/03
10:13	Point & Shoot	Promo 23001	00/00/15/00
10:13	AT&T Commercial	A&T	00/00/30/00
10:13	Midas Commercial	Midas	00/00/45/00
10:14	Juke Box Hero	Foreigner	09/04/19/01
10:19	Changes	Bowie, David	20/03/31/01

- Easy on-line playlist editing capability.

Pristine RapidFire:
the all-in-one digital broadcast system.



www.pristinesys.com (310) 670-7500

"Tom, we bought another radio station last night."



**Intraplex
STL PLUS**

Wondering how to handle growth? More groups have placed their trust in Intraplex than any other digital transmission solution.

The Intraplex STL PLUS T1 multiplexer transmits program audio for STLs, TSLs and intercity links, data for remote control, automation, and LANs and voice for off-premise extensions and intercom. Consolidate program audio, data and phones over one high quality digital line, with STL and TSL at any distance over any terrain. Even better, you'll be ready to handle the next station. And the next.



next level solutions

WIRELESS

BROADCAST

COMMUNICATIONS
PRODUCTS

HARRIS
Communications

1-877-468-7275 • www.harris.com/communications

Circle (1) On Reader Service Card
World Radio History

◆ MARKETPLACE ◆

Products for the Radio Broadcast Professional

Mail info and photos to: RW Marketplace, P.O. Box 1214, Falls Church, VA 22041

Logitek Numix Console

Logitek offers the Numix, an on-air console with an ergonomic shape to give



a studio a modern, open look. The enclosures are low and narrow so the air talent can more easily see one another.

The control surface is modular in design. Start with a Selector wedge and add as many fader wedges as you need. The monitor speakers, operator headphones, guest headphones and cue speaker are all controlled from the Selector wedge. Each Fader wedge has six input channels with 100mm Penny & Giles faders and guarded On and Off buttons.

The digital technology behind the Numix allows most features to be assignable. Faders are no longer tied to just a few inputs, so smaller hardware can accomplish large tasks. The surface is as flexible as the user wishes: faders can be limited to just one or two inputs or can access up to every input and output on the audio engine.

Stored setups can be created to allow each operator or daypart to have a different configuration. You can have multiple control surfaces connected to one audio engine. These surfaces can run independent studios or act as one large console for talent and producer type shows.

The Numix connects to the audio engine with a single cable, which simpli-

fies installation.

For more information contact Logitek in Texas at (713) 782-4592, fax (713) 782-7597 or circle Reader Service 121.

BASF CD-R Master

BASF offers a ceramic-plated CD-R Master suitable for audio and data applications. Each unit features a hardened white ceramic coating for added safety of stored information.

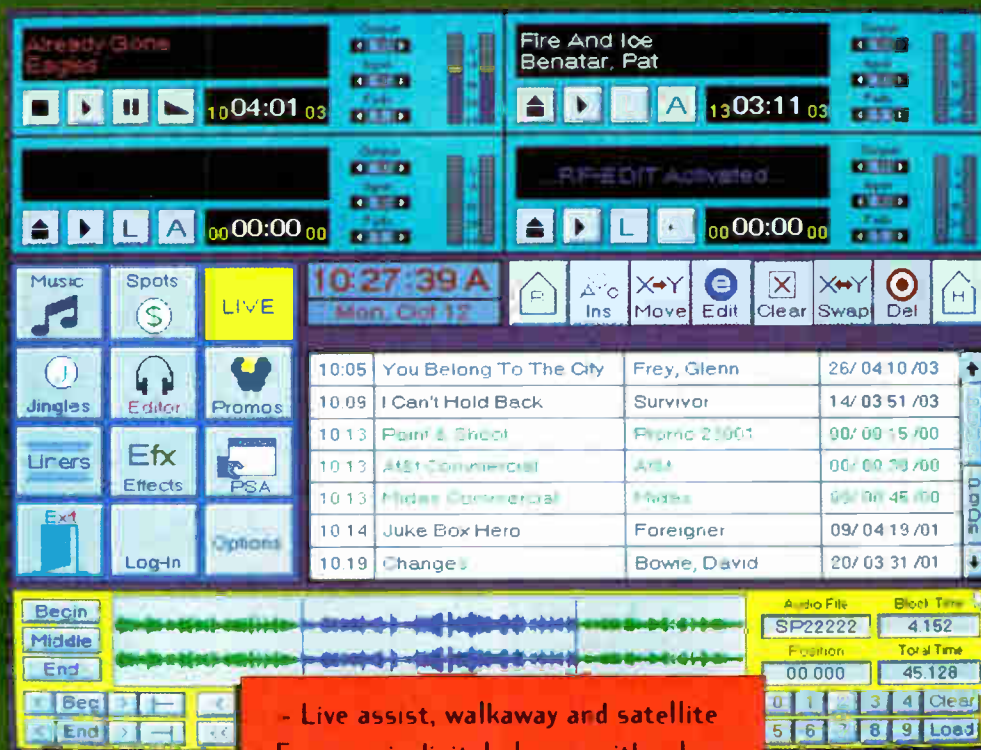
The ceramic coating works with the transparent protective layer to deliver stable protection evenly across the reflective layer.

This significantly improves information preservation.

See MARKETPLACE, page 32 ▶



Get the full picture.



- Live assist, walkaway and satellite
- Four on-air digital players with volume, fade and seque control
- Easy playlist editing capability
- Access your entire audio library
- RF edit on-air waveform editor
- Instant jock "audio drop box"
 - Bulletproof reliability
 - Satisfaction guaranteed

Pristine RapidFire:
the all-in-one digital broadcast
system.

Access **RAPIDFIRE** on the web at www.pristinesys.com or call (310) 670-7500

CartWorks Digital Audio

CartWorks/dbm Systems recently added several new digital audio formats to its live-assist, satellite automation and music-on-hard-drive systems. The three new formats, MPEG Layer II, MPEG Layer III and linear, were introduced at NAB99.

Support for MPEG Layer II digital audio compression was added at the request of many broadcasters, as the standard continues to grow in popularity. With this format, interchanging digital audio files among different hardware brands is made simple.

The MPEG Layer III format is becoming popular over the Internet. The ability to play these files through CartWorks adds powerful capabilities to the broadcast studio.

The linear format will allow audio purists to use audio files, specifically Microsoft WAV files, from home computers without the need for conversion.

For more information contact CartWorks/dbm Systems in Mississippi at (601) 856-9080, fax (601) 853-9976 or circle Reader Service 131.

Pristine RapidFire is a product of Pristine Systems, 3841 Holliman Way, Suite A, Culver City, CA 90230





AUDICY CAN TURN YOUR GM FROM SKEPTIC TO BELIEVER IN :30 SECONDS.

**BUT WE'LL
GIVE IT TO
YOU FREE
FOR 30 DAYS,
JUST TO MAKE
SURE.**

General Managers are paid to be skeptics. So why waste time explaining to them how Audicy has turned production managers, interns, and on-air talent into fanatics from coast to coast. Show your GM. We'll arrange to give your station free use of an Audicy workstation for thirty days with no obligation. And no strings attached.

In fact, in the time it takes a GM to recite the "we can't afford this" speech, you can demonstrate why so many fiscally-minded stations have concluded

just the opposite. There is no better way to speed up audio production; no quicker return on investment. The new Audicy offers features that keep the entire station working smarter today and tomorrow. Fully networkable and file compatible with major on-air delivery systems, it's fast, flexible, intuitive, and easily the most creative tool you can use.

STILL A SKEPTIC?

Let your GM set an unrealistic deadline. Then stand back and watch Audicy go to work with RAM-based speed, editing and mixing up to three times faster than other digital workstations. With Audicy you edit in real time, by ear, working on up to 24 tracks. Access to audio is instantaneous even when using its complete suite of built-in effects including OPTIMOD compres-

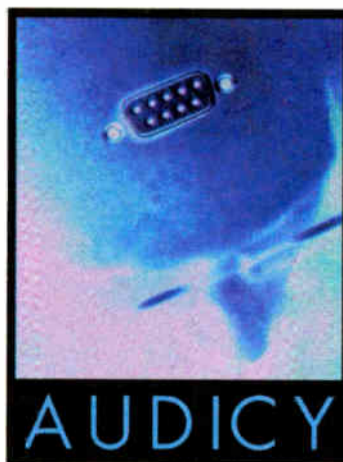
sion, EQ, and Lexicon reverb. Not to mention Time Fit, the industry's best-sounding time compression.

WORK FASTER, WORK SMARTER.

The sleek controller gives you positive, tactile command over all functions, with dedicated controls for every key operation and parameter setting. The transport controls and scrub wheel let you "feel" the audio, scrubbing with sample-accurate precision—and sounds to match at any scrub or fast wind speed. And since most

of your work is done from one screen, you never get lost navigating through endless drop-down menus.

Everyone who sits down at Audicy learns faster, works smarter, and gets more done in dramatically less time. And since time is money, why not think like a GM. Call us on it, toll free of course. To arrange your free Audicy for 30 days, call 1-800-622-0022.



AUDICY

orban

A Harman International Company

RVN Moves Into D.C. Landmark

Alan R. Peterson

The tale of the Radio Voyager Network (RVN) is a fascinating one that has ties to Washington, D.C., Europe, and the upstate New York college town of Ithaca.

RVN is an outgrowth of Finger Lakes Productions International (FLPI), an Ithaca-based creator and distributor of environmental and socially responsible feature programming. In 1998, the dream

behind by WWRC(AM) and WGAY(FM) on Georgia Avenue in Silver Spring, Md. In 1998, parent company Chancellor Broadcasting relocated those stations to nearby Rockville, Md.

Fittingly enough, the 10-story landmark Silver Spring building that RVN moved into is known locally as the World Building.

"WGAY(FM) and WWRC(AM) were here for decades," said Bill Torrey, executive vice president for FLPI. "The place has raised computer floors, miles of existing wire and lots of documentation. And the acoustics are amazing."

The two RVN studios, on-air and production, were built into office spaces formerly used by WGAY, which actually were configured as studios from the original buildout. Each studio is heavily constructed with multiple-layer walls, double glazing, sealed doors and an "inverted pyramid" acoustic space above the air talent. The original builders had an eye for audio quality and permanence.

"To build out just one of these rooms the way you see them now," said Torrey, "would have cost more than all of the equipment we purchased for Radio Voyager."

Besides having a ready-made radio plant at its disposal, the RVN management team was pleased to receive a good deal on the rent. The city of Silver Spring is undergoing a renewal and the building's owner, pleased to have

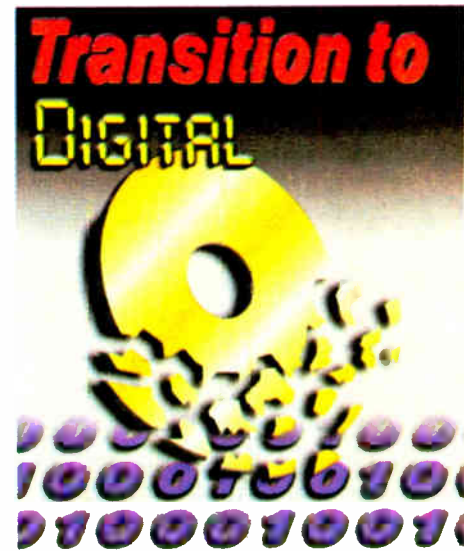
another radio facility move into the existing space, worked out a fair rate for the 2,800 square feet that RVN occupies.

Engineering AirWave analog consoles and Scott Studios DOS-based audio storage and management systems.

The gear

RVN keeps its technical operation simple, yet pumps a high-quality digital signal across the Atlantic.

Each production and air studio is equipped with Pacific Research and



"We are using about 100 GB of storage in our Scott system," said Torrey. "We can store linear audio or compress it 4:1 or 6:1 and the Scott



The World Building in Silver Spring, Md. When WGAY moved out, Radio Voyager took over the ninth floor.

of producing what the RVN brochure describes as "radio with a conscience" became a reality when the network went online. RVN now beams a 24-hour-a-day English-spoken Modern AC music mix to Europe, via a fascinating hopscotch of landlines, fiber optics and satellites that almost seem to double back on each other.

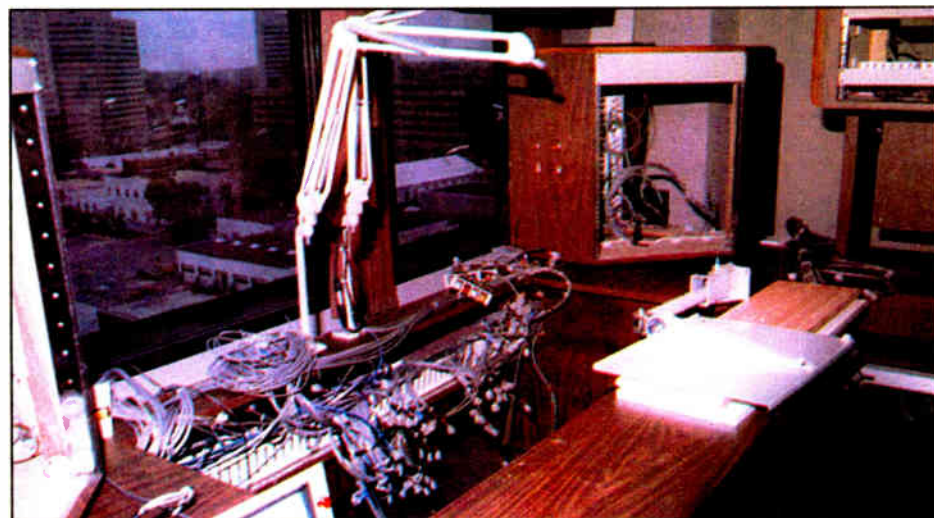
The people behind the scenes at RVN were planning a digital studio environment a year before a single brick was laid for their facility. As it turned out, almost no bricks were needed: A former Washington radio station building was about to become available for occupancy, following the consolidation of several stations to a new facility.

Ready-made

Realizing that recycling existing studio space would be both environmentally responsible and inexpensive, RVN "hermit-crabbed" into vacant studios left



Across the hall, Mega Communications uses the former WWRC facility to drive five Washington-area AM stations.



The Old WGAY Production Room, Awaiting New Duties for Radio Voyager

system will handle it fine." As a rule, Radio Voyager stores uncompressed audio on redundant hard drives. Music is stored on the drives, as well as voice-tracking for the hours when RVN is not live.

For multitracking and recording in the production room, Torrey and company use SAWPro from Innovative Quality Software as well as Cool Edit Pro from Syntrillium Software.

"Everybody knows them. We all have Cool Edit on our own computers so we know how it works," Torrey said.

In a corner of the production room sits an idle Studer two-track, quarter-inch analog tape machine. Is it there as a salute to tradition and the old-school way of doing production? Not at all, according to Torrey.

"Someone offered us this recorder for a ridiculous price," he said. "A couple of

See VOYAGER, page 34 ▶



April 14, 1999. Lucent Digital Radio IBOC DAB.
The first successful on-air hybrid test.

Lucent Digital Radio

www.lucent.com/ldr

SPECIAL REPORT

Answers to Your DAT Questions

Jeff Johnson

The DAT service articles published over the past year in *Radio World* have generated questions, additional information, and solutions from readers also struggling with digital audio tape.

Many have found success servicing their own equipment, and have come up with excellent solutions and one surprising discovery. The questions and answers presented in this article have come from many readers. Thanks to all!

Many people think DATs cannot be bulk-erased. I was told this in person and have seen a number of mentions in

print. I've told others that it cannot be done. I was wrong!

Question: "Can you bulk a DAT? If so, what kind of bulk eraser should you use?"

One reader answered: "Never bulk a DAT, is what I've been instructed. Is this due to time coding that is formatted into the tape?"

My earlier, incorrect answer: "No, bulking of a DAT is not possible due to the digital (full on or full off) nature of the recording. Record silence. Consider it a Buddhist experience."

The correct answer: "Yes, you can bulk DAT tapes and probably should."

The handheld tape eraser that you can

get from Radio Shack (Catalog No. 44-233A) does a perfectly satisfactory job. I use one every day to bulk DATs before re-recording. Bring your DAT tape slowly into contact with the bulk eraser once it has been turned on, rotate the DAT cassette in your hand for about 10 seconds and your tape is as blank as the day it was made.

Why go through that process? Minor alignment problems between machines can cause rather nasty error rates when one machine re-records a tape made on another machine. (Some previously recorded signal may remain, due to the misalignment, causing tracking and crosstalk problems.) Bulking the DAT

cassette in question before re-recording usually restores the error count to low single digits or zero.

I've just bulked a DAT to do the RF record adjustment (new heads), and I couldn't see anything on a scope, nor a sign of an index. The bulk eraser is the same I've used with reel-to-reel machines.

So, I tried it for 30 seconds on each side using an R/S 44-233A with the same circular-motion technique as with an analog tape. It erased the DAT! I played the tape on a machine with a scope hooked up the same as for alignment and saw no signal.

Never believe what you hear. Try it.

The following are the experiences of a reader.

"I have been working on primarily Panasonic SV-DATs for about three years, spending probably well over 1,000 hours repairing and calibrating them. Here are a few Panasonic DAT war stories.

"Case 1: The drive gear assemblies that we are receiving from Matsushita are not holding take-up tension. This is an old problem that they supposedly solved about a year ago. One possible solution we are looking at is refurbishing older units by cleaning and roughing up the felt clutch. The first two attempts at this seem to be working well.

"Case 2: On almost every one of our Panasonic DATs, I have found that the plastic base of the take-up guide roller assembly eventually cracks from age, resulting in unstable tape alignment. If the part wasn't so cheap, we would have it fabricated out of aluminum at a local machinist. So for now, replacing the assembly is the solution.

"Case 3: During a recent head replacement on an SV-3800, the tape path would not align after changing the head. Adjustments to the guide rollers and angle post made no difference. When I tried a second new head, the tape path aligned easily. Usually, a head replacement is the easiest repair that I have to make on these units in the rare occasion that a head fails. I am suspecting a tolerance stack-up between the scanner's mounting pads and the mounting surfaces on the deck plate.

"Case 4: A Panasonic DAT kept 'losing its mind,' i.e., kept forgetting its mode position. I tried replacing the mode switch. This seemed to help, but the problem quickly returned. We solved the problem by replacing the mode motor.

"By the way, Jeff, I liked your idea on how to keep track of past repairs by putting old parts in a plastic bag inside the case. I also faced the problem on how to keep track of repair history on our Panasonic DATs. What began as a spreadsheet eventually became a multi-level Access database that keeps track of repairs and part replacements by machine number, repair request number, date and head hours. I also incorporated part purchasing and inventory information, so that I can track overall part usage and part shortages."

More reader questions:

Q: "Sometimes we get tapes in that don't play on our DAT machines, which are all Tascam DA-20 or DA-30 MKII units. There's audio when you rewind and fast-forward but nothing when you play back. Have you ever heard of this?"

A: This is an alignment error between the two machines. Yours are no doubt OK, since they are all the same. The tapes you are receiving must be incorrectly aligned.

See DAT, page 31 ▶

THE NAB RADIO SHOW

The Best Show on Radio!

August 31 - September 3, 1999

Orange County Convention Center
Orlando, Florida



Bob & Tom host
The NAB Marconi
Radio Awards.

Thursday Sept. 2nd

Developed By Radio Pros, For Radio Pros

NAB has brought together 21 of radio's top programming, management and sales minds to plan the Best Show on Radio. The 1999 NAB Radio Show Steering Committee has planned a show for you that promises to be current, controversial and very entertaining.



Steering
Committee Chair:
John Cullen
Co-Chief Operating Officer
Capstar



Management
Subcommittee Chair:
David Pearlman
Co-Chief Operating Officer
CBS/Infinity



Programming
Subcommittee Chair:
Don Benson
Corporate Vice President, Operations/Programming
Jefferson-Pilot Communications



Sales & Marketing
Subcommittee Chair:
John Douglas
Chief Executive Officer
OIA, LLC

NAB National Radio Award Winner



Join us as Bill Stakelin, President/COO Regent Communications, will be honored with the 1999 NAB National Radio Award at the NAB Radio Luncheon on Wednesday, September 1.

Over 65 Sessions
& 150+ Exhibitors

Make Your Plans Today!

Visit www.nab.org/conventions/
For updates, registration and accommodations.

Call 1-800-342-2460
For general information.

Want to exhibit? Call 1-800-NAB-EXPO or 1-202-775-4988

see you in
Orlando!

► DAT, continued from page 30

Q: "We have an SV-3800 with a glitch. The unit works fine if you don't operate the shuttle wheel or use the search functions. If you do try to shuttle or search, the unit locks up and won't respond to any commands. When you push the open-close button, the drawer opens even though the tape is extended out of the shell. Any clues on what to look for?"

A: I assume the tape is extended on eject only after the use of the shuttle or search.

Reverse shuttle (reverse cue), as I mentioned in a previous DAT service article in *RW*, is the toughest mechanical test of a machine. Search causes a reverse cue when the desired PNO is reached.

It is likely that the capstan is loaded with tape coating. This can cause the tape to "walk" up or down the capstan and out of the guides, especially in reverse cue. Clean the capstan. It is also possible that the left hub (take-up during reverse cue) is not turning during reverse cue, causing the tape to slacken.

Either condition will cause the cessation of tape contact with the heads. The machine will lock up because it doesn't know where it is. A cure is to turn it off and on, then eject.

It is also possible that the mode motor is not operating properly, resulting in the same outcome.

In any event, open the case and observe the tape and hub motions during reverse cue. The cause will present itself. If you or anyone at your place is mechanically handy, read the article and go at it!

Q: "This one's got me: a Panasonic SV-3800 that just stops right in the middle of playback. Has anyone found the cause of this 'Panachronic' problem?"

For this question, let's turn to the advice offered by another reader:

A: "It seems many of us have had similar problems.

"I've experienced very intermittent transport loading and unloading, error code Exx01 pointing to a 'mechanism mode switching lock' and, in the DAT notes, also servo system. The Mode switch seemed OK, I replaced the mode motor and to make a long story short, I eventually exchanged all boards (except power supply) and the capstan assembly with a spare, and checked all connectors and adjustments including end of the tape.

"I also disassembled the lower mechanism looking for bad gears, etc., noticed the supply-side post roller was very loose and not fully retracting and the supply loading levers were not normal — there were unusual spacings on the levers at unload.

"I decided the supply roller post support must be worn; that requires an expensive jig for alignment after replacement. I sent the unit out and it came back quicker than expected, with a lower bill than the estimate! They had replaced three of the loading gears and cams, 105/106/112 and some minor adjustments.

"Upon examining the old gears, I noticed some teeth with slight nicks and some bits of gear plastic when I had disassembled the mechanisms, but had not seen the nicked teeth. The loading side post is still a bit loose and doesn't seem to fully retract on unload. It has been working for about eight months with no particular complaint.

"Leave the moral for each to decide. I will examine the gear teeth more closely the next time I see bits of plastic. Also, having a spare to exchange boards is a big plus."

Q: "We have 10 Panasonic 3700 DAT machines. For the most part they are excellent performers, but we have a problem with the rewind mode. We are chang-

ing the rewind gears in the decks at least once a year. Is this a normal rate for others using this unit? Any suggestions on what causes the gears to wear out so fast? Since I don't have any alignment gear or tapes, what should I be able to change without doing any realigning?"

damaging the gears.

Q: "How long will it take to learn DAT service?"

A: Don, a colleague of mine, learned all he needed to know specifically in an hour or so. I am very modest when I say that which I know, I learned with the shop manual, test tapes and a 'scope.

Yes, I have had success in taming DAT machines, including the Panasonic units, but I don't consider myself anything other than merely having put in the time to learn.

■■■

Jeff Johnson is network engineer for WVXU(FM) and the X-Star Radio Network/Cincinnati, and the chair of SBE Chapter 33.

Reach him at Jeff.Johnson@goodnews.net

ing the rewind gears in the decks at least once a year. Is this a normal rate for others using this unit? Any suggestions on

A: I have never experienced a gear tooth problem. I keep the brakes in good condition. Strong brakes keep torque from

Minor alignment problems between machines can cause nasty error rates when one machine re-records a tape made on another machine.



SMARTI®
SMARTI® POTS Codec
1 and 4 audio channel
models available



SRPT-40
Frequency agile
remote transmitter
VHF and UHF frequency
agile models available



Cellcast
RBS-400 Cellular remote
broadcast studio



GX-500
Remote mixer
Available in August

With Fall remote season around the corner, it's time to prepare your game plan to increase income. Don't rely on worn out gear that could leave you speechless on the sidelines. *MARTI®* has

a remote package for every station's needs - RPU, Cellular, POTS, VHF/UHF Frequency Agile, and more. And *MARTI* tackles the competition when it comes to reliability, high performance and value.

Contact *MARTI* or your favorite *MARTI* distributor today and get in on the savings in time for Fall sports remotes. Check out our web site at www.marti.bdcast.com for a complete listing of products and *MARTI* distributors, or call *MARTI* at 817-645-9163.

READY TO SHIP NOW!

MARTI

ELECTRONICS
Performance Value Leader
A BROADCAST ELECTRONICS COMPANY

421 Marti Drive, Cleburne, TX 76031 • Phone: (817) 645-9163 • Fax: (817) 641-3869 • email address: marti@flash.net • web address: www.marti.bdcast.com
RWD799 ©1999 Marti Electronics

MARKET PLACE

► MARKETPLACE, continued from page 27

The BASF ceramic CD-R Master incorporates all features from its previous CD-R Master, plus a silver reflective coating for improved reflectivity, an organic dye for minimal errors and long life and a special on-disc writing surface. Precision manufactured for use at all writing speeds, the CD-R Master is available in 74-minute/650 MB capacity.

For more information contact the company in California at (805) 295-5551, fax (805) 295-5554 or circle Reader Service 141.

Digital Stereo Generator

The Omnia.sg from Cutting Edge is

a digital stereo generator that assists audio processing at FM stations by placing the processing in the studio and stereo generation at the transmitter.

By placing the Omnia.sg at a transmitter site, the tight coupling between the stereo generator and exciter is maintained and loudness-hindering overshoots are minimized.

Derived from the digital technology used in the Omnia.fm on-air processor, Omnia.sg also features a composite clipper for extra loudness and a low-pass filter for interference-free subcarrier operation.

To accommodate STLs, the unit accepts analog inputs in addition to digital inputs through its onboard sample rate converter. Dual-composite outputs are

provided along with SCA loop-throughs for easy hook-ups at the transmitter site.

The simple interface of the Omnia.sg allows for quick setup and calibration. A lockout function prevents inadvertent changes.

Other front-panel features include a BNC composite monitor point for testing and LED monitoring of input and output levels.

Front panel status LEDs are duplicated on a rear panel connector to provide status outputs and inputs for remote control. A silence warning is also found on the rear panel.

For more information contact Cutting Edge in Ohio at (216) 241-3343, fax (216) 241-4103 or circle Reader Service 82.

The Rules They Are-a- Changing

► BOOK, continued from page 22

equip and train their employees. Did you know, for instance, that a tower owner is required by law to maintain a physician-approved first-aid kit at the tower site and inspect/restock it monthly? This is just one of the important pieces of information presented in the OSHA regulatory overview. Other OSHA items discussed include work lighting, RF radiation protection and, not surprisingly, fall protection.

The EPA seems to have its fingers in everyone's pie these days, and tower owners are no exception. The two areas that the EPA is most concerned with at tower sites are PCB transformers and underground storage tanks. A brief discussion is included on how to identify a PCB-containing transformer and what your obligations are should you have one. Underground storage tanks are also defined and discussed along with leak detection and spill/overflow protection.

The last section in the overview has to do with the leasing of tower space to others. Many of the issues that such leasing entails are briefly discussed (such as structural analysis, lease term, rate increases and the like), and the narrative will likely bring to mind many other issues that should be considered in the leasing process. This section is one of the real jewels of this publication.

Following the narrative are the exhaustive appendices. They include:

- FCC Form 854 and FAA Form 7460-1
- FAA Lighting/Marking Advisory Circular
- FCC OET Bulletin No. 65 (RF Radiation)
- FCC Environmental/RFR Compliance Worksheets
- Sample Tower Lease Agreement
- FCC Rules Part 17
- OSHA Telecommunications Rules
- OSHA Lockout/Tagout Rules
- EPA PCB Rules
- EPA Underground Storage Tank Rules
- List of FCC and FAA Field Offices

In short, one-stop shopping. Everything you need to keep your tower site legal and more is contained in this one volume. For the tower owner or manager, staying ahead of the government enforcers can be a real headache, even for the most diligent. The Tower Site Regulation Handbook can be a great tool to help you succeed.

■■■
Cris Alexander is director of engineering for Crawford Broadcasting and a regular contributor to *Radio World*.

Looking for the best digital audio system?

Compare apples to apples.



Digital audio systems aren't created equal. You'll find that Digital Universe, CBSI's new system for live assist, satellite, automation and routing, stands out from the crowd.

cbsi
Custom Business Systems Inc

P.O. Box 67 • Reedsport, Oregon 97467
Telephone 541 271-3681 • FAX 541 271-5721
E-mail: info@cbsi.org • www.digitaluniverse.org

800 547-3930

Uncompressed Audio

Because most other systems depend on compression, they take huge bites out of your audio before it ever reaches the airwaves. Digital Universe serves up full CD-quality, 44.1 kHz audio, start to finish. That's audio fidelity sure to appeal to even the most golden-eared of your listeners.

High Channel Capacity

Just try running a station on 2, 3, even 6 channels. Most systems can't get much further than that, uncompressed, without adding lots of extra hardware. Digital Universe gives you 50 stereo channels,* all from a single server. No other system comes close.

*Tested capacity as of January 1999. Advances in PC hardware yield ongoing improvements in channel capacity.

No Proprietary Hardware

These days, any system built around proprietary hardware is a dead end. But Digital Universe is software based, so your hardware choices are wide open. Run your system on standard, affordable PCs and mix and match audio cards among workstations: it's up to you.

Windows NT + Client/Server

Digital Universe's leading-edge Windows NT platform and client/server architecture give your system room to grow, without clumsy workarounds or multiple PCs in every studio. And Digital Universe was written for NT, not just "optimized" for it - it's the right infrastructure for the future as well as the present.

Sound impossible? Take the Digital Universe challenge. Contact us today to request your checklist for selecting a future-proof digital audio system. Then, compare apples to apples. Once you've heard what Digital Universe can do for your station, you won't settle for anything less than gold.

DIGITAL



UNIVERSE



Circle (26) On Reader Service Card

World Radio History

ATU, in the Path of The Pulse

► **WORKBENCH**, continued from page 16 and wipe down the outside while inspecting for cracks. Check the horn gap spacing if used on the ATU output. Make sure the horn gap brackets are tight and set them using the same procedure mentioned earlier for the ball gaps.

Look for burns or shorted turns on both the static drain choke and the tower lighting choke. Also check that the j-plugs plug firmly into the j-plug jacks. If an OIB is handy, measure the impedance or do a sweep as shown in Figure 3 to make sure the match hasn't changed.

A can of bee spray, liberally applied to the overhangs of the ATU cabinet, underneath and along the fence will deter wasps, hornets and bumblebees.

Another tip that has saved me both time and aggravation has been to mark down the component values used in the network. This is especially true for an older ATU where the manufacturer is no longer in business. Trying to decipher the value from a blown mica cap is time-consuming when the ID plate has been obliterated with dried dielectric.

★ ★ ★

In the Oct. 28, 1998, issue, we talked about using a Radio Shack auto-dialer for remote alarms. Mark Tomlonson, the chief at WMUK(FM) and WIDR(FM) in Kalamazoo, Mich., has been using one of these devices, and came upon a glitch he wanted to share with *Workbench* readers.

In addition to a pre-recorded message, the auto-dialer sends a series of DTMF tones. These were included to allow the receiver of a call to differentiate between two kinds of alerts, labeled "alarm" and "fire" on the auto-dialer.

When Mark started using new pagers, they stopped receiving alerts. The problem was traced to the DTMF codes. It seems that when the paging service got the "7-3-7-3-7-3" of the auto-dialer's "alarm" setting, the message disappeared into the bowels of the paging system! By switching the alert contact closure to the "fire" setting, a "3-3-3-3-3-3" message is generated, which the pager passes along fine.

Compounding the problem is that when the auto-dialer is tested using its "test" mode, the DTMF codes are not sent. The problem was not discovered until an actual alarm condition occurred. Mark's advice is to *really* test the system by actually closing the contacts on the alert device.

■ ■ ■

John Bisset has worked as a chief engineer and contract engineer for more than 20 years. He is a district sales manager for Harris Corp. Reach him at (703) 323-8011.

Submissions for this column are encouraged, and qualify for SBE recertification credit. Fax your submission to (703) 323-8044, or via e-mail at jbis-set@harris.com

Maintaining Antenna Systems

► **AM**, continued from page 21

In this case, the power is 5,000 watts. If the antenna impedance dropped to 45 ohms, one could still probably adjust the transmitter to produce 10 amperes; however, a maximum of 4,500 watts will be produced.

I say maximum because there would probably be a phase shift occurring because of a change of reactance, which causes even less power to be radiated. An increase in impedance will add impedance to the entire system, limiting current and reducing power.

An antenna system can "look" like it is working when, in fact, it is not. A shift in antenna impedance can affect the bandwidth of the station. All stations are sup-

posed to be able to pass the audio frequencies established by the NRSC standards. However, if the antenna is not maintained, they may not.

A narrow bandwidth results in low audio fidelity. The impedance of the antenna should be checked annually with an operating impedance bridge. This will tell you if the antenna is functioning as it was designed. An antenna sweep is also prudent, as is to determine how well the antenna passes sidebands. Information gathered from these tests should be compared with the original antenna proof.

The IBOC plan for digital AM is proposing the digital information to be in the 5 kHz to 10 kHz area of the sidebands.

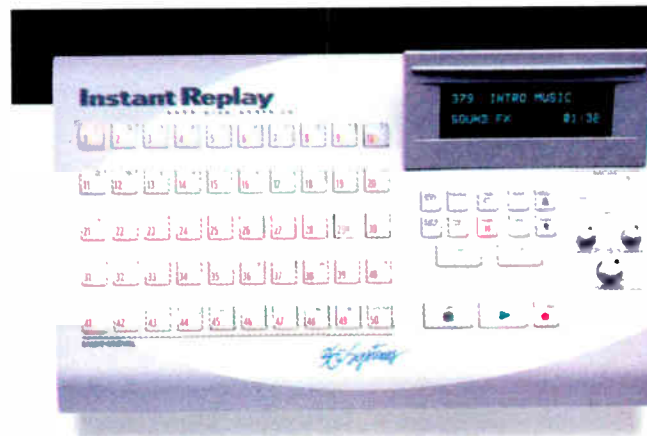
This is in the first-adjacent channel area and the signal is about half the power of the primary sidebands between the carrier and 5 kHz. If the antenna can not pass these frequencies adequately, the digital signal will be severely attenuated, possibly causing problems with the yet-to-be-designed digital receiver.

■ ■ ■

Ed Montgomery is the video technology and communications lab director at Thomas Jefferson High School for Science and Technology, Fairfax County, Va. He has worked as a broadcast engineer and college-level instructor.

Reach him at emontgom@lan.tjhsst.edu

Meet the "Morning Show Team"



Instant music, instant sound effects, instant fun.

- Holds up to 1,000 "carts" of any length, from milliseconds to hours.
- 10 banks of 50 programmable Hot Keys. It's like having 50 cart machines pre-loaded and ready to fire.
- Up to 24 hours of total on-line audio storage.
- "Find" button locates any cut instantly.

There is nothing faster, easier, or cooler! You can finally let go of your analog cart machines and associated maintenance headaches. Or, if you're running automation, now you have the perfect compliment for those times when you need to play something, and you need it now.

Instant Replay^{2.0}

HARD DISK DIGITAL AUDIO

Fast and easy editing for news and listener call-ins.

The New Short/cut '99 has arrived!

Short/cut '99 delivers these exciting new features:

- Variable length cross-fades
- Programmable Fade In and Fade Out
- Gain adjustment of selected audio with ramping
- .WAV, .BWF and .AIFF file import and export
- External sample rate synchronization
- D-NET™ Echo

Get superior audio quality, true cut-and-paste waveform editing, massive hard disk storage and support for external removable media drives,* all in one compact, easy-to-use package.



Short/cut '99
BROADCAST AUDIO EDITOR™



Attention call letter stations.** You're only a phone call away from a free 10-day Test Drive. So try it out. We'll understand if you don't give it back.

(818) 991-0360

360 Systems®

PROFESSIONAL DIGITAL AUDIO

For more information call (818) 991-0360 / Fax (818) 991-1360 / e-mail: info@360systems.com / Website: www.360systems.com

*Optional Zip™ drives available from 360 Systems.
**Offer good in U.S. and Canada only.
© 1999-360 Systems

Voyager on the Air

► VOYAGER, continued from page 29
times a month, we have material that comes in on reel, so we need it."

The Scott Systems main computer and storage array are kept in an engineering rack located near the entrance to the RVN studio cluster. Torrey also keeps equipment for signal digitizing and optical encoding, automated contact-closure, and emergency silence-sensing in this area.

"Should we lose the signal from the studio," said Torrey, "the silence-sensor turns on a CD jukebox, much like one you would find at home. This plays generic programming until we can resolve the problem."

Before Radio Voyager's digital signal can be heard in jolly old England, it must first head west to California.

"We ship our signal via fiber optics to Chicago," said Torrey. "There, it gets sent up to the GE-3 satellite for reception here in the U.S."

The satellite signal is received in Napa, Calif., where it is again placed on a fiber-optic cable for a trip back east across the U.S., then on to the transatlantic fiber-optic cable for delivery to Europe. The trip sounds redundant and lengthy, but is the most efficient way to put up the signal.

"Once in London, our signal is beamed up to the Eutelsat II F6 satellite. Our footprint covers all of Europe, North



The new on-air studio at Radio Voyager is built inside former WGAY office space. A Scott Studios DOS-driven automation system runs the show during unattended hours.

Africa and the Middle East," said Torrey.

Because the signal can be picked up off of Eutelsat, direct delivery of Radio Voyager to homes is possible using inexpensive home satellite dishes. But RVN is also broadcast in FM stereo by affiliate stations in Italy, Malta, Bulgaria, Finland, Macedonia and Albania. Domestic U.S. listeners can hear Radio Voyager off of GE-3, Transponder 7.

Future plans for RVN include the refitting of the last of the WGAY studios into large talk/conference studios for programming decisions yet to come.

Radio Voyager took over only half of the abandoned WGAY/WWRC facility, meaning an entire second studio cluster was available for another tenant to occupy.

The space has since been filled by Mega Communications, owners of Spanish-formatted stations in Washington, Boston, Philadelphia, and Hartford, Conn. The company consolidated five Washington AM sta-

RVN 'hermit-crabbed' into vacant studios left behind by WWRC and WGAY.

tions into the WWRC studio space and moved its corporate offices from New Jersey into the 10th floor of the World Building.

Still in an early phase of building out its own space, the five Mega stations use a mix of Scott Systems audio management systems and MiniDisc players. Two ProTools computers and a self-contained Roland workstation round out the production complement for the Mega stations.

Both Radio Voyager and Mega have global visions and treat each other as good local neighbors. It is not uncommon to see an RVN technician stroll down the hall and help Mega out with the Scott Systems units, or see staffers from both operations hanging in the halls by the elevators, talking radio.

■ ■ ■

For information on Radio Voyager programming contact Greg Hartz, executive vVP of marketing, finance and client relations in New York at (607) 275-9400.

For information on the Mega Communications stations call the corporate headquarters in Maryland at (301) 588-6200.

Affordable Digital Consoles

Logitek digital with a better difference!

3320 Bering Drive, Houston, TX, 77057 e-mail info@logitekaudio.com

Voice: North America 800.231.5870 Fax: 713.782.7597 Others 713.782.4592

Visit our home page at www.logitekaudio.com for more information

If Sending Audio is Your Business...

Giving You the Best Way to do it is Ours!

MUSICAM USA Codecs, Used by More Audio Professionals
Than All Other Brands Combined.

CDQ Prima

Stereo Codecs

- MUSICAM® MPEG Layer II, Layer III and G.722 coding
- SMPTE Time Code capable
- Point-to-MultiPoint Transmission (up to 6 sites)



RoadRunner

Portable Codec/Mixer

- Your one-box remote broadcast solution
- Three-channel mixer
- Built-in ISDN terminal Adapter



FIELDPHONE II

Analog (POTS) Codecs

- The best quality audio over a single telephone line
- Perfect for sports, breaking news, even music!



Studio FONE
Bi-Directional POTS Codec

TEAM

T1/E1 Audio Multiplexing Transmission System

T1/E1 Audio Multiplexing Transmission System

- Digital master-quality audio with no compression
- Transmit 12 audio programs simultaneously



Over 17,000 in use worldwide

Need a Codec? Call Us!

670 N. Beers St. ■ Bldg. 4
Holmdel, New Jersey, USA 07733
E-Mail: sales@musicamusa.com



Tel.: 732-739-5600
Fax: 732-739-1818

www.musicamusa.com

T H E F

What will it

Two tin cans and a string. A simple way to transmit sounds, gone forever except for the memories.

The world is more complex now. We record everything we say and play, storing it for future generations. Technology has taken us to a new level, relegating cylinders, vinyl and analog audiotape to museums, replacing these once ground-breaking media with alphabet soup: ADAT, DTRS, DAT, CD-R, MD.

But now the world of professional audio recording media can be summed up in four new letters: FUJI.

Fuji, an established name in professional digital videotape products, now offers a line of professional digital audio products. Every cassette and disc comes with Fuji's established high quality and consistency.



U T U R E

sound like?



 **FUJI**
PROFESSIONAL
AUDIO
P R O D U C T S

**HERE
TODAY.
HEAR
TOMORROW.**



The industry's most advanced manufacturing technology packed in every product. And a knowledgeable and dedicated sales and support staff, ready to stand behind every piece we ship.

We can't tell you what the future will sound like.
We can only assure you that we'll be around to record it.



© 1999 Fuji Photo Film U.S.A., Inc. For more information, contact your Fuji Account Representative.
You can also find us online at www.fujifilm.com/provideo.

Circle (30) On Reader Service Card

World Radio History

100% Orban engineering.

THE OPTIMOD-FM 2200 is

everything you'd expect from Orban engineering: superior design, a big, loud OPTIMOD sound, plus Bob Orban's proven processing know-how. In fact, about the only thing unexpected is the price. Around half what you'd expect to pay for 100% Orban performance.

In one slim package, you get features usually reserved for high-end processors. Including built-in digital stereo encoding, eight factory presets (each with 19 LESS/MORE variations) and eight user presets. No other processor in this price range delivers a louder, brighter, or cleaner sound—with more bass punch. That's because the 2200 is a direct descendant of the best-selling digital processor in the world, pioneered by one of the most competitive engineers in radio.

THE FAMILY RESEMBLANCE IS CLEAR.

The 2200's two key processing structures come directly from Bob's evolutionary work on the OPTIMOD-FM 8200.

In the Two-Band structure, Bass EQ lets you selectively add punch, while a High Frequency enhancer

The OPTIMOD-FM 2200



automatically adds "sparkle." Protection mode maintains unmatched transparency and makes the 2200 an ideal upgrade for stations using Orban's classic 8000A. Both structures tightly limit peaks while providing superb baseband spectrum control. This guarantees highest loudness by

protecting the stereo pilot tone and preventing overshoots in any uncompressed digital STL.

The result is the ability to create a big, loud, signature sound for all kinds of formats: pop music, talk, classical or jazz. All at a price that has competitive written all over it. Just like the engineering.

THE SCIENCE BEHIND THE SOUND

More and more broadcasting chains demand digital consistency. That's why the 2200's built-in encoder generates the stereo composite signal digitally. Digital encoding is ultra-stable; no periodic tweaking is required.

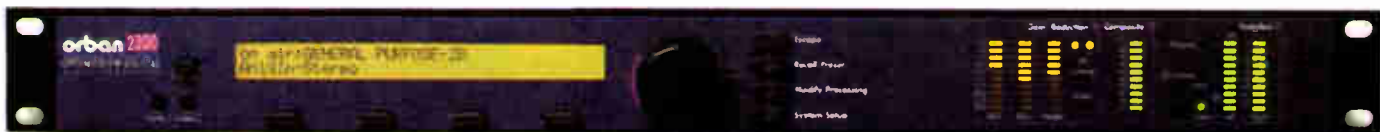
The OPTIMOD-FM 2200D version also includes AES/EBU digital inputs and outputs in addition to standard analog.

So you get loud, clear digital sound across the entire spectrum—and you can keep your signal in pure digital form all the way to the transmitter.

At
about
half
the
price.

orban[®]

A Harman International Company

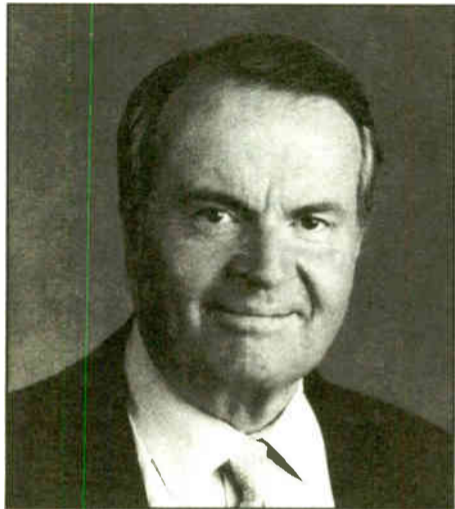




Osgood: A Life of Achievement

Laurie Cebula

Charles Osgood, legendary news anchor for CBS radio and television, received the 1999 Lifetime Achievement Award at the recent Radio-Mercury Awards ceremony. The host of "CBS Sunday Morning" since 1994 and radio host of "The Osgood Files," Osgood is no stranger to recognition.



Charles Osgood

He has received numerous awards — among them two Peabody Awards, a Marconi, the Washington Journalism Review's Best in the Business Award as Best Radio Reporter, and in 1990, was inducted into the National Association of Broadcasters Hall of Fame.

On winning the Lifetime Achievement Award, Osgood said he was pleased to be included in the list of Mercury winners.

"I have attended the awards in the past and in fact, presented the award to Paul Harvey. It's a great honor indeed to be on the receiving end."

The award was conceived to recognize an individual whose lifetime work has

raised radio advertising to a level of high artistic merit. The award was first given in 1997 to Harvey.

Osgood, the CBS poet-in-residence, talked with *RW* recently on winning the award and his experiences in radio.

RW: How did you incorporate or develop the creative use of your voice in delivering broadcasts?

Osgood: I certainly wouldn't recommend to anyone that they cultivate any particular way of doing it. I think the more like yourself you can sound, the better. In fact, almost anything that you do to make yourself sound like somebody else is going to work against you.

RW: When you started the verse-like delivery, how was it received by your supervisors at the time?

Osgood: It was not very well-received. They said, "Very nice, very ... nice ... don't ... do ... that ... again."

I think the reason is because everybody wants to put things into a category. And management has the illusion that it's running things. So, nobody told me to do a poem, and if I wasn't told to do a poem, what was I doing one for? They said, "That's not the format."

We stopped doing them, but then we started getting a very good response to the particular one that they had heard. So I started to slip it back in and it turned out to be a signature for me. But I wouldn't call it poetry.

When you do something like that, some people are going to love it and some are going to hate it. It's a little risky and I try not to do it too much.

RW: What is your vision of news radio in the new millennium?

Osgood: It's very interesting. I have now been in this business for a long time, I've

been with CBS for 32 years; before that I was with ABC. I think I can speak now from some experience.

Ever since I have been in this business, which dates back to the 1950s, everybody always was talking about the new media that have come along and

how they were going to replace radio. It's interesting, because now we have additional new media with satellites and the various forms of SDTV. There are so many different forms, and radio has never been stronger.

Radio is still a marvelous information medium, a marvelous entertainment medium and a great advertising medium. It's all those things. It's

See OSGOOD, page 45 ▶

Agency Earns \$100K Prize

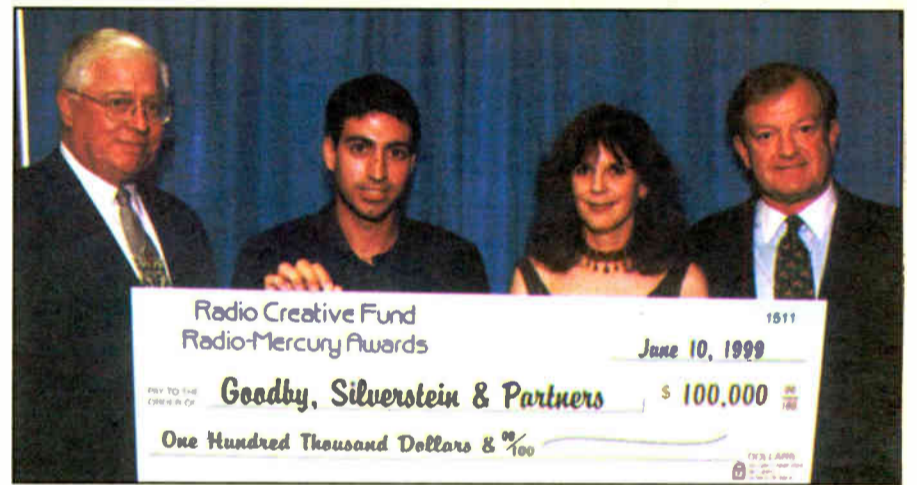
It was a good night to be a lizard.

Goodby, Silverstein & Partners received the \$100,000 grand prize for the best radio commercial at the 8th Annual Radio-Mercury Awards at New York's Supper Club last month.

The winning spot, "Selling Out," was developed for Anheuser-Busch

awarded for the top commercials of 1998 from the general, Hispanic and station-produced categories. The Radio-Mercury Awards also honored the best public service announcement.

CBS news anchor Charles Osgood received the 1999 Lifetime Achievement Award, which recognizes a person whose



(Left to right): RAB President and CEO Gary Fries, Steve Dildarian, Rosemary Love and Jim Thompson

as part of the Louie the Lizard campaign by writer Steve Dildarian, producer Cindy Epps and Creative Directors Jeffrey Goodby and Rich Silverstein.

The agency is not new to Mercury success. In 1996, it won \$100,000 for a commercial for Sega of America.

A total of \$210,000 in cash was

lifetime work has raised radio advertising to a level of high artistic merit.

The Radio-Mercury Awards are governed by the Radio Creative Fund, a nonprofit corporation funded by the Radio industry.

Audio of the winning spots is available at the Mercury Web page located at www.rab.com

Radio Assist[®] Complete Radio Automation Systems.



Netia Americas Ltd. • 10805 Green View Way • Columbia, Maryland 21044 • tel: (410) 730-2616 • toll free: (877) 730-2616 • fax: (410) 730-6718
<http://www.netia-broadcast.com>

Janoff, Seeking a New Level

Laurie Cebula

Four years ago, as general sales manager of top-ranked CBS station WINS(AM) in New York, Greg Janoff formed the WINS Promotions Group. The group became a full-service promotional agency that offers advertisers more than a radio ad campaign — it also coordinates the inclusion of other media available to advertisers through the CBS empire of radio, television and new media properties.

Now, Infinity Radio has appointed Janoff as vice president of a new sales and marketing unit, CBS Radio Promotions Group. He remains based

in New York and retains his duties as sales manager of WINS.

Janoff is confident the group will be successful in its mission to expand local sales and marketing efforts to a



national level, while maintaining the customized appeal to local advertisers.

In a recent interview, Janoff gave an inside view of CBS' cross-promotional strategies and what's ahead for the new group.

RW: What is the new CBS Promotions group and what are your main objectives as vice president?

Janoff: The promotions group is not a brand-new effort. It's more like taking an effort that has already been happening in a lot of local markets where we have great clusters of radio stations and bringing it into the next phase, bringing it to a new level.

We have had these promotions groups running very effectively, often based out of some of the stations in the markets, and we are putting it all under the banner of the promotions group. Now we are taking it to another level of consistency within our own company where we can

really implement multiple-market deals for our marketers.

RW: Does this then involve implementing your strategies from the WINS Promotions Group and using them at a national level?

Janoff: To an extent. We started the WINS Promotions Group about four years ago and the vision is, they operate as full sales-promotions agencies.

Operating as the WINS Promotions Group, we still did some deals that included other markets, and we didn't always have media time running on WINS as part of a program that we would sell. That evolved into making this group more of a market-wide group to service all the (CBS) stations. And that started happening all around the country in different markets that we have.

It also brings a better system to implement these programs for our clients.

'The thing that is interesting about this is that they are not cookie-cutter promotions.'

RW: Tell us about those people who are working with the Promotions Group.

Janoff: It varies by market. Some of them have been up and running for three or four years and are very successful. We're going to kind of all fly under the same banner and have a lot more communication with each other.

If we have a client, for example, based out of New York, who needs Los Angeles and Detroit, we'll be able to implement those programs really easily now in those two markets. And we could before, but now there is a more consistent effort.

Some markets are in start-up, some are up and running already and the structures are based on the market. Generally, we have a managing director in the market that runs the effort and we usually have a few people that are also dedicated to the promotions group office that are selling.

Then in some other markets, there are qualified sellers who also sell for their stations, but who need to qualify and maintain levels of performance to be able to also sell the group.

Selling nationwide

RW: So, the group has regional and local representatives acting throughout the country?

Janoff: We also have someone who runs our Los Angeles office, our Chicago office, and our Baltimore office who will also have regional responsibilities. (This is not one person, but three separate offices each run by its own director, who will also take on regional responsibilities.)

RW: Are the ad campaigns varied? Is it feasible to come up with an ad campaign for radio that can be effective throughout

See JANOFF, page 44 ►

September 24-27, 1999
Javits Convention Center
New York, NY, USA


107th
convention

exhibits
technical papers
workshops
tours
events

AES
audio engineering society

advancing
the art of
sound

leading the world of audio
into the 21st century

 800-541-7299
212-661-8528
www.aes.org

ONLINE RADIO

News Sources Available Online

Kim Komando

The Internet has provided a major boost both in the amount of information available to broadcasters and how quickly we can get our hands on it. Sure, many of us still read the morning paper and weekly news magazines complete with razor blade in hand cutting stories for fodder. However, finding backgrounders, experts and stories to cover on the air is truly as easy as point and click on the Internet — as long as you know where to look.

The best place to start on the Internet is with the wire services. For starters, the Associated Press offers a clean and overall efficient site at www.ap.org

The top AP news stories are available through a service called The Wire. To use The Wire, you're first asked to identify a newspaper near you that participates in the program. Select the newspaper and AP stories are displayed with that newspaper's logo at the top of the page. You're still on the AP Web



site the whole time; apparently AP provides this as a promotional service for its participating newspapers. Another link marked AP Y2K Update offers some interesting fodder on the so-called Millennium Bug.

Reuters offers its own collection of headline news at www.reuters.com

One advantage over the AP site is that you don't have to waste time with the extra step of choosing a newspaper to view. Just click on the News link, and then on the story you want to read.

Another great feature of the Reuters site — especially if you're looking for unusual stories — is its Oddly Enough section. Although the actual stories are carried on other so-called portal sites, such as Yahoo and Excite, the Reuters site provides a direct link to the stories. On the day I dropped by, some "top" sto-



ries included:

- "Thai Transvestites Protest Govt TV Order" — A group of Thai transvestite actors and gay activists staged a noisy protest at a government media office against an official order to television stations to cut down their roles in programs.
- "Robber-Turned-Author Accused Of New Heist" — Canadian author Stephen Reid, who turned a career of robbing banks into a best-selling book, was back in jail, accused of returning to his previous criminal career.
- "Jailed Man Freed After Jury Realizes Mistake" — A New Mexico man walked out of a Texas jail after a jury realized it had mistakenly sentenced him to prison rather than parole.

These aren't stories you're necessarily likely to find in the local newspaper.

Looking for the latest press releases

from one company or another? Chances are, they were put "on the wire" by either PR Newswire or Business Wire. Both services offer searchable archives of current and past press releases. They're



located at www.prnewswire.com and www.businesswire.com respectively.

Easy as it may seem to check out all these sites, click from one news service to the next may still take more time than you have to spare. If you're crunched for time, what I call a news aggregation site, like Yahoo News (dailynews.yahoo.com/headlines) or TotalNews (www.totalnews.com), may be just what you're looking for. Sites like this pull news stories from a variety of sources, including AP, CNN, Reuters, ABC News, E!Online and Variety.

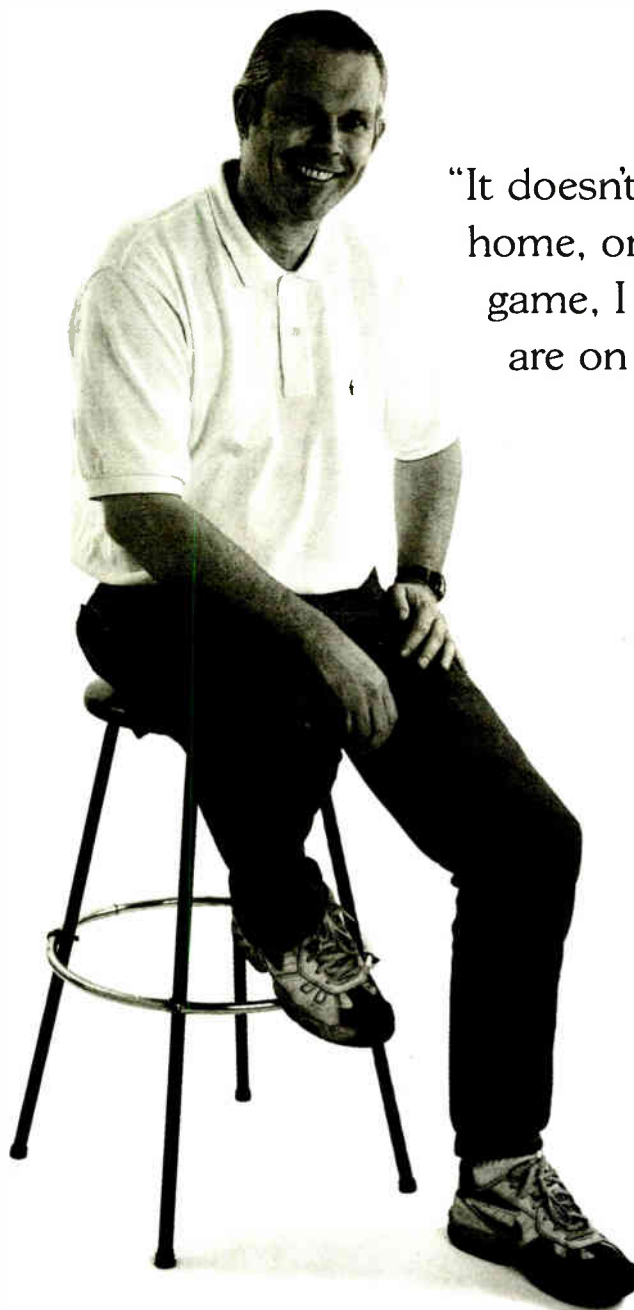
If the thought of going out to look for news bores you, why not have the news you want delivered to you — almost like your own custom e-newspaper. A number of news sites, including CNN (www.cnn.com) and MSNBC (www.msnbc.com) give you the option to customize the news that's presented when you log onto their site. You pick the topics and categories, and the Web site



does the rest. Best of all, because the purpose of this service is to get you to come back to their site so you can see more banner advertising, it's free aside from the extra eye strain.

Taking it one step further, there's the PointCast Network (www.pointcast.com). PointCast is software that runs on your computer, but automatically updates itself with the latest news of your choosing via the Internet. This is especially handy if you have an "always on" connection to

See KOMANDO, page 47 ▶



"It doesn't matter if I'm at work, home, or my son's little league game, I know our transmitters are on the air."

Introducing the

**1.9 Network Module
TCP/IP for WAN/LANs**

Now Available!



Remote Facilities Management for Transmitters



The GSC3000 is the most reliable, intelligent remote control on the market today—it can even call you at the baseball park.



Perfect Communication through Technology, Service, and Education.™

◆ STATION SERVICES ◆

Programs and Services for Radio Stations

Mail info and photos to: RW Station Services, P.O. Box 1214, Falls Church, VA 22041

Westwood One Unveils 'Players Inc Radio'

NFL veteran Matt Millen is the host of Westwood One's new program, "Players Inc Radio." Millen is joined by co-host Dan Miller — Fox-TV sports anchor.

"Players Inc Radio" is a weekly two-hour program scheduled to air for 21 weeks beginning Sept. 10 and running through Jan. 28, 2000.

According to Westwood One, "Players Inc Radio" is dedicated to

"getting the helmets off the players, highlighting their activities on and off the field, and bringing out the personalities behind the face masks."

Weekly features on the program include exclusive player interviews, contests and questions from listeners.

Players Inc is a company that creates and develops marketing opportunities for current and former NFL players.

For more information contact Susan Mazo in New York at (212) 641-2057 or circle Reader Service 81.

"Heart to Heart with Naomi Judd" airs Sunday evenings from 8 p.m. to midnight and showcases Judd's faith and values, medical knowledge, humor and musical talents. Audience participation is also welcomed.

The four-hour musical program has featured guest stars such as Rosie O'Donnell, Andy Griggs, Sarah Evans, Natalie Maines of The Dixie Chicks and Ashley and Wynonna Judd. The program also includes regular drop-ins from Brad Schmidt of "The Nashville Tennessean," who provides reports on the latest in film, television and country music. "Heart to Heart" is broadcast from Judd's studio outside Nashville.

For more information, contact Jennifer E. Johnson in California at (818) 461-5418 or circle Reader Service 134.

'Rhona At Night' to be Distributed by Jones

Jones Radio Network has announced that the company is exclusively distributing and marketing the nighttime talk show "Rhona At Night."

The program, hosted by Rhona Raskin, a registered clinical counselor and family therapist, features advice, humor and information on love and sex with an emphasis on human relationships.



The program is available on a barter basis and is targeted toward "Hot Talk" and FM talk stations as well as music stations.

"Rhona At Night" currently airs in Seattle, Tucson, Ariz., and in Roanoke/Lynchburg, Va.

For more information contact Phil Barry in Colorado at (303) 784-8752 or circle Reader Service 123.

Save Your Issues of Radio World in Style



Now there's an easy way to organize and protect your copies of Radio World, the industry's best read newspaper, keeping issues readily available for future reference.

Designed exclusively for Radio World, these custom-made titled cases provide the luxury look that makes them attractive additions to your bookshelf. Each case is sized to hold a year's issues (may vary with issue sizes), and is made of reinforced board covered with durable leather-like material in blue, with the title hot-stamped in gold. Cases are V-notched for easy access and free personalization foil is included for indexing the year.

Cases
1-\$8.95 3-\$24.95 6-\$45.95

Call Toll Free
7 days, 24 hours
1-800-825-6690
Charge Orders (Minimum \$15):
AmEx, Visa, MC, DC accepted.

Jesse Jones Industries,
Dept. 95RW
499 East Erie Ave.
Philadelphia, PA 19134

Allow 4 to 6 weeks for delivery
SATISFACTION GUARANTEED

Add \$1.50 per case for postage & handling.
Outside U.S. (including AK & HI) \$3.50 per case
(U.S. funds only).

PA residents add 7% sales tax

Premiere Presents 'Heart to Heart with Naomi Judd'

Premiere Radio Networks is syndicating a family radio program featuring Naomi Judd. The Big Kmart



The C.A.R. Show' Drives Listener Message

Tune in ... and tune up! That's the mantra of "The C.A.R. Show," a syndicated radio program offering consumer automotive repair information. The weekend talk program, featuring guests and listener call-in questions, is hosted by Roger Kwapich. Kwapich's background includes technical and service work, as well as management at auto repair facilities and dealerships. He also worked with Champion Spark Plug for 16 years in

many areas of testing and training.

Program topics focus on troubleshooting and preventive maintenance as well as automotive news.

"The C.A.R. Show" currently is syndicated on about 90 stations across the country. A shorter feature called "The Car Care Tip of the Day" is also offered. The two-minute segment runs Monday through Friday and currently is syndicated on about 130 stations. Both programs are available through barter.

For more information contact Jim Renda in Ohio at (888) 871-1777 or circle Reader Service 113.



Donna Wick Radio To air on Internet

Internet community provider Talk City has been tapped by Donna Wick Live! Intelligent Radio for Women to bring her live radio program to the Web.

Wick's program provides women with information and strategies they can use in everyday life and is intended to inspire, empower, support and encourage women.

Chat rooms are available Monday through Friday 9 to 10 p.m. CST following the 8 p.m. broadcast. In addition, the Donna Wick chat room (www.donnawick.com) is always open. Wick often participates in question-and-answer sessions during the chat.

Donna Wick Live! Intelligent Radio for Women is a nationally syndicated radio broadcast produced by New Vision Communications Group.

For more information, contact Mary Derincenzi in California at (408) 871-4254, visit the Web site at www.talkcity.com or circle Reader Service 132.



A digital PR&E console starting at just \$11,010.* (So advanced, even the price is digital.)

Airwave™ Digital. Three program busses. Two mix-minuses. One remarkable board.

\$11,010. Now there's a string of binary code anyone can understand. So if you're budgeting to go digital—and running tight on budget—take a close look at a 12 or 20 input Airwave Digital on-air console. Its familiar layout flattens the digital learning curve. And with 3 program busses, talent can be playing Madonna, time shifting a Dr. Laura feed, and laying down voice tracks—all at the same time. So you can squeeze more production out of your payroll.

Airwave's flexible, too. One or two telco modules and B-side logic are among a host of available options. And unlike some digital consoles, you can reconfigure input modules from analog to digital—or vice versa—at your studio, just by changing a card.

Best of all, Airwave Digital comes with that “no-need-to-rationalize-to-anyone” PR&E quality. Want to know more? Call 760-438-3911, visit www.pre.com or email sales@pre.com.



PACIFIC RESEARCH & ENGINEERING

*12 input mainframe, standard clock/timer, monitor and output modules, standard 5-mic preamp module, 3 analog inputs, 4 digital inputs and one telephone input/output module.

Circle (33) On Reader Service Card
World Radio History

Janoff Heads CBS Promotions

► JANOFF, continued from page 40
the nation?

Janoff: It depends. The thing that is interesting about this, I think, is that they are not cookie-cutter promotions that we go out and offer to people. Most of what we do is based on the needs of the client. We develop a program for them then, customized to their needs.

But there are some programs that are done very successfully (in a regional or local market.)

is that we are easily able to take this (idea) to about four or five other markets, and have consistency in implementing these ideas — hopefully just as well — in those markets.

But a lot of the programs that we run are different. They don't all include media. We do work for some clients on retainer or getting fees for different services. If media is involved, the great thing about being part of Infinity and affiliated with CBS is that we have the great plat-

Janoff: It gives great opportunity because we are part of this company with incredible assets across several different types of media.

Radio happens to be a great promotional medium because it's so local and flexible. It has such a great relationship, locally, with an audience base. Radio stations also tend to have great relationships with clients, like large retailers in a market and venues, concert venues and things of that sort that lend themselves to great events.

So, radio is often the media of choice to get the word out to the consumer. But, if the needs are for something else, we have done some programs where we have brought TDI in — as an example — or where we have partnered up with Sportsline.com.

I love radio. I have been doing it my whole career and it is a great vehicle for an advertiser.

RW: What are some of the events that you may be thinking of turning from a local to a national level for CBS radio stations?

Janoff: The exciting part of the future of the group is being able to take a great idea or event in a market and rolling it out across several markets.

"A Taste of Baltimore" is an annual event that the CBS group, based in Baltimore, has put together. The event is also produced in CBS' Chicago and Boston markets.

The group really worked hard when they had a chance to create this event. It's held at Camden Yards. I believe there are three radio stations there that all took part, so all stations were able to promote it to their different audiences.

We sold full event sponsorships and the great thing for the client was, they were able to get the event — obviously — which had thousands of people at Camden Yards, a great venue. We had entertainment that we brought in, as well as the stations' personalities themselves who served as part of the entertainment. With all three stations able to promote the event, we were able to get a diverse audience there.

Events like these are great for the stations, the sponsors and the audience. The basic concept of the "Taste" is that they bring together a lot of different restaurants in a market to come out for that three-day event and sample their product.

It's just an example of something that, once we have a model, could be easily done in other markets.

RW: An event that is already an annual one in any market then, is not off-limits to support from the Promotions Group in that market?

Janoff: We can also go out to existing events and become a strategic partner with them and take it to a different level. So we will be looking for opportunities for other events that are in multiple markets where we are and try to find partners so that we could not only sell a national or a multiple-market sponsor, but we can also go into each market and customize it and sell local sponsorships.

A lot of events look to radio stations to help promote. I think we can bring a lot to the table.

RW: Why has WINS been so successful?

Janoff: 1010 has an incredible heritage

— over 35 years as an all-news radio station. I wish I could tell you that I had a lot to do with that but I have been here for four years. What makes WINS special, I think, is that it's like a lot of other CBS-owned news stations. It's like a utility; you walk in the house and flick the light switch and you pretty much expect that the lights are going to go on.

You turn on a station like 1010 WINS



and you know what you're gonna get. We tell people what we are and we deliver on it and we've done it for 35 years. It's like a utility for us in New York. It is really mass appeal. WINS in New York reaches about 2.3 million people. We mirror the market in male/female, ethnically, and in many more ways we mirror the market.

RW: How do you keep your advertisers happy at WINS?

Janoff: People would not spend a second advertising dollar if the first dollar didn't work for them. We have an incredible track record over time and many companies have built their business by advertising with us. It's just a huge station with mass appeal.

For the purposes of the Promotions Group, well, we have a lot of great stations, right here in New York — as well as across the country. Another area that gives us an advantage over another radio-owned promotional division is that we have great heritage radio stations.

We have very entrepreneurial, very creative people who are going out there hoping to solve the needs of clients and when it comes time to run campaigns on radio, if that's what is needed, the people we have running our radio stations are running the sales departments and programming and they know their stations.

RW: Who designed the Web site?

Janoff: It's designed and maintained in-house by Mark Mason, our executive editor and program director. June marks the one-year anniversary of 1010WINS.com

RW: Do you have anything to do with the site?

Janoff: The WINS sales department will sell advertising on the site. The great thing is that we have found we can easily promote the site as part of the format of 1010 WINS. We can drive our listeners to the site; we do it all the time.

We can offer that ability to advertisers as well. A lot of "dot-com" companies are spending most of their advertising in traditional media. And news and information is one of the biggest reasons people go to the Web.

RW: Does it alter your advertising plan in any great way to include "dot-com" in your advertiser's campaigns?

Janoff: I think it is the same. It brings another element to it, another place that you can reach a consumer. For an advertiser that is interested in doing that (reaching people on the Web), it's a great way to do it because we constantly are driving people to the site.

'I love radio. I have been doing it my whole career and it is a great vehicle for an advertiser.'

We have one, for example, that was done in Dallas. And, because it was so well done, the people there who were responsible for other markets asked our Dallas office to implement the same type of promotion in about four or five markets.

It was something that was a good idea, was easily done and was already really successful in Dallas. The great thing about the phase that the group is in now

form of TV, outdoor and new media.

Being a media-owned sales promotion agency and the fact that CBS is the company we are part of gives us great opportunity if the needs of the client are for other media.

RW: Is the group, under your direction, exploring multimedia campaigns that use radio and the Internet?

TRY SOMETHING REALLY COOL!

Cool Edit Pro

The complete multitrack recording studio for Windows™

The easiest way to:

- Record and build spots, news, and clips
- Add music and sound f/x
- Stretch or condense

Cool Edit Pro has been the dream come true that we have wanted for decades: a low cost production studio software package that has the power of any hardware studio we have worked in. Our morning shows across North America now have the capability of doing all their show preparation in their home studios with Cool Edit Pro. It is not just a new program, it's a revolution that has changed the way radio is done.

- Bob Hamilton, New Radio Star

It's difficult to go anywhere in Cool Edit Pro and not hear yourself whispering to yourself 'this is cool.'

- Dave Oliwa, Radio And Production, May 1997

Check out our downloadable demo at:
<http://www.syntrillium.com>

Syntrillium

PO Box 62255
Phoenix, AZ 85082-2255 USA
cepro@syntrillium.com
+1-602-941-4327
+1-602-941-8170 (fax)
1-888-941-7100 (US & Canada toll-free sales)

Osgood, Ever Loyal to Radio

► OSGOOD, continued from page 39 proved that the fact that these other things have come along has not put it in

RW: Has the new media of this age changed your job at all?
Osgood: I am working in television now

RW: What advice would you give to those students in broadcasting who aspire to be a Charles Osgood someday or to achieve some of the success you have?

Osgood: I think that sounds terrific, but if I knew the name of such a person, let's say he is Joe Jones, I would tell him not to try to be a Charles Osgood but try to be Joe Jones. Be yourself and work on getting your own style.

In fact, you shouldn't even think of it as style. Rather, work on how to express what's in you, in your mind

worked at a college station. I did not ever take a journalism course or take a communications arts or broadcasting course. I majored in economics but I did work at the radio station all the time.

What drew me to working at the radio station is that it was such fun. It seemed to me it was a business that was extremely enjoyable. It wasn't drudgery, it seemed to be the most fun you can have without breaking some law.

RW: You're not a behind-the-desk kind of a guy?

Osgood: No. But I have had desk jobs in radio, as a matter of fact. I was the general manager of the first pay television in



NAB President and CEO Eddie Fritts and Charles Osgood at the Radio-Mercury Awards

decline at all.

If anything, we just take it more for granted now. You turn the radio on and what comes out is whatever you want. It only depends on which station you tune in to.

It's wonderful for keeping people company in their cars. Most people used to have a radio the way everyone now has a television set. But now, there's a radio in the bedroom, in the kitchen, of course in the car and chances are, there is a clock radio in everyone's room in the house.

as well as in radio, so it's changed my life to that extent. Every chance I get I will always say that I think radio is the superior medium because the pictures are better.

I do "Sunday Morning" for CBS Television, and at the end of every broadcast, I say: "I'll see you on the radio." That's a sort of loaded farewell there, because what I really mean is that radio is a visual medium. The pictures that you create in your own mind are more powerful and will last longer than the pictures that you can get on the screen.

'I did not ever take a journalism course. What drew me to working at the radio station is that it was such fun.'

and in your heart. Discover how best to communicate *that*. I don't think anybody should try to be somebody else.

RW: Any particular mentor or person or organization that helped you in your career?

Osgood: I had a very lucky break. I

the United States. That was in 1953, in Hartford, Conn. Zenith and RJR General had a pay-TV experiment and I was the general manager.

One of the things I learned from that little experiment was that I would prefer to be on the air rather than behind the desk.

digital consoles — outstanding



Fast, powerful and intuitive and best of all ... priced like a quality analog broadcast console

- SPHERION features:
- unlimited input & output expansion
 - any source available on any fader
 - the ultimate in "logic follow"
 - programmable button bank accessory
 - "on the fly" recall of entire console setups
 - expandable mix-minus
 - powerful DSP capability
 - multiple console integration via DÍAN fiber optics
 - ... and much more

integrates with VADIS 3d: audio router

KLOTZ DIGITAL ... you just have to speak to the right people



KLOTZ DIGITAL <http://www.klotzdigital.com> • e-mail: sales@klotz-digital.de
KLOTZ DIGITAL Audio Communications GmbH, Germany Hans-Stiessberger-Str.2a • D-85540 Haar • Phone: +49-89-46 23 38-81 • Fax: +49-89-46 23 38-61
KLOTZ DIGITAL AMERICA INC., USA Nortech Park • 5875 Peachtree Ind Blvd. #340 • Norcross, GA 30092 • Phone: +1-678-966-9900 • Fax: +1-678-966-9903
KLOTZ DIGITAL, France 87 Rue St. Martin • F-75004 Paris • Phone: +33-1-4887 4681 • Fax: +33-1-4804 7146
KLOTZ DIGITAL (M) SDN BHD (454 317-X), Malaysia Wisma Samudra • Level 4, No.1, Jalan Kontraktor U1/14 • Seksyen U1, Hicom-Glenmarie Industrial Park
 40150 Shah Alam • Selangor Darul Ehsan • Phone: +60-3-5193233 • Fax: +60-3-5195133

KING Still at Home in Cyberspace

Alan Haber

Many years after they first came on the scene, Mozart and Beethoven and Bach and a bevy of similarly talented once-newcomers enjoy a spot in the rotation at KING(FM) — something even many of *today's* artists cannot boast.

On the air in Seattle for more than 50 years, KING was the first classical music station to send its signal out over the Internet. The year was 1995, but it wasn't called Webcasting back then, and the act of duplicating a station's signal on the Net was called crazy by some.

One of the true Webcasting pioneers, KING is as dedicated to cyberspace in 1999 as it was in 1995; today, the station is heard on the Internet each day by about 8,000 unique listeners. That's right — 8,000 unique listeners, from around the world.

So much for the nobody-is-listening-on-the-Net theory of life.

General Manager and Seattle native Peter Newman, who admits to liking both Mahler and Johnny Cash, has always been a great source for Internet-related conversation. His always-incisive views come from the heart of a man with a true love for classical music, and for radio.

Consider Newman's take on sending KING's local commercial stream over the Internet.

"It doesn't really benefit us to do so," he said. "We don't really benefit economically by having a local radio commercial appear in ... Zimbabwe, and a national advertiser isn't going to be paying any more for Internet stuff, at least not yet."

Newman said KING wants "to establish our Internet feed as a separate commercial property as well as a separate programming property. It seems to me that there are things about the regular radio commercial model that I'm not particularly happy with. I don't want to see us just take a radio station and duplicate it on the Internet."

There are some things that Newman is just not happy with.

"For our format in particular, the commercials often that appear on our station are not all that well targeted to our listeners. I mean, you'd think a classical radio station — we ought to be having certain kinds of products and services that are obvious, and just because of the way that radio is bought in this country, we don't — our commercial inventory is not used as effectively as it might be ... I see this as a way of doing better targeting."

Who's listening?

"We get an extraordinary bunch of people who listen to us on the Internet," Newman said. "We just found out that a bunch of Pentagon research planners can't get radio in their building and so we seem to be, at least among a certain corner of the Pentagon, sort of the radio station of choice there. We have e-mails from physics labs in France and Germany."

KING has been on the cutting edge of the increases in audio quality on the Internet; the station has been a beta tester for the last three versions of RealAudio.

I don't want to see us just take a radio station and duplicate it on the Internet.

— Peter Newman
General Manager

Listeners have reacted to the changes as they have occurred.

"It's the 'I can't believe this sounds so good' category and the 'Why does it drop out, why is it not in stereo' — those kinds of questions, which again speak to a sort of pretty critical listenership," said Newman.

Indeed, things weren't always sounding so great on the Net.

"At the beginning, I think it was just

enough to kind of get it and go, 'Gee whiz.' Now people are looking at it and they really want to treat it like radio. You don't turn on your radio and hope you're going to get the station. You get the station."

If you're the 8,001st person trying to listen to KING over the Internet, you probably are being served with an error message that tells you the station's server has reached its capacity.

"Until multicasting comes around and solves that," said Newman, "it's always going to be, I think, at the periphery of a broadcast medium rather than being a real broadcast medium."

And, possibly, at the periphery rather than the realization point of being a profit center. "I think everyone is looking so far down the road at what could be that they are putting a lot of legal roadblocks up," said Newman. "I suppose the other side of it is they are trying to protect their interests now because once it's out the door, trying to pull it back after some sort of precedent is made would be pretty difficult."

Newman provided an example. "Locally, we are not allowed to broadcast our local

symphony and opera broadcasts over the Internet because the musicians would want an additional fee for it," he said.

"From their point of view, they see it as potentially profitable. I can say to them right now, 'But we're not making any money at it, we're just doing you a service, we're getting you heard throughout the world. Isn't this a good thing?' They would agree with that, but they would also say at that point where it does make money they



Peter Newman

want to make sure that they've established a precedent of not having given it away."

A long-range view of all things Internet may well be the key to succeeding on it. "There may be yet some other technology — satellite digital services are going to hit (in the year) 2000. Maybe that undercuts the whole thing and renders Internet broadcasting useless. But if multicasting comes around the corner, which it's supposed to, then potentially every radio station in the world is an Internet worldwide radio station, and then what? If everybody is on, how do you divide up the pie that finely?"

Newman will surely be there, pie divider in hand.

"I love this stuff," he said. "I think this is more fun than waking up in the morning and just thinking about regular old radio."

"In part, KING has the luxury of being a mature format. We are what we are and it's not likely we're going to be making any gigantic changes in our station as a local radio station. I could be wrong about that, subject of course to what happens in the marketplace, but here in Internetland, it really is this whole new thing that we get to play around with, and it's terribly exciting."

KING's cyber home is at www.king.org

Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No.(s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

Designed for Broadcasting! MINI-MIX 8A



\$2499
List

12 Stereo Inputs 2 Stereo Outputs
2 Dedicated Mikes 1 Mono Output

Service & Affordable Quality for Over 28 Years

AUTOGRAM
CORPORATION

1500 Capital Avenue (972) 424-8585
Plano Texas 75074-8118 1-800-327-6901
FAX (972) 423-6334
info@autogramcorp.com

READER SERVICE NO. 86

EQUIPMENT LEASING

START UPS
TURNAROUNDS

\$100,000
TO
\$1,500,000

CALL ... (617) 267-2900

BOSTON FINANCIAL & EQUITY CORP.
20 OVERLAND STREET BOSTON, MA 02215
WWW.BFEC.COM

READER SERVICE NO. 96

AUTOMATION SATELLITE LIVE ASSIST

Single Systems or Networks
24Hr Support, Quick Delivery

1-877-LPB-COMM (toll free)
<http://www.lpbinc.com>

YOU CAN RELY ON LPB
SINCE 1960

READER SERVICE NO. 107

Get the Latest News on the Web



► KOMANDO, continued from page 41
the Internet, because you're assured of having the latest news at your fingertips. The software comes with a screen saver

the news. For example, if satire is your thing, you should definitely bookmark American Newspeak (www.scn.org/news/newsspeak). Updated biweek-

BullsEye Pro exactly what type of content you're looking for and where you want it to look. In other words, once you click on the News Finder icon, you have the following options:

- Search All Major News Sources
- Search Recent News From Wire Services
- Search Business News
- Search Computing News
- Search Entertainment News
- Search Finance and Investment News

Only after you make a choice from this menu do you have the opportunity to type in a few key words. By telling the program not only that you want to

look for news, but also what type of news, you can greatly reduce the number of irrelevant hits that are so common when you are using a regular Web-based search engine. And if you're looking for a funny bit, the Entertainment section even has a Search for Humor option.

At about \$150, BullsEye Pro isn't cheap. And as we all know, in this business, time is money. For sure, anything that reduces the time it takes you to search for news will quickly pay for itself.

Copyright 1999, The Komando Corp. All rights reserved.

If the thought of going out to look for news bores you, why not have the news you want delivered to you?

that displays the latest news in a scrolling ticker across the bottom of your screen.

Like the many Web-based custom news services, PointCast is available free. And of course, like the others, it's advertiser supported. That means in addition to getting the news, you'll get your fair share of advertising. The good news is that since all the ads are downloaded with the news when



you're not watching, they don't add extra download time when you go to view the page.

There are plenty of sites to visit, too, if you're interested in an "alternative" take on

ly, this site not only reports the news, but points out how stupid it can really be.

On the flip side, if you're looking for serious criticism of news media coverage of various events, be sure to visit FAIR (Fairness and Accuracy in Reporting) at www.fair.org

This site gives you "the story behind the story," so to speak. Believe me — the people who run this site don't pull any punches.

If you want to make your news searches as easy as possible, there's one software product that I have to mention. It's called BullsEye Pro, from Intelliseek (www.intelliseek.com). BullsEye Pro is like a super-mega search engine, except that it runs as an application on your computer. You tell BullsEye Pro what you're looking for; it logs onto the Internet and checks dozens of sources to find just what you need.

Why is this program so important to the news searcher? Because before you even type a single key word, you tell

STATION/STUDIO SERVICES

Sound Effects Production Effects Buy-Out Production Music!

Over 60 products to choose from.
Call 612-522-6256 or get full details and hear on-line demos at our web site:

<http://radio-mall.com>

Dave Dworkin's Ghostwriters
2412 Unity Ave N., Dept RW,
Minneapolis, MN 55422

READER SERVICE 55

101 Radio

Satellite Delivered Radio Programming

Tel: 954-735-4070

Fax: 954-735-0370

READER SERVICE 65

Are you reading someone else's copy of Radio World?

If so why not apply for your personal subscription?

Simply complete the subscription card & return it to us! You'll never have to risk missing an issue of

Radio World

Music Maintenance

Adult Contemporary Programming

- › Song by song playlists customized to your market.
- › All AC formats are available.
- › Discounts for stations who lease scheduling software.
- › Affordable prices for small markets.
- › Complete format packages with image production.

La Palma Broadcasting 714/778-6332
E-mail lapalma@pacbell.net

ATTENTION PROVIDERS!

Promote your services to **Radio World's** 15,000+ readers. Reach Radio Station and Recording Studio owners/managers and engineers with your message. For information on affordable advertising call **Simone** at **1-800-336-3045, extension 154.**

Arrakis Studio Furniture systems are #1 with over 1,000 sold!

The Master Control Studio, shown right, is one of seven Arrakis studios in Sony's Manhattan network origination center for SW Networks.



Arrakis furniture is #1 ...

- Off the shelf -or- Custom
- Easy to design & assemble
- Very fast delivery !!!

call today to find out why Arrakis studio furniture is the choice of broadcasters worldwide...
from Moscow, to Tokyo, to Manhattan...

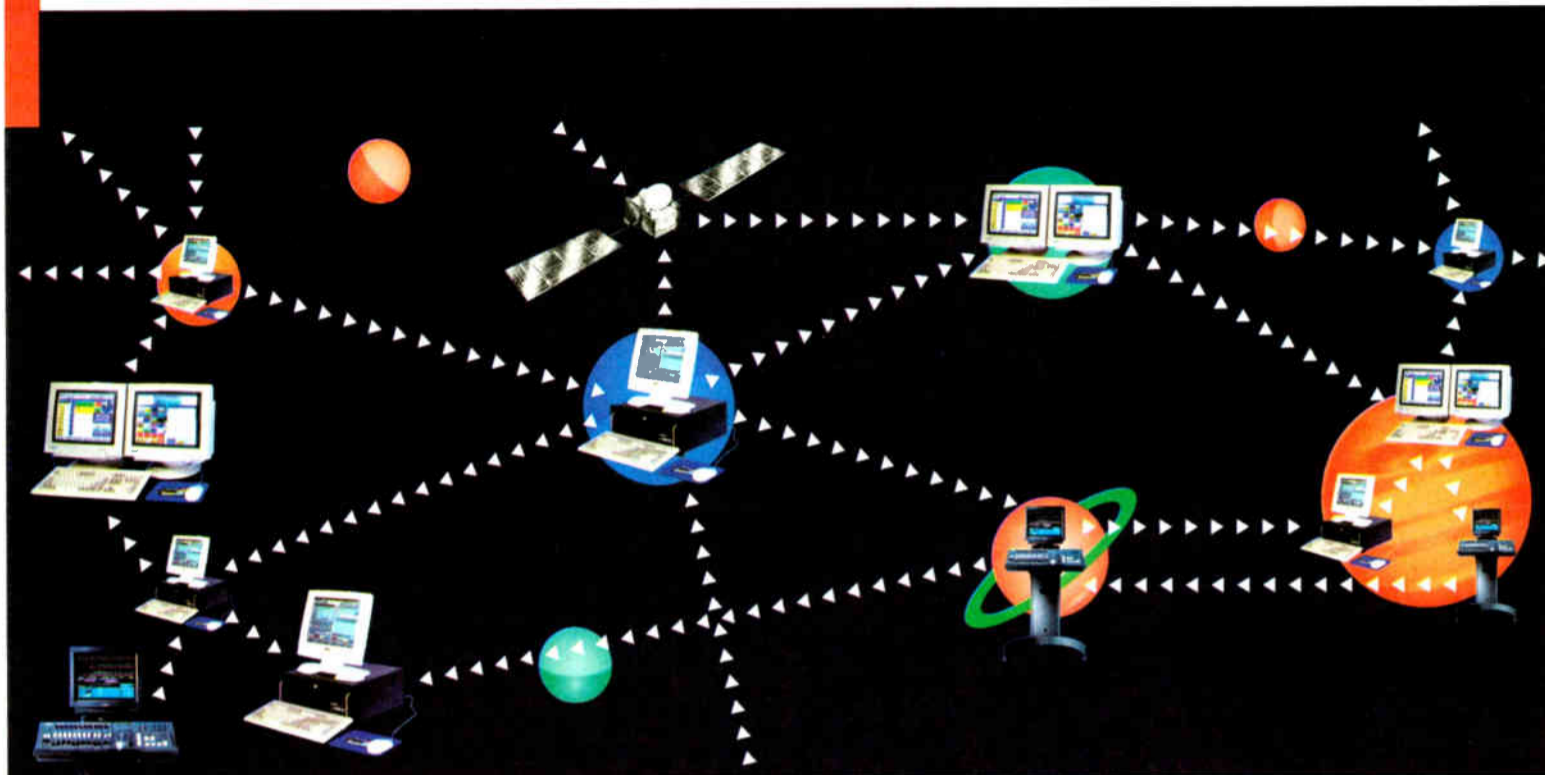


(303) 224-2248

or (970) 224-2248

1995 Arrakis Systems inc. 2619 Midpoint Drive, Fort Collins, CO. 80525

Your Wide Area Networkability Is Limitless



ENCO **DAD_{PRO}32** Digital Audio Delivery System

The demands of today's fast paced broadcast marketplace require maximum utilization of resources to achieve cost effective performance. Thanks to the latest advances in digital technologies, multiple broadcast facilities can now seamlessly share audio inventories, news, scheduling and billing data, and often consolidate other redundant functions.

All of this is possible by combining the advantages of non-proprietary products such as the ENCO DAD_{PRO}32 Digital Audio Delivery System with Wide Area Network (WAN) architecture. Audio production may now occur from virtually anywhere within a group, information flow is automatically managed between multiple remote locations, and transfer schedules are configured to take advantage of varying tariffs for maximum efficiency and cost control.

The ENCO DAD_{PRO}32 Digital Audio Delivery System provides a powerful professional audio management tool for both live assist and automated on-air operations, production, and inventory control. Support of Wide Area Networking is inherent with DAD_{PRO}32, providing capabilities to take full advantage of distributed data and group interconnectivity.



next level solutions

WIRELESS

BROADCAST

GOVERNMENT

NETWORK SUPPORT

HARRIS

Studio Sessions

She's the voice
of Bart
Simpson.
See Page 50

Radio World

Resource for Radio Production and Recording

July 7, 1999

PRODUCT EVALUATION

A Processor With the Right Stuff

Michael Parks

"Everything you need in one unit ... and it looks really cool." Those were the words of Geoff Lissamon of dbx when I asked him to give me his thoughts on the 1086 microphone processor.

The 1086 has been on the market for about a year and is part of the company's 10-series line of equipment which keeps dbx "hanging ten" as it rides the digital wave into the future.

There are many high-tech features on the 1086, including what dbx boasts as the best high-resolution analog-to-digital processing around. Actually, the unit is a bit of everything for mic processing packaged in one nice piece of equipment.

The dbx 1086 is a microphone pre- and dynamics processor. It's a single-channel unit, which is a prime selling point according to Lissamon, product development specialist. While many mic and voice-processing gear out there are two channels, the 1086 is only one channel.

You name it, it's packed into this one little monster. The 1086 has a premium low-noise mic pre capable of going direct to tape or straight into a digital workstation. If you don't need the pre, it can be disabled.

'Lightpipes'

The mic pre and processor sections are separated by a very neat-looking VU meter. I've been told that this is the only single-rack space unit with an analog VU. The 1086 also has its share of LEDs, but these aren't just any LEDs — these are what dbx calls "lightpipes." Easier to read than many other models and simple to operate, they too are really sharp looking. Compared to regular LEDs, the lightpipes are similar to the difference between the tail lights on an Escort and those on a Corvette — they just look hotter.

But enough about the cosmetics. As mentioned, the dbx 1086 has practically everything you will need in one unit. The

classic dbx dynamics processing for recording or live sound are present. There's a variable-frequency low-cut fil-



The dbx 1086 wraps a number of features into one unit.

ter and unique low- and high-detail equalization controls. The mic pre section also has plus-48V phantom power, a 20dB pad and a phase invert switch.

Then there are all the features that have made dbx famous: its award-winning compressor, as well as a de-esser, an expander/gate and a limiter. The

dynamics processing section can be accessed separately, which makes the 1086 two independent processors in one

rack space. In the compressor, you can select hard knee or dbx's own "Over Easy" settings to fulfill your needs in both heavy compression and soft smooth gain leveling.

The de-esser is the dbx classic, featuring variable control for both threshold and frequency settings. The last feature to

the far right of the unit is the company's "Type IV" conversion system for analog-to-digital processing. If you are using digital workstations or digital multitrack machines, some of the digital converters being used are not all that great. The 1086 allows you to bypass these inferior converters. The company also claims its conversion system brings the warmth of the original analog signal into the digital domain.

Ear candy

Yes, the unit is loaded. But how does it sound?

I asked the guys with the "dog ears" here at Dame Media-Harrisburg to turn the knobs, talk to themselves and give the 1086 a trial run. They all liked the features but most, if not all of us, had trouble with the gating on the unit — it's too abrupt

See PROCESSOR, page 52 ▶

LINE OUT

Recording and Equalization Hints

Bruce Bartlett

At each recording session I have done, I learned a new way to improve sound quality, or to make the session run more smoothly. Over the years I've collected a number of these tricks. I'm happy to pass them on to readers of Studio Sessions.

At the end of a recording session, many clients like to have a cassette or CD copy of the songs or spots recorded that day. Normally, at the end of the session, one would have to cue up the multitrack tape or hard disk to the beginning of a song, set up a rough mix, copy the mix to cassette and repeat for each song. This can obviously be time-consuming.

A simpler strategy is to record the monitor mix during the session. With a rough mix already set up on your monitors while tracking or overdubbing, why not use it? When the client has finished working on a particular song or spot,

play the multitrack tape and record the monitor mix on a cassette. Do the same

which to evaluate the performance and develop ideas for further work.

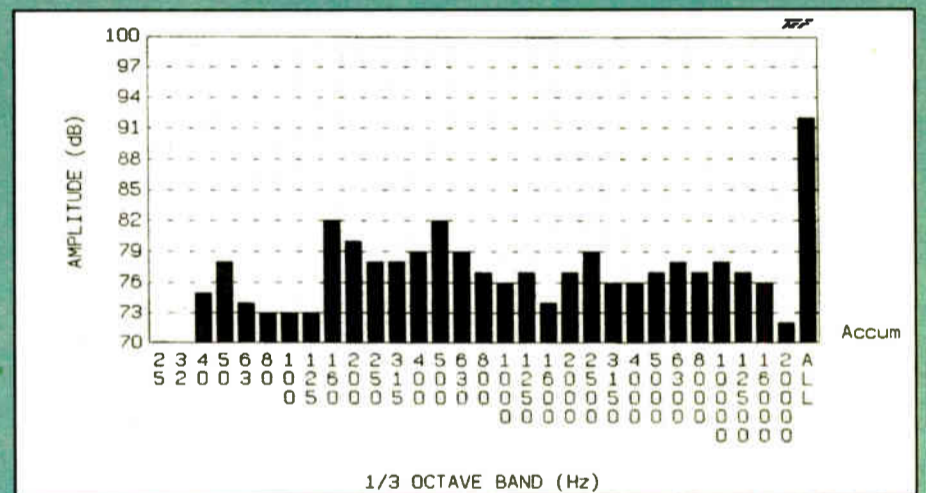


Figure 1: Speaker Response: Speaker Not Raised

procedure each time you finish a song or spot. That way, at the end of the session, the client can take home a tape from

Some engineers like to record the monitor mix on two spare tracks. Then, See LINE OUT, page 52 ▶



Trash your carts, burn CDs

Give all your production material the performance and reliability that only comes from CDs. CDs are the new standard in audio — compact, easy to use and efficient.

CD Architect is the professional mastering software that's accessible to untrained users. It verifies Red Book

standard audio before burning, fully supports PQ code editing, and lets you prepare the material in its own editor with multi-level undo.

From Sonic Foundry, the leader in Windows-based digital audio. Visit www.sonicfoundry.com or call us at 800-57-SONIC for more information.



From Radio to the Simpsons

Ken R.

In this issue, *RW* talks to Nancy Cartwright, the voice of Bart Simpson in the long-running FOX television series, "The Simpsons."

Cowabunga, Dude! When Bart Simpson opens his mouth, the voice actually comes from a sweet, Dayton, Ohio-born blond female.

Nancy Cartwright may not yet be a household name, but her voice characterizations circle the globe. In addition to her work on "The Simpsons," Nancy has contributed to other cartoons including "Richie Rich," "Pound Puppies" and "The Pink Panther." She has also appeared on camera in "Fame," "Cheers," "Fresh Prince of Bel-Air," "Twilight Zone The Movie" and the recent turkey "Godzilla."

When Nancy speaks, her words cascade in a torrent of giggles, regressions, memories, ideas and praise for her co-workers and mentors. But her success story begins with a failure ... in radio.

RW: You actually started out at a radio station in Ohio, right?

Nancy: I was working as a waitress at Friendly Ice-Cream, and the general manager of WING-FM ("Winging it in Dayton" was one of its catch phrases because of the Wright Brothers and all that) came in. He knew me from church, and knew I was a communications major at Ohio University and I was into speech competition. He said, "Hey, would you be interested in a part-time job?" I mean, he offered it to me, I didn't even ask! He laid it right on my plate!

RW: Were you a DJ?

Nancy: No, this is like "primo," the station was right behind my house ... and I filled in for everyone that went on vacation, so by the end of the summer I had learned about every aspect of running a radio station. I started out in reception

and learned how to answer the phone ... that was my least favorite (giggle). I was so bad at that because I was no good at lying. I had to say, "no, such-and-such's not available" when I knew she was standing right there. I like to tell the truth so I didn't do that very good. Then I did accounting, that was kind of a disaster, too (huge giggle).

RW: Is there anything at the station you were good at?

Nancy: No, and they just kept movin' me around! But I really loved continuity so one morning at 6:30 the disk jockey called me. Something was screwed up and they were missing a cart for some spot, and because I lived right behind the station they said I had to come over and fix it. We had a softball game the night before ... you know, the radio station would play other radio and television stations to raise funds for charity. The night before I didn't get home to bed until 1:30 in the morning.

RW: So after four hours of sleep they made you go trotting across the field to fix a commercial?

Nancy: Oh, yeah ...

RW: And you did it because you were so dedicated?

Nancy: Yeah ... I barely knew what I was doing but I straightened it out. Boy, oh boy.

RW: So you worked for the station during the summer?

Nancy: Yeah, but one day some woman from Warner Brothers records came in and she was promoting music for their clients. The GM introduced me to her because he knew that I was interested in voice, and Warner Brothers to me meant Mel Blanc. And I'm going, "Wow, this is where I'm headed. I want to do cartoons." I asked this woman if she could help me out or maybe direct me to the right person. She said, "Oh, yeah, absolutely

here's my card, write me back and tell me what you need and I'll pass it on to the right person." So I did, and she did.

I got a letter back with the home phone number of Daws Butler! (The legendary voice of Huckleberry Hound, Yogi Bear, Quick-Draw McGraw and Elroy Jetson to name a few.) I called and got his answering machine.

RW: Did his message sound like Huckleberry Hound?

Nancy: No, he did another character. (Nancy now affects a gruff British upper-crust voice.)

"Hello, this is Daws Butler's butler. My name is Percival Pickles. Mr. Butler is not here right now."

RW: So who did you think this was answering the phone?

Nancy: I knew it was Daws, but I was going "Oh, my God ... this is cool, this is wow!" And then he says "leave your name and wait for the beep." And all of a sudden I realize I'm supposed to say something and I went (affecting her own upper-crust British accent), "Ello, Mr. Butler, this is Nancy Cartwright. I'm calling from Dayton, Ohio, and I understand you have a workshop and I'd be very interested in finding out more about that so if you could just write to me, my address is" And I then added "pip pip, cheerio" and hung up. I was so embarrassed ... I couldn't believe that I did that!

After I hung up I realized I didn't give him my phone number so I called back. (In British accent:) "Ello, this is Nancy Cartwright again ... so listen I was just thinking, it might be much easier if you just ring me on the telly, so I'm going to give you my phone number. Give me a little ring at your convenience and please call collect." I left my number and that was it!

I went upstairs and I told my mom and dad, "I just called this guy in Beverly Hills and told him to call me back col-



Nancy Cartwright

lect, so I hope you don't mind."

RW: So you sat there by the telephone without moving?

Nancy: Oh, absolutely! I did not leave. This was a Sunday about four in the afternoon, and I think it was about eight at night that he called me back. When the phone rang I was like "I'll get it! I'll get it!" I'm one of six kids and we all fight for who's going to get the phone. I picked it up and said, "Cartwright residence." And it was the operator. "Will you accept a collect call from Mr. Daws Butler from Beverly Hills?" I'm like "Yes! Yes!" (laughs) "Please don't drop that line!"

They put him through to me and I'm like "Hello? Daws is that you?" He says "Nancy, is that you?" And I said, "Oh my gosh, I can't believe I'm actually talking to you ... this is so cool!" We chatted for about 10 or 15 minutes, he told me that his workshop is something very simple, he wanted to send me a script in the mail and that I should take a look at it. And maybe he could get me to actually record something and I could put it on tape and mail it back to him and I'm like, "Oh my God, yes, absolutely!"

And this started a relationship between him and me and he'd send me scripts and I'd record my voice on a little hand-held cheap cassette recorder. Daws would then critique it and he was always encouraging. He always took the viewpoint of "that was really well-done."

RW: It's great that he took you under his wing.

Nancy: Totally!

RW: So did you start going out there and visiting him?

Nancy: After corresponding for about three months I realized that I wasn't going to get very far in Ohio with my passion for cartoons ... they just don't make them in Ohio. So I started thinking how I could do this and it was real clear that it was through the school system ... that would be my ticket. I would finish up my sophomore year at Ohio University, then transfer as a junior and make my move.

So I told Daws that this was what I wanted to do. He encouraged me so I literally pulled out a map of Los Angeles and found his street and said "OK, he's in Beverly Hills. UCLA is two inches away, and USC is like fourteen inches away. Well it was clear; I had to go to UCLA! And that's what I did.

We all planned to fly out to California in September when my mom was suddenly diagnosed with cancer. She was very sick and in and out of the hospital

See CARTWRIGHT, page 54 ▶

Furman: The leader in pro audio power conditioning for 25 years is now serving the broadcast industry.

HERE'S HOW TO MAKE YOUR FACILITIES QUIETER — INSTANTLY.

BALANCED POWER FROM FURMAN

THE FEATURES

- Available in 10, 20 and 30 amp models
- All three models provide precisely balanced AC power for ultra-low-noise installations
- The IT-1210 and IT-1220 have 12 outlets on the rear, plus two on the front. The IT-1230 has one 30A twistlock outlet and ten 20A outlets on rear, plus two outlets on front
- Exclusive "Soft Start" circuit prevents turn-on transients
- Extreme Voltage Shutdown circuit protects against dangerously high or low input voltages
- Toroidal transformer with center-tapped secondary is the most efficient, compact design, with least magnetic field leakage
- Faraday shield reduces electrostatic coupling between primary and secondary
- Provides Furman's best power conditioning (spike suppression, RFI filtering) plus gas discharge tube to dissipate spikes
- Ground fault (GFCI) protection
- Microprocessor-controlled "smart" AC voltmeter also flashes alerts for marginal and extreme conditions
- Three Year Limited Warranty
- IT-1210 and IT-1220 UL/CUL listed



THE BENEFITS

Furman's IT Series Balanced AC Power products are specifically designed to reduce buzz and hum in installations where ultra-low-noise performance is a must. The IT Series is a proven solution for decreasing noise. We've been selling them to top recording studios for years.

Every production studio and news facility can benefit from Furman

Balanced Power. The IT Series dramatically reduces the noise floor (up to 16 dB improvement), and noticeably improves dynamic range and clarity. Set-up is as easy as plugging in an AC power cord.

Furman has a Balanced Power model for every application: IT-1210 (10A), IT-1220 (20A) and IT-1230 (30A).

Furman Balanced Power. It's what you need. It works.

Available at:



FURMAN

FURMAN SOUND, INC.

1997 South McDowell Blvd.

Petaluma, CA 94954

Phone: (707) 763-1010 • Fax: (707) 763-1310

Web: www.furmansound.com

E-Mail: info@furmansound.com

Circle (39) On Reader Service Card

Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No.(s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

The CircuitWerkes AC-12 Telephone Autocoupler Bay



Get up to 12 couplers in a neat, compact chassis

- Auto answer & disconnect.
- 2 audio busses for mass feeds.
- Individually card selectable buss or auxilliary audio I/O.
- LED indicators for ring, clipping, power & online.
- Ring counter answers on user set ring number.
- Momentary or latching dry contact outputs at pickup.
- Remove & install cards without affecting the rest.
- The aux. audio jack is ideal for multiple IFB feeds, etc.
- Check out our www site for more info and tech manuals.

The AC-12 rack-mounted coupler bay is the best way to eliminate a wall or cabinet full of yesterday's couplers. Our unique dual audio busses eliminate the tedious and messy wiring associated with networks and other mass feeds. Each card can also individually either send or receive telco audio. Best of all, a fully loaded AC-12 lists for under \$175 per coupler.

CircuitWerkes
3716 SW 3rd Place
Gainesville, Florida 32607
(352) 335-6555 / fax 380-0230
<http://www.circuitwerkes.com>

READER SERVICE NO. 58

REMOTE MONITORING AND CONTROL FOR ANY SIZE SITE

Davicom systems provide all the automated monitoring, reporting and control functions you need to keep your site(s) operational and legal. Our systems are practical: they are sized for every type of operation from small AM sites to large TV facilities, with set-up and operational software that even casual computer users can understand.

Call us today for more information!
Toll Free : 1.877.327.4832
(609) 653.1065



READER SERVICE NO. 68

Your New Interview Tool



INLINE PATCH Telephone Audio Interface

Simply connect Inline Patch between your telephone and the wall jack. You will get separate control over your voice and the caller's voice. A great little hybrid!

List Price
\$270.00



JK Audio Remote Broadcast Gear

800-JK Audio (815) 786-2929 www.jkaudio.com
800-552-8346 Fax: (815) 786-8502

READER SERVICE NO. 78



Econco REBUILT POWER TUBES



Approximately One Half the Cost of New

3,000 Hour Unconditional Guarantee

Call for Our Price List

Econco 1318 Commerce Ave. Woodland, CA 95695
Phone: 530-662-7553 Fax: 530-666-7760 Telex: 176756
Toll Free: 800-532-6626 From Canada: 800-848-8841

READER SERVICE NO. 88

Affordable Custom Broadcast Furniture



32 Pennsylvania Avenue, Malvern, PA 19355

READER SERVICE NO. 110

Delivered and installed by

STUDIO
TECHNOLOGY

TEL: 610-640-1229

FAX: 610-296-3402

email: sales@studiototechnology.com

web: www.studiototechnology.com

PTEK

LOW COST FM TRANSMITTERS & POWER AMPLIFIERS



Exciters/Transmitters
10W
25W

Power Amplifiers
150W
300W
500W
1000W

CALL 888-411-5174 FOR DETAILS

1814 SCHOOLDALE DRIVE, SAN JOSE, CA 95124. 408-448-3342 FAX 408-448-5951

READER SERVICE NO. 109

1,000 Hits on HARD DRIVE for \$695!

Compatible with Arrakis, BE, BSI, Enco, Prophet, Smarts, Register Data, others...

All formats! Oldies, '70s, AC, Country
1-day service at no extra charge!
We load IDE, SCSI, JAZ

Just call our name

800-HALLAND
800-425-5263



1289 East Alosta Avenue
Glendora, CA 91740 USA
Tel 626-963-6300
Fax 626-963-2070
www.h-b-s.com

For Music on CD
call 800-759-4561

READER SERVICE NO. 98

Off-Axis Speakers, Flatter Sound

► **LINE OUT**, continued from page 49
if a client wants a take-home copy at the end of the day, a usable mix is already on tape, ready to dub to cassette.

Equalize by changing placement

Are you unhappy with the accuracy of your monitor speakers? The frequency response of Nearfield monitors can be adjusted by moving them around. To measure its response, ideally you'd place a flat-response omni mic at the listening position, play pink noise through each monitor and read the response on the

behind the console rather than on the console meter bridge; this "smooths" the response. Also helpful is the installation of some acoustically absorbent material (such as Sonex) on the wall area between and behind the speakers. This will reduce comb filtering due to reflections off the nearby wall.

The closer to a wall a speaker is, the more deep bass it produces. You can use this principle to adjust the low end. While listening to some high-quality CDs, place the speakers at various distances from the wall behind them. Listen

off-axis. This fact can be used to your advantage: If the speakers sound too bright or treble-heavy when they are toed in to aim at you, aim them straight ahead. That way, you will be hearing the speakers off-axis, where the high end might be flatter.

It's also a good idea to orient the monitors vertically, because this causes less "lobing" in the horizontal plane. The result is a more consistent sound from side to side in front of the console.

Big bright labels

For some industry veterans, equipment labels are becoming hard to read due to farsightedness.

Dim studio lighting adds to the problem. This problem can be addressed by labeling connectors, inputs and outputs with yellow drafting tape or stick-on labels, lettered with a large permanent marker. Big, bold numbers taped on each snake connector are much easier to read

in the dark than engraved numbers or tiny labels.

Taping audience reaction

Imagine that you're taping a concert for broadcast. All your tape tracks are assigned to instruments and vocals, but you also want to capture the audience applause.

Try recording the audience with two mics into a DAT recorder, not synched with the other tracks. After the concert, back in the studio, mix the music tracks down to two tracks. Using digital audio editing software, copy the music mix to your hard drive. Also copy the audience DAT tape to the hard drive.

Align the audience tracks in time with the music tracks, taking into account any delay in the audience mics. When you mix the four tracks, you have a concert recording with audience reaction.

■ ■ ■

Bruce Bartlett played in a rock band in high school. He recorded the band with a Pentron tube tape recorder, got hooked, and has been recording ever since.

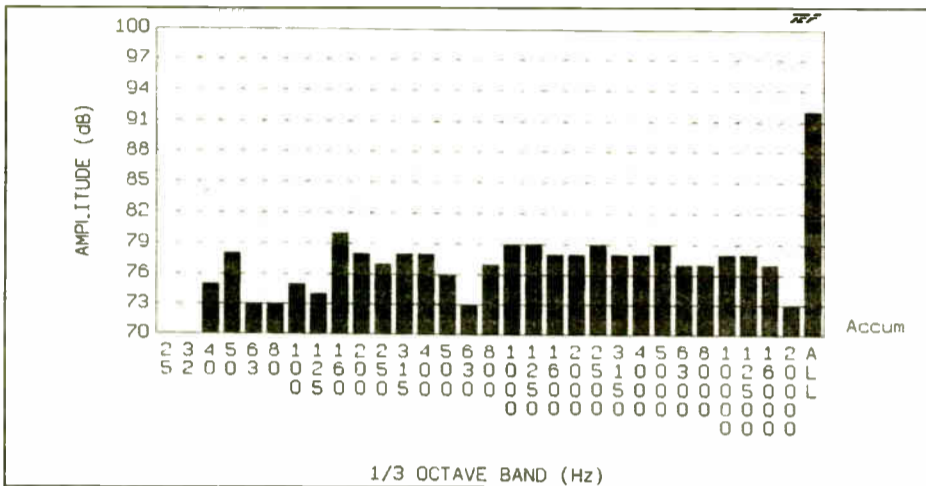


Figure 2: Response With Speaker Raised to Ear Height

screen of a real-time analyzer. An alternative is to play one-third octave pink noise bands from a test CD and note their levels on a VU meter. You could also just use your ears.

Once you've worked out a way to measure the response, it's time to experiment with speaker placement. Most Nearfields are designed to be used in free space, away from room surfaces. However, many of us have limited workspace, so the monitors end up near a wall behind them or close to a console surface.

Most console reflections can be avoided by placing the monitors on stands

to how the low end changes and find a distance that sounds right. If the speakers have too much bass at any distance, consider raising them or stuffing their ports (if any) with cloth.

Figure 1 shows the one-third octave response of a Nearfield monitor on a table behind my mixer, with the tweeter below ear height. The mid-bass is bumped up, and the upper mids are weak. When I raised the speaker by placing it on a foam-covered paint can, the response flattened out as shown in Figure 2. All that improvement came from vertically moving the monitor a few inches.

Most speakers roll off in the highs

The Lean, Clean 1086 Processor From dbx

► **PROCESSOR**, continued from page 49 and sharp. You're either on or off, and you can hear it. Gary Barnes, production manager, said it doesn't actually clip the first part of the beginning syllable, but comes dangerously close.

I was doing some voice work for a local TV station laying down straight voice when I noticed it, and it can be quite annoying. No matter what we did, we just couldn't adjust it to our satisfaction.

Clean sound

Other than the gating problem, the unit was very "clean" sounding. With all the features in one lean mean rack-mounted unit, if you're putting together a studio or looking to go digital, the dbx 1086 is worth a look. Geoff at dbx said many of the people purchasing the 1086 were people doing voice work who were setting up their own personal studios. Churches are also purchasing them, finding they don't have to spend a fortune on a mid-price console. By simply purchasing a nice low-end console and allowing the 1086 to handle mic processing, which in most cases is just for one speaker, the job has been done well.

So how good of a deal is the 1086? Suggested retail is around \$750. For a less expensive unit, the dbx 1066 — strictly a processor — runs \$550.

Product Capsule: dbx 1086 Microphone Processor

- Thumbs Up**
- ✓ Neat analog VU meter
 - ✓ Unique equalization controls
 - ✓ Single-channel unit

- Thumbs Down**
- ✓ Abrupt, sharp gating

For more information contact dbx in Utah at (801) 568-7600, visit its Web site at www.dbxpro.com or circle **Reader Service 111**.

Considering all the little extras you get with the 1086, it seems like a pretty good deal.

■ ■ ■

Michael Parks is production director for Dame Media stations WHP(AM), WRVV(FM) and WWKL(FM) in Harrisburg, Pa.

BELAR STEREO MONITOR

You can measure...

with the best monitor and the most accurate test set.

The FMM-2/FMS-2 series monitors provide an even greater degree of precision measurement than ever before... You can measure S/N below 90 dB, You can measure crosstalk below 85 dB, You can measure separations of better than 70 dB, You can measure frequency response to better than 0.25 dB, You can measure distortions to lower than 0.01%, and much more... Our uncluttered panels and autoranging voltmeters make these measurements a dream.

BELAR ELECTRONICS LABORATORY, INC.
LANCASTER AVENUE AT DORSET, DEVON, PENNSYLVANIA 19333
Call or write for more information on Belar AM, FM, Stereo, SCA and TV monitors. (610) 687-5550

MediaFORM Solutions in CD Duplication

3706 Autoloader & Printer In One
The MediaFORM 3706 is the most impressive MediaFORM unit ever.
This 6 drive autoloader accommodates up to 200 CDs for unattended cd duplication which features an integrated Rimage thermal printer.

AP1000 Automated Printer
MediaFORM's new AP-1000 allows for unattended printing of up to 140 CDs at a time.

3702 Autoloading CD-R Duplicator
The 3702 delivers simple operation and unattended duplication of up to 100 CD-R's.

5400 4 Drive Duplicator
The new MediaFORM 5400 is capable of producing 4 CDs simultaneously without the need of a PC.

5900 8 Drive Duplicator
The MediaFORM 5900 is the industry leader. This 8 drive system boasts of easy one-touch operation and options for DAT import.

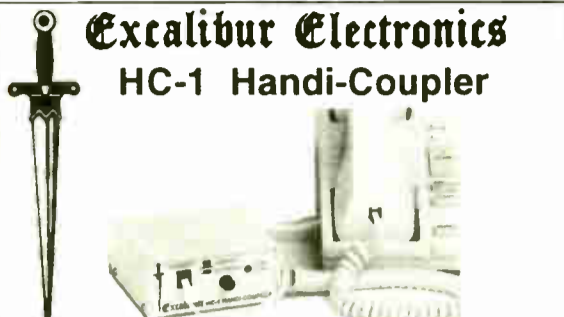
Now Available On demand publishing for unique CDs

Call the World's Largest Distributor of MediaFORM CD Duplication Equipment at: **MEDIASTORE**
www.mediastore.com

800.555.5551

Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No.(s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.



Excalibur Electronics
HC-1 Handy-Coupler

Here is the simplest, quickest, most convenient way to connect audio to a telephone. The HC-1 connects in series with the handset of any phone using modular connectors. No connection to the phone line is needed. Press the front panel button and external audio is available on separate send and receive 1/4" TRS jacks on the rear panel. Release the button and the handset is once more connected for normal use of the phone. Nothing could be simpler!

You can find many uses for the HC-1 around your station: on-air studio, production room, newsroom, sales office, field news kits, sports remotes, etc.

EXCALIBUR ELECTRONICS, INC., CHANTILLY, VIRGINIA
Please circle our bingo number for a data sheet and a dealer list

READER SERVICE NO. 57

NEW

RU-SM16
Dual Audio Meter



Anywhere you need

- ✓16 Element Resolution
- ✓Peak Hold Indication
- ✓Precision Audio Level Metering
- ✓Digital String Display Indication
- ✓Precise Left/Right Meter Tracking
- ✓Individual Channel Calibration Controls
- ✓Selectable PEAK or AVERAGE Metering
- ✓Visual Verification of Adequate Headroom

You Need: **RU-SM16**
Dual Audio Meter




Toll free (800) 281-2683
Local (805) 684-5415
Document Server (800) 391-0017
Web Page www.rdlnet.com

READER SERVICE NO. 67

Hard Drive Audio
We Have
The Answers!

Let DJital Solutions show you how to produce better sound quality & a strong bottom line. We'll assess your needs and provide a cost effective solution.



A registered Trademark of DEK Group

Audisk Sales/Installation and Training
740-653-4798

READER SERVICE NO. 87

NEW! World's Most Advanced
CD Duplicator



- Industry's First System with Pro Audio Compare Mode
- 7-Drive / 200 CD Capacity
- Networkable to 28 CD-R Drives
- Simple Unattended Operation
- Analog/Digital Audio Import Options
- ONE-BUTTON Operation
- Copies All Current CD Formats

CD-3707
AUTOMATED
Spindle Based CD-R Copier

Mitsui Silver as Low as \$1.35



GLOBAL DATA INC SINGLE SOURCE SOLUTION FOR ALL YOUR CD/DVD NEEDS

CALL 414-797-9772
FOR ADDITIONAL DUPLICATORS AND CD ROM PRINTERS

READER SERVICE NO. 97

THE COST EFFECTIVE ALTERNATIVE TO MANUFACTURER SERVICE

SERVICE, REPAIR & CALIBRATION

- STL's • RPU's • TSL's
- Exciters • Optimods
- AM/FM Monitors
- Remote Control Systems

SPECIALIZING IN EQUIPMENT BY

- Belar • Marti
- Moseley
- McMartin
- TFT
- And others...

WE ALSO PROVIDE
Free, over-the-phone technical assistance
STL loaner/rentals
PCL 505 Certification



2198 Hubbard Lane, Grants Pass, OR 97527

(541) 471-2262

READER SERVICE NO. 56

REMEMBER THE CORTANA FOLDED UNIPOLE ANTENNA? WE STILL MAKE IT WITH THE SAME HIGH QUALITY MATERIALS AND WORKMANSHIP. IT FEATURES...

- BROAD BANDWIDTH for better sound,
- GROUNDED ANTENNA for lightning & static electricity,
- ELIMINATES ISOCOUPERS in VHF & UHF antenna lines,
- BEST ANTENNA FOR DIRECTIONAL ARRAYS.

ALSO
DETUNING SYSTEMS FOR ANYTHING THAT DISTORTS YOUR AM COVERAGE PATTERN: TOWERS, POWER LINES, TANKS OR ANY METAL STRUCTURE.

FOR INFORMATION CALL, FAX OR WRITE:

nott ltd.

4001 La Plata Hwy
Farmington, NM 87401
phone 505-327-5646 fax 505-325-1142

READER SERVICE NO. 66

Switcher tools

Designed by broadcast engineers for broadcasters, our audio and digital audio switchers offer excellent sonic quality, removable I/O connections, contact closures and serial remote control capabilities and flexible mounting accessories.

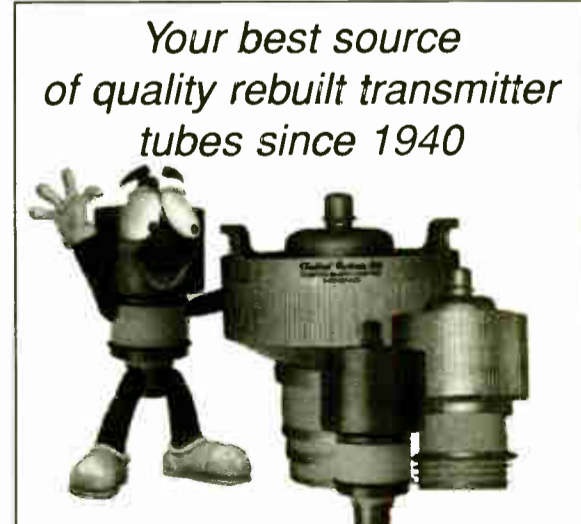
<p>SS 12*4 Active crosspoint switching/routing with 12 stereo inputs and 4 stereo outputs.</p>	<p>8X2D Active crosspoint switcher with 8 stereo inputs, 2 stereo and 2 mono outputs</p>	<p>SS 3.1 Passive switching/routing with 3 stereo inputs and one stereo output or vice-versa.</p>
<p>10X1 Passive switching/routing with 10 stereo inputs and one stereo output or vice-versa.</p>	<p>6X1G Passive switching/routing with 6 stereo inputs and one stereo output, or vice-versa.</p>	<p>SS 2.1/BNC Passive switching/routing with 2 composite audio, video, or AES/EBU inputs to 2 composite audio, video, or AES/EBU outputs, or vice-versa.</p>
<p>SS 8.2 Active crosspoint switching with 8 stereo inputs, 2 stereo plus 2 mono outputs.</p>	<p>3X2B Active crosspoint switcher with 3 stereo inputs and 2 stereo outputs.</p>	<p>SS 2.1/TERM Passive switching/routing with two stereo inputs to one stereo output or vice-versa.</p>
<p>8x1 DAS Routes any one of eight AES/EBU digital inputs to split outputs.</p>	<p>Check out our web site for product information, list pricing and a list of distributors!</p>	

Internet: www.broadcasttools.com E-mail: bli@broadcasttools.com Voice: 360 . 428 . 6099 Fax: 360 . 428 . 6719

BROADCAST tools inc.

READER SERVICE NO. 108

Your best source of quality rebuilt transmitter tubes since 1940



Freeland Products, Inc.

75412 Highway 25
Covington, Louisiana 70435 U.S.A.
1-800-624-7626
(504) 893-1243 FAX (504) 892-7323
www.freeland-inc.com
Email freeland-inc.com@freeland-inc.com

READER SERVICE NO. 76

Simpson Star's Radio Start

► CARTWRIGHT, continued from page 50
that whole summer. We always had it in mind and made it a game to get my mom better because you just don't really acknowledge the fact that someone's dying. You don't really admit that it's going to happen to you until they're like practically dead. And bless her heart — she ended up dying two weeks before we were all to leave.

RW: So she never got to see what you did with your life?

Nancy: Right. She never saw any of her kids get married and have babies. She never got to be a grandma, and she never got to see the success that I've had either.

RW: Did the rest of the people in your family buy into this whole fantasy career of yours or did they think you should keep your job at the restaurant just in case?

Nancy: Oh, no ... my family was very supportive. I was 20. It was an extraordinary thing to do, to follow your own heart. Some people go through their whole life and never learn what they're supposed to be doing. When I talk to kids on the lecture circuit, I try to encourage them by saying, "You're going to have to work, like it or not ... but I say like it! Don't settle for something just because it's going to bring you a paycheck."

RW: So you finally got out there, you met Daws Butler (voice of Huckleberry Hound and others) and you got to meet the cartoon creators.

Nancy: At that time, Daws was working on some Popeye cartoons as the voice of Wimpy. And he said to me, "When the time's right, I'm going to introduce you around. We'll continue working together and when you and I put together a real demo tape I would like to introduce you to everyone ... but we have some work to do."

I would take the bus to his house every Sunday for a private lesson, but I stayed

all afternoon, just him and me in his converted garage studio. And we would just read scripts, record stuff, play it back, and it was like a Cinderella story that he cared for me that much. I became sort of like the daughter he never had.

RW: Daws Butler was an awesome talent.

Nancy: Yes, but he was never as well known as Mel Blanc, because Daws was not into promotion. He just wouldn't do PR. Anyway, we finally put a demo tape together and he took me out there to Hanna Barbera. I got to sit in on a recording and I was just in awe — I'd heard of these names, but here I was sitting in the same room! At one point they needed the voice of a little girl, and it took all of my self-control not to jump up and yell "I can do it!" I just sat in my seat and kept my mouth shut.

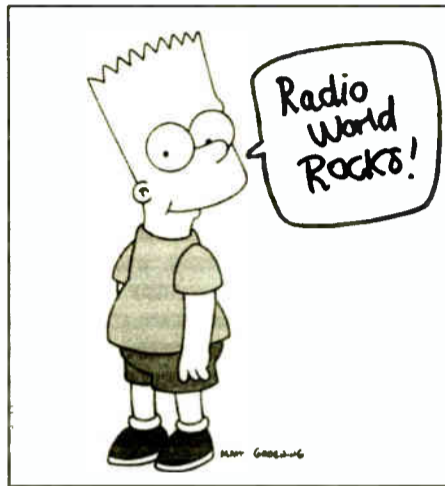
One of the directors I met was Gordon Hunt. He has done about 30 of the "Mad About You" episodes with his daughter, Helen by now. Anyway, I went in to audition for the voice of Gloria on "Richie Rich." I had a couple of callbacks, but I didn't even have a car! I had to get there, I had to buy a map, I had to figure it all out.

I finally arrived and I ended up getting the job! We did a couple of years of that and it seemed like an extraordinary amount of money for a student like me to be making. I got in the union so Gordon and I continued to work together for five years doing "Snorks," "Pound Puppies" and "Popeye and Son" at Hanna Barbera.

Cartwright continued to work successfully in cartoons, on the stage and in commercials. Her agent, Bonnie Pietila, was trying to cast some strange cartoon characters which were to be a part of "The Tracey Ullman Show." Originally asked to read for the part of shy Lisa Simpson, Nancy Cartwright felt more comfortable voicing the mischievous Bart

Simpson. Something clicked and she was hired on the spot. These short cartoons eventually outgrew the Ullman show and became a worldwide phenomenon. She picks up our conversation with a project she's working on now.

Nancy: Gordon Hunt was recently hired as a director for a new NBC show called "God, The Devil and Bob." I think it's fantastic because he knows what he's



doing. James Garner is the voice of God, Robert Downey, Jr. is the devil, and they are both perfect. You got this guy French Stewart (from "Third Rock from the Sun") playing Bob. And Laurie Metcalf from Roseanne is on there, too. I'm playing the voice of the daughter, Meagan, so it's great! I'm saying to these producers, "This show will be a hit because it has heart. You care about the characters!"

RW: And this show will be on when?

Nancy: It'll be a mid-season replacement in January of 2000.

RW: So "The Simpsons" is still running, and you're going to continue with that for a while?

Nancy: This is season 11 that we're finishing up that will air in September. And then we've got another year after that ...

and then rumor has it that they may renegotiate another deal.

RW: If they (Fox) stop making original shows and it goes into syndication, are you a participant in all the profits of that too?

Nancy: Well, yes! Actors get residuals on syndication, sure. Then they're thinking about doing a feature film too ... and between you and me, I don't know if "The Simpsons" will ever end because they are part of Americana. Whatever Matt (Groening, creator) wants to do and whatever Fox wants to do with it they could come back and do specials, advertising, whatever. I just don't think that it's going to end just because the series ends.

RW: To switch subjects ... many of the characters you portray, such as Nelson the bad kid, Todd Flanders and others all seem to have a touch of mischief. Is that just a part of your personality?

Nancy: It must just be a coincidence! (laughing) You know we were just assigned those parts — we didn't audition them or anything. We would get the scripts on a Wednesday night, and a new character (like Database) would just be given to me and I would have to come up with something for it. So next day at the table read I would do this new character. They may say, "Can you make him a little less intelligent?" Or, "Can you make him higher-pitched?" But basically they've accepted everything we've come up with.

RW: Is there anything that you wanted me to mention in this article?

Nancy: Well I have this Web site — it's won 10 awards — and it's something that I really enjoy working on. I've gotten 40,000 hits in a year, which I find kind of amazing. Its address is thenancyshow.com for those people who would like to check it out.

RW: As I listen to your voice over the phone I can definitely hear Bart Simpson hiding in there somewhere.

Nancy: (laughs) Yes, he's always in there.



Anyone can take a device and shove it in a rack. It takes something special to make the product more intelligent in the process. **Something special has arrived...**

modem • parallel printer port • battery backup • surge suppression

The **RAK-1 Intelligent Rack Adapter** provides data communications and printing capabilities, a battery backed power supply, telephone line surge suppression and front panel indicators. It's all combined in a sleek new aluminum rack-mountable chassis for one low price. And perhaps best of all, it protects your investment by using the RFC-1/B system that you already have!

The ultimate upgrade for the RFC-1/B!

 **Sine Systems**, Inc.
innovative solutions

615 • 228 • 3500 (vox)
615 • 227 • 2367 (fax)
615 • 227 • 2393 (f.o.d)
www.sinesystems.com

Circle (41) On Reader Service Card

Compact Disc Changers

Denon has introduced two carousel-type professional broadcast CD players: the DCM-30P and DCM-60P.

Both machines are five-disc players and feature a new digital pickup servo circuit which enables the optimum servo quantity to be set each time a new disc is loaded. Numerous playback modes, including program play, continuous play, five-way repeat and three modes of random playback, are provided to fulfill a wide range of playback requirements. A 12-step digital attenuator function (1.5 dB steps) lets the user adjust the analog output level to match to other sources in the system.

There are some differences in the

processing features of the two machines. The DCM-60P utilizes the Alpha Processor from Denon, a new technology that reproduces 16-bit digital data from compact discs in 20-bit quality. According to Denon, the Alpha Processor is the first device to reproduce digital data as a smooth analog waveform.

The Denon DCM-30P uses a multi-level noise-shaping DAC that removes the adverse effects of jitter. Since it is built into the output amp, a clean analog output with suppressed high-frequency interference can be directly obtained.

For more information contact Denon in New Jersey at (973) 575-7810, fax (973) 808-1608 or circle Reader Service 124.



PRODUCT EVALUATION

A Library to Shake the Foundation

Sallie Schneider Sauber

When it comes to production elements, Network Music is "sweeping" the nation with its latest creation "AfterShock" (son of ShockWave).

According to Network Music CEO Bruce Tucker, a survey indicated clients wanted more sounds like those from ShockWave that Network introduced back in the early 1990s. The idea for AfterShock was to mirror ShockWave's content but with 389 new sounds and elements.

"We did our best to fill up the four CDs in the package," said Tucker. "Each CD has at least 95 tracks — you can't fit much more than that. We really tried to flesh out the package and make it as full as possible for our clients."

Wizardry

Sound designer Bill Byrne is the wizard behind the curtain, handling the majority of the design and mixing for both ShockWave and AfterShock.

"It's a fairly technical process in that we often start with a simple organic sound or maybe a synth sound from a Mini Moog," said Byrne. "We'll fool around with the parameters until we come up with something we really like."

According to Byrne, the key is to "come up with something we've never done before and that can be a challenge." Coming up with one sound effect involves a lot of layering with oscillation, effects, filters and maybe even sampling it across 88 keys! One single element may be the result of 24 tracks of "stuff."

"We're always looking for the latest greatest thing, but what we've discovered over time is that the units that are analog in origination tend to have the fatter, bigger sounds," he said.

"Sound design is very similar to orchestration in that a sampled performance always sounds thinner. There are fewer instruments and the sampled instruments sound fake (when compared with the real analog instruments). As with sound design, if you only have a few sampled elements making up the entire sound, the result tends to be very thin."

Byrne said a lot of sounds happen by accident.

"We had a box that we knew was about to fry and would make the strangest digital sounds so we always had a DAT rolling to capture the weirdness."

For a typical library the number of hours spent on sound design can be in upwards of 1,400 hours! According to Byrne, "It takes a tremendous amount of planning, scheduling and documentation."

Good stuff

As if merely generating the sounds weren't enough, Network has gone to the trouble of creating a name for each and every stager, sweeper, laser and zap. Ever heard a "Squirty Rise" or a "Pulsy Zipper?" How about a "Kill Me," "Laser Hooty Missile Hit" or a "Nebula Burst"?

Trust me, you haven't. This is good

stuff, unlike the crappy whooshes and tones included in the miscellaneous category of your prod studio's basic sound effects library.

Think about it: The sweep, laser or zap you use today is the sound your

The sweep, laser or zap you use today is the sound your listeners are going to identify with your station.

listeners are going to identify with your station at the top of every hour.

during promos, liners and even commercials. You certainly don't want your big voice guy or gal (that you paid a lot of money for) to be accompanied by a laser that sounds like it came from your kid's toy fighter jet.

Keep it flowing

AfterShock (Son of ShockWave) is perfect for any radio station format that requires you to keep it flowing on the faster side with everything from your IDs and liners to promos and even some commercials.

■ ■ ■

For more information contact Network Music at (800) 854-2075 or circle Reader Service 77.

Sallie Schneider Sauber is copywriter and production director at WATH(AM) and WXTQ(FM) in Athens, Ohio.

Trust MediaTouch For Digital Audio Solutions

The Quality And Support You Want

Since 1984, MediaTouch has provided radio broadcasters with innovations that make radio work better. With MediaTouch by OMT Technologies, your station always has crisp, clean digital sound, without the muddiness or other problems of audiotape. Your station works together as a team, because MediaTouch connects the different departments together and allows them to easily share information. And when you have a question, our staff of radio professionals is on call toll-free, 24 hours a day, 7 days a week. MediaTouch is peace of mind.

Custom Tailored To Fit Your Needs

At MediaTouch, we realize that one size does not fit all. That's why MediaTouch is a system: you pick and choose the features you need. Want to time shift programming? We have tools for that. Take lots of news feeds? We can record and "splice" them digitally and automatically. Want to do walkaway automation? Our voicetracking is easy. Want to do your shows live? Our system is the only one that's as easy to use live in the studio as it is fully automated.

Cart Replacement Software Starting At \$995

For One Station or Many Stations

Our first "Super-Duopoly" was in 1991, and our experience leaves nothing to chance. Wide Area Audio Networking (W.A.A.N.TM) software lets you effortlessly communicate and share files with stations near and far. Monitor transmitter sites and stations from far away with a web browser and an internet or intranet connection. Our systems are built solidly, so they keep running day after day. That's why MediaTouch/OMT is the software behind virtually every cable/satellite direct music service in North America, as well as over 500 stations around the world.

What's Your Dream?

Call us toll-free at (888) 665-0501, and tell us what you want your MediaTouch system to do. We'll work with you and find ways for your stations to sound better and save more money.



MediaTouch
A DIVISION OF OMT TECHNOLOGIES INC.



2480 S.E. 52nd Street
Ocala, Florida 34480-7500
Tel: 1-352-622-7700
Fax: 1-352-629-7000

"The situation here is not what it seems."

Qui-Gon Jinn, Jedi Master

I was recently told by the president of another digital automation company, "Ron, you're leaving money on the table. You could charge twice as much and they'd pay." I said, "Mr. XXXXX, that's not the point. We charge a fair price and that generates a lot of referral business. That's worked great for us; our users are our best salesmen."

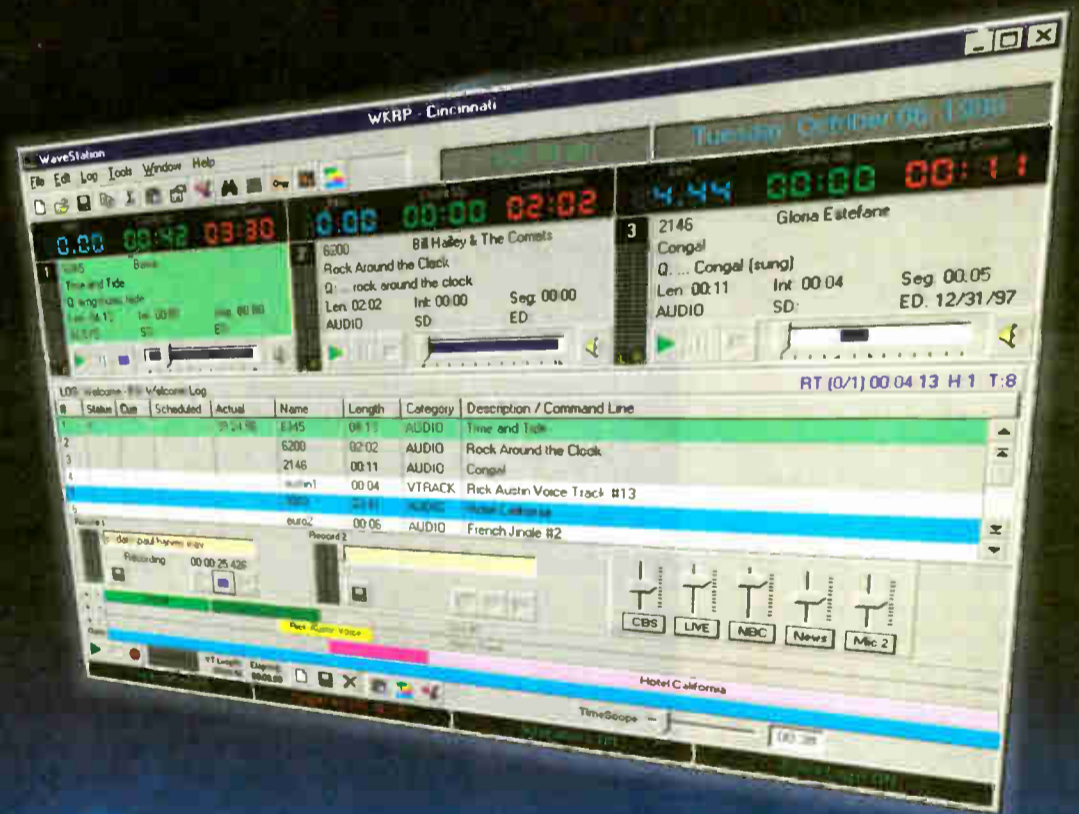
From UPI to NetRadio Networks, thousands of satisfied WaveStation users worldwide have decided they don't need to pay outrageous prices for powerful, reliable non-proprietary digital studios.

Our \$999 WaveStation 3.0 automation software has all of the features of the more expensive systems, and some they don't, such as control & query of your automation system via regular email, Microsoft standard digital labeling and even built-in support for their proprietary audio formats. Plus... it's non-proprietary, just add a PC and sound card and you're on the air.

Just software, or complete systems... talk to us about how we can save you tens-of-thousands of dollars on your digital audio facilities. The US Army gave us an award for saving the taxpayers more than \$20,000 on an automation system. So, actually, we've already saved you money.

Add to that, free tech support, inexpensive seminars & telephone training, and free upgrades... and there's no reason you shouldn't give us a call, visit our web site, download the real software, and try it for yourself.

*BSI President
Ron Burley
talking about BSI's
WaveStation 3.0
digital automation*



888-BSIUSA1

WWW.BSIUSA.COM

© 1999 - Broadcast Software International ph: 541.338.8588 fx: 541.338.8656 email: info@bsiusa.com Eugene, Oregon, USA GMT-8

Circle (44) On Reader Service Card

World Radio History

Buyer's Guide

Tech Updates



Inside

Radio World

Digital Storage, Live Assist & Automation

July 7, 1999

USER REPORT

Enco Sends Its DAD to Orlando

by Dennis Sloatman
Director of Engineering
Chancellor Media

ORLANDO, Fla. Chancellor Media's four Orlando radio stations, WJHM(FM), WOCL(FM), WOMX-FM and WXXL(FM), began a consolidation project in January of this year.

We had several key decisions to make regarding types of audio consoles, studio equipment and digital storage solutions for the new facility.

All of these choices were quite important to be sure, but I considered

This is a user-friendly system that operators seem to have no difficulty adapting to.

the digital storage/cartridge replacement issue to be the most critical because the entire commercial inventory, liners and image drops would reside on the system.

After carefully evaluating several, I chose the **Enco DAD_{PRO}32** digital audio delivery system, due in no small part to my previous experience with the system and the company at another radio station. Other deciding factors: the NOS utilized is the well-known and stable Novell NetWare and the strength of Windows NT for the audio workstations involved.

A routine affair

Once delivered, I found installation to be a routine affair with few surprises. Also, the use of Enco's supplied and integrated rack-mount servers and workstations made for an organized installation and stable system from the outset.

Of course, any such system is only as good as its ease of use for the largely non-technical jocks, and in this area, DAD_{PRO}32 shines brightly.

We paid for factory on-site training, found the excellent tutoring of Enco's Kevin Sikes to be par excellence and

See ENCO, page 63 ▶

USER REPORT

Nome Turns to the Wizard

by Tom Busch
General Manager and
Chief Engineer
KNOM-AM-FM

NOME, Alaska As author Joe McGinniss puts it in a book about Alaska, "Nome is at the end of the line ... if there were a line to be at the end of!"

Closer to Russia than the nearest Alaskan town of any size, we are about as remote as it gets. Here, in the land of the midnight sun, reliability and dependability are more than sales promises. They are characteristics we must depend upon for our very existence.

Divinity in the wilderness

Owned by the Catholic Diocese of Northern Alaska, KNOM(AM) has been on the air since 1971.

KNOM broadcasts with 25 kW in the daytime and 14 kW at night from a remote site three miles from town, along the shore of the Bering Sea, and is licensed on clear channel 780 kHz.

Our 88 W FM station, on air since 1993, simulcasts in audiophile-quality stereo. Both stations operate 24 hours a day using our live-assist system.

KNOM serves this vast area of more than 50 remote Eskimo villages covering over 100,000 square acres of land in addition to its home city, population 4,000.

With literally no road access into or out of Nome, we depend on air service to connect us to the outside world and provide all of our supplies. In bad weather, we can go for two days without a plane. There is simply no such thing as overnight FedEx to Nome!

It is easy to see why, when we went in search of equipment for our station, reliability and rugged durability were at the top of our demanding list. In addition, we must depend on prompt telephone support, because service calls are out of the question.

We are supported by contributions and are cognizant of the sacrifices made by individuals to keep us on the air, so we are careful how we use our financial resources.

In 1989, we bought a music-only system from a competitor, and I guess you could call it a learning experience. It was awkward to use, awkward to interface with. It suffered IM distortion and its main features remained vaporware for its troublesome five-year life!

We spent the 1994 NAB show searching for a system that really worked. We knew that such a large purchase would marry us into a long-term relationship, and we were cautious.

By the time we talked with **Prophet Systems Innovations**, conflicting sales pitches, claims and counter-

claims from other companies had beaten us up.

What we wanted was solid "it-does-

Broadcasters themselves, the Lockharts know what constraints and challenges face broadcasters and have



Tom Busch works with the AudioWizard from Prophet Systems.

what-we-say-it-does" honesty. We found that and much more in PSI and with Ray and Kevin Lockhart.

gone to great lengths to respond to those needs. We were impressed with

See PROPHET, page 62 ▶

CartWorks The Choice is Easy !

Digital Audio Systems

Time	Cart	Title	Artist	Length	Index	End Type
16:33:43	1000	Home Quarters		01:00	1	COM
16:33:48	1001	Windy's		01:00	2	MUS
16:36:48	1002	Century Cellnet		01:00	3	MUS
16:36:50	M12	Amagobden 8	Del Leppard	02:56	22	F MUS
16:41:53	V001	Voice Track 1		00:00		VTR
16:41:58	M17	Party Town	Glen Fry	02:40	06	C MUS
16:44:48	1003	Century Next Music		01:00		MUS
16:44:54	M09	Listen To Me	Tom Petty	02:40	11	C MUS
16:47:42	DAL V1	15M/7 with		02:00		VTR
16:50:42	1004	Dance The Night	Van Halen	02:47	13	F MUS
16:53:35	V005	Voice Track 5		00:00		VTR

10:27:36

On The Air

Live Assist/Cart Replacement

The first truly user friendly digital audio system. A perfect replacement for those aging cart machines. Operate manually like a six deck cart machine or use Script Automation for advanced live assist features. You won't need a staff of computer wizards to operate it either. Because CartWorks is designed to look and operate like traditional broadcast equipment, it's easy to learn and use.

Music-On-Hard-Drive

Designed after the original CartWorks friendly user interface, here's a professional Music-On-Hard-Drive system that's simple to operate yet powerful. Sound live 24-hours a day with pre-recorded, in-context voice tracks that match what's actually on the air.

To keep things simple, Spot sets are played from a familiar cart deck. Music log events are played from a music log. CartWorks MHD accepts logs from most any of your favorite music schedulers. Or use our included Quick Scheduler. Switching between automated and live assist modes is as simple as pressing a single button. And options are available to easily add Satellite Automation. CartWorks MHD won't drain your budget or your brain.

Like all CartWorks products, it's backed by 24-hour technical support.

Prices start at \$ 4,995 Complete !

For information call: 1-800-795-7234 Or visit us on the web: www.cartworks.com

USER REPORT

Opening the Vault at WTLC

by Dave Hood
Chief Engineer
WTLC-AM-FM

INDIANAPOLIS, Ind. AudioVault from Broadcast Electronics is the system of choice of the five Emmis stations and two statewide networks in Indianapolis.

As the chief engineer for WTLC-AM-FM and the AudioVault administrator for all of the stations in Indianapolis, I participated in the evaluation of several systems. In our evaluations, the corporate offices at Emmis made sure that accommodations were made for Bernie Eagan.

the keyboard.

Broadcast Electronics donated an

interface console that was made in Germany. It has Braille keys, which



Bernie Eagan has found the AudioVault from BE a valuable tool.

That's the beauty of the AudioVault Windows interface. You can do it all from the keyboard.

Eagan was the first jock hired by Emmis Broadcasting in 1981 — 18 years ago. That's a distinction in itself.

Tools for the job

He's the afternoon jock on WENS(FM), Emmis' very first radio station in its hometown of Indianapolis. But what makes this story most interesting is that Bernie is blind, and he runs his show on WENS' AudioVault system.

Bernie's got the AudioVault down cold, and he runs it completely from

USER REPORT

Auto-Mate Provides Alternative

by Scott Bailey
Program Manager,
Chief Operator/Engineer
WMRO(AM)

GALLATIN, Tenn. Two years ago, when our Sono-Mag Automation System had just about seen its last days, we purchased Auto-Mate Systems software. WMRO(AM) uses the full Auto-Mate version 3.0, which includes the Random and Pick List Playback Modes and the Full Satellite Playback Mode.

Auto-Mate is a DOS-based program, easy to install into any PC.

Because WMRO uses a satellite network for all its programming, we had to purchase a very inexpensive relay card to receive relay closures from the satellite network. In addition to the relay card, we purchased a Compaq PC and a

SoundBlaster 64 Soundcard.

The total amount of money spent in hardware and software for our Auto-Mate automation system was under \$1,000.

The software was easy to install, and was done in about one night. The instructions were simple to follow and covered every possible use of the software in any application.

WMRO is an affiliate of Westwood One Oldies Channel and CNN Radio News. The Auto-Mate receives its relay closures from Westwood One via our Virtex digital satellite receiver.

The Auto-Mate, in the Satellite Playback Mode, plays all commercial breaks, liners, jingles, etc., when the appropriate closure is received. When a relay closure is received from the network to play the Legal ID at the top of the hour, the system will update its DOS clock, keeping the sys-

tem from getting "off-track" and or playing commercial breaks at the wrong times.

The Auto-Mate can match up DJ liners and jingles to his or her shift, giving the station a live sound. The Auto-Mate, along with Westwood One, has given WMRO such a live sound that our listeners really believe the air staff is sitting right there in our Gallatin studio.

tem from getting "off-track" and or playing commercial breaks at the wrong times.

His only cheat sheet is a Braille printout of the program log, which he uses only as a backup, and a Braille printout of all liners and sweepers by cut number.

But he's not locked into the schedule any more than any other announcer is. If he needs to vary the programming from the log for any reason, he can flip through the various AudioVault "tabs" and search the system by cut number. When he finds the cut he wants, he just loads it with a hot key.

That's the beauty of the AudioVault Windows interface. You can do it all from the keyboard if you want to. Bernie loves it!

For more information contact Broadcast Electronics at (217) 224-9600, fax (217) 224-9625, visit the Web site at www.bdcast.com or circle Reader Service 161.

For more information contact Auto-Mate Systems at (503) 769-2886, visit the Web site at www.wvi.com/~automate or circle Reader Service 103.

On its own

WMRO uses the Auto-Mate to air "live" traffic reports in morning and afternoon drive as well as "live" on-location, weekend remotes from local businesses in the area. This is done by Auto-Mate, without operator intervention, through a regular dial-up telephone line and a Broadcast Tools dial-up remote control, wired to the computer's relay card.

The person doing the remote "call in" simply calls in to the remote control and listens for Auto-Mate for his cue to go on the air. The Auto-Mate can put our CNN, top-of-the-hour newscast on the air with ease; the system sees CNN as "source number two" with the relay card. The system knows when to turn source number two on and off with programmed time commands.

Recording and scheduling spots, PSAs, promos, local news and weathercast is done with ease with the Auto-Mate. As a good safety measure, we keep about 200 songs on file in the computer's hard drive, just in case we lose the satellite feed from Westwood One.

We can access these files through the Random or Picklist Playback modes. People who have stopped by the station to see the Auto-Mate system in operation have been impressed, including John Krogstad, affiliate relations director of Westwood One.

At WMRO, the output of the Auto-Mate is wired to a Autogram IC-10 console, then sending the audio to an Orban 9000A processor and a Harris Gates One transmitter before going over the air.

I recommend the Auto-Mate to any station looking for an inexpensive way to automate its setup.

For more information contact Auto-Mate Systems at (503) 769-2886, visit the Web site at www.wvi.com/~automate or circle Reader Service 103.

ComStudy by RadioSoft.

Radio Mapping At Its Best.

ComStudy by RadioSoft sets a new standard for accurate and efficient mapping of all radio signals. ComStudy can bring a world of information about your existing or planned signals right to your screen. ComStudy 2 offers a lot...

- Fully integrated transmitter databases
- Fastest and most accurate calculations
- Automatic interference calculations
- Real time 3D displays
- Area reliability studies
- Accepted by the FCC
- APCO coordination standard
- All FCC, TIA, and ITU procedures included

ComStudy offers breakthrough software at a fraction of the cost of more cumbersome software programs. We'll even let you test drive ComStudy for 15 days. Just call or visit our website.

The World Leader In Radio Mapping Technology.
109 W. Knapp Avenue, Edgewater, FL 32132
Phone 1-888-RADIO95 in the USA
Globally, phone 1.904.426.2521 • www.radiosoft.com
RadioSoft Is A Customer Friendly Company.

Circle (46) On Reader Service Card

USER REPORT

RapidFire Performs for Trombo

by Ray Reich
President/General Manager
Reich Communications Inc.
WDXY(AM)-WIBZ(FM)-WKHT(FM)

SUMTER, S. C. Reich Communications, located in Sumter, S.C., operates three radio stations from one facility. We utilize RapidFire from Pristine Systems.

Pristine is not new to our operation, as we were one of the pioneers to begin using digital automation. We first automated our AM station, WDXY, with a digital system in early 1991. At that time there were only about four systems on the market.

After thoroughly comparing the systems available, we selected the Pristine MMCS system. We thought we had taken a giant leap forward with the first-generation Pristine automation. It played commercials from the hard-drive and interfaced with Pioneer CD players for music.

It seemed like magic, light-years ahead of the old reel-to-reel automation systems of the 1970s and '80s.

Compared to the current generation Pristine RapidFire, the MMCS seems like a clumsy dinosaur.

Our evolution from the Pristine MMCS to the RapidFire began in early 1998. We knew the time had come to move into the next generation of automation.

By 1998 there were many more players in the marketplace.

Our three stations have different needs. WDXY is news/talk with some music at night and on weekends. WIBZ(FM) utilizes Pure Gold from ABC during some dayparts and we use locally originated programming in others. WKHT(FM) utilizes Tom Joyner's morning show and The Touch from ABC.

On WKHT we are local in only one daypart. We needed a system that could handle satellite interface, music, commercials and all other audio elements on hard-drive and the demands of audio and satellite switching needed for news/talk.

Another absolute must was "shrink and stretch," the ability to adjust automatically the sampling rate of commercial audio to make it time out exactly for satellite breaks.

A three-minute break must be three minutes, not 2:59:58 or 3:00:02. Nothing makes a station using satellite-delivered programming sound worse than going back to the satellite too early or too late.

We also needed the ability to delay-broadcast a feature. Pristine's Time Warp accomplishes this task.

When shopping the various vendors, I found that the Pristine RapidFire could handle all the needs of all three stations.

Other systems that could also do the job were priced significantly higher, once I added all the add-ons necessary to make the system do what we needed. I was also uncomfortable with some of the negative user reports that I had received regarding several of the systems on the market.

Good support is a *must* when it comes to digital automation.

It was the competitive pricing, features and, most important, the past support experiences that led us back to

Pristine Systems for our purchase of a new system.

We decided to make the conversion slowly. We started with the change from MMCS to RapidFire on our oldies station, WIBZ. As is usually the case with new software, the first conversion had its moments. There was a software glitch in shrink and stretch that took Pristine several weeks to work out.

After we got past that problem and had the learning curve behind us, we were thrilled with RapidFire.

Six months later, we converted WDXY, our new/talk station.

Conversion No. 2 was a breeze. It's amazing how much easier it is once you are past the learning curve! We are now completing the conversion of our third station, WKHT.

After getting through the learning curve of a new system, they are in agreement that the RapidFire is superior and more user-friendly than systems they used elsewhere. User friendliness is important when it comes to training new staff members, especially weekend part-timers.

The ability to buy off-the-shelf replacement parts also is important to me.

If your motherboard gets fried by

lightning or your hard-drive crashes, you can go down to your local computer shop and get a replacement.

I have heard horror stories of other vendors charging highly inflated prices for replacement hard-drives. They claim only they can format it to work with their system.

This is not the case with RapidFire.

In summary, RapidFire was our choice of a system to carry us into the new millennium for many reasons.

Most important were eight years of positive support experience with Boyce Williams, Beau Sanders, Kevin Loper and the rest of the staff at Pristine.

For more information contact Pristine Systems at (310) 670-7500, fax (310) 670-0133, visit the Web site at www.pristinesys.com or circle Reader Service 64.



We started this company with a single goal—to be the best! My staff likes to joke about my "speech". I stress that we can be the system of choice if we SIMPLY provide the best software, the best hardware, the best support, the best sales service, the best training, the best installation, etc. Simple strategy? But, my message gets through loud and clear—I don't settle for average!

From this mandate and the already powerful AudioWizard software comes NexGen Digital™. More than an upgrade, NexGen takes a decade of experience in digital automation and offers you the virtual radio system to take you into the next century.

-Kevin Lockhart, PSI President



Sales: (800) 658-4403
 Support: (800) 658-4396
 E-Mail: sales@prophetsys.com
 Web: www.prophetsys.com

NexGen Digital features:

- Compressed or non-compressed audio
- Real-time status of up to 128 local network workstations
- A single PC running a station
- Redundancy using multiple file servers
- Individual user preference records
- Customized default configuration
- High speed digital audio extraction
- Timesaving drag and drop capabilities
- Pot status window
- Voice-track recording concurrent with programming
- Instant and seamless mode and shift changes

Circle (47) On Reader Service Card

USER REPORT

Nassau Loves Scott Studios

by Tony Gervasi
Senior Vice President,
Engineering & Technology
Nassau Broadcasting Partners

Princeton, N.J. Nassau Broadcasting uses Scott Studios digital audio systems in 19 of our 21 stations. We operate local radio stations for 5 million people in New Jersey, airing every imaginable format.

New York or Philadelphia. Local content and listener phone calls air in all shifts. Some calls in voice-tracked shifts may have come in earlier, but viewpoints are local, interesting and informative.

Sure, we had a learning curve serving several markets from our Princeton hub. We brought "Scott School" technicians to our stations. Our senior vice president of programming coaches our staff on com-

ule and know everything happening. They have Scott Hot Keys, countdown timers and auto-calculations for the hour and ability to move events around just like in the studios.

Rock solid

Our Scott Systems have been rock-solid. The weakest point of the Scott is its generic computer hardware. A hard-drive can fail (and two have) but we were back quickly with non-proprietary replacements. Scott exchanged the drive under its five-year warranty.

No Scott software bug has taken us off the air, which is more than I can say for other systems we purchased. Even factory technicians from major companies couldn't get their digital equipment to work as advertised, so we ripped out the others and replaced them with Scott Systems.

Nassau's digital audio sounds fantas-

tic! We use MPEG 4:1 at 44.1 kHz, although Scott works uncompressed and at any sample rate. All our systems have quadruple overlap through separate faders. Scott works hand-in-glove with remote starts on our consoles, and Scott's touchscreen turns console channels on and off seamlessly.

At our highest billers, we use Scott Invincible Systems with everything redundant and self-healing. Once we had a problem an entire weekend before anybody realized the standby had kicked in. Scott's Invincible

is bulletproof. Announcers don't have to do anything to activate the backup.

With only seven engineers running 21 stations, we don't worry about our Scott Systems. As for the two Nassau stations not yet running Scott Studios, they will be by the time you read this.

If you're near Princeton, N.J., and want to see Scott Systems in action, feel free to call and I'll give you the tour.

For more information contact Scott Studios at (800) Scott-77, visit the Web site at www.scottstudios.com or circle Reader Service 71.



Nassau Broadcasting Partners utilizes Scott Studios digital audio systems.

A third of our stations are Scott voice tracked or extensively localized satellite formats. Two-thirds have live announcers on some shifts and voice-tracks in others.

In Monmouth and Ocean Counties (market 47), our five stations are vacant from Friday at midnight through 5:30 a.m. Monday. Listeners don't hear any difference.

Personalizing broadcasts

Although we don't have people at every location, it certainly sounds that way. Our Princeton hub always has talented people feeding updated local information every quarter-hour to every station by T-1 or Scott's Voice Trax Via Internet (VTVI).

Listeners hear up-to-the-minute local news and weather they can't get from

selling content and passionate delivery.

Scott pre-dubbed our initial music library. For updates, we put audio CDs in CD-ROM decks with Scott software, digitally transferring five-minute songs in 20 to 30 seconds.

One reason we operate our 21 stations so efficiently is because our Scott Systems are tremendously reliable and the Scott equipment promotes localism.

We recently had a fire in one of our buildings. The fire department evacuated everyone for afternoon drive. Our Scott Systems didn't miss any commercials, songs or liners, although we couldn't do live traffic reports.

We use laptop PCs at live remotes with ISDN and Telos Zephyrs for audio and RS-232. Announcers see their sched-

USER REPORT

Halland Broadcast Loads the Music

by Hank Landsberg
Halland Broadcast Services Inc.

GLENDORA, Calif. In 1996, Halland Broadcast Services Inc. introduced "HitDrive," a hard-drive music loading service.

HitDrive lets a broadcaster create a custom playlist that is then loaded to a hard drive in one day. Halland can do in a few hours what would take the broadcaster over two weeks of studio time.

Here's how the HitDrive system works: Halland supplies "HitPick" software for free. The HitPick software essentially is a database of the inventory of music. It includes the most programmable songs covering all popular music formats: Oldies ('50s, '60s), Gold ('70s), AC ('80s, '90s), and Country.

The HitPick software runs in any DOS or Windows computer, and allows the user to pick any combination of songs to create the playlist (or format) desired. The user simply scrolls through the list, and "checks off" each song wanted. Songs can be picked in any combination.

There's even an easy way to "quick-pick" songs within designated years, or by a certain artist(s). Once the playlist has been picked, the song list data is sent to Halland on a floppy disk.

After researching the industry, it was determined that the most common "compression format" was MPEG Layer 2, operating at a sample rate of 32K and a data rate of 192KB in stereo.

Halland's entire 5,000-song library is stored in this format; the "pre-compressed" files can be quickly transferred to the client's drive at a rate of about 15 songs per minute. An average 1,000-song library can be transferred in less than two hours.

Most stations simply send their hard drive to Halland. The drive is connected to Halland's computer system and loaded directly on to the station's drive.

Some stations prefer not to ship their drive due to the possibility of damage in transit. In this case, music files can be loaded to a "JAZ" cartridge. A typical 1,000 song library will fit onto three 2GB cartridges.

When the station receives the JAZ cartridges from Halland, they simply transfer the music files to their on-air drive. Not only does this eliminate any chance of damage to the air drive; it also provides a level of security, since the JAZ cartridges are then kept as backup.

In the event of a hard-drive crash, a new drive can be quickly loaded from the JAZ cartridges.

Data playback

The new 32K sample rate provides full 15 kHz bandwidth without degradation or "digital grunge." All audio tracks are recorded with consistent levels and balance, and checked for proper EQ and mono-compatibility.

In addition to the music files themselves, Halland also provides a custom database of the tracks loaded. The database provides information about each track: artist, title, running time, intro time, end code, etc.

This data is supplied as a standard ASCII text file, which can be imported into most music-scheduling software. The data can also be used by the playback system to display pertinent information (artist, title, time, etc.) about each song as it is playing.

For more information contact Halland at (800) HALLAND, fax (626) 963-2070, visit the Web site at www.h-b-s.com or circle Reader Service 94.

Telephone Line "Eliminator"



7 DIAL-UP DEVICES CAN SHARE ONE CENTRAL-OFFICE LINE

Inovonics' PBX is a cost-saving alternative to the multiple telephone lines otherwise needed for modems, alarms and other dial-up apparatus installed at remote equipment sites. The PBX allows as many as seven devices to share a single central-office line, for outgoing calls and with selective incoming access as well.

The PBX finds immediate application with the expanding use of unattended remote equipment:

- Broadcast Transmitters/Translators
- Cellular/2-Way Radio Facilities
- Microwave Relays
- Geophysical Monitors
- Pumping Stations
- Security Systems

**PBX
\$420**

Inovonics, Inc.

1305 Fair Ave., Santa Cruz, CA 95060 USA
TEL: (408) 458-0552 • FAX: (408) 458-0554

www.inovon.com



Circle (48) On Reader Service Card

USER REPORT

CartWorks Serves WKXS(FM)

by Johnny Boswell
President
WKXS(FM)

JACKSON, Miss. In a crowded market like Jackson, being competitive is essential. Today's economies don't allow plush budgets; all departments must operate efficiently to succeed, which often requires assigning multiple duties to employees. I've found the features of digital audio systems from **CartWorks/dbm Systems Inc.** indispensable in achieving these goals without overloading my staff.

Broadcaster-friendly

CartWorks is broadcaster-friendly. The screens are uncluttered, familiar and arranged in a logical manner. New hires usually become productive the first day. Most of them previously operated digital systems at other stations and comment how much quicker, easier and straightforward CartWorks is to use.

Integration between departments is important. Traffic generates logs with Darts, the PD creates music logs with Music 1 and CartWorks interacts with both via the LAN network.

Rather than merge both logs into one long, confusing list of events, CartWorks keeps them separate. An on-screen cart deck always shows what's coming up in the next spot break and the music log displays the play list along with all liners, jingles, voice tracks, etc.

Sometimes things must be changed at the last moment. CartWorks allows the operator to override most anything on either log without the need to track down numerous people.

We use several programs in production: SAW, Cool Edit and Winamp. CartWorks' new WAV/MPEG systems directly import these and many other

formats without time-consuming conversion. Uncompressed WAV, MPEG Layer II and III may be played directly on the air.

With stations in multiple cities, CartWorks allows us to make the most of our staff's talents. Production done in any room, in any city, is transferred to its destination either by LAN or WAN. This really helps meet otherwise impossible schedules and has saved us literally hundreds of hours transporting tapes.

The Remote Control option has been a lifesaver, too. During unattended hours, the program director can access

the control room directly from his home computer and operate it as if he were there.

Our CartWorks systems have paid for themselves many times over — not just in staffing cost, but by allowing us to do things that otherwise were not feasible. Prices are reasonable. Other stations in our market have spent tens of thousands of dollars more and still can't top our final on-air product.

Of our three stations, two run satellite formats. The WKXS CartWorks computer, however, runs a satellite morning show, then goes live-assist, followed by music-on-hard-drive

automation overnight. It also background-records four network feeds each hour from ABC and Westwood One. News and network spots are automatically captured and played back, which is useful for catching the must-clear spots during the morning show.

CartWorks technical support is second to none. We never have problems receiving knowledgeable support when the occasional technical situation arises or when we have wanted to implement changes at our stations.

CartWorks has been the idea fit for our stations. After six years I still wouldn't change, and given that CartWorks is Y2K compliant, I won't have to.

For more information, contact **CartWorks/dbm Systems Inc.** at (800) 795-7234, visit the Web site at www.cartworks.com or circle Reader Service 73.

MASTER CONTROL

The 'Selector-smart' on-air system



TECH UPDATE

Arrakis Systems

Arrakis has released several new upgrades to its DigiLink series.

The Version 3 upgrade for DigiLink 2 features Y2K compliance, portal for Music-On-Hard-Disk, and extended support calls.

Other features supported in Version 3 include optional DL4 factory-loaded music, real kill dates, e-mail audio files with Trak*Star, dial-in recording, dial-in remote broadcast, and extensive logging added.

DigiLink 3 Version 4 features enhanced Voice Tracking, WAV PC editor import, and extended support calls.

Other features supported in this upgrade include auto voice track cart numbering, edit voice tracks, schedule donuts, e-mail audio files with Trak*Star, dial-in recording, dial-in remote broadcast and Y2K compliance.

For more information contact **Arrakis Systems** at (970) 224-2248, fax (970) 493-1076, visit the Web site at www.Arrakis-Systems.com or circle Reader Service 142.

Go with what you know:
www.rcsworks.com

info@rcsworks.com

(914) 428-4600

Fax:(914) 428-5922



Audio Wizard: Elegant and Seamless

► PROPHET, continued from page 57
their commitment to quality and customer service.

In a sometimes impersonal industry, their word was, and continues to be, their bond. They stand behind not only their products and people, but their customers as well.

Creating magic

While some companies had fancier screens, we found the AudioWizard's operation to be elegant and seamless. It did exactly what Ray and Kevin promised.

Five years ago when we installed our AudioWizard system, we anticipated

normal installation problems, but that wasn't the case. The system was simple

Closer to Russia than the nearest Alaskan town of any size, we are about as remote as it gets.

and straightforward.

Throughout the years, Prophet has

been there to answer our questions and help us grow. Just this past fall, we

upgraded to the latest software version. The system has performed like a

pro, going 160 straight days without a single glitch!

You may have heard how some companies are now touting their "extensive" training. I would venture to say that Prophet has taken its commitment to training to a new level with their state-of-the-art training facility.

Last summer, after five years with our AudioWizard system, we decided to take advantage of the training, in light of our impending fall system upgrade.

While we have always found Prophet's AudioWizard to be extremely user friendly, we had been self-taught on the system, and we knew there were holes in our knowledge.

At the academy, we learned a handful of short cuts, as well as how to better instruct our own staff.

People may laugh when you talk about going to the Nebraska prairie for training. (Living in a place even more remote, we get the same question they do: "How can you possibly live *there*?")

Stunning

But the facility was stunning.

We trained with a handful of other small stations and with a delegation from Jacor, and found PSI's hospitality to be exemplary.

Large group or mom 'n' pop, everyone gets the red carpet treatment at Prophet. Don't be fooled by their location. Their technology and expertise are cutting edge.

In this age, where the debate rages on how digital automation can "put people out of work," folks are surprised to hear that our staffing hasn't changed a bit.

On the other hand, we've expanded our hours to 24 with the same size crew, who are better rested, more productive, and better able to utilize their time creatively, thanks to voice tracking and live-assist operations.

We also have the assurance of AudioWizards' redundancy in its mirrored hard drives, which helps me to sleep better.

The folks at Prophet listen to customers and design the software and products to meet, and exceed, their expectations. At the most recent NAB show, the company previewed its newest system, NexGen Digital, and we look forward to taking advantage of their new technologies in the future.

Not without acclaim

As remote as we are, KNOM isn't without its own acclaim. KNOM is proud to be a National Association of Broadcasters Marconi Award winner, a Crystal Award recipient, and a six-time winner of the Gabriel Award for Station of the Year — three times in the last three years running.

At KNOM, we pride ourselves on our product and the service we are able to provide to our listening audience. In an area where there are too few priests, sisters, and volunteers to serve the areas needs, we provide inspiration, news, music, and companionship to thousands of Alaskans.

We couldn't do that today if it weren't for the reliability and quality we have found synonymous with Prophet Systems Innovations.

For more information contact Prophet Systems Innovations at (800) 658-4403, fax (308) 284-4181, visit the Web site at www.prophetsys.com or circle Reader Service 91.

**All Digital.
All Radio.
All Here.**

- Voice Tracking
- Copy Management
- Digital Audio
- Live Assist
- WAN Support
- Automation
- News Room Integration
- Digital Switching
- Multi-Track Editing
- Satellite

Computer Concepts Corporation

Toll Free 1-800-255-6350
www.ComputerConceptsCorp.com

Maestro • NewsRoom • ReeLogger • LogMerge • VoiceTracker

USER REPORT

A New Universe From CBSI

by **Troy Richards**
Operations Manager
KCCS(AM)

SALEM, Ore. The search for the right digital automation system is a lot like looking for the perfect car. After a while they all start to look alike with only slight variations of a common theme. Then all of a sudden a model jumps out at you causing you to say, "Wow! Is this for real?"

There sits **Custom Business Systems Inc.**'s new Digital Universe on the show-room floor.

The control room is playing audio on air while I am doing voice-tracking for tomorrow's shift, net capture is recording three programs off of the satellite, the production guy is recording a commercial and the sales guys are auditioning spots for their clients all at the same time.

One thing that sets apart the Digital Universe is its use of uncompressed audio.

What would have been ludicrous five years ago has become, at least in my eyes, a breakthrough because of the affordability of multi-gigabyte hard drives.

Uncompressed audio gives us a lot of options with the use of our sound files that we never had before.

CBSI's use of non-proprietary hardware makes the system more affordable and creates limitless opportunities for expansion.

The net capture feature was one of our greatest concerns because we are highly dependent on satellite feeds both live and

recorded from 11 different sources. I have found the network capture software to be intuitive, and far exceeding the performance of previous systems we have used improving the transitions of our programs and audio quality.

In fact, one of the most impressive things about the Digital Universe is that it is all intuitive. Even the most computer illiterate of our DJs (one of

which is still struggling with the concept of a mouse) have found the DU to be user friendly and were able to start operating the control room after about 30 minutes of training.

Mini production studio

DU's Dynamic Voice Tracking creates a little mini production studio light on the control room screen allowing the jock to hear the segue of the songs which can be easily adjusted or ducked down.

The on-screen buttons are simple and uncluttered and arranged logically from a radio perspective, and not overwhelming to the operator. Because of the ease of operation and minimal maintenance, we have greatly improved the productivity of our limit-

ed staff and have a "big station" sound.

There are many other neat functions of the DU, but ultimately, two words convinced us that the CBSI Digital Universe was worth investing in: customer service.

Our station has used CBSI for all of our traffic software for many years and they have always gone the extra mile to meet our needs.

The DU staff has already demonstrated to us that they are committed to upgrading and improving the Digital Universe as more user needs become known and I never worry about hearing the words, "I'm sorry, you're just going to have to live with that."

It's nice to deal with a company that is always looking to improve its product, thus improving our station.

For more information contact CBSI at (800) 547-3930, fax (541) 271-5721, visit the Web site at www.cbsi.org or circle Reader Service 83.



CBSI's Digital Universe in Use at KCCS(AM)

I decided to take it for a test drive to see if it would deliver as promised.

Juggling duties

Our station has a fairly complex mix of talk and music, live and recorded, and so we needed a system that had great versatility.

The client/server nature of the DU allows us to record and play audio on multiple channels simultaneously.

Enco DAD: A User-Friendly System

▶ ENCO, continued from page 57
felt that we "got our money's worth."

This truly is a user-friendly system that operators seem to have no difficulty in adapting to from the world of carts and CDs.

We found that integration of the DAD system to our Marketron traffic software to be quite easy, due in large part to Enco's customizable import program. We initially had a few minor issues, but those were identified and resolved quickly.

Our system qualifies as a relatively large one by current standards, with redundant file servers utilizing Novell SFT III and 12 workstations running NT 4.0.

Each of our four control rooms have dual 17-inch touchscreen monitors utilizing NT's "spanning" feature, allowing the jocks a great deal of flexibility in their on-air setup.

They generally run the DAD_{PRO}32 MasterLog on the left screen and MiniArray cart walls on the right.

The eight production rooms use 17-inch non-touchscreen monitors. We

elected to remote mouse, monitor and keyboard for each studio by use of Cybex Snap III boxes, thereby allowing location of all hardware in engineering to eliminate fan noise in the studios.

We have Digigram DSP Boards in our system, and have been pleased with the audio performance. At press time, we use MPEG 44.1/28 kbps for spots, and will use 44.1 linear PCM (uncompressed) for music when we expand the amount of hard-disk storage next year.

I am looking forward to making even better use of our system as we expand our knowledge of its capabilities, which are considerable indeed! I believe if you closely analyze all the systems available, there are several good solutions in the marketplace, but it appears that Enco has built a solid leading position in the digital audio delivery arena.

For further information contact Enco Systems Inc. at (800) 362-6797, visit the Web site at www.enco.com or circle Reader Service 112.

TECH UPDATE

MediaTouch

MediaTouch released its new QuicPix Audio Studio software package, with pricing starting at \$699.

The QuicPix Audio Studio runs on the Windows 95/98 platform and uses MediaTouch's Card Independence technology to play and record broadcast-quality MPEG layer 2 audio.

In the playlist mode, users can load anything from the audio library into a seven-event virtual cart player, or switch to a library view to "hot start" any of 40 items on the screen. Two items may overlap each other on a single audio card.

The QuicPix Audio Studio also features production power. CDs can be "ripped," of digitally converted to an audio file, in less than real time without dubbing.

or sources can be recorded through the sound card using the traditional tape deck-like control buttons.

A professional version of the program, priced at \$995, adds cut-and-paste waveform editing and effects such as audio flip and pitch change.

For more information contact MediaTouch at (888) 665-0501, fax (204) 783-5805, visit the Web site at www.omt.net or circle Reader Service 143.



GET YOUR SOUND TOGETHER

FM MODMINDER TURN-KEY PROCESSING FOR THE NEW RADIO

PROBLEM: How to get the competitive edge and maintain your format's quality sound in an ever-consolidating radio market.

SOLUTION: FM Modminder from Modulation Sciences, The Processing Authority

Radio consolidation doesn't have to add confusion when it comes time to equip those new or revamped studios. The **FM ModMinder** from MSI gives you just the edge you need. It's truly a revolution in modulation monitoring, not only allowing your station reach its full power but maintaining your superior sound quality at the same time.

Modminder means one more tool for success in the new radio and one less headache in a frantic industry where things change overnight.

At a time when the newest mega-deal is just around the corner, you can rely on Modulation Sciences to pull your stations' processing together.

ModMinder ignores brief peaks to give you every bit of modulation your station can legally use. It draws out your format's dynamics, whether the sound is jazz, country, soft rock or anything in-between.

FM ModMinder features Modulation Sciences' quality design, meticulous engineering and just the right approach to meet the challenges of the real world of radio. It's simple to set-up and easy to operate. And you needn't worry that it's a budget breaker when your group is set for multiple buys.



CALL NOW for information about FM ModMinder, StereoMaxx, the CP-803 Composite Processor or any of our rock-solid radio line.

12A World's Fair Drive
Somerset, NJ 08873
Voice (732) 302-3090
(800) 826-2603
Fax (732) 302-0206

AEQ

The MAR4WIN from AEQ is a hard-disk system that allows operation modes such as manual, live-assist and fully automated operation.



It can receive news agency feeds with its MAR4NEWS module and handle remote recording access via phone lines with its MAR4Remote module.

The system can be configured to accommodate one radio station, or an entire network.

The system allows access to several databases, local or remote, through information managers that organize the

material by folders. Audio, text and playlists drag and drop easily, and can be organized, manipulated and controlled by the user. While reading news in the text file on a playlist, the presenter may click on the

associated audio recorded earlier to broadcast an interview, comments and other material.

The MAR4WIN runs on Windows NT and Windows 95. The 32-bit native platform allows up to four audio boards to record and playback simultaneously in the same workstation.

For more information contact AEQ at (954) 424-0203, fax (954) 424-0902 or circle Reader Service 115.

BSI

WaveStation 3.0 from Broadcast Software International is on-air digital audio automation software for radio stations.

Based on a Microsoft Windows platform (95, 98 or NT), the system features the ability to run other programs, "triple overlap" for true voice tracking, includes Cool Edit Pro LE recorder/editor software and imports program log data from any traffic management or music scheduling system.

WaveStation 3.0 is equipped with BSI WAV file labeling technology.

This allows users to insert information right into the audio file. No outside databases are used and if transferred from one PC to another, or even to

another station via e-mail, the label information goes with it.

WaveStation 3.0 can run entirely automated or as a live-assist system. In automation mode, WaveStation can run unattended for weeks at a time.

In live assist, the operator can make changes to the program log, even while WaveStation is playing. The operator can even edit the log for a completely different time of day, without interrupting WaveStation operation.

WaveStation 3.0 uses Microsoft standard WAV audio files (compressed or non-compressed), MP3 files (with installed codec), and TM Century files.

For more information contact Broadcast Software International at (541) 338-8588, fax to (541) 338-8656, visit the Web site at www.bsiusa.com or circle Reader Service 116.

Register Data Systems

RDS has added a lengthy list of features to its Phantom system.

On-screen level meters now have three times the resolution, with wider dynamic range, new logarithmic dB scaling and better color-coding. The Cart look-up list now shows the artist/outcue information for each Cart, and can be sorted by artist.

The Phantom's menu of reports has been rearranged and enhanced. In timer schedules, repeated functions such as hourly timer records can be copied, so the user need not repeatedly enter the same functions.

Multicut Cart lists can be imported and exported among Phantom systems. Also,

for systems configured for music-on-hard-drive automation using "Q" codes, a simple keystroke can stop the Phantom momentarily for manual override.

A new freestyle method of importing traffic logs from RDS traffic and billing systems is available, allowing traffic to control most Phantom events, such as break times. Also, Carts recorded by a Timer Scheduler now have expiration dates. And more provisions have been made to prevent any Y2K problems caused by hardware limitations or external sources.

For information from Register Data Systems, contact the company in Georgia at (800) 521-5222, fax at (912) 745-0500, send e-mail to sales@registerdata.com or circle Reader Service 95.

mediatron

German firm mediatron has launched the '99 version of its hard-disk PC-based digital audio system for radio.

Improvements in the form of plug-in tools make the system more effective in connection with new technologies such as Internet, intranets and DAB.

It is now possible to access the broadcast schedule of a mediatron system from any remote site and to record directly into the schedule.

The recorded voice elements can be directly transmitted. Virtual voice tracking allows the user to employ talent at various radio stations at the same time. A program which in the past had to be produced in real time now can be prepared in a few minutes.

The AirControl NT live-assist and automation system is available in Standard and Professional versions. The

Standard version is a cost-effective alternative, designed for small radio and Internet stations.

"We want small to medium radio stations also to profit from the efficiency of our broadcast systems and to save costs by consequently applying our digital technologies and automation techniques," said mediatron Managing Director Markus Stein.

The Standard version of AirControl NT 99 can be built up to the Professional version without an added licensing fee.

The system runs under Microsoft Windows NT 4.0. With plug-in technology designed by mediatron in 1997, the system is easily adapted. The supplier now offers 14 plug-in modules.

For more information contact mediatron at +49-8131-8305-0, fax +49-8131-8305-25, visit the Web site at www.mediatron.com or circle Reader Service 127.

Dalet

Dalet's newest suite of integrated digital audio software for radio stations and groups, Dalet5.1, provides enhancements in production, scheduling, broadcasting and database management.

Stations can take advantage of improved digital audio quality with linear recording, storage, editing and play-



back. Mixing of compressed and linear audio is enabled allowing for flexibility in managing sound libraries.

"Surfer," the built-in audio editor, offers new functions for more precise and refined editing. Database management is

simplified with the implementation of a new, more powerful search engine, and operations can be streamlined with full report, back-up, and archiving tools.

Dalet5.1 also represents the continuing evolution of the Dalet architecture, with VisionCast, a more robust and media-rich broadcasting platform.

With this architecture, stations can incorporate their on-air operations with Internet and digital audio broadcasting. A single system can be used to edit media files, manage titles, develop playlists and simultaneously broadcast audio, graphics, and video over multiple mediums.

For more information contact Dalet Digital Media Systems at (212) 825-3322, visit the Web site at www.dalet.com or circle Reader Service 128.

RCS

Radio Computing Services offers Internet VoiceTracking, or IVT, for the RCS Master Control NT Digital Automation System.

Using RCS Master Control NT, sta-



tions can voice-track any shift on any station from any geographic location with reliable Internet access. IVT works with a normal Web browser at dial-up connection speeds and requires only a Windows-compatible

sound card and microphone at the remote site.

IVT operates from the station's secure "voice tracking" Web site. The system allows the user to choose the station to voice track then the same "Living Log" seen everywhere in the station appears on the Web browser.

The user decides where the voice track is to be placed and the audio surrounding it is downloaded to the computer.

Voice tracks are recorded at broadcast quality and uploaded with no degradation. Log revisions occur in real time.

Use IVT with a quality microphone and mic processor for professional sound, or just use portable computers and a small mic for breaking news stories, election returns or even simple remotes.

For more information contact Radio Computing Services Inc. at (914) 428-4600, fax (914) 428-5922, visit the Web site at www.rcsworks.com or circle Reader Service 129.

SMARTS

SMARTS offers a new addition to its Smartcaster Music-On-Hard-Drive data-storage system. Smart-Dub is an automatic dubbing system that allows users to select a track and enter the details of the cuts to be dubbed. The unit does the

rest. Smart-Dub uses special software to automatically place end-of-message tones on the music being dubbed to ensure proper overlapping.

For more information contact SMARTS Broadcast Systems at (800) 498-0487, fax (800) 398-8149 or circle Reader Service 85.

Radio World

Broadcast Equipment Exchange

"Broadcast Equipment Exchange" accepts no responsibility for the condition of the equipment listed or for the specifics of transactions made between buyers and sellers.

ACOUSTICS

WANT TO SELL

AcousticsFirst™
Toll Free 888-765-2900
Full product line for sound control & noise elimination.
www.acousticsfirst.com

AMPLIFIERS

WANT TO BUY

Microtech 1200. W Gunn, 760-320-0728.

ANTENNAS/TOWERS/CABLES

WANT TO SELL

Scala 5 element yagi's, 2 receive antennas cut to 106.5, can be recut for higher freq, \$150 ea. C Marker, 906-249-1423.

S.W.R. FM Antennas
Great Antenna Great Price!
HE HALL Electronics (804) 984-4255

Potomac Instrument 5 tower antenna monitor, digital read out, new, never used in original box, BO; ERI 2 bay FM antenna, 106.9, can be returned, new, never used, BO. F Webb, 770-491-1010.

Tower on 2.5 acres of land, call for more details. CE Streetman, 409-564-8292.

Coax patch panel 3-1/8"-7 pole. Mike, 800-588-7411.

Dielectric 3-1/8" coaxial relay, Mike, 800-588-7411.

AUDIO PRODUCTION

WANT TO SELL

KLH/Burwen TNE 7000A (2) transient noise eliminators, pop & click removers, excel cond, \$125 ea; Maze R-1 reverb, +4 balanced, spring reverb for vintage sound, recapped in 2/99, \$65; Carver CT27V tuner, AV-preamp w/Pro Logic decoder, as new in box, \$200. D Bailey, 214-343-0879.

QED ProTech stereo elect speaker fusing boxes (2), from 20-200 W amps, screw down connections w/TaraLab cables attached, \$35 ea; Custom 75 ohm dis box, (1) 75 ohm input, (4) 75 ohm outputs, RCA jacks, 9 V batt or ext pwr, make 4 digiaudio dubs at once, \$99. J Sunier, 415-457-2741.

Sony PCM 501ES, 44.1 PCM digital audio processor, A-D converter, \$500. B Meuse, 650-969-2433.

ADC Propatch 1/4" punch-block patchbays, new, \$600 (many, ADC TT 144 point patchbays recond, \$149-229, Switchcraft 1/4" 96 point, new, 2 spaces, \$249. W Gunn, 760-320-0728.

ANTEX AUDIO CARDS, will not be undersold. A.S.C. (619) 523-1575.

CASSETTES · CARTS · REELS
J & I AUDIO/VIDEO
A wholesaler in the Radio and Television market. Now running SPECIALS on audio and video:
BASF CASSETTES-AMPEX R-Rs
AUDIOPAK, FIDELIPAC & ITC CARTS
DAT & THE NEW R-CD
For more information call Kris Elliot at 1-800-942-1711 or write to: J&I Audio/Video 20899 Kelvin Pl. Woodland Hills, CA 91367
Circle (166) On Reader Service Card

Yamaha BP-2 bass pedals electronics and/or schematic of this unit. B Meuse, 650-969-2433.

WANT TO BUY

Optimod 8100. V Zandt, 217-487-7711.

Yamaha BP-2 bass pedals, bass synthesizer schematic or electr only. B Meuse, 650-969-2433.

Dolby 301s; Neve 33609, 1072s, 1073s, 1081s, Urei LA4s, 1176s. W Gunn, 760-320-0728.

AUTOMATION EQUIPMENT

WANT TO SELL

BE Audio Vault, 2 station system, 2 yrs old, on air, running fine, country music on hard drive, \$15000. D Graichen, 318-487-1035.

Century UDS I, Z-4000 computer, Y2K upgradable w/Auto-Seque audio controller, (3) Sony CDK-006 CD changers, monitor, keyboard, software, cables & user/install manual, working cond, \$1000; Century UDS II Z-4000 computer, Y2K upgradable w/A4000 audio controller, (3) Sony CDK-006 CD changers w/UDS II interface boxes, monitor, keyboard, software, cables, working cond, \$1500. G Parmelee, 802-476-4168.

Complete Axis system, currently on line but avail this summer, AM sat automated, FM automated & live assist, news room prod, additional on-air work station w/prod, backup PC, multi-CD players, switcher, decoder, all included, \$12,000/BO. M Murrey, 715-234-2131.

Schafer 903 w/keyboard, remote box, control unit, pwr supply, manuals & cables, BO; Instacart 48PBS stereo cart machine w/control unit, control cards, brand new replacement heads & spare trays, BO. D Lurtey, 864-370-1800.

SMC Carousel, 24-slot, \$325; Otari ARS-1000 1/4" reel automation w/SMC modification 3175/7.5 ips stereo, excel cond. J Sanders, 714-738-1501.

IGM EC automation system, (3) IGM Go-carts w/software, manuals, \$300. 707-829-5999.

WANT TO BUY

Sono-Mag MSP-12 programmer & DAS-12 audio switcher programmer, must be in working cond with or w/o control heads; Audio switcher wanted for parts. B Howe 607-243-7158.

Used DADpro systems & Antex SX-9 & SX23e audio boards. L Mueller, 407-830-6398 or email: LewMew@worldnet.att.net.

BUSINESS OPPORTUNITIES

PRODUCE Host your own
Call Ken Sperber 212-760-1050 radio show
Generate hundreds of qualified leads
50,000 W NYC radio station

CART MACHINES

WANT TO SELL

Audicord DLPM, not used, still in box, \$700. M Larsen, 510-465-6035.

BE 3 deck, record mode needs work, approx 10 yrs old, 200 carts free, \$1500/BO; Tapecaster X-700 in gd cond plus Harris 60's vintage, \$75 ea. C Marker, 906-249-1423.

BE 3000 stereo PB; ITC 3D stereo PB; ITC record play Premium. J Phillips, 419-782-8591.

Gates & ATC, various mono R/P units, fair-gd cond, BO. D Lurtey, 864-370-1800.

ITC PD11 cart machines (2), BO. N Hopper, 770-387-0917.

BE 3000A mono P/R, \$200; Dynamax CTR-10 stereo play w/manuals, \$200. 707-829-5999.

ITC/RP-Stereo. Manufacturer reconditioned, original packaging, mint condition, \$650. ITC/Audiopak carts (44) and repro/alignment cart, \$65. 516-432-4021 or email: webfoot@optonline.net.

COMPLETE FACILITIES

Picture This:
Your 1999 Complete Equipment Dealer

* Experienced Professionals
* RF and Studio Packages
* Personal Service *
New Stations and Rebuilds

Your Project is Important to Us

Atlantic Media Broadcast
Call - Rick Johnson -

* Toll Free *
888-744-6635
email - rick@costone.net

NEW OR USED COMPLETE PACKAGES
STUDIO/STL/TRANSMITTER/ANTENNA OR ANY COMBINATION OF ABOVE.
-LEASE OPTIONS-
-EMERGENCY RENTALS-
-REMOTE BROADCAST RENTALS-
SCMS, Inc. (800) 438-6040
"You Know We Know Radio"

CONSOLES

WANT TO SELL

Mackie 1604 mixer board, 2 yrs old, new, still in box, never used, \$700. J Smith, 336-751-0758.

Sparta 4 pot A-10B, works, \$75. C Marker, 906-249-1423.

DO YOU NEED PARTS FOR AMPRO CONSOLES & CART RECORDER
SEQUOIA ELECTRONICS
1-(408) 383-1846
FAX 1-(408) 363-0957

Arrakis 15 chnl slide stereo; Harris Stereo 80; Harris mono. J Phillips, 419-782-8591.

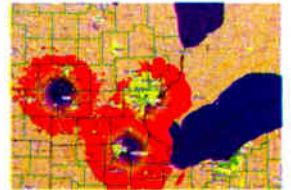
BE 150 Series 8 chnl board; Arrakis 500SC board, BO. N Hopper, 770-387-0917.

BE 8S150, 8 chnl stereo mixer, excel cond, \$900; Harris Stereo 80 8 chnl stereo mixer, gd cond, \$600; Harris Stereo 5, 5 chnl stereo mixer, gd cond, \$400. T Toenjes, 785-437-6549.

McMartin B-803 8 input dual chnl output, BO. D Lurtey, 864-370-1800.

BROADCAST ENGINEERING CONSULTING SOFTWARE

Professional software packages for preparing FCC applications and plotting coverage. For Windows and NT.



- ✓ Create "real-world" coverage maps with Longley-Rice, TIREM, PTP & other models using polygon map features.
- ✓ Prepare concise FCC model coverage maps and allocation studies using USGS geographic map databases. Census calculations, tower and airport databases.
- ✓ Search for AM, FM, TV, DTV & LPTV channels with graphics oriented programs and FCC databases.
- ✓ Plot STL paths in 3-D using NGDC terrain databases... and more!

VSoft Communications
800-743-3684
www.vsoft.com

Tascam M-3500-24ST rcdg console, factory recond by Tascam, 260 point patch bay in 6.5' oak console w/full length 32 meter bridge, 24 input chnls & 8 stereo chnls, 56 input capability, \$4500. Bill, 616-271-5275.

Logitek 12 stereo mixer. Mike, 800-588-7411.

MCI 618 24 inputs (12 mono, 3 w/super EQ, 12 stereo) great prod board, \$6k, MCI 528 27 in recording board \$7k, Neve 8108 65 in, mint \$59k, D&R Orion 1k-nu 26 inline, (64 on mixdown) \$12k, Trident 70 28x16, \$8500, JL Cooper 16 trk automation, \$1200. W Gunn, 760-320-0728.

WANT TO BUY

5-8 chnl stereo console for on-air production. B DeFelice, 203-929-0730.

BE Mix Trak 100, 2-3 in gd cond. S Brown, 920-831-5659.

Soundcraft 600/800, Tascam 2600, Audiotronics 110A, Mackie 1604, Neotek Elite. W Gunn, 760-320-0728.

DISCO-PRO SOUND EQUIP

WANT TO BUY

Altec 604/605 duplex speakers. R Cobb, 813-634-1940.

LIMITERS

WANT TO SELL

Dorrough DAP 610A tri-band audio processor (2), \$275 ea/BO +shpg. B DeFelice, 203-929-0730.

Orban 8100 A/1 Optimod, complete system w/XT 6-band compressor & studio AGC chassis, excel cond, w/manuals, \$5000/BO. H Landsberg, 626-355-3656.

Collins 26J-1 tube compressor, fair cond, BO; Altec 439A & 436C tube compressor, fair cond, BO. D Lurtey, 864-370-1800.

HE HALL Electronics
706 Rose Hill Dr. Charlottesville Va. 22901
804-984-4255 (Voice) 804-984-3299 (Fax)

This Month's Special !!

BSI
Broadcast Software International
Broadcast Automation Software
JUST \$999 List
Turnkey Systems Starting at \$2995

Call or visit our web site for your discount price
sales@halls.com www.halls.com tech@halls.com

Circle (176) On Reader Service Card

LIMITERS (WTS) cont...

dbx 163X limiters (2), excel cond w/rackmounts, \$125/pr; Audio Logic MT-66 2 chnl limiter w/Gates, excel cond, \$175. D Bailey, 214-343-0879.

Marti SEG-10 subcarrier gen, \$400; Symetrix 425 limiter/expander, excel cond, \$400. P Passink, 804-993-3300.

Texar Audio Prism w/Eagle AM, Gentner Prism II AM, Aphex Compeller 303 pair, CRL SG-800 stereo gen, CRL SPP-800 stereo prep processor, CRL PMC 300 peak mod controller, CRL NRSC adapter, Mod Sci CP-803 Composite Clipper, Urban studio chassis. J Phillips, 419-782-8591.

Urei LA2A (extra meter added) \$2500, dbx 900 rack (4 comps/4 gates) \$1800, Gates Toplevel \$550, CBS Audimax, Volumax comps, Dynamic Presence EQ \$400 ea. W Gunn, 760-320-0728.

WANT TO BUY

UREI, dbx, Collins, RCA, Gates, Universal Audio. T Coffman, 619-571-5031.

Teletronix LA-2A's, UREI LA-3A's & LA-4's, Fairchild 660's & 670's, any Pultec EQ's & any other old tube compressor/limiters, call after 3PM CST, 972-271-7625.

MICROPHONES

WANT TO SELL

EV 634A hog nosed, dynamic hi-impedance w/cable, works gd, \$65; copy of EV-664, needs little work, \$40/BO. W Dougherty Jr, 573-998-2681.

Turner Super Sidekick mic; EV 623 mic; I-Com SM-20 mic; Astatic JT-30 mic, BO. G Swayne, 814-742-8002.

Neumann U87s \$1800, Telefunken U48, long body, chrometop, New \$6800, Altec salt shaker mics, \$175/ea, Sony C37fet, ECM377 mics, \$600/ea, Neumann U89, w/shockmount \$1500. W Gunn, 760-320-0728.

WANT TO BUY

Ribbons, condensers, dynamics, tube 1950-90. T Coffman, 619-571-5031.

RCA 77-DX, 44-BX, KU-3A's, WE-639's, On-Air & recording lights wanted. 615-352-3456, FAX: 615-352-1922.

RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST, 972-271-7625.

RCA ribbon mics. W Gunn, 760-320-0728.

MISCELLANEOUS

WANT TO SELL

360 Systems Instant Replay, hot key playback of digital sound EFX, drops & jingles, mint cond, 24 hr version, OEM soft case & manual, \$2000/BO. J Herbert, 410-519-1517.

RF Warning Signs
9"x 12" \$13.95
10"x 19" \$19.95
HE HALL Electronics (804) 984-4255


Albums, 33 & 70 rpm Christian music, light pop, 80's by many artists in excel cond, \$75 +shpg; Biltmore USA Bd trumpet in excel cond w/hard-shell case, \$200. W Dougherty Jr, 573-998-2681.

ROTRON BLOWERS AND PLATE BLOWERS new & rebuilt for Elcom, Harris, CCA, CSI, McMartin, Goodrich Ent. 11435 Manderson St, Omaha, NE 68164 402 493 1886 FAX 402 493 6821

RCA 5' heavy duty metal equip cabinet, weighs 200 lbs, \$50. C Marker, 906-249-1423.

Small start-up station on air in Grand Bahamas seeking used equip of all types, not much budget. Jim, 1-800-887-2346.

Sony MDS-B3 Mini-Disc writer/player, excel cond; Sony MDS-B4P Mini-Disc player, gd cond. T Nelson, 612-798-8618.

DeForest D-6, excel original cond w/sales tag still inside, \$350. S Horner, 805-469-3096.

Pacific Recorders XB-200 (20) stereo inputs by 2 stereo outputs w/built-in buffer amp, excel cond, w/schematic, \$300. S Horner, 805-469-3096.

**1 Balanced Input
5 Balanced Outputs**

9K-600-4 AUDIO DISTRIBUTION TRANSFORMER
Replaces expensive distribution amplifiers.
Balanced, floating inputs and outputs.
Economical, reliable audio routing.
audisar
P.O. Box 1561, Bellevue, WA 98009
425-454-2040
Website: www.audisar.com

Circle (186) On Reader Service Card

Ruslang RL-600 roll around console designed for Otari 5050 or similar, works well w/rack mount Mackie mixers as console, excel cond, \$75; (3) OC White mic arms, \$25 ea; JVC CR4400U 3/4" Umatix portable VCR, \$100. D Bailey, 214-343-0879.

TM Century HitDisc, approx 500 CDs avail beginning w/10/90-4/96, Country, Rock, EX, Urban, TM Century red & blue hit disc series, sold as lot, \$500. S Horner, 805-469-3096.

WE 12-A pwr unit, steel cabinet only, housing for pwr supply guts for WE 25-B console, BO. S Horner, 805-469-3096.

WANT TO BUY

Schematics for CCA compressor CGA-1, also CBS Audimax I. R Robinson, 203-949-0871.

Jazz record collections, 10" LP/12" LP be-bop, swing, dixie, highest prices paid. B Rose, Program Recdgs, 228 East 10th, Nyny 10003. 212-674-3060.

MONITORS

WANT TO SELL

Belar FMM-1 & FMS-1 baseband & stereo monitors, work OK, w/manuals, \$400/both. H Landsberg, 626-355-3656.

Belar AM RF amp; McMartin 3 piece stereo FM mon package. J Phillips, 419-782-8591.

Altec 15" Valencias (voice of theater) \$600, Yamaha NS10Ms \$295, RSL 12" 3 says (same as JBL 4310) \$250. W Gunn, 760-320-0728.

Used Mod Monitors, McMartin & Belar. Many to choose from, tuned & calibrated on your frequency, full guaranteed. Goodrich Ent. 402-493-1886.

WANT TO BUY

TFT or similar FM monitor w/5 station preselector, operational, or non-functional but complete units, considered. B DeFlice, 203-929-0730.

RECEIVERS & TRANSCEIVERS

DISTRIBUTOR(S) WANTED: New line of FM/SCA receivers from Apexcom, audio and data. Tel (613) 838-4054 Fax (613) 838-4357, e-mail: djlee@on.aibn.com.

WANT TO SELL

**RECEIVERS - ALL TYPES
WE BUILD RECEIVERS**
**FM, FM/SCA, WEATHER, RDS, PUBLIC SERVICE,
MONITORS, FM/SCA Ethnic, SPECIAL, CUSTOM**
WWW.DAYTONINDUSTRIAL.COM
Dayton Industrial Corp
2237 Industrial Blvd, Sarasota, FL 34234
TEL: 941-351-4454 FAX: 351-6081

800 MHz 50 dB gain 12' tall base ant, \$50/BO, will trade to single bay CP any freq on low end FM band. R Chrysafis, 304-235-2292.

Cobra PF-1 VHF mon rcvr; IC solid state dual band 30-50 MHz & 152-174 MHz, BO. G Swayne, 814-742-8002.

Regency 25 W VHF FM 10 ch self prog 2-way w/program instructions RH256b, \$200/BO; 21' UHF 440-470 MHz 10 dB gain base ant made by Antenna Specialists, \$500/BO, will consider trade to Belar mod mon for FM stereo. R Chrysafis, 304-235-2292.

Wegener DR 185, nearly new, in use now, \$950; Zephyrus (3) std analog, 322 whisperer, used 4 yrs, in use, \$250 ea. G Huff, 606-877-1326.

WANT TO BUY

STL for small community FM, prefer stereo, Alaskan exceptions for RPU's, microwave. Lewis, 907-783-2256.

RECORDERS

WANT TO SELL

Ampex AG-440C, excel cond, \$2000/BO; Sony 3 head TC-355, solid state works, table-top, \$75. C Marker, 906-249-1423.

**STUDER REVOX
PARTS/SERVICE**
Cassette-CD-Open reel
Capstan resurfacing, ALL BRANDS.
JM TECHNICAL ARTS
1515 Elm Hill Pike #203
Nashville, TN 37210 (615) 365-9030

Sharp stereo cassette deck, hi-bias, metal counter, works gd, \$35. W Dougherty Jr, 573-998-2681.

DAT Machine Service
Digital Audio Tape
Fast, expert repairs on all DAT recorder brands & models including ADAT and DA-88
Warranty Service on Most Brands
Over 3000 Machines Serviced!
New/Refurbished DATs Available
Compare Our Rates!
Pro Digital Inc.
DAT Recorder Service Specialists
(610) 353-2400

Tepecasters X700 RP & P, vgc, \$395/RP, \$195/P. A Ishkanian, 804-752-6942.

Akai X-360 cross-field head design bdct quality r-r P/R, \$600/BO or trade to dbx or Behringer stereo comp/limit/exp/gate rack mountable. R Chrysafis, 304-235-2292.

ITC record machine, BO. N Hopper, 770-387-0917.

MagnaCord 1022, fair cond, BO. D Lurtey, 864-370-1800.

CONSULTANTS

EVANS ASSOCIATES Consulting Communications Engineers
FCC Applications, Design, Field Engineering & Tower Detuning
Video/Data/Voice • Statewide Networks • Wide-Area Networks
EXPERTS IN:
TV • AM • FM • ITFS • MICROWAVE • PCS • FIBER
210 S. Main St., Thiensville, WI 53092 (414) 242-6000 FAX (414) 242-6045
Internet: <http://www.evansassoc.com> Member AFCCE

**Consulting Communications Engineers
EMC Test Lab**
• FCC Applications and Field Engineering
• Frequency Searches and Coordination
• AM-FM-CATV-ITFS-LPTV
• EMC Test Lab-FCC and European (IEC)
OWL ENGINEERING, INC.
E-mail: info@owleng.com 1-800-797-1338 Fax (612) 785-4631
8899 Hastings St NE, Minneapolis, MN 55449 (612)785-4115 *Member AFCCE*

T. Z. Sawyer Technical Consultants
AM-FM-TV-LPTV
• FCC Applications & Exhibits • Frequency Studies
• Experimental Authorizations • Class Upgrades
• AM Directional Antennas • STL Applications
• High Power Antenna Arrays • Station Inspections
1-301-913-9287
FAX: (301) 913-5799 • 5272 River Rd, #460 • Bethesda, MD 20816

PC - SOFTWARE
AM FM TV Search Programs
Signal Mapping—STL Paths
RFHAZ—US Census PopCount
FAA Tower—Draw Tower
Doug Vernier
Engineering Consultant
1600 Picturesque Drive
Cedar Falls IA 50613
800-743-DOUG

System One Communications
Broadcast Constructors & Consultants
Houston, Texas
888-625-5649
Complete Turnkey Construction
Antenna Line Testing
AM Directional Field Work
AM and FM Applications
Tower Services
Studio Designs
Custom Studio Furniture

**E. HAROLD MUNN, JR.
& ASSOCIATES, INC.**
Broadcast Engineering Consultants
AM - FM - TV
THE BROADCAST ENGINEERING CONSULTANTS
Box 220, 100 Airport Rd.
Coldwater, MI 49036
517-278-7339

GRAHAM BROCK, INC.
BROADCAST TECHNICAL CONSULTANTS
Full Service From Allocation to Operation AM FM/TV/ATIS Services:
Field Work; Antenna and Facilities Design
Over 35 years engineering and consulting experience
912-638-8028
202-393-5133
www.grahambrock.com

MULLANEY ENGINEERING, INC.
Consulting Engineers
• Design & Optimization of AM Directional Arrays
• Analysis for New Allocation, Site Relocation, and Upgrades
• AM-FM TV LPTV
• Wireless Cable (MDS/MMDS/ITFS/OFS)
• Environmental Radiation Analysis
• Field Work
• Expert Testimony
9049 Shady Grove Court
Gaithersburg, MD 20877
Phone: (301) 921-0115
Fax: (301) 590-9757
email: mullengr@aol.com

DON'T GAMBLE WITH YOUR ADVERTISING DOLLARS!

Advertise in Radio World and reach 18,000+ broadcast professionals.
Call Simone TODAY!
703-998-7600

dataworld
Market Analysis
Engineering Software
Ethnic/Demographic Data
Custom Full-color Mapping
Sales Marketing Packages
www.dataworld.com 800-368-5754
info@dataworld.com fax: 301-656-5341

EME COMMUNICATIONS
CONSULTING ENGINEER
AM-FM-TV-LPTV
912-890-2506
912-985-0864 FAX
MOULTRIE, GA.
www.emecom.com

RECORDERS (WTS) cont...

Otari MTR-12 (2) 1/2" 4 trk console type r-r recorder system w/electr overbridge, 1987 mdl; Otari MTR-10 (2) 1/4" 2 trk console type r-r recorder system w/electr overbridge, 1987 mdl. S Brown, 920-831-5659.

Otari MX5050BII (3), excel cond, \$1245. J Sanders, 714-738-1501.

Revox A-77, fair-gd cond, BO. D Lurtey, 864-370-1800.

Revox PR-99 r-r play only w/manuals, \$250. 707-829-5999.

Sony TCD-D7 Walkman DAT, \$475, Brand New MCI 110C-2s \$1600, MCI 24 trk \$7000, MCI, Scully 8 trks \$1500-2500, New short MRL test tapes, \$229 for 2" \$79 for 1/4" all formats avail, Otari MX5050 Mk III-8 \$3k, Otari CB110 remote, \$300, CB116 locator, \$550 (all for \$3.5k), Tascam 85-16 w/locator, remote, dbx, \$1800, MCI JH110B-8 trk w/locator \$2900, Akai Adam new, digital 12-trk \$3500 (was \$20k). W Gunn, 760-320-0728.

WANT TO BUY

Ampex ATR100 taperecorders for parts. Circuit cards, heads, motors, machine parts, or electronic parts. Call 818-907-5161.

Ampex MM1200-16 and 1200-8, Tascam DA38, Ampex ATR100s, Ampex tube recorders & electronics. W Gunn, 760-320-0728.

REMOTE & MICROWAVE

WANT TO SELL

Bogen Friday, 8 mailbox ans machine, 2 lines remote notify, all digital, \$200. M Larsen, 510-465-6035.

Marti R-10, STL 10, gd cond, \$1600; Gentner VRC-200 command relay & remote, \$900; Marti AR-10, RPT-15 remote transceiver & rcvr, chnl 161.640 & 161.670, \$1800. J Smith, 336-751-0758.

WE RENT FOR LESS

Hotlines	FM Exciters
Zephyrs	STL's
News	FM Pwr Amps
Audio	Test Equipment

If we don't have it, we will get it!
SCMS, INC. (800) 438-6040
"You Know We Know Radio!"

Telos Zephyr 9200, new w/20 bit codec & built-in terminal adapter, \$3995. P Christianson, 904-571-0364.

RENTAL EQUIPMENT

COMREX Vector, Hotline, ISDN codecs
TELOS Zephyr, Zephyr Express, digital hybrids
MUSICAM Prima 120 and 230

Silver Lake Audio
516 763-1776
fax 516 763-1750
internet: silverlakeaudio.com

Remote Audio Packages
Mixers
Microphones

Gentner EFT-3000, 3-line freq extender for 7.5 kHz on 3 POTS lines. J Sanders, 714-738-1501.

WE RENT

TELOS ZEPHYR
CCS "Prima" Codecs
COMREX
3-line extender
610-642-0978

Frank Grundstein
Audio/Video
Consultants

Marti STL 10, 2 rcvrs & 2 xmtrs for stereo xmission, in use now, \$3400/all. G Huff, 606-877-1326.

WANT TO BUY

Gentner Teleswitch line switcher for hybrid unit. M Shane, 402-422-1600.

Gentner VRC-2000. V Zandt, 217-487-7711.

SERVICES

SIMPLE CONNECTION

Prewired Racks & Console Harnesses

Connect to the Turnkey Distributor...

BROADCAST RICHMOND

E-mail broadcast@infocom.com
Tel 765-966-6468 Fax 765-966-5505
www.broadcast-richmond.com

2 Non-commercial FM's. Top 100 Market 68.n.e. WI. 100,000 watt, \$10.6 million, 50,000 watt, \$2.25 million. Details: 1-920-743-7443, ask for Mark.

WANT TO BUY

Network looking for stations! dark, brokered, AM & FM, fax details to programming: 954-735-0370.

TAPES/CARTS/ REELS/CD'S

WANT TO SELL

Scotchcart II, 300 3.5 min, new cond, \$.85 ea +shpg. B Lord, 206-932-4839.

TELEPHONE EQUIPMENT

WE BUY AND SELL BUSINESS TELEPHONE EQUIPMENT. DOMINION TELECOM. 800-998-3281.

TEST EQUIPMENT

WANT TO SELL

Portable Audio Generator

The RX-11 ToneJack is a battery operated, hand-held portable audio generator.

- FEATURES include:
- 1 Hz - 29,999 Hz (1 Hz steps)
 - Sine and Square wave outputs
 - RS-232 controllable
 - Store and recall 10 user frequencies
 - Log sweep from 50 Hz to 20 kHz
 - Tone burst (1 mS to 29.999 seconds)

SLP \$229.00

FOR MORE INFORMATION
800-645-1061

CONEX ELECTRO SYSTEMS
1102 Carolina Street, Birmingham, WA 98226
(206) 734-4923 FAX (206) 870-4872

www.conex-electro.com

TUBES

WANT TO SELL

RCA 4-400A; Sylvania 866A; Westinghouse 822A; Amperex 807; JAN CRC 814 (VT154); RCA 814 (2), BO. G Swayne, 814-742-8002.

WANTED FOR LEASE

FM frequency air time anywhere in the USA to run ethnic programming for the South Asian community. Individuals/Corporations may contact

JASPAL SURI
PRESIDENT
EASTERN BROADCASTING CORPORATION
456 MIDDLESEX AVENUE
METUCHEN, NJ 08840
PH: 732-452-9533
FAX: 732-452-9537
EMAIL: indiardi@aol.com



ISO 9001 Certified

The Reliable Manufacturer for

NEW POWER TUBES

- Triodes
- Tetrodes
- Pentodes

NEW SOCKETS & REPLACEMENT PARTS TUBE REBUILDING

Worldwide Availability
Made in U.S.A.

CALL 800-414-8823
Int'l (415) 592-1221
Fax (415) 592-9988

Visit our Web Site at
http://www.eimac.com



Circle (196) On Reader Service Card

AMPEREX, EIMAC, RCA, SVETLANA 3CX400A7/8877, 3CX3000A7, 3-500ZG, 4CX250B, 4-400, 4CX400A, 807, 833C, ETC. Westgate 800-213-4563.

FOR THE BEST PRICE
& 24 Hr service on transmitting tubes & sockets/parts, new & rebuilt call Goodrich Ent. at 402-493-1886 day or night, FAX 402-493-6821.

ECONCO

Quality Rebuilt Tubes
Approximately 1/2 the Cost of New

Call for Our Price List

800-532-6626

530-662-7553

FAX 530-666-7760

Circle (206) On Reader Service Card

TURNTABLES

WANT TO SELL

Technics 1200MK2. D Lurtey, 864-370-1800.

WANT TO BUY

TURNTABLES, LIMITERS, RECORD CUTTING MACHINES. 612-869-4963.

Radio World

5827 Columbia Pike
3rd Floor
Falls Church, VA 22041
PHONE: 703-998-7600
FAX: 703-998-2966

Call Simone Mullins,
Classified Ad Manager,
to reserve space in the
next issue.

Use your credit card to
pay, we now accept
VISA and
MASTERCARD.

Select from these
categories for best
ad positioning:

- Acoustics
- Amplifiers
- Antennas & Towers & Cables
- Audio Production (Other)
- Brokers
- Business Opportunities
- Cart Machines
- CD Players
- Computers
- Consoles
- Disco-Pro Sound Equip.
- Financial Services
- Leasing
- Limiters
- Microphones
- Miscellaneous
- Monitors
- Receivers & Transceivers
- Recorders
- Remote & Microwave Equip.
- Repair Services
- Satellite Equipment
- Software
- Stations
- Stereo Generators
- Tapes, Carts & Reels
- Tax Deductable Equipment
- Test Equipment
- Transmitter/Exciters
- Training Services
- Tubes
- Turntables
- Positions Wanted
- Help Wanted

DISTRIBUTOR DIRECTORY

The following distributors serving the broadcast industry would be glad to help you with any of your requirements.

CORNELL-DUBILIER MICA CAPACITORS

FROM STOCK

JENNINGS VACUUM CAPACITORS

FROM STOCK

JENNINGS VACUUM RELAYS

SURCOM ASSOCIATES

2215 Faraday Ave., Suite A
Carlsbad, California 92008
(760) 438-4420 Fax: (760) 438-4759
e-mail: link@surcom.com web: www.surcom.com

...country, top 40, news, urban, talk, jazz, the classics, mixed bag...

RADIO! The beat goes on!

CROUSE-KIMZEY OF ANNAPOLIS

tops in broadcast equipment
1-800-955-6800
ask for Kathleen
kkannapolis@worldnet.att.net

TUBES cont....

TUBES

WANT TO SELL

Manufacturing
The Best For
Amateur Radio
and Broadcast
Applications

QUALITY • RELIABILITY • SERVICE

POWER TUBES
www.svetlana.com

Svetlana
ELECTRON DEVICES

HQ: 8200 S. Memorial Parkway Huntsville, AL 35801 Phone: 256-882-1344 Fax: 256-880-8077
Mktg & Eng.: 3000 Alpine Road Portola Valley, CA 94028 Phone: 650-233-0429 Fax: 650-233-0439

Circle (216) On Reader Service Card

TRANSMITTERS

WANT TO SELL

Energy-Onix Legend 1000FM, 1 kW, excel cond w/freq adjustable 30 W Energy-Onix exciter, \$3900. A Statmat, 732-845-9362.

**OFF THE AIR?
EMERGENCY BACK-UP RENTALS**
FM Exciters - STLs -
FM Pwr Amps - Antennas -
Studio & Test Equipment
SCMS Inc (800) 438-6040
"YOU KNOW WE KNOW RADIO"

Gates 10kW AM BC10P, 1010 kHz, on-air standby, mint cond, 8302 hrs, avail in 2 mos, BO; RCA Ampliphase AM BTA50G, 1010 kHz, on-air, excel cond, avail in 2 mos, BO. Mr Kaufman, 618-797-2299.

Harris 1 kW 1996 Quest FM xmtr, solid state, excel cond, avail 5/15/99, \$8500; Harris 1 kW Quest 1996 FM xmtr, new cond, used only 2 yrs, avail now, \$8500. M Rogers, 831-373-2250.

USED: FM/AM Transmitters, RPU's, STL's, FM Antennas, Consoles, Processing, etc.
CONTINENTAL COMMUNICATIONS
3300 Chippewa,
St. Louis MO 63118
1-800-664-4497
FAX 1-800-700-9427
contcomm@fiastl.net

Harris MS-15 FM exciter, freq agile, w/composite input module, 15 W output, excel cond, w/manual, \$1500/BO. H Landsberg, 626-355-3656.

Tepco J-340 5-40 W (3), 2-4 yrs old, excel cond, \$2000 ea. C Marker, 906-249-1423.

1994 CCA 4000G w/FM 60G exciter. N Hopper, 770-387-0917.

Cadco 36 ch stereo TV xmtr rack mountable, \$700/BO or trade to freq agile FM stereo xmtr for 88-109 MHz that is rack mountable, adj pwr level 0-10 W preferred. R Chrysafis, 304-235-2292.

CSI T-02-A 20 W AM, BO. D Lurtey, 864-370-1800.

Delta TCA-20EX ammeter system, 0-20 A RF, like new, factory cal cert, \$490. D Kiker, 850-477-8500.

Radio World

Broadcast Equipment Exchange

Sell Your Used Equipment Here.
Call or FAX Simone Mullins
for Information on
Affordable Advertising Rates.

PHONE
703-998-7600 Ext. 154
FAX
703-998-2966

Harris BC10-H 10 kW AM, 1090 kHz, gd cond, \$9000; RCA BTA-50 5 kW AM, 810 kHz, excel cond, \$4000; Continental 831D-2, 2.5 kW FM, gd cond, \$6000. T Toenjes, 785-437-6549.

Harris HT10, 4 yrs old, \$24,500. G Huff, 606-877-1326.

REBUILT TRANSMITTERS
Call **ARMSTRONG TRANSMITTERS**
Ph: 312-673-1269
Fax: 312-673-9972

Henry 250 W FM pwr amp; Henry 100 W pwr amp. J Phillips, 419-782-8591.

Radio Systems Phase II carrier current coupler, BO. D Lurtey, 864-370-1800.

Tepco J-316 FM translator w/modulator, excel cond w/manual, \$900. P Passink, 804-993-3300.

Harris FM-20K transmitter, very good condition, presently on air. Call Chris, 816-628-5959.

Harris FM-25-K xmtr. Mike, 800-588-7411.

WANT TO BUY

Low pwr AM bdct xmtr or exciter, up to 100 W, in working or non-working cond, for community bdct license, can arrange collection anywhere by FedEx. W.H.Y.? Fax: UK 011-44-1908-365726 or email: BigMobile@g4zow.freereserve.co.uk

McMartin AM/FM xmtr, any model, exciter or stereo modules. Goodrich Ent., 11435 Manderson, Omaha NE 68164. 402-493-1886.

For details on space availability contact Simone at 703-998-7600

ACTION-GRAM

EQUIPMENT LISTINGS

Radio World's Broadcast Equipment Exchange provides a FREE listing service for radio stations and recording studios only. All other end users will be charged. This FREE service does not apply to Employment Help Wanted ads or Stations For Sale ads. These are published on a paid basis only. Send your listings to us by filling out the form below. Please be aware that it takes one month for listings to appear. The listings run for two consecutive issues and must be resubmitted in order to run again. Thank you.

Please print and include all information:

Contact Name _____
Title _____
Company/Station _____
Address _____
City/State _____
Zip Code _____
Telephone _____

Are you currently a subscriber to Radio World?
 Yes No

Signature _____ Date _____
Please check only one entry for each category:

- I. Type of Firm**
- D. Combination AM/FM station
 - A. Commercial AM station
 - B. Commercial FM station
 - C. Educational FM station
 - E. Network/group owner
 - L. Consultant
 - N. Delivery Service (Internet/Cable/Satellite)
 - F. Recording Studio
 - K. Syndicators/Station
 - M. Ind. Engineer
 - G. Audio for Video/TV Station
 - H. Consultant/ind engineer
 - I. Mfg. distributor or dealer
 - J. Other

Brokers, dealers, manufacturers and other organizations who are not legitimate end users can participate in the Broadcast Equipment Exchange on a paid basis. Line ad listings & display advertising are available on a per word or per inch basis.

- II. Job Function**
- A. Ownership
 - B. General management
 - C. Engineering
 - J. Promotion
 - H. Programming/production
 - G. Sales
 - E. News operations
 - F. Other (specify)
 - K. Production Mgt or Staff

WTS WTB Category: _____
Make: _____ Model: _____
Brief Description: _____
Price: _____

WTS WTB Category: _____
Make: _____ Model: _____
Brief Description: _____
Price: _____

WTS WTB Category: _____
Make: _____ Model: _____
Brief Description: _____
Price: _____

WTS WTB Category: _____
Make: _____ Model: _____
Brief Description: _____
Price: _____

*Closing for listings is every other Friday for the next month's issue. All listings are run for 2 issues unless pressed for space or otherwise notified by listee.
Broadcast Equipment Exchange
PO BOX 1214, Falls Church, VA 22041 • Tel: 800-336-3045 • Fax: 703-998-2966

TRANSCOM CORP.

Serving the Broadcast Industry Since 1978

FOR INFORMATION & THE LATEST PRICES, VISIT OUT WEBSITE - www.trcorp.com
SEND YOUR E-MAIL REQUESTS TO: transcom@trcorp.com

Fine used AM & FM Transmitters & New Equipment. The best deals on Celwave products, Andrew cable and Shively antennas.

- 100 W FM 1985 Harris FM100K
- 2.0 KW FM 1996 BE FM 2C Solid State
- 2.5 KW FM 1974 Harris FM 2.5H3
- 2.5 KW FM 1984 Continental 814R1
- 2.5 KW FM 1976 Collins 831D
- 3 KW FM 1975 CSI FM3000E
- 3.5 KW FM 1986 Harris 3.5K
- 5 KW FM 1988 Harris FM 5K1
- 5 KW FM 1989 BE FM 5B, Single Tube
- 5 KW FM 1967 Collins 830E
- 10 KW FM 1967 Collins 830F1
- 10 KW FM 1962 RCA BTF 10D
- 25 KW FM 1981 Harris FM 25K

- 1 KW AM 1979 Harris MW1A
- 1 KW AM 1965 Collins 20 V3

- 5 KW AM 1980 CSI T-5-A
- 5 KW AM 1982 Harris MW5A
- 10 KW AM 1982 Harris MW10A

- 50 KW AM 1978 Continental 317C-1
- 50 KW AM 1982 Harris MW-50B

P.O. Bo 26744, Elkins Park, PA 19027
800-441-8454 • 215-938-7304 • FAX No. 215-938-7361

Circle (226) On Reader Service Card

EMPLOYMENT

HELP WANTED

Prophet Systems Innovations Tech Support opportunities

A position with PSI offers growth potential that is limited only by your drive to succeed. A degree is not required for this position as we value a good work ethic, the desire to do the job right and previous experience as being more important to success. Knowledge of DOS, Win3.1 and Windows95/98 a must, Novell Networking, LAN/WAN Experience a Plus. Computer Hardware Knowledge - Chassis to full running computer beneficial. Advancement, personal development, and knowledge enhancement opportunities available.

Prophet Systems, a division of Capstar Broadcasting Partners, is the worldwide leader in broadcast digital automation and audio playback systems. We are currently upgrading our Audio Wizard for Windows software and branching out into delivery of audio and programming via the Internet and Satellite. We are also expanding into audio delivery and playback for the restaurant and entertainment industries.

If you desire an exceptional working environment - where your ideas are taken seriously - and want to live in a small Midwest town that offers a low cost of living, good schools, little crime, and excellent outdoor recreational opportunities then we have the position for you.

Please fax, mail or email your resume and salary requirements to:

Prophet Systems Innovations
Attention: Candy Spady, Human Resources
111 West 3rd Street
Ogallala, NE 69153
Email: candys@prophetsys.com
Fax: (308) 284-2382

BROADCAST ENGINEER for expanding N.E. PA radio group. The experienced candidate will repair and maintain all studio and transmitter sites. Experience with automated systems and directional AM's required. Associate degree in broadcast technology or related field required; SBE certification, computer maintenance/repair and networking experience are all pluses. Salary commensurate with demonstrated ability. E.O.E. Send Resume to: Donna Ryan, Human Resource Director, Citadel Communications Corporation, 600 Baltimore Drive, Wilkes-Barre PA 18702.

CHIEF ENGINEER needed for 6 station cluster in Central Pennsylvania. Experience must include RF broadcast engineering, computer software, hardware & network maintenance, digital audio delivery systems, transmitter maintenance & repair & multi-tower directional antenna tuning. Fax resume to:

Chris Tyler
at Dame Media, Inc.
at (717) 901-6729

POSITIONS WANTED

Calif Radio AT - PD/MD exp, drive time wiz, women, phones, ratings! A/C, oldies, country only. Mike 707-252-3370.

Hard working, friendly, outgoing CE seeks employment, FT, PT, contract work, NE, T/FM/AM/ cable licensed, avail immed. M Rakoff, 718-969-5224.

Let me fill your Midday or Nighttime vacancy, 9 yrs on-air exper, ready to relocate! Drew, 330-633-5323.

Listeners want to hear real announcers again instead of today's talents who sound like digitized radio nothings. Call Alex, 513-777-8423.

Interested in Uncapped Income?

If you have incredible sales talent and drive, we have two unique opportunities. As **National Accounts Manager**, you will use radio knowledge, technical ability, and consultative sales approach to market Broadcast Electronics' industry leading products to the top companies in radio. As **Senior Account Manager**, you will use your radio expertise to sell directly to stations in your exclusive territory. You will be a high profile member of our overachieving sales team. Your compensation will be among the best in the industry, and your effort and results will earn you the opportunity to advance as we grow.

Fax Res & cover to VPSM
603-794-8494



Solutions for Tomorrow's Radio

American Broadcasting School grad willing to relocate, extremely imaginative & very dependable, looking for long term employment in radio business. Tony, 405-732-8709.

Emmis Communications has an opening for a staff engineer at WIBC, our 50 Kw DA AM station in Indianapolis. Responsibilities encompass the maintenance and repair of studio and transmitter site equipment, technical support for remote broadcasts and our state radio networks, and project construction.

Candidates will be evaluated with regard to work history in the following areas: ability to perform accurate diagnostic troubleshooting procedures; ability to perform repairs, do wiring and complete projects in a professional and timely manner; experience with directional AM transmitter site maintenance and measurements; experience setting up and running remote broadcasts using ISDN and RPU equipment; experience with state radio network satellite distribution systems.

Knowledge of FCC rules and regulations and FCC General Radiotelephone Operator License and SBE certification are a plus.

Emmis Communications Indianapolis is a smoke-free workplace.

Resume to: Chief Engineer, WIBC Radio, 1 Emmis Plaza, 40 Monument Circle, Suite 400, Indianapolis, IN 46204-2902.

Emmis Communications is an Equal Opportunity Employer

CHANCELLOR MEDIA, WASHINGTON DC, has openings for Chief Engineers in our State of the Art, Market Dominant cluster of stations serving our Nation's Capital. We offer challenging work with a skilled crew, Excellent Pay and Benefits. EOE

Contact:
Tom Shedlick-Market DOE
Chancellor Media
1801 Rockville Pike, 6th floor
Rockville, MD 20852
Fax 301-984-4892

Broadcasting School grad w/exp in live studio seeking position at your station, multi-task oriented, any position sought. Victoria, 405-681-9538.

CE position wanted: exp w/computers, xmtrs, automation, DCS, UDS, digital studios. R King, 541-269-9109.

CE/Computer Tech w/20+ yrs hands on engineering exper seeks CE position in top 100 market, strong audio, computer networking & RF skills. 704-563-8676.

ADVERTISE!
703-998-7600
call now!

Listeners yearn for local talents again, get mature jock, news anchor, prod announcer for salary above poverty level. Alex, 513-777-8423.

Seeking **CE or Asst CE** in Texas, AM, FM or TV, currently doing contract work. J Ragsdale, 409-968-3940.

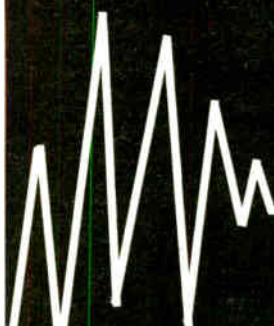
Turbo Air talent, adult, topical, humor, California trained, PD/MD exp, women, phones, ratings. Mike 707-252-3370.

ADVERTISER INDEX

This listing is provided for the convenience of our readers. Radio World assumes no liability for inaccuracy.

Page No.	Advertiser	Reader Service No.	Page No.	Advertiser	Reader Service No.
33	360 Systems	27	51	JK Audio	78
20	Advanced Furniture Systems	90	45	Klotz Digital	35
23	Aphex	19	47	La Palma Broadcasting	-
19	Armstrong Transmitters	16	34	Logitek	28
18	Arrakis	18	46	LPB	107
47	Arrakis	36	29	Lucent Technologies	24
6	ATI	6	31	MARTI/Broadcast Electronics	25
5	Audio Broadcast Group	5	52	Media Store	50
2	Audioarts Engineering	2	55	MediaTouch	43
66	Audisart†	186	63	Modulation Sciences	52
46	Autogram Corporation	86	35	Musicam USA	29
52	Belar	40	11	Netia	11
46	Boston Financial & Equity	96	39	Netia	31
20	Broadcast Devices, Inc.	60	53	Nott Ltd.	66
15	Broadcast Richmond	-	28	Orban	23
56	Broadcast Software Int'l (BSI)	44	38	Orban	!!!!!!
53	Broadcast Tools	108	43	PR&E	33
41	Broadcasters General Store	32	25	Pristine Systems	-
12	BSW	12	27	Pristine Systems	22
4	Burk Technology	4	59	Prophet Systems Innovations	47
57	Cartworks/DBM	45	51	PTEK	109
32	CBSI	26	61	Radio Computing Service (RCS)	49
20	Circuit Werkes	99	53	Radio Design Labs	67
51	Circuit Werkes	58	10	Radio Systems	8
62	Computer Concepts Corp.	51	58	RadioSoft	46
7	Comrex	7	20	RDA Systems	79
1	Continental Electronics	100	8	Register Data Systems	10
20	Cortana	59	3	Satellite Systems	3
67	CPI	196	14	Scott Studios	14
22	Crown Broadcast	15	20	Shively Labs	70
13	Cutting Edge	13	20	Silicon Valley Power	89
17	Dalet	17	54	Sine Systems	41
51	Davicom Technologies	68	49	Sonic Foundry	38
24	Denon America	20	51	Studio Technology	110
53	DJital Solutions	87	68	Svetlana Electron Devices	216
51	Econco	88	44	Syntrillium Software	34
67	Econco	206	9	Telos Systems	9
53	Excalibur Electronics	57	68	Transcom Corp.	226
53	Freeland Products, Inc.	76	20	Videoquip Research	80
36, 37	Fuji Photo Film USA	30	71	Wheatstone	53
50	Furman Sound	39	72	Wheatstone	54
47	Ghostwriters	55			
53	Global Data Inc.	97			
20	Gorman-Redlich Mfg. Co.	69			
65	Hall Electronics	176			
51	Halland Broadcast Services	98			
48	Harris-ENCO	93			
26	Harris-Intraplex	37			
47	IBN Radio	65			
21	Inovonics	21			
60	Inovonics	48			
53	J Squared Technical Service	56			
65	J&I Audio/Video	166			

Without Advertising
a Terrible Thing Happens . . .



. . . NOTHING

◆ READERS FORUM ◆

Swapping stories

Dear RW,

In the May 12 issue, the article "Swap On a Chopper Lift" referred to the helicopter shown as a "Soviet-made Sikorski 'Sky Crane.'" While Igor Sikorski (not Sikorski) was a Russian and the inventor



of the helicopter, he immigrated to the U.S. many years ago and established Sikorski Aircraft in Stratford, Conn.

I was born and raised in Stratford, and both my father and I worked at Sikorski Aircraft, a division of United Technologies Corporation. I believe that helicopter was made here in the U.S. and is a model S-64.

*Bruce W. Clark
Operations Manager, Chief Engineer
WFRS(FM)
Central Islip, N.Y.*

Concert promotions

Dear RW,

I just finished reading Mark Lapidus' article on promoting concerts ("Forge New Relationships With Promoters," RW, April 14) and thought I would give you my two (Canadian) cents on the matter.

We are a small-market AC radio station in Southern Ontario. We are in between two medium markets (London and Windsor) and a major market (Detroit). Because of our geographical location, we don't get the big name groups in Chatham. We have, however, established excellent relations with music and concert reps and most of the time are able to get tickets to any concert in our area. We then sell a promotions sponsorship package to our clients and end up making money on a promotion. It's fantastic for us because we make money. It's fantas-

tic for the clients because they get lots of promotion and it's fantastic for the concert promoter because the concert gets lots of hype in an adjacent market.

*Christa Pare
Morning Show Co-Host/Promotions
Director
CKSY FM95
Chatham, Ontario, Canada*

SESAC attack

Dear RW,

The article "Radio Music License Agreements Update" (RW, May 26), quotes RMLC attorney Jonathan Weiss as saying "although the committee does not endorse the SESAC rate structure, it does advocate negotiating with the organization to obtain an equitable deal." The problem is, SESAC refuses to negotiate. They have taken the position that stations must pay the rate structure they have decided to impose, and there will be no negotiating.

I've challenged them to provide me with a list of SESAC-licensed music played on my stations, but all they did was send me some slick brochures. I've checked my playlists for the last several weeks, and can find no SESAC-licensed music. I'm canceling the SESAC contracts on all my stations and have instructed my staff that no SESAC-licensed music is to be played after the expiration of the contracts.

*Larry Fuss
President, General Manager
Delta Radio Inc.
Cleveland, Miss.*

New technology?

Dear RW,

I was very surprised at your article on the "new" idea of inserting text and number data in WAV files as proposed by Orban. ("'Cart Chunk' May Enhance Broadcast WAVE," RW, May 12.)

There really isn't anything new or surprising about it. Anyone with a little Microsoft Windows programming knowledge can already write "chunk" data of any type to WAV files. It's just part of the WAV specification originally published by Microsoft in their Multimedia Programmers Workbook (1991).

Using the spec for labeling isn't new. The music industry has a set of digital labels based on the spec they've used for years. Anyone can set up their own labeling. Just send your proposed field names to Microsoft and they'll register them.

For more than four years, Broadcast

Service to America

Broadcasters do best when they do well by their communities. The National Association of Broadcasters Education Foundation recognized this with its first Service to America Summit.

The foundation established the event to recognize and encourage outstanding community service, not only by radio and television stations, but also their community partners.

At a day-long event in Washington, former Joint Chiefs of Staff Chairman Colin Powell delivered opening remarks. Former First Lady Nancy Reagan and radio legend Don Imus were honored for life-long efforts to improve the lives of Americans.

Reagan was saluted for her work with the Alzheimer's Association and several other causes; Imus for his fundraising work to benefit the CJ Foundation for AIDS, Tomorrow's Children's Fund, and the Imus Ranch for children with cancer and families victimized by AIDS.

Appropriately, Imus is the first recipient of the new Samaritan Award, paying tribute to a person or organization in broadcasting that exemplifies the industry's commitment to use the airwaves to promote public good.

The NABEF honored stations for community work. Among them: Four Omni Broadcasting radio stations joined with CellularOne of Central Minnesota to raise money against child abuse. WZZK-FM in Birmingham, Ala., conducted a donation drive to collect money, clothes, water and food in the wake of a tornado, and worked with Habitat for Humanity to help build two homes. Several television stations were also honored.

The associated symposium explored how broadcasters can be more effective in the community, how non-profits can benefit by working closely with stations, and how broadcasters can keep the electorate informed. The NAB and Bonneville International Corp. funded the event. Proceeds were donated to the National Women's Cancer Research Alliance.

Broadcasters perform outstanding public service every day. In this space, we have urged stations to do a better job of explaining the important community work they do. That effort must take place at the national level as well as the local.

We commend the organizers of this event for helping to move broadcaster service to a higher profile.

— RW

Software International (BSI) has implemented the Microsoft WAV specification for digital labeling of audio files in our various products for the radio industry. More than 4,000 users of our software worldwide are labeling files with it every day. Many of them were surprised to find out what they've been taking for granted for years is really "new technology." It was also surprising that RW thought the procedure was "new" because you reviewed our labeling as part of your BSI WaveStation Automation article in December 1997.

Take a look at the specification and you can see that Orban's plan to create a new chunk structure is unnecessary. The WAV format isn't "brain dead" as quoted in your article. Although Orban apparently doesn't have enough brain power to see that our industry needs a new data structure like we need another audio format. All we really need is to agree on a standard set of label fields or "tags" to go into the already existing, and well-used, Microsoft WAV specification.

One very nice thing about using the Microsoft WAV spec properly, as compared to the Orban version, is that you can use variable-length data at the end of the audio file. This means that you can change the data at will, without having to rewrite

the audio data. The Orban proposal would force the audio data to be rewritten (a lengthy process) any time the file changed.

If you would like to take advantage of the BSI labeling, we offer a free utility called "Event Builder Express" on our Web site. With the EBE, you can easily label and index all the audio files on your hard drive. Just go to www.bsiusa.com and select the downloads section.

I would be very willing to enter into a dialog with representatives of other automation and digital audio manufacturers to decide on a common set of label fields. It could be done in about a week and wouldn't take any "new" technology.

*Ron Burley
President
Broadcast Software International
Eugene, Ore.*

Write to Us

RADIO WORLD
READERS FORUM

P.O. Box 1214
Falls Church, VA 22041
radioworld@imaspub.com

—EDITORIAL STAFF—

Paul J. McLane	ext. 117	Editor
Sharon Rae	ext. 126	Managing Editor
Leslie Stimson	ext. 129	News Editor/Wash. Bureau Chief
Laurie Ann Cebula	ext. 198	Business/GM Journal Editor
Brian Galante	ext. 146	Associate Editor
Bernie Cox	ext. 183	Buyers Guide Editor
Thomas R. McGinley	—	Technical Adviser
Alan Peterson	—	Technical Adviser
Marlene Lane	ext. 128	Editorial Director/Assistant COO
T. Carter Ross	ext. 120	Editor-In-Chief (International)
Marguerite Clark	—	Editor (International), Milan
Christine Joaquim	ext. 138	Managing Editor (International)
Marcelo Morichi	ext. 171	Latin America Managing Editor
Karina Gerardi	ext. 137	Latin America Assistant Editor
Renata Beck	ext. 196	Latin America Assistant Editor
Peter Finch	—	Editorial Assistant, Milan

—EDITORIAL CONTRIBUTORS—

W.C. Alexander, James Careless, Harry Cole, Troy Conner, Ty Ford, Harold Hallikainen, Mario Hieb, Paul Kaminski, Peter King, Mel Lambert, Mark Lapidus, Carl Lindemann, Dee McVicker, Lynn Meadows, John Montone, Rich Rarey, Bob Rusk, Randy Stine, Tom Vernon.

Radio World

Vol. 23, No. 14

July 7, 1999

Telephone: (703) 998-7600 • Business Fax: (703) 998-2966 • Editorial Fax: (703) 820-3245
E-mail: radioworld@imaspub.com • Web site: www.rwonline.com

—ADVERTISING SALES REPRESENTATIVES—

Sales Mgr., US Southeast & Mid-Atlantic: John Casey	330-342-8361	Fax: 330-342-8362	email: jdcasey@compuserve.com
US Northeast & Central: Sandra Harvey	765-966-0669	Fax: 765-966-3289	email: adsales@aol.com
US West: Dale Tucker	916-721-3410	Fax: 916-729-0810	email: dtucker@ns.net
Classified Ads: Simone Mullins	703-998-7600 x154	Fax: 703-671-7409	email: smullins@imaspub.com
Germany, Austria: Dagmar Hänle	+39-02-7030-0310	Fax: +39-02-7030-0211	email: 102521.2001@compuserve.com
France: Silvia Di Stefano	+33-1-45-48-42-17	Fax: +33-1-45-48-42-19	email: sdsimas@aol.com
European Sales Mgr., Africa, Middle East: Raffaella Calabrese	+39-02-7030-0310	Fax: +39-02-7030-0211	email: 102521.2001@compuserve.com
Japan: Eiji Yoshikawa	+81-3-3327-2688	Fax: +81-3-3327-3010	email: callems@msn.com
Asia/Pacific: Wengong Wang	+852-2787-4727	Fax: +852-2787-4041	email: imashk@compuserve.com
Latin America: J.O. Lima e Castro	+55-11-3641-4511	Fax: +55-11-3641-4511	email: limcas@uol.com.br

NEXT ISSUE OF RADIO WORLD JULY 21, 1999

For address changes, send current and new address to RW a month in advance at P.O. Box 1214, Falls Church, VA 22041. Unsolicited manuscripts are welcomed for review: send to the attention of the appropriate editor.

—ADMINISTRATION & PRODUCTION—

Stevan B. Dana	.....	President/CEO
Carmel King	.....	VPI Group Publisher
Chuck Inderrieden	.....	CFO
Eric Trabb	.....	Sales & Marketing Director
Lisa McIntosh	.....	Production Director
Jeff Fisher	.....	Production Manager
Kathy Jackson	.....	Ad Traffic Manager
Christopher Duerk	.....	Senior Graphic Designer
Alex Frosini	.....	Graphic Artist
Heather Harris	.....	Marketing Manager
Sheryl Unangst	.....	Circulation Director
Robert Green	.....	Circulation Manager
Steve Berto	.....	Accounts Receivable

Radio World (ISSN: 0274-8541) is published bi-weekly by IMAS Publishing (USA), Inc., P.O. Box 1214, Falls Church, VA 22041. Phone: (703) 998-7600, Fax: (703) 998-2966. Periodicals postage rates are paid at Falls Church VA 22046 and additional mailing offices. POSTMASTER: Send address changes to Radio World, P.O. Box 1214, Falls Church VA 22041. REPRINTS: Reprints of all articles in this issue are available. Call or write Michael Crossett, P.O. Box 1214, Falls Church, VA 22041, (703) 998-7600, Fax: (703) 998-2966. Copyright 1999 by IMAS Publishing (USA), Inc. All rights reserved.

—Printed in the USA—

Everyone Wants to Own a Convertible!

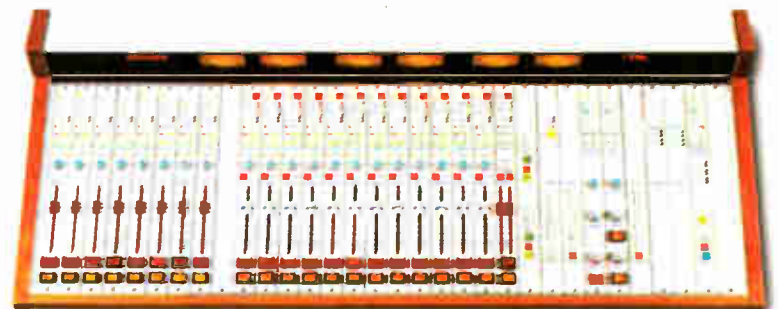


It doesn't matter what's under the hood...

So...How About a Convertible Radio Console?

Our New WHEATSTONE A-5000 gives you the **best** of both worlds. Order it from the factory now as a topnotch ANALOG on-air console. Then later, when you're ready, switch it out to DIGITAL! That's right, this new design accepts modules from our top-of-the-line D-500 and D-600 consoles, allowing it to be converted from analog to digital in the field!

Think of it: no new studio furniture, *no rewiring*—all your existing studio connections simply replug. And while we're at it, no re-training your staff either. A painless switchover on your own timetable, right in your own facility! If you need a new radio console *now* but aren't quite ready for the Big Switch, then check out our new A-5000—you'll like what's under the hood!



 Wheatstone Corporation

600 Industrial Drive, New Bern, North Carolina 28562 (tel 252-638-7000/fax 252-637-1285/email: sales@wheatstone.com)

Circle 53 On Reader Service Card



DIGITAL INTEGRATOR

DON'T LET THE TRADITIONAL LOOK FOOL YOU!

This new audio console from Wheatstone has the most advanced DIGITAL FEATURES available on the market today! How about **serial control** of all switch, fader and eight-character source display settings—for **TRUE INTEGRATION** with routers and automation systems? Four stereo mix busses with simultaneous digital and analog outputs? Multiple mainframe sizes? Dedicated phone modules with DSP generated mix-minus for easy control of two to four callers?

BUT DON'T STOP HERE: optional DSP equipped modules allow programmable ducking with gain reduction and master/slave selection, digital input attenuation, pan/balance, 4-band sweep EQ (plus sweep high pass), and compressor/limiter with threshold, ratio, attack, release and makeup gain—all on *each* input!

A meterbridge **router controller panel** can run our new Wheatstone rackmount switcher for hundreds of additional inputs. The totally modular hot-swap design accepts both analog *and* digital inputs. Dual metering is simultaneous VU and full scale digital peak. Add a PC based **setup program** for quick configuration of all displays, mutes, tallies, machine starts and mix-minus assigns (once set the PC is removed for console stand-alone operation) and you begin to see the *power* that lies behind this intuitively simple control surface.

SOUND LIKE SOMETHING YOU'RE LOOKING FOR? Give us a call here at **Wheatstone** and ask about the brand new **D-600 DIGITAL AUDIO CONSOLE**—our sales engineers would love to tell you more!



 *Wheatstone Corporation*

600 Industrial Drive, New Bern, North Carolina 28562 (tel 252-638-7000/fax 252-637-1285/email: sales@wheatstone.com)