Radio World®

EAS takes center stage. See Buyers Guide, page 51.

Vol 20, No 21 | Radio's Best Read Newspaper | October 16, 1996

AT&T Pulls IBOC from DAB Tests

by Lynn Meadows

SAN FRANCISCO AT&T/Lucent Technologies and Amati Communications withdrew their in-band, on-channel (IBOC) system from the digital audio broadcasting (DAB) field tests last month.

In doing so, they join USA Digital Radio, which withdrew its three IBOC systems (two FM and one AM IBOC) from the field tests in the spring citing irreconcilable differences with the testing and reporting procedures.

The only systems that remain to be tested in the field are Eureka-147 on the L-band, an S-Band system from VOA/JPL and the in-band, adjacent channel (IBAC) system from AT&T/Lucent Technologies and Amati Communications.

After the AT&T announcement, the National Association of Broadcasters (NAB) offered its services "to facilitate a fair and impartial IBOC testing program for all proponents as soon as the technology is appropriately developed."

In letters to USA Digital Radio Partners and AT&T/Lucent Technologies, NAB President and CEO Eddie Fritts wrote that the NAB is a strong supporter of IBOC DAB over competing technologies.

"This is because IBOC, operating within existing allocated radio broadcast spectrum, has the greatest potential to preserve the infrastructure and viability of the United States radio industry while providing broadcasters and listeners with enhanced digital quality and ancillary data services," Fritts wrote.

The IBOC systems originally submitted by the two proponents did not fare extremely well in lab tests conducted by the Consumer Electronics Manufacturers Association (CEMA) in conjunction with the National Radio Systems Committee.

With the field tests approaching, the big issue was which San Francisco station would volunteer to play host to the IBOC systems. Despite months of searching, no volunteers came forward.

According to CEMA, the NAB agreed to find a radio station to host the IBOC system experiments, but even the NAB could find no volunteers.

The NAB has said that both the recent station sales in the Bay Area and the

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Quello on Radio Today, Tomorrow and Yesterday

by Lynn Meadows and Paul J. McLane

WASHINGTON FCC Commissioner James H. Quello also qualifies as radio's raconteur: he shares anecdotes with the best of them. But James Quello commands the respect of the industry — an industry he has helped grow, steer and regulate during his 52 years of hands-on experience on both the broadcasting and the regulatory side of the business.

After 22 years on the Federal Communications Commission, the young 82-year-old jokes that he has not missed a meeting or an award. This year has brought a bumper crop to a man who has seen both the battles of regulation and the face of war.

The National Association of Broadcasters awarded him with its Belva Brisset Award at the 1996 spring show. Michigan State, his alma mater, gave him its Distinguished Alumni Award in September. He will be inducted into the Radio Hall of Fame in Chicago on Oct. 27; three days later, he will be the honorary target at The John Bayliss Media Roast in New York.

FCC Commissioner James H. Quello

Luck smiles

Not bad for a fellow who once threw the pastor of a Unitarian Church into a river. The man was protesting the Reserve Officers' Training Corps (ROTC) and Quello believed he was a communist.

"Luck has had a hell of a lot to do with everything I've ever done," said Quello, warming up for an interview with RW, "except luck did not smile on me when I sold my Capital Cities stock in 1974."

Before World War II, Quello was editor of the school newspaper and, in 1934, the first newscaster at

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Eureka Debate in Germany

by Michael Lawton

COLOGNE, Germany The German Association of Private Broadcasters (VPRT) has decided to leave the country's DAB Platform, the main DAB coordinating body in Germany, at the end of the year.

It is not the first time the VPRT has caused a stir in the world of DAB. Three years ago at the International Radio Show in Berlin, VPRT Chief Executive Ursula Adelt said that she thought DAB would not happen. While it is not yet entirely proven that she was wrong, she probably was.

Her statement made those in charge

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NEWSWATCH

WCLV Honored Overseas

CLEVELAND The European Broadcasting Union honored WCLV(FM) and its production/syndication arm, WCLV/Seaway Productions, for a series of live broadcasts to Europe it produced over the past two years.

The EBU awarded WCLV for "outstanding contributions in expanding the knowledge and distribution of American music and musicians." WCLV, in cooperation with Intercontinental Media, produced and distributed the "Six Great American Orchestra" series for both the 1994-95 and 1995-96 seasons.

Broadcasts of performances by The Cleveland Orchestra, the New York Philharmonic, the Boston Symphony and many others have reached Europe and Asia. This fall, the programs will also be distributed to American stations starting Oct. 30.

Bloch Pleads Guilty

NEWARK, N.J. Sonny Bloch, 59, the former radio financial talk show host, pleaded guilty last month to defrauding his listeners out of millions of dollars.

He faces 70 years in prison plus fines for eight felony counts of encouraging listeners to invest in schemes that he knew were worthless.

Gorman-Redlich Certified

WASHINGTON Gorman-Redlich is now certified to sell its Emergency Alert System product. The EAS-1 features five two-way RS-232 inputs/outputs for computer, remote signboard and a character generator.

Owner Jim Gorman said he expects to be shipping the EAS product in late October. The company joins TFT Inc., Sage Alerting Systems and HollyAnne Corp. who have all been certified by the Federal Communications Commission to sell EAS products.

The list price on the Gorman-Redlich EAS unit is $1,750. For more information, call (614) 593-3150.

Etter Leaving the NAB

WASHINGTON Terry Etter, a veteran National Association of Broadcasters staff attorney, was scheduled to leave the NAB on Sept. 27 to pursue new opportunities in Columbus, Ohio.

The Ohio native joined the NAB in 1980 after five years with WVTL-FM in Monticello, Ind.

He also served a brief stint as operations manager at WTON(AM) in Staunton, Va. and rejoined the NAB legal team in 1982.

Etter's specialties at NAB included political programming, common carrier, EEO, license renewal and labor relations issues.

"His shoes will be hard to fill," said NAB General Counsel Jeff Baumann.

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Last WME Bodes Well for Radio

LOS ANGELES It is the end of an era, although not a very long era: The National Association of Broadcasters announced last month that it would fly solo for its 1997 Radio Show.

Since 1994, the NAB has teamed its radio show with conventions from the Society of Broadcast Engineers (SBE), the Radio-Television News Directors Association (RTNDA) and the Society of Motion Picture and Television Engineers (SMPTE), joined by a combined exhibit floor, forming World Media Expo.

The last World Media Expo — WME '96 — just concluded in Los Angeles on Oct. 12. Less than a month before the show, NAB announced WME '96 will be the last jointly-produced event.

Radio Hall exhibitors were told that it was becoming too hard to secure future sites "that adequately meet the needs of all four groups and the markets they serve."

"This decision allows us greater flexibility in scheduling and locating future Radio Shows in different cities around the country," NAB Senior Vice President, Radio John David said in a statement.

The NAB and SBE have a contract whereby the NAB pays the SBE for its part in the spring and fall shows. SBE President Terrence Baun said that nothing in the contract changed except for the SBE role in the fall show.

The SBE, said Baun, has found its relationship with NAB "very rewarding." Although the next step is up to the SBE board of directors, Baun said he did not think the society would try to replace WME with a standalone national convention of its own.

Baun said that the SBE serves its members well by providing smaller and more localized opportunities for technical education. He mentioned that board members might decide to hold their meetings at one of the successful regional conventions and rotate which one each year.

SMPTE President Stanley N. Baron said that his organization plans to meet in New York in November 1997 and again in November 1999. The society will meet in Long Beach, Calif., in 1998 and 2000.

Meanwhile, the jury is still out among manufacturers as to what the split up of WME will mean for them.

"To be honest we don't know yet," said Jim Woods, Director, Studio Products for Harris Corp.

Woods said he is a big supporter of a focused radio show. He said that the radio show did well when it moved around each year to places like Boston and San Francisco. He added that the floating format worked well because it pulled a nice attendance both regionally and nationally.

No matter what happens to the show, Woods said, the industry will have to support it in order for manufacturers to be able to attend.

Tim Schwieger, vice president, marketing for Broadcast Supply Worldwide (BSW), said he thinks it is a positive that the NAB is really focusing in on radio. Schwieger said the fall radio show was always a good show before the addition of the other conventions.

He said he would like to see the show move to smaller venues in the future away from cities like Los Angeles and New Orleans.

He suggested some East Coast cities like Boston, Washington or Orlando that would be good locales for the show. Schwieger said he would also like to see the Radio Show in a midwestern city as well as a city like Anaheim, Calif.

The 1997 NAB Radio Show is scheduled for Sept. 17-20 in New Orleans.

Schwieger shared some ideas for how the NAB could promote the exhibit hall. He said that activities like a complimentary cocktail hour and walk around lunches held in the exhibit hall used to be successful ways to bring in attendees. Schwieger also suggested prize giveaways in the exhibit hall would encourage more people to visit.

He said that the NAB made some positive steps at WME '96 like leaving some time between sessions to allow attendees to check out the exhibit hall and separating the radio and television halls.

"We need people. We need attendees," said Schwieger. "We need to be able to justify the expense of attending these shows."

RealAudio Benefits From Dolby Know-how

by Frank Beacham

NEW YORK A new audio streaming technology by Progressive Networks and Dolby Laboratories for the first time allows broadcast-quality audio programs and spots to be distributed real time to radio stations anywhere in the world via the Internet.

In a related development, Seattle's KING-FM used the new technology to broadcast a 17-minute live stereo classical music feed directly from a server on the World Wide Web to its radio audience. The test, thought to be the first of its kind, occurred during the station's drive time programming on Sept. 13. Listeners were not told of the unique audio feed and the station received not a single comment about sound quality.

ISDN, LAN, 28.8

KING-FM used a beta version of Progressive Networks' new RealAudio 3.0 streaming technology that allows stereo sound over 28.8 kbps modems and near CD-quality transmissions over ISDN and LAN bandwidths. A laptop using an ISDN connection to Progressive's server on the Internet was patched directly into the KING-FM control room console for the live broadcast.

"The result of the test confirms in my mind that RealAudio 3.0 truly delivers broadcast-quality audio over the Internet," said Peter Newman, general manager and program director at KING-FM. "Our audience consists mainly of experienced classical music listeners who demand the best in audio quality. Our listeners couldn't tell the difference."

RealAudio 3.0, now in beta and expected to be available by year's end, was designed by Progressive Networks in collaboration with Dolby Laboratories to upgrade the quality of audio programming for Internet listeners. It was an unexpected consequence that the technology may also dramatically lower the cost and complexity of broadcast program and spot distribution to radio stations.

"What if you flip the Internet experience around?" asked Newman. "What if you turn it from the broadcaster to the Internet and make it from the Internet to the broadcaster? This could allow a broadcaster to get feeds and commercials off a server without having to establish a satellite or a separate ISDN connection."

Newman said advertisers could put their commercials on a server and make them available to stations via the Internet within minutes after production is completed. Even instant networks could be formed.

"Say you want to get a program out to several hundred broadcasters. You could rent the uplink time but that would be expensive and complicated. This offers the opportunity to simply place the program on a server. The station, then, can tape it off the server at its convenience and put it on the air almost instantly."

Sound transmission with RealAudio 3.0 is said to be more reliable and less subject to the pauses and dropouts that have plagued Internet audio feeds during peak traffic periods.

The short gaps in sound are caused when TCP protocols are forced to retransmit information from the server to the client.

The new version of the RealAudio client-server system introduces a feature called "Robust UDP," a technology based on the UDP protocol that enhances error mitigation.

Robust UDP improves the loss correction of the system by intelligently managing latency and jitter to resend critical dropped packets without delays or wasted bandwidth.

Because of this new feature, KING-FM experienced no dropouts or pauses in its Internet-to-broadcast feed.

"There were absolutely no hits or imperfections in our test," said Newman.

Introduced only 18 months ago, RealAudio has become the de facto standard for delivering real-time Internet audio. There are currently thousands of servers distributing over 7,500 hours of live programming on the Internet. More than 10 million free RealAudio players have been downloaded for listening by Internet users.

RealAudio 1.0, designed to work with 14.4 kbps modems, was optimized for speech over low bandwidth connections. Real Audio 2.0 was optimized to handle speech and music over 28.8 connections. The codecs in RealAudio 3.0 are based on DolbyNet technology from Dolby Laboratories and are designed for music compression. They perform an analysis based on the psychoacoustics of human hearing and perceptual masking effects. They can also be scaled from low bit rates

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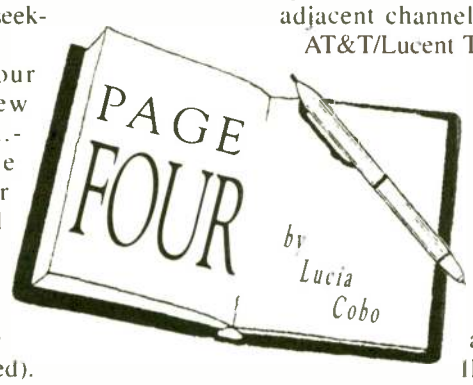
What Lies A-Head for Radio

WASHINGTON Just when you think you've heard it all, along comes a new gadget that just makes you smile.

First we learned about hand-crank radios that not only are ideal for third world nations with little or no access to batteries and regular electricity, they also enhance a man's ranking in the spouse-seeking market.



Hang on to your hat because New Century, Kan.-based Dazey, the manufacturer of Soft and Hard Bonnet hair dryers, just launched the Sound 'N Style hair dryer (pictured).

What a neat idea for those of us who cannot live without our morning news, music and info hits from our favorite radio station, or our set-in-stone beauty routines. This thing features built-in mylar speakers that are compatible with most sound sources.

The Dazey Sound 'N Style 1200 allows you to plug into your radio, television, CDs and, yes, even your PC, while you dry your hair in any one of its four temperature settings.

It's great for traveling, too. The Touch 'N Tilt bonnet folds into a "lightweight" carrying case that makes it eminently transportable. What a hoot! If you would like more information on this dryer, contact Dana Swearengin at (913) 782-7500.

★ ★ ★

There is, of course, more serious news to ponder these days. As you tackle this issue you will notice that there is a lot of news on the digital audio broadcasting front, and not all of it heartening at first glance, but not really all bad either.

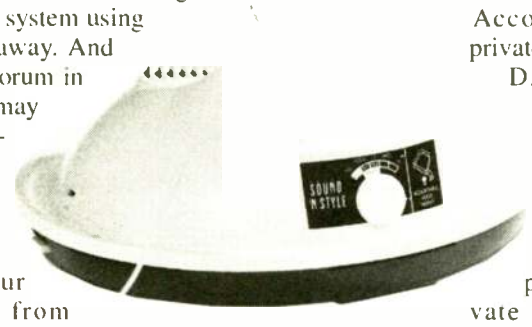
AT&T and its IBOC partner, Amati Communications, pulled their IBOC system out of the field tests. Bad news, because now there are no IBOCs being tested. In pulling out, they join USA Digital Radio, which withdrew its three IBOC systems (two FM and one AM IBOC) from the field tests in the spring, citing irreconcilable differences with the testing and reporting procedures.

In the field we now have only the Eureka-147 L-band system, an S-Band system from VOA/JPL and the in-band, adjacent channel (IBAC) system from AT&T/Lucent Technologies and Amati Communications.

After the AT&T announcement, the National Association of Broadcasters officially offered its services "to facilitate a fair and impartial IBOC testing program for all proponents as soon as the technology is appropriately developed."

On page 1 of the last issue of **RW**, NAB President Eddie Fritts went on record to that effect. Furthermore, the NRSC has halted the testing of IBOC (see page 1 for the complete story).

While on the surface, this may seem troubling, keep in mind that even a digital audio broadcasting system using Eureka-147 is years away. And as hard as the DAB Forum in the United Kingdom may try to paint a rosy picture of DAB developments, not all is going smoothly on that front either.



Case in point is our other page 1 story from Michael Lawton in Germany. The German Association of Private Broadcasters (VPRT) has decided to leave the country DAB Platform, the main DAB coordinating body in Germany, at the end of the year.

VPRT has been unhappy all along with the DAB scenario unfolding in Germany. The biggest concerns are that the Eureka-147 system was designed for the big government-funded public stations with little concern for the burgeoning world of private radio stations in Europe. The Eureka-147 technology upon which the European DAB system is based was developed largely by public stations and includes such characteristics as identical coverage for up to six programs — ideal for national or regional public stations, but not so appropriate for private stations that compete with other stations.

According to the private stations, the DAB Platform has not taken the disadvantages the characteristics of the system present to private broadcasters seriously. One example was its decision to put local stations on L-band and regional stations on channel 12. L-band is more expensive to operate on and, in Germany, local stations are almost all private stations.

In addition, public stations have a set amount of money — thanks to a dedicated portion of the license fee — to spend solely on DAB pilot projects. Private stations have no such "benny" to help finance the additional transmission costs — especially at the stage when there are practically no listeners to DAB, and won't be for years to come.

Where is the heartening news? The fact that withdrawal from the testing process has allowed the Westinghouse-backed USADR to explore larger options for its systems.

Tapping into the scientific pool of knowledge and research at Westinghouse Wireless Solutions Co., for one, is a further symbol of the company's commitment to digital audio.

At the WWSC, the initial IBOC failures are "well understood, several solutions to remedy these problems have been proposed and development is underway to produce improved and robust IBOC systems," according to one of its scientists.

Not only that, but the group has approached Lucent Technologies about a working relationship in which Lucent would participate in the development of the USADR IBOC systems.

Specifically, wrote WWSC Chief Scientist Brian Kroeger, "we are interested in Lucent's PAC (Perceptive Audio Coding) audio compression technology which we believe has the capability to deliver superior audio quality at reduced data rates."

Now maybe I'm too hopeful but the way I see it, if any group can figure out an IBOC solution, it has to be the combined brain trust of AT&T/Lucent Technologies, the inventors of the transistor in 1947, and Westinghouse, first licensed commercial broadcaster, largest group owner, hugely successful defense contractor, pioneer in the launch of HDTV transmission, etc.

And as the largest group owner (until someone eclipses its purchase of Infinity Broadcasting — if that is possible) it will ensure that the U.S. broadcasters' interests are kept top-of-the-agenda, in a way that EIA politically, because of who its members are, could not.

So go NAB, go Westinghouse, go AT&T. Because if you guys can't pull it off, then I guess IBOC is not an option for the United States.

Just sign me a hopeful believer in Yankee ingenuity ...

READERS FORUM

If you have comments for Radio World, call us at 800-336-3045 or send a letter to Readers Forum (Radio World, P.O. Box 1214, Falls Church, VA 22041 or e-mail 74103.2435@compuserve.com or MCI Mailbox #302-7776). All letters received become the property of Radio World, to be used at our discretion and as space permits.

It Pays to Care

Dear **RW**,

RW is always informative and interesting but two letters in *Readers' Forum* really hit home. A few issues back, a gentleman wrote from Waynesboro, Va., bemoaning the lot of radio personalities.

In 1948, I began a long career in broadcasting (almost 40 years) at WAYB in Waynesboro, a 250-watt Mutual station. Waynesboro had a population of about 10,000 and about the only industry was the DuPont Orlon plant, so I realize the town has changed considerably with growth.

Of the three stations I was with over the years (two much larger than WAYB), the best operated of the three was WAYB. General Manager Bill Kidd made the station an important part of the community. Most of the smaller communities had their own program with their own talent and commercials, a local plumber sponsored "Church in the Wildwood" without commercials, and only an opening statement mentioning the sponsor because he liked the program and thought the community should support the station.

The news director was John Meridith Patterson, a WWII veteran who lost both legs in Europe and had a degree in History from the University of Pittsburgh and a masters in Journalism from Northwestern.

Pat rewrote every newscast so it would not be the same as the many rip and read stations and allowed for individual announcers for timing and also any words or sounds they might have trouble with. Last I knew of Pat, he was alternating with Dan Rather on the weekend CBS Radio News. Sports was handled by the late Dick Rhodes who went on to do the West Virginia University basketball games. Chief engineer was Ed Goodwin who had years of experience with large stations and was attending the University of Virginia.

For anyone entering broadcasting, I would advise you to look for a well-run station and not worry about the size of the market — even some small stations pay well.

Also, in the Aug. 7 issue, there is a piece by Henry Schultz of Erie, Pa., about the 4th Radio Broadcasting Company. I was with the 4th Mobile Radio Broadcasting Company, also a psychological outfit assigned to SHAEF headquarters. I was on detached service to the 9th Army, and ended up as driver-technician with a mobile loudspeaker unit, mainly with the 84th (Railsplitters) division.

The bulk of the 4th MRBC was combined with the 5th MRBC and assigned to Radio Luxembourg. As Mr. Schultz stated, psychological warfare can be interesting and fun.

Eric Blehr
SBE 1013 (Life)
Certified Senior Broadcast Engineer
#1424 (Life)
De Land, FL

Radio Blues

Dear **RW**,

I have a problem that has been bothering me for some time now. Here it is:

My father passed away last August. In his will, he left me the radio station. I have been around the business all my life. I even remember being around it when I was only five years old. I've been working in radio for 13 years, now (I'll be 28 next month).

My problem is that no local banks want to help me on getting a loan to pay off my father's note on the station. I've been turned down several times. I am working with someone who is trying to get me an SBA loan, but it is taking too long. How and where do others get loans for radio stations? Am I the only one who has this problem?

I'm getting very tired of waiting and waiting on something to happen. I'm almost to the point of giving up. If I do, I will lose everything: my home, car, etc. I'll watch for a response in the *Readers' Forum* for any ideas. Thanks very much.

Doug Cochran
KBEL-AM-FM
Idabel, OK

Taking Issue

Dear **RW**,

In response to Jim Bixby's letter printed in the Sept. 18 issue, Mr. Bixby believes PCS/cellular/wireless operators do respect AM station operations and that fortification of the rules protecting AM directional arrays is not necessary.

On the contrary, they need to be codified and etched in granite for all to see. How about placement in Part 1, 2 or 17? Mr. Bixby apparently hasn't dealt with the RSA providers who operate one county and don't feel they need to follow the rules like the rest of us. Or the numerous other providers who identify sites by propagation and contour coverage, place an X on the spot, build and run.

Then never return phone calls from station engineers or peer consultants attempting to resolve the re-radiation issue locally before resorting to expensive mouthpieces and legal rhetoric.

In urban/suburban/ex-urban areas, short towers are located everywhere. I have walked up to towers that are less than 30 degrees in electrical length and have found harmful re-radiation from that tower. A structure in the magnetic field (read within 1 wavelength-up to 1/4 mile) or any reasonably sized structure within the specified distances will impact a radiation pattern. Maybe not on the ground, but in at a different angle of radiation.

And I can say that is true from experience or witness. A host of variables are in play and I find the blanket statement by Mr. Bixby that most towers will not require detuning (read impact the pattern of the AM array) to be misleading.

Also, Mr. Bixby's comment seeking elimination of partial proofs in favor of near field measurements as the means to determine if an impact has been eliminated is flawed. A veiled attempt to save his PCS/cellular/next generation clients money. Simply ask any AM DA engineer who operates a station near high-tension power lines about the variations in its pattern measurements. Then throw in a cell tower near one of those lines. Because of the re-rediation from the high tension towers and cable, near field measurements were useless and revealed nothing.

A partial proof done after the cell tower was installed and only six months following a full proof revealed the cell tower did impact the array, yet the near field measurements were inconclusive. The partial proof does have its place in the process.

I do agree with Mr. Bixby that communication (yes, we are in that strange business aren't we?) is the best means to prevent ugly confrontations like the two I cited. And in most cases a full proof is not always necessary either. But should be retained as a final determination. Given the fact many PCS/next generation communications and site aquisition engineers do not possess knowledge of Part 73, nor many of the issues that surround an AM station, they simply ignore the issue and hope no one notices. Then when it comes back to bite them, teeth grind and lawyers get busy.

It really doesn't matter to me. I'm getting rich from all the work anyway. I just wish I didn't need to deal with the "Who, us? No, not our tower ..." after the fact.

Michael G. McCarthy, President
McCarthy Radio Enterprises Inc.
Mt. Prospect, IL

Adieu, World Media Expo

We applaud the NAB's decision to return to a radio-only show, and we look forward eagerly to next year's convention.

RW has urged our readers to attend WME. It allowed several trade groups to run their own sessions, share one exhibit floor, and stop competing for exhibitors. A radio manager, the engineer and the news director could attend their respective seminars, then walk the exhibits together. The content of the shows has been strong. The NAB sessions alone are a treasure chest of management and engineering ideas.

But the show developed a multiple personality. Floor traffic was underwhelming, and NAB is accustomed to impressive numbers. Some attendees were confused by the floor layout, and exhibitors grumbled privately that the business didn't justify the trip. The Television Advertising Bureau pulled out of this year's show.

Geography was a problem. For several years, the major radio conventions, spring and fall, have taken place in just three cities: Los Angeles, New Orleans and Las Vegas.

A radio-only show solves many of these problems. Radio folks can hope that the NAB will bring a show to their region. Exhibitors will know who the registrants are. NAB can focus on what it does best.

Of course, attendees may again feel they must choose between shows. The smaller associations will have a tough row if they want to present their own. SBE and RTNDA in particular are close to our hearts.

But this provides a great opportunity for NAB to turn its conclave into a true, across-the-board radio show, not just a programmer's or engineer's event, and to demonstrate its commitment to the stations who pay such a big part of its budget. The NAB can send a hearty sign of its commitment to radio by presenting a strong, focused, radio show, in a different city each year.

Further, why not locate the fall show east of the Mississippi? The spring NAB isn't going anywhere thanks to its size. Let the fall show attract those who can't make it to Las Vegas each spring.

Next year's is set for New Orleans. Observers mentioned other possible sites: Boston, Washington, Orlando. Don't overlook Philadelphia, Indianapolis, and Nashville.

Bring on the 1997 Radio Show.

—RW

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Next Issue of Radio World
October 30, 1996

Radio Has a Friend in High Places

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WKAR(AM), the Michigan State 5,000-watt radio station.

In the summer of 1945, back from 33 months overseas, Quello took his wife to New York City and had the good luck to meet a patriotic stranger who treated the couple to a night on the town. He turned out to be the executive vice president and a stockholder of WXYZ(AM), Detroit, home of "The Lone Ranger" and "The Green Hornet" radio programs.

So Quello went to work on publicity and promotions for WXYZ. He met the short, blue-eyed man who played Tonto, and learned the secret of the Lone Ranger's horse, Silver: namely, two plungers on a wooden box.

In 1947, Quello moved to 50 kW clear channel WJR(AM) in Detroit. He worked his way up at WJR and added civic involvement to his resume, serving on the Detroit Public Housing and Urban Renewal Commission for 22 years, supported, he said, by both Republican and Democratic mayors.

He served on the State of Michigan Veterans Trust Fund, supported by governors of both parties. Already he was demonstrating an ability to earn the respect of influential people, regardless of political affiliation.

In 1974, Quello was president of the Michigan Association of Broadcasters when a seat on the Federal Communications Commission opened. He had been legislative chairman of the MAB for 12 years, rubbing elbows with lawmakers in Lansing and Washington, taking Gerald and Betty Ford to dinner.

The MAB told him that, with "all the guys" he knew on the Communications Committee, he would have a good chance to become commissioner. It was not so easy.

Quello said he found out later that then-Vice President Ford had actually pounded on Richard Nixon's desk to get his name in. Nixon had not wanted a controversial industry appointment in light of Watergate. Critics argued that an "industry man" had no place on the commission.

"I broke all records for length of hearing in 1974. I was on and off for eight days" before winning confirmation, said Quello. He has now been through four confirmations. The shortest took 12 minutes.

Friend of broadcasters

Quello is salty and charming. Thanks to his background, he enjoys a good relationship with broadcasters. Competing media honor him too: he has been honored by the Personal Communications Industries Association. He received the first Distinguished Service Award from the cable industry at its national convention.

"I said, 'This is rather unusual. You guys realize that I've been around long enough to vote against you at least twice.' And they all yelled 'Three times!'"

Quello chalks up a lot of his popularity with broadcasters to his stated view that the FCC should not have the power to put people out of business.

"I don't think any government agency should have the power to put a leading news and information medium — not entertainment medium, this means TV and radio — out of business. I would say that power is excessive," said Quello. When the FCC must revoke a license, said Quello, the station should be made to sell the license at a reduced price to a minority.

"Give them a chance to get out with their cost. When we took licenses away, what happens is all you've got is a bunch of second-hand equipment. You don't have a business. You're stuck. No industry, no monopoly, no utility has that kind of a sword over its head."

Pleased with Congress

Quello is pleased with the improvements made in the licensing process by this year's Telecom Act, including the longer period between renewals and a new, two-step process.

"If the FCC finds you qualified, you're qualified. Nobody is going to be able to challenge your license. If you're unqualified, it's open season. That's fair enough."

While television broadcasters are facing competition from new services, Quello said that radio is in good shape because of its accessibility and its immediacy in emergencies.

He expressed concern about the multiples now being paid for stations, saying he does not know how owners will make money paying 20 times cash flow unless they "fire a lot of people and put everything on automation. The value of radio is again very local service and immediate local service. You get your warnings. You get the time, weather, temperature, emergency news, the whole thing."

Asked if the deregulatory trend will eventually lead to the total removal of all ownership caps, Quello said antitrust would be the issue.

"When does owning more than 35 percent of the total radio revenue constitute an antitrust problem or dominance? I'm not sure what the answer is. But I'd hate like hell to compete in a market where someone had 50 percent of the advertising revenue and I was the other guy."

In middle- and large-sized markets, he said he thinks there has to be some kind of local limit.

"I haven't decided what, but there has to be a local ownership limit." He added that the antitrust division will have to decide if a 35-percent limit should apply only to radio revenue or to the total advertising pie in a market.

"You go to the average citizen (and ask), 'Should one guy own all the radio stations in (a) town with one newspaper?' I'd like to see that referendum. I don't think it's going to come out in favor of one guy owning all the radio stations."

In 1976, Quello proposed that Congress pass a law that put a "reasonable" spectrum fee on radio and television stations in exchange for reducing the license renewal procedure and a lot of the regulation.

Bureaucratic overkill

"I said, let's do this: Let's put a reasonable spectrum fee on it — radio and TV. They pay it. Same as the newspapers. Let the market decide whether one guy owns one, two, three, four and get rid of all these blackmail — at that time, competitive filings."

But Quello's idea eventually evolved into a proposal that neither he nor broadcasters could support, and it died.

Twenty years later, Quello understands broadcasters' fears about paying for spectrum.

"I think you have to be worried about paying fees and still having a very strong public interest obligation with that fee." He calls the idea of auctioning broadcast digital spectrum "bureaucratic overkill to the ultimate degree."

Quello is definitely not anti-spectrum auctions, however. He fought to win the approval from Congress for the first spectrum allocation of PCS.

"Don't say I'm anti-auction. I'm for auctions where they make sense. But all the auctions we did before resulted in companies that are going to get a direct payment directly from the consumer. We want to protect free over-the-air broadcasting. You pay the same for your television reception today that you did 30 years ago — nothing."

Quello said the only substantial threat to radio broadcasting is the "40 signals coming in from satellite" and he favors keeping that a subscription service.

These days, Quello says he listens mostly to news talk radio.

"I will tune into to Stern maybe once every two weeks just to see how he's doing and how far he's going in his raunchy approach to life. He's very entertaining."

Quello said he was the "principle antagonist" to Howard Stern, supporting the $1.75 million dollar fine levied against him. He says Stern is not as raunchy as before and a the seven-second delay was a good move.

Stern had a first amendment right to be wrong, said Quello, and to ridicule government officials and to be an "insufferable smart ass."

"He did not have a First Amendment right to violate existing indecency and obscenity laws and regulations. That's where he got in trouble."

Quello's term expired on June 30. He said he may leave the commission in May 1997, but has not decided.

Michigan State wants to name a chair in Broadcast Management after Quello. He taught broadcast management and the practicalities of government regulation at the school when he was vice president and general manager of WJR.

"I like it. It kept me young and it kept them informed. Fact is, with some of the practical experience, you always get the students' attention."

He smiled. "What I would like to do, if I'm going to lecture there once a week, I'd like to lecture while I still have 75 percent of my marbles and delusions of adequacy."

The blunt and friendly Quello would be sorely missed both by his staff — most of whom call him "Boss" with obvious affection — and an entire industry.

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Circle (4) On Reader Service Card

Countdown to EAS Implementation

With Less Than Three Months Until the EAS Deadline, Stations Have More Options

WASHINGTON There are 76 shopping days left until the Jan. 1, 1997, deadline for having the Emergency Alert System equipment in place.

Happily, there are a lot of places to shop these days with several new manufacturers newly-certified or about to be certified by the Federal Communications Commission.

In addition to Sage Alerting and TFT Inc., the pioneer EAS manufacturers, HollyAnne and Gorman-Redlich recently had their EAS equipment certified.

Within a day of receiving certification, owner Jim Gorman said his company had received 10 orders. He expects to begin shipping the product in late October. Gorman and the newly-certified EAS-1 are continuously on tour. He will be at the Broadcasters' Clinic in Madison, Wis., on Oct. 16 and also at the Pittsburgh SBE show.

Two other applications are still being processed: Multi-Technical Services and Burk Technologies both hope to be certified soon.

Lyn Williams, president of MTS, invited broadcasters to visit the company Website at www.mts.wl.com to find out more about its EAS product.

It was announced at the NAB Spring Show that Burk Technology and TFT Inc. had allied and planned to produce and sell EAS equipment to the broadcast market.

The deal fell through. Burk Sales Manager Bill Gould said his company designed and built its own EAS product which is ready for sale pending FCC approval.

Despite the late start date, Gould said Burk is ready to fill the demands of broadcasters and added that the phones never stop ringing.

"We anticipate that we'll be able to fill all the orders once that window is open to us," he said speaking of FCC certification. Broadcasters can visit www.burk.com to check out the Burk EAS product.

HollyAnne is enjoying its newly certified status.

"Interest is high because the price is right," said Dave Halprin of HollyAnne. Like the other newly-certified companies, HollyAnne (e-mail sam@synergy.net) is scheduled to begin shipping products before the end of the month.

Meanwhile, the EAS office at the FCC is awaiting emergency plans from all states and territories to review and approve. Frank Lucia, acting chief of the EAS Staff, said they have received 10 state plans so far — most of them drafts.

In addition to Sage Alerting and TFT Inc., the pioneer EAS manufacturers, HollyAnne and Gorman-Redlich recently had their EAS equipment certified.

"It certainly would be nice to have them in by the first of the year," said Lucia. He noted, however, that it took a while to finalize plans for the Emergency Broadcast System.

Asked what would happen if a broadcaster had a purchase order but no EAS equipment by Jan. 1, Lucia said, "I wish I could answer that."

He did say that if a broadcaster does everything in his power to get the equipment on time but does not have it by Jan. 1 because of manufacturing delays, it is not his fault and the commission will handle those cases separately.

Lucia reiterated his advice for broadcasters from earlier in the year. He said stations should see what equipment and features are available and "of course, price" before making a decision.

The FCC will probably release two new Report and Orders regarding EAS soon. Lucia said the original rules, now nearly two years old, do not have very many emergency codes for man-made disasters like toxic gas leaks or spills. He said he expects a ruling that will add more.

Plus, the commission has to issue a Report and Order regarding EAS cable issues addressed in a Future Notice of Proposed Rulemaking. Lucia said he expects that to be released "soon."

WINX: Upbeat and on the Street

by Lynn Meadows

ROCKVILLE, Md. USAIR chose WINX-AM-FM for a promotion that included flying two disc jockeys to Munich, Germany for a week-long broadcast.

The remote, although farther away than usual, was only one of many that took place at the station that week.

"We sell remotes like McDonalds sells hamburgers," said General Manager Bill Parris, citing low prices and high frequency.

He said that the simulcasting stations typically do an average of six to seven remotes a week, not bad for a duopoly that reaches a huge market like Washington.

Remotes are a promotional tool for Radio Broadcast Communications, the company that owns WINX-AM-FM. Parris said the remotes help spread the station call letters across the beltway without the expense of billboards and TV ads.

In addition to sending its afternoon and evening jocks to Germany, WINX promised USAIR it would do some "Beltway Blitzes" for the company. In a Beltway Blitz, the morning show is broadcast from a studio inside an RV that circles the beltway. An electronic sign attached to the RV provides information on USAIR and its promotion.

The company actually has five remote vehicles — two for outdoors, three for indoors. The on-air talent does the voices while the CDs are played back in the main studio.

That is how it worked in Munich. The microphones and mixers were fed to a Telos Zephyr and dialed to a studio in Long Island, N.Y. Then a two-line Comrex fed the signal to Rockville. The listen line was back-fed on a Zephyr to Munich.

Radio Broadcast Communications has some unusual ideas about radio, given today's realities. Its first station was WINX(AM) which it bought from United Broadcasting Co. in 1993. At the time, the AM station had been losing about $1 million a year for almost 17 years, said Parris. He called it a great start.

Mike Parris and Jeff Conner on a Long-Distance Remote in Munich

The idea was to be inventive and innovative and come up with new ways to do radio. RBC changed the station format to up-tempo oldies and spent a year inventing ways to sell a standalone AM.

Parris and his team thought back to what had made radio successful in the 1950s and '60s. They resurrected the idea of high energy remotes — doing limbo and hoola hoop contests at remotes in their "Rolling Rock and Roll Oldies Party."

About a year after that purchase, Parris said, the station began to turn around. The team then decided to look for an FM. They established an LMA with WQRA(FM) in Warrenton, Va., in January, bought the station in August and changed the call letters to WINX-FM in September. Parris said they hope to double the FM signal by the end of the year.

"We look for things to invent and do differently," he said. "Radio has degenerated into a business of imitation and copying." He said large market stations run to "security blankets" like researchers and consultants.

He said he is concerned that innovation is disappearing in local radio because it is the losing stations that historically inspire creative people. Parris said that large stations buying losing stations may be good in the short run for the former owners but bad in the long run for radio.

"Necessity to invent is being systematically eliminated," said Paris of the industry.

He said that when a station becomes merely a conduit to deliver music, it is extremely vulnerable to new technologies.

"I hope our company never sees a satellite dish," said Parris.

While continuing to do remotes and work creatively, Parris said Radio Broadcast Systems will look for opportunities to acquire more stations — preferably, he said, those that are 'basket-cases.'"

In addition to having three or four radio stations by next year, Parris said the company also wants to get involved in syndicated programming. He sees that as a growing area especially in light of emerging technologies, which will need good programming.

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Take advantage of the MiniDisc format by taking your cue from Sony. After all, not only did we create an entire MiniDisc product line - we created the MiniDisc. And our latest creations are proof that big ideas come in small packages. Consider the convenience of editing on location with instant access to tracks; being able to re-record over a million times on a single disc (with 74 minutes of digital audio); and having a shock resistant recordable media so small it could easily quadruple your storage space. Frank Beacham of *Radio World* had this to say about the MZ-B3 MiniDisc Portable Recorder: "Its powerful search features could be a lifesaver for radio news reporters trying to access a newsworthy sound clip under deadline pressure... It was indispensable..." And Chris O'Brien, Program Director of WRCY in Washington D.C., said this about the Sony MiniDisc Cart Recorder: "...Everything I needed was all in one place, and I didn't need to rifle through a stack of carts every time I needed a particular sound element." For compact impact at your radio station, make Sony MiniDisc products part of your format — and get on the digital fast track to success.

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Development Fund Proceeding Slowly

by Sharon Rae

WASHINGTON Citing burgeoning opportunities in the telecommunications industry, the U.S. Congress developed a fund to assist small communications businesses.

The Telecommunications Development Fund (TDF) is the brainchild of Congressman Edolphus Towns (D-N.Y.).

"TDF is essentially a provision designed to provide access to capital for small businesses," said Khalil Munir, Towns' communications director and legislative assistant. "The TDF was born out of recognition that the primary impediment that confronts small businesses is lack of capital."

Small businesses are defined as having $50 million or less in gross revenues.

Benefits for small businesses

According to Munir, while the Telecommunications Act of 1996 was designed to promote competition and deregulation, the lion's share of the benefit on the front end would accrue to big business.

"Over the long haul, there would be benefits that would accrue to consumers," said Munir. "So with that recognition, in addition to the fact that certain programs have been eliminated in the aftermath of anti-affirmative action, (we realized) there has to be a universal category, race and gender neutral, that subsumes minorities, women and others ... and that is the TDF, because small business is the engine that drives our economy."

According to Munir, the big question in developing the TDF was how to generate money for small businesses without creating a giveaway program.

The answer: TDF would provide low interest loans, not grants, to small businesses and it would access the funds in a way that would not affect appropriations or revenue.

"We realized that with the spectrum auctions that were taking place that the money was not being placed in an

continued on page 14 ▶

Enhanced RealAudio Arrives

▶ continued from page 3

delivered across 28.8 modems to high bit rates delivered across ISDN lines.

For 28.8 connections, program producers have a selection of new codec options for optimizing pop, instrumental, voice and stereo feeds. At 28.8, frequency response ranges from 4.0 to 5.5 kHz depending on content setting.

At higher bandwidths, such as the single ISDN connection a radio station would use, frequency response ranges from 8 kHz for stereo to 11 kHz for mono.

Dual ISDN lines can deliver 16 kHz for stereo and 20 kHz for mono.

Broadcast interest

Progressive Networks announced that more than 40 entities are already planning to launch content using the stereo sound capability of RealAudio 3.0.

They include the Evergreen and Infinity radio networks, CBS Radio, NBC, ABC and the CBC. Also on the list are the music distributors Sony, Warner, Polygram, BMG and MCA and Internet broadcasters AudioNet, SonicNet and ENSO/Muzak.

Kathryn Dillon, vice president of production and technology at the ABC Multimedia Group, predicted the new sound technology will have a major impact on broadcasters. "The broadcast community will really stand up and take notice of RealAudio 3.0 stereo quality and plan new broadcast applications," she said. "ABC intends to announce new services and programming using RealAudio 3.0."

Newman, whose KING-FM on-air signal serves the Puget Sound region, southern Vancouver Island and the lower mainland of British Columbia, said his station's experience with Internet broadcasting over the past year has opened his eyes to new possibilities beyond his local market.

"We get e-mail from listeners in Indonesia. We have listeners in the U.S. embassy in Beijing. It is amazing how much globalization of radio is now possible," Newman said. "It calls into question what is local radio in an age where you can be heard all over the world.

"As an industry we're all waiting around for DAB standards. We're waiting for some station in the United States to adopt a Worldbeat format yet the market forces won't allow it," he continued. "But these Internet technologies have ended up leapfrogging all of the radio industry's traditional concerns."

The RealAudio 3.0 beta can be downloaded at http://www.realaudio.com

Radio Station Comes to the Rescue

by Bob Rusk

SEATTLE Radio listeners throughout the city were startled by sudden screams when KPLZ(FM) put a caller on the air after a song.

Carrie Gleason, calling from a cellular phone in her van, was not reacting to the song. She was gripped by fear as her van was struck by another vehicle.

"What's going on?" morning DJs Alan Budwill and Kent Phillips asked the frightened Gleason.

"I just got into the biggest car accident," she replied.

The DJs immediately tried to calm Gleason, then told her to get the license number of the suspect vehicle before it could flee the scene.

Quick thinking

"Once they realized I was in an accident," Gleason said, "the first thing that came to their minds was to ask what the vehicle looked like, where it was headed and where I was.

"I told them where I was but couldn't describe the other vehicle. I just couldn't think at that moment, but I knew what it looked like because I was watching it go up the street."

Luckily for Gleason, the motorist behind her was also listening to KPLZ and got the suspect vehicle's license plate number.

Adding to the pursuit of the hit and run driver, yet another Good Samaritan spotted the car and called in a description of the vehicle to the radio station.

KPLZ morning DJs, Alan Budwill and Kent Phillips, kept their cool on-air while talking a listener through a hit-and-run incident.

"You couldn't miss that car," said Gleason. "The side panel was practically missing. One tire was smashed in."

The Sept. 10 incident occurred during rush hour in Bellevue, a Seattle suburb.

"I slammed on my brakes and (the other vehicle) hit my right front bumper," Gleason explained. "I let out a blood-curdling scream. Trying to swerve from him, I hit the vehicle that was in the lane next to me."

With the help of Budwill, a former reserve police officer, and Phillips, the driver and his car were located.

"We telephoned the police on the air and the guy was caught in less than an hour," said Phillips.

Once police officer Mark Tomlinson got the call from his dispatcher, he turned on KPLZ in his patrol car and received additional tips from the radio station quicker than the dispatcher could relay them.

The suspect vehicle, a late-model Ford station wagon, was found in the parking lot of Bellevue High School. The driver, whose name was not released by police, is an 18-year-old student who reportedly said he was late for class and planned to report the hit and run after fourth period.

Film at 11

There were no injuries in the accident, and it probably would not have rated even a mention in local news coverage had it not been for the radio station's involvement.

"A reporter told me he has worked in TV news for 25 years and had never seen anything like this," said Gleason.

KOMO-TV, the local ABC affiliate which is co-owned with KPLZ, used the accident as the lead story on the 11 p.m. news after a brief mention of a powerful earthquake in Japan.

Viewers sent e-mail comments in to the station. One person wondered if the fact that Gleason was on the phone played a role in the accident.

"Granted, she was 'cut off' in traffic," the viewer wrote, "but I believe that too many people are driving erratically while on their phones."

Gleason stated that speaking to the radio station while she was driving had nothing to do with the accident.

"If you can go to downtown Bellevue and find 10 people who aren't on cell phones, tell me," she said. "If I hadn't been on my cell phone, there still would have been an accident. The kid wasn't paying attention. I was. I saw him pull out. I saw exactly what happened."

Officer Tomlinson confirmed that the cell phone was not the cause of the accident. The student was arrested and subsequently released.

Tomlinson sent his report of the incident to the city prosecutor and is recommending a charge of hit and run. The maximum penalty would be one year in jail and a $5,000 fine. Phillips, who is also the KPLZ program director, was pleased to find out that listeners were willing to help solve the crime.

"It was neat to see everybody get involved to help nab the guy," said Phillips. "It all worked out great."

Ironically, Gleason had called the station to comment on a song. Its name: "Ode to My Car."

No More IBOC Systems Being Tested in Field

▶ continued from page 1

coming and going of engineers made it difficult to pin down an agreement.

Stations may also be hesitating because the lab tests results indicate that the IBOC signal interfered with both the host analog signal and second adjacent channels.

CEMA offered to co-locate the IBOC station with KEIA, for which it has an experimental license from the Federal Communications Commission.

KEIA is located at 96.9 MHz with a tower on Mt. Beacon. Edward Chen, technical manager/department head of AT&T Labs-Research, said that KEIA is representative of less than one percent of all stations in the country mainly because its neighboring stations are so close.

Chen said that there is an FM station at 97.3 that also has a tower on Mt. Beacon as well as a strong FM signal coming from 96.5 MHz.

"This frequency is second adjacent (carrier spacing 400 kHz) to an analog FM station on Mt. Beacon with much higher relative power," Chen wrote to John Marino at the NAB. "In our estimation, using KEIA for field-testing of the AT&T-Lucent-Amati IBOC DAB system does not serve a useful purpose. This testing situation does not reflect current or future mainstream broadcasting scenarios in the United States."

He said in order for 96.9 MHz to work for IBOC, AT&T and its partners would have to filter 97.3 MHz, which would hurt the IBOC signal.

CEMA President Gary Shapiro touted the withdrawl of the last IBOC system as an indication of the "failure of both system performance and real interest from broadcasters" and stated it "calls into question the future of IBOC."

In the same press release, Shapiro added, "Further attempts to redesign the IBOC systems must be skeptically weighed against broadcasters' interest in delaying digital radio and the realities of present-day physics. It may be time to look worldwide to others who are taking the lead in digital radio implementation as the U.S. continues to lose ground."

Fritts' letter, however, indicates that the NAB is not worried about the United States losing ground.

"Our hope is that through this pioneering work of your respective companies, a DAB technology emerges that will benefit the general public, as well as all radio broadcasters."

Chen said AT&T was considering the possibility of a third party to test its IBOC system next year. At the time of the CEMA announcement, he was in San Francisco preparing for the IBAC tests.

Brian Kroeger, chief scientist for Westinghouse Wireless Solutions Company, said that USADR commissioned a study addressing the failures in the tests on its IBOC systems.

"These failures are now well understood, several solutions to remedy these problems have been proposed and development is underway to produce improved and robust IBOC systems," he stated via e-mail.

He said the company plans to demonstrate its improved AM and FM IBOC systems in 1997. Kroeger said the company is talking with Lucent Technologies about a working relationship in which Lucent would participate in the development of USADR's IBOC systems.

"Specifically," he wrote, "we are interested in Lucent's PAC (Perceptive Audio Coding) audio compression technology which we believe has the capability to deliver superior audio quality at reduced data rates."

Jukebox Radio Will Not Go Quietly

by Lee Harris

NEW YORK Try as they may, foes just cannot kill New Jersey's Jukebox Radio. Accused time and again of violating both the spirit and the letter of FCC regulations, the roundabout broadcaster keeps bouncing back.

This time owner Gerry Turro has eluded a competing station's efforts to shut him down by contracting to sell his two FM translators in an unusual $1.5 million deal.

Circumvent signal

At issue are the FCC FM translator rules, which bar translator owners from originating programming. Critics charge that Jukebox Radio owner Turro has effectively circumvented those rules and created what amounts to the only commercial FM station licensed to New Jersey's populous and well-heeled Bergen County.

In an ingenious bit of problem solving, Turro arranged for his Bergen County-based programming service to provide full-time programming to WJUX(FM), a class A station licensed to Monticello, N.Y. The programming is then picked up off-air 50 miles to the southeast in Pomona, N.Y., by Turro's 3 watt translator on 94.3 MHz.

That signal is then picked up 20 miles to the south in Fort Lee, N.J., by Turro's 34.5-watt translator at 103.1 MHz.

As far as most listeners know, the Fort Lee translator is Jukebox Radio, because virtually all the commercials, news and information on WJUX are clearly intended for Bergen County listeners.

Despite the low ERP, Jukebox Radio's adult standards format has proven very successful in both listenership and revenue. This has raised the hackles of Universal Broadcasting, owners of WVNJ(AM), another adult standards station licensed to Oakland in Bergen County.

Universal's lawyers have repeatedly challenged the legitimacy of Jukebox Radio, successfully convincing the FCC that Turro cannot continue to own and program the translators, even if he does not own the intermediary station, WJUX.

The FCC shot down Turro's attempts to turn the translators over to a blind trust. Now WVNJ is taking aim at Turro's latest solution, the sale of his translators to Press Broadcasting of New Jersey for $1.5 million.

> **The facts are clear and the law is clear. The commission must enforce its rules.**
>
> —Richard Helmick
> WVNJ(AM) Attorney

"This sale is ludicrous on its face," says WVNJ attorney Richard Helmick. In an interview with **RW**, Helmick noted that the transfer application does not explain how Press Broadcasting can make any return on its large investment, because Press cannot use the translators to rebroadcast its WKXW(FM) (Jersey 101.5) in Trenton.

Asked if this is a "sweetheart deal," Helmick replied "Of course it is, and I don't think we're being told everything."

Press Broadcasting spokesman Tim Zeiss explained that the purchase was a "speculative move" and that for now there are no plans to change the programming.

No plans made

In fact, Zeiss says, there are no plans for the translators at all. This is the part Helmick finds suspicious.

"For the outrageous price of $1.5 million, they should be able to get a return on their dollar. The application does not explain how this could possibly happen. What are they buying? The physical assets are minimal, certainly worth no more than $25,000."

FCC rules would prohibit Turro from paying Press Broadcasting to carry his programming on the translators. Despite repeated requests, Turro would not speak to **RW** about the deal.

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NRB Fosters Debate

WASHINGTON Public policy took center stage at the National Religious Broadcasters' first Public Policy Conference last month.

More than 140 broadcasters and others attended the two-day event, which focused on issues close to the hearts of religious broadcasters.

Rep. Ernest Istook Jr. (R-Okla.) opened the conference as the guest speaker at the opening breakfast.

Istook spoke as the official representative of presidential candidate Bob Dole who was not able to attend. Istook spoke about tax breaks for families and the war on drugs — two big issues in Dole's campaign.

In the first seminar of the conference, Mark Gorman of Gorman Consulting gave a primer on how to "Make an Impact on the Hill." He stressed five strategies: keep it simple, keep it short, keep the group small, stay on your message and ask for action.

Attendees were encouraged to drop by their congressional offices to discuss "The Fairness in Musical Licensing Act." This is the bill the NRB Music Licensing Committee has been working on since 1995. More than 30 attendees paid visits to their representatives.

Other seminars included "Affirmative Action, EEOC Regulations and Racial Reconciliation," "Restore Family Values to Our Culture" and a "Telecommunications Reform Update."

Syndicated columnist Cal Thomas hosted the "Real Reasons and Real Solutions" seminar and discussed the perceived media bias against those who are religious.

"What the media needs is not cheap newsprint, but courage," Thomas said.

Legal heavyweights sat on the "FCC of the Future" panel including Saul Shapiro, assistant chief of technology for the Federal Communications Commission (FCC), Anita Wallgreen, FCC legal adviser and Henry Bauman, executive vice president and general counsel of the National Association of Broadcasters. Former FCC Chairman Richard Wiley moderated the seminar.

"A lot of efforts are under way to reinvent government ... over the next few years, we'll see an increase (in automation) for filing and other routine (duties)," said Shapiro.

The conference closed with a Congressional Banquet and a keynote address by Alan Keyes, former United Nations ambassador and presidential candidate. Keyes spoke about the "growing hardness of heart" he sees in America. He said the fact that "our moral heart is dying (is the) number one crisis in America."

NRB President E. Brandt Gustavson said he heard glowing reports of the conference from the attendees and many requests that the conference become an annual event.

"We will evaluate that request," he said.

The NRB is now looking ahead to its 54th Annual Convention, scheduled for Jan. 25-28 at the convention center in Anaheim, Calif.

'Granny' Klink Keeps Radio Lore Alive

BALTIMORE The local chapter of the Society of Broadcast Engineers heard from living and working legend Granville "Granny" Klink at its September chapter meeting.

Klink is celebrating his 60th year as an engineer at WTOP(AM). The 86-year-old spoke about his Golden Years of Radio to a packed room.

He began his career at a religious station in Elkins Park, Pa., in the early 1930s. St. Paul's Episcopal Church used its station once a week to broadcast Sunday services.

The station call letters, WIBG(AM), stood for "I believe in God." At the time, the Federal Radio Commission (FRC) required that call letters be announced every 15 minutes.

The requirement was waived for church services provided the station read a disclaimer.

When the FRC told WIBG owners that the station would have to broadcast on a daily basis, the church sold the station to an electrical construction company.

The team immediately requested a power increase from 25 to 100 watts. The FRC granted the request "without delay," said Klink joking that was "something new."

The new owners then built studios in Germantown, Md., getting free rent in exchange for mentioning the owner of the business who owned the building. They had one program director, two full-time and one part-time salesmen and two announcers.

Klink said the program was always live except for 78 RPM records that a local music store provided in exchange for an on-air mention.

After two years of keeping live talent on the air and running the transmitter, the chief announcer and his father took over running the studio.

He travelled with FDR on his train, playing low-stakes poker with the president's bodyguards in the club car.

Klink said it is a testament to how quickly things were moving in those days that it took only two years to sell to a new owner, install a new transmitter and build new studios.

With that kind experience under his belt, Klink accepted a position running a 250-W transmitter at WDAS(AM) on the roof of a hotel in Philadelphia.

His goal at the time, he said, was to get a good job at the Columbia Broadcasting System.

He was always stopping by CBS-owned WCAU(AM) in town to talk to the manager and try to land a job.

When CBS-affiliate WJSV(AM) (James S. Vance, the owner) in Washington, D.C., announced it had an opening, Klink applied via Western Union Telegram. He got the job and started on July 7, 1937, at the station that would use his expertise for the next 60 years and later be renamed WTOP.

Klink spent the first 15 years at WJSV in Field/Studio Operations setting up broadcasts for the likes of Franklin Roosevelt, Kate Smith and "Amos 'n' Andy."

He traveled with FDR on his train, playing low-stakes poker with the president's bodyguards in the club car.

One of the perks of being on the road with the president was visiting Warm Springs, Ga., on Thanksgiving when FDR gave his holiday speech.

Once the equipment was set up for the evening broadcast, Klink said the visitors were welcome to play a round of golf on the nine-hole course or go swimming in the spring-fed, 80-degree swimming pool.

One of many historic events Klink witnessed was the 75th reunion of Civil War veterans in Gettysburg on July 3, 1938. Not only was Klink able to see soldiers who had fought in the War Between the States, he helped set up one of the first broadcasts from an airplane that day.

The broadcast was a description of the mock battle between Union and Confederate troops taking place on the ground. They did a test flight the day before to check audio quality and signal levels.

"The broadcast may have been one of the first of its kind from an aircraft," Klink told the SBE members.

There was an ironic twist to the event as well. WJSV told Klink to pick up a technician from WCAU in Philadelphia to help him out in Gettysburg.

When Klink walked into WCAU, the secretary immediately recognized him from all his previous visits looking for a position.

Before he could say a word about borrowing a technician, she told him she was sorry, but there were still no openings and the chief engineer was not in. When he showed her his CBS card, the engineer appeared as if nothing had happened.

Turro Pushes Envelope

▶ continued from page 12

Helmick said he will file a petition to deny the sale, citing these peculiarities and other facts, including what he calls repeated misrepresentations by Turro to the FCC.

In an earlier complaint to the commission, Universal alleged that "the programming produced by Turro and broadcast by WJUX is not intended to serve Monticello or the WJUX service area, but rather is directed at Bergen County, which is wholly outside the WJUX service area. This contrivance is wholly inconsistent with commission rules and policies, a perversion of the WJUX license authority and a misuse of Turro's associated FM translator facilities."

Universal went on to charge that the FCC staff had evidence verified by its New York field office that the Fort Lee, N.J., translator was not, as the rules require, picking up the WJUX signal off-air. Universal maintains that the translator was originating, not repeating, the WJUX programming, noting that when WJUX was off the air due to technical difficulties, the translator continued to carry WJUX programming.

Commission credibility

Universal demanded the revocation of the licenses for WJUX and the translators, adding that such action is "required if the commission is to have any credibility to enforce its own rules and policies."

Helmick charges that politics is at the heart of the FCC's failure to pull Jukebox Radio of the air. Indeed, Turro has marshaled substantial political firepower in his efforts to stay on the air. Jukebox Radio's format of big-band and adult standards music has an incredibly loyal following of older, affluent and politically important listeners, who have been apprised of the threat to their favorite station and have been asked to contact their congresspeople.

U.S. Representative Marge Roukema (R-N.J.) has been especially outspoken in her defense of Jukebox Radio, saying that both it and WVNJ are necessary to serve the residents of Bergen County.

But Helmick is determined to blow the roof off this time around.

"The facts are clear and the law is clear. The commission must enforce its rules."

The case remains a tricky one for the FCC because this conflict pits the demonstrated needs and desires of a radio audience against strict interpretation of FCC rules. The thousands of listeners who have come to depend on Jukebox Radio are not concerned with the translator origination rules or the specifics of the sale to Press Broadcasting.

Once again, the FCC may have to decide if its own rules are in the public interest or are merely serving to protect the interests of broadcasters.

Lee Harris is the morning news anchor at WINS(AM). He is also president of Harris Media, a company specializing in web site design and hosting. Contact him by e-mail at lee@harrisnet.com

Going Private with Eureka

▶ continued from page 1

begin to take the interests of private radio stations seriously as far as DAB was concerned. Unfortunately, the DAB Platform did not take those interests seriously enough.

From the beginning, private radio suspected that DAB was designed for the benefit of public stations. The Eureka-147 technology upon which the European DAB system is based was developed largely by public stations and includes such characteristics as identical coverage for up to six programs — ideal for national or regional public stations, but not so appropriate for private stations that compete with other stations.

Not taken seriously

According to the private stations, the DAB Platform has not taken the disadvantages the characteristics of the system present to private broadcasters seriously.

For example, it was decided to put local stations on L-band and regional stations on channel 12. L-band is more expensive to operate on and, in Germany, local stations are almost all private stations.

In addition, public stations have a set amount of money — thanks to a dedicated portion of the license fee — to spend solely on DAB pilot projects. It is not known how the private stations will finance the additional transmission costs, especially when there are practically no listeners.

The DAB Platform — which includes broadcasters, receiver manufacturers and transmission providers, as well as government regulators — responded to the accusations by pointing out that it has called for a subsidy for private stations from the public license fee to help offset their competitive disadvantage.

They also contested the facts cited by the VPRT. It is not true, the platform said, that the L-band policy puts private stations at a disadvantage. Regional private stations, such as Antenne Bayern, are on the same channel 12 frequency blocks as public stations.

And, said the platform, it cannot distribute frequencies. That is up to the broadcast licensing authorities of the individual German states.

Hans-Peter Hillmoth, station manager of Radio ffh in Frankfurt and chairman of the Radio Committee of the VPRT, said its criticism is that the platform has not represented the interests of private radio well enough.

"Now we are outside the platform," he said. "We are no longer bound by it and can represent our own interests better. In the past, whenever the Platform said something, it tended to be taken as gospel, and no other view came out."

He also said the platform has tended to paint too rosy a picture of the development of DAB.

For example, said Hillmoth, the DAB Platform underplayed the serious problem of the shortage of receivers, perhaps because the receiver manufacturers were among its members. More likely, the platform wanted the public to view the pilot projects as going well.

Hillmoth also pointed out that the emphasis is shifting from the national level to the state level, with state licensing authorities and state governments putting together pilot projects that are expected to form the eventual backbone of national DAB coverage.

That means it is important for the private stations to have a clear voice at the state level — a voice that can be independent of other interests.

The VPRT insisted its departure from the DAB Platform will not stop its members from continuing their involvement in pilot projects, nor will it stop the VPRT from being closely involved in all DAB developments.

The DAB Platform admitted that, as a coordinating body, it cannot please everyone all the time. Platform member Andreas Maurer agreed that the platform must sometimes represent opposing interests.

One of the issues that it can do little about is the fact that transmitters are operated in Germany by the public broadcasters themselves or by Deutsche Telekom. Because the public stations are clearing their own television signals from channel 12 on their own transmitters, they do have an unfair advantage in deciding who will use channel 12 for DAB.

Channel overload

The private stations fear that the public stations will overload channel 12 with their own programs, even pulling in public stations from other states to ensure that the private stations do not get space on the channel.

The DAB Platform also publicly welcomed developments that worry the VPRT like the possibility of using a number of DAB channels in a frequency block to broadcast television pictures. This is in light of the limited capacity currently available for DAB, which, according to the VPRT, puts the chance of reflecting the entire existing FM landscape in DAB at risk.

Although the VPRT announced its departure, the private stations will not be entirely underrepresented in the DAB platform. The Working Group of Private Radio Operators (APR) said it agrees with the VPRT criticisms, but it will stay in the organization nevertheless.

But the APR does not have the lobbying power of the VPRT.

Insiders point to one development sparked by the VPRT decision: The state broadcasting authorities have noticed the strength of feeling among the private stations and have begun to take their interests more seriously. The state authorities are now expected to press for equal access for private stations to channel 12.

Michael Lawton, a free-lance broadcast journalist, reports on the industry for Radio World International from Cologne, Germany.

Wanted: TDF Board Members

▶ continued from page 10

interest bearing account," said Munir. "There were literally hundreds of millions of dollars in the various auctions that have been conducted. The money was just sitting there, waiting for the respective auctions to be concluded. So we developed a provision to allow for that money to be placed in an interest bearing account and to siphon off the interest only ... and create a fund that will provide access to capital for small business."

That solution presented a problem.

"The struggle that we had to overcome legislatively and politically was getting the legislature and the Treasury Department to appreciate the fact that there wasn't going to be any loss of revenue to the federal government because they wouldn't be accumulating any interest anyway," said Munir. "We had to get all those principals to appreciate the simplicity and also the relevance of this mechanism."

Snail's pace

The TDF measure, which enjoyed broad bipartisan support, was signed into law with the Telecommunications Act. It gave the Federal Communications Commission 30 days to name the chairman for the board of directors. The board will be made up of three individuals employed by the federal government and four people employed by the private sector.

While Solomon D. Trujillo of US West Communications was named as the interim chair, the rest of the process is going along at what Munir calls a "snail's pace."

"Everything is in a state of flux," charged Munir. "The glow of a well-conceived program has lost some of its luster because the mechanics of bringing the program to fruition have not been very solid."

Munir also called the process of selecting board members frustrating.

"There are so many people who are waiting for information and appointments to be made because nothing can happen until such time as the board is fully constituted, and so you can't go forward," said Munir. "As we begin to approach the height of the election cycle, the question is whether or not these potential board seats would be used as 'political plums.'

"It's like a mule that's capable of working, but you've got to whip it to make it plow," said Munir. "It's just not an issue that is seemingly a high priority (for the FCC)."

Catherine Sandoval of the FCC Office of Communications Business Opportunities disagreed.

"I think TDF is a big priority for us," she said. "We have been working diligently to put together a good board who can help to leverage resources from the private sector for small businesses, and to make this fund something which is sustainable and is going to be an important resource for small communications businesses."

Looking for input

"The purpose of the TDF, according to the statute, is to make loans to and equity investments in small communications businesses," said Sandoval. "The purpose is to promote innovation, economic development, job development, competition and universal service."

Trujillo agreed. "This is an opportunity for small business development. The telecommunications industry is more than a number of large companies. There hopefully will be lots of additional players."

Trujillo has asked those working with the TDF to come up with a market-oriented approach to fund the management of it. He has also encouraged a look at the initial funding in such a way that it attracts additional investments.

"We'd like to build on the best of equity fund stories and build this along proven principles of design and management."

What does this mean for broadcasters looking for funding?

"Right now," said Sandoval, "we are still in the process of naming all the board members ... so the board will decide on exactly how TDF is going to be structured and what it is going to do in terms of being able to offer financial assistance."

Sandoval cited many decisions to be made, but ultimately the TDF will provide a source of financing to a variety of communications businesses including wireless and cellular services.

"This is good news for small businesses," said Sandoval. "I think this will create another source of financing and capital. Part of our goal is also to use this money ... to leverage other private sector investments. At this point, we have about $6 million."

Sandoval is asking for input from entrepreneurs.

"We'd like to hear from small businesses about what they perceive to be the gaps in the capital market and how TDF can help to fill those gaps."

The Office of Communications Business Opportunities in Washington can be reached at (202) 418-0990.

Sharon Rae is principal of Rover News Services in Michigan. Reach her at e-mail: SColton@aol.com

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Studio Sessions

Equipment and Applications for Radio Production and Recording

New Recorder/Editor Uses PCMCIA Media
See page 19.

Express DAW Does the Job Fast

by Dave Green

ORLANDO, Fla. Not long ago, the Paxson-Orlando radio group acquired two additional stations for a total of six. This meant training two new airstaffs on our digital production equipment in a short time.

I had once mentioned to our Spectral representative how nice it would be if the ...ny had a simplified piece of soft-...e to allow even the most inexperi-...ced user to perform sophisticated edits ...d expand the limits of their creativity ...ith a very low learning curve.

...Quite frankly, I was surprised when I ...as told they had something just like that ...n the works. It was not long before ...Express" came along and I was eager to ...y it out.

...oo much to handle

Paxson-Orlando has three Spectral ...orkstations. One features the 16-track ...udioEngine card and two others use the ...2-track Prismatica card. All have J.L. ...ooper CS-10 MIDI interfaces and all ...e constantly in use. Spectral's products ...re PC-based and, though sophisticated, ...e simple to use.

Prismatica can be a bit too much for the ...verage radio joe to handle at times. After ...shift, they just want to go into a room ...nd bang out a spot without leaping over ...lot of technical hurdles in the process.

I always felt the Spectral folks needed ...to come up with software specifically ...directed at radio production. The result is ...called Express for Prisma.

...All aboard the Express

At first glance, Express looked like a ...hole different animal from what we ...ere used to.

Express offers eight dedicated tracks ...ith simultaneous record and playback. ...hat means four stereo tracks that can be ...plit to eight mono. By contrast, ...rismatica offered 96 virtual tracks with ...to 12 simultaneous tracks.

Express has just two screens. One is the ...ain Multitrack screen, which is aesthet-...ally pleasing, with nice colors that are ...sy on the eyes.

Next is the Directory screen which ...behaves the way a Windows File ...Manager does, allowing drag-and-drop ...access to soundfile folders. This is also ...where you can keep track of your hard drive space, your backup projects and ...just about anything else dealing with ...your soundfiles.

Everything I needed for fast, clean editing was all on the main screen. There were not a lot of cryptic icon buttons either. All function buttons are big and clearly marked, and each is labeled with its specific function.

There is no unnecessary on-screen clutter, either. There is no changing from screen to screen. There are no pesky pull-down menus or floating toolboxes to mess with. Just the editing tools that you need most often right on the screen within easy reach of your mouse.

Where Prismatica offered on-screen waveform editing as an option, Express provides it automatically with one click. There is the ability to instantly zoom in and out on the waveforms, allowing hyper-accurate edits. And the clean, sharp graphics are a big improvement, too.

I have to admit that when I first sat down for the demo of Express, I was expecting the usual pitch and routine: Sit for an hour while the rep amazes and astounds all with the bells and whistles ... not to mention his own technical wizardry. Then, when he finishes, you realize that you don't remember how to do one thing you were shown. Not so with the Express demo. After a brief overview from the rep, I plopped down in front of the screen, grabbed the mouse, cut a track and started editing — all with very little prompting from the demo guy.

Express For Prisma Screenshot

What makes the whole process so simple is not having to punch lots of buttons to make things happen. Express is pretty much mouse-driven. Once you have recorded your audio into Express, it is up on the screen right away as an easy-to-comprehend waveform segment. To move it, click the mouse in the middle of the segment, then drag and drop. To change the segment length, grab the beginning or end of the segment, and drag and drop.

Fade-ins or -outs? Just grab the little box always showing in the corner of the segment, then drag and drop.

Whether cutting, copying, splitting, inserting or pasting audio, all can be accomplished quickly and easily by mousing the segment and clicking the appropriate function button.

By this time, I was thinking that Spectral cooked up a pretty descriptive name for this new software when they named it "Express."

There are many good editing features on Express. As with Prismatica, you have the ability to scrub your audio as you would if rocking a reel of tape. The really handy difference Express provides is the scrub function. It is right inside the mouse, so it is always there in your hand.

Point your cursor on the segment of audio you want to listen to, click and hold down the right mouse button and scrub away. The velocity-sensitive scrub tightly matches pitch to the speed with which you move the mouse back and forth. I have never worked with a more accurate mouse scrub than this one.

Ever wish you could select multiple segments and affect them all at once? Express lets you highlight any group of segments by dragging and dropping a box around the segments with your mouse.

Once done, you can copy, delete, paste, insert or do whatever you want to the whole lot of them, without mashing a bunch of buttons.

Two other very useful buttons on the screen are "Hear Selection," which allows you to hear the segment currently selected and "Skip Selection," which lets you listen to your edit before you make it.

One-click Mix

And how can I forget the Mixdown button? After you have all levels set the way you like, click the Mixdown button and Express takes an instant "snapshot" of your mixed audio project as a soundfile.

Now, how do you keep track of all your audio segments and back up your work? Glad you asked.

Return with me to the previously mentioned Directory screen. Everything you need is there. You can manage your audio libraries and segments, as well as perform backups to your choice of media: Data DAT, Exabyte, M-O or Jaz Drive. If you need to, you can even backup to your computer C:\ drive.

The Directory screen is also the place to perform DSP functions. These include time companding, normalizing and gain reduction, as well as labeling audio segments with text for quick and easy identification.

If you are anything like me, you want to link your workstations together to share audio and drive space, right? Express can be readily networked, making for a smoother production operation all around.

One thing I noticed missing from Express — that exists on Prismatica — is track equalization and automation

continued on page 21 ▶

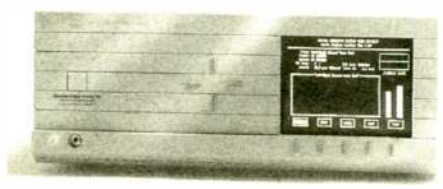
SHORT TAKE

DGS Welcomes Its 5,000th Station

The ubiquitous DG Systems receiver that is most likely a fixture in your production room has recently welcomed its 5,000th sibling into the world.

On Sept. 18, DG Systems announced the 5,000th radio station to join its digital distribution network. WMTZ-FM, "The Mountain," in Johnstown, Pa., is the record-setting station that added the orange-screened DGS digital receiver to its facility.

DG Systems began digital delivery in 1991. In addition to 5,000 stations, the company has 4,500 advertisers, 650 agencies and 300 studios on-line. It is now testing a similar system for digital distribution to television stations.



DGS: Five Thousand Strong

A technical explanation of the basic DG Systems receiver was published last year in **RW** (Aug. 9, 1995, page 30). The 1995 model combined a DOS-based 486-33 computer motherboard with modem, Antex soundcard and 420 MB hard drive.

The DG Systems distribution center uses a dedicated line (POTS or ISDN) to call receivers. It then transmits audio and spot flight information to a receiver as a digital datastream. Audio is stored on the hard disk using Dolby AC-2 compression.

The meandering monochrome orange-yellow screen displays a list of all spots on the receivers' hard drive. Each station offloads the audio for playback on-air. New audio downloaded to affiliate stations is recorded over older outdated spots. At present, the unit at stations is still a receive-only device. Two-way transmit/receive terminals are located at agencies and studios in the United States and Canada.

DG Systems provides digital delivery of commercials, new music singles and short-form programming along with associated traffic information and promotional support material.

For information on the DG Systems receiver or services, contact the company on the World Wide Web at www.dgsystems.com or at (415) 276-6600.

- Alan R. Peterson

Nano-Nano: Tiny New Alesis Reverb

by Alan R. Peterson

WASHINGTON A little over 10 years ago, Alesis gave the world the MidiVerb: a flat black plastic case with a few rubber membrane buttons and a whole bunch of reverb programs. It proved a good-sounding digital reverb did not have to cost $1,000.

Around 1989, Alesis introduced the Micro Series MicroVerb, which proved a good-sounding digital reverb could fit into a one-third rackspace.

Now, Alesis does it again with the NanoVerb, a high-quality digital effects processor slightly bigger than a cart and less than $180. I get the feeling Alesis could put a reverb into a watchcase if it really wanted to.

Alesis NanoVerb: Simple, but Sounds Super

The NanoVerb lets you select one from three each of Hall, Room or Plate reverb programs. Besides these nine reverbs, there are three Chorus settings, Flange, Delay, a Non-linear reverb and a Rotary Speaker emulator. Each effect is designed more suitably for music recording, but all are legitimate effects for radio production.

A rotary switch lets you pick an effect, and an Adjust pot alters reverb decay, delay time or flange speed, depending on the chosen effect.

A nice touch to the Rotary Speaker program: When the Adjust dial is varied, the effect does not change immediately but slowly shifts speeds. This is the same behavior you would expect from old Leslie speakers. The inertia of the rotating horns caused a ramping up or down to the desired speed.

Overall control

Other dials on the NanoVerb front panel are for Input and Output level and wet/dry Mix. Response is 20 Hz to 20 kHz, and the input can be anything from mic to line level. A green power light and a clip LED round out the front panel.

This is not a MIDI-controlled box. All adjustments made to the NanoVerb are done on the front panel, keeping things simple for the casual production person.

Inside the case, the circuit board is a mix of surface-mount and conventional components. All of the analog audio circuitry mounts on top, including the nice quiet TL084 chips, while the digital processing devices are surface-mounted on the reverse foil side.

The wall wart power supply provides the NanoVerb with 9 VAC. Rectification and filtering is done internally. A five-volt regulator and co-mounted electrolytic filter cap run quite warm to the touch, but the cap is rated to 105 degrees Celsius, so don't worry, be happy.

Alesis could put a reverb into a watchcase.

The Alesis NanoVerb sounds very bright and alive when a moderate amount of decay is dialed in. With the Adjust control way up, reverb density is as thick as gravy at a cheap diner and could begin to light the Clip LED. As any effect, creative restraint should be practiced.

There are compromises to the device. While the Flange sweep speed is controllable, it is permanently set for high-resonance mode. The Delay program is set to provide multiple echoes only, even though delay periods are variable.

The only effect you might have difficulty finding a use for is "Non-Linear," a simulated gated reverb. I have wrestled with this effect since it appeared on the old Yamaha SPX-90, and I still cannot find much of a vocal use for it. May you have better luck.

The NanoVerb is tiny enough to fit anywhere. In smaller backup production rooms — where that old '70s-era Gatesway 80 console ended up — the NanoVerb can occupy those last six inches of space next to the CD player and make voice tracks sound terrific. As for the price, the NanoVerb is a much better value than its 1989 granddad.

Alesis has already come out with the MicroVerb and NanoVerb. According to my table of scientific prefixes and multiples, should this trend continue, the next two reverb products will most likely be called the PicoVerb (one trillionth) and FemtoVerb (one quadrillionth). No matter what they call it, I joyously await whatever Alesis comes up with by then.

For information, contact Alesis Corporation at (310) 841-2272 or circle ***Reader Service 90.***

INTERNATIONAL UPDATE

PCMCIA Recorder From Europe

by Keith Spencer-Allen

LONDON When you come up against a product such as the Maycom Digicorder, it is easy to describe it as only a portable recording system. But, that is an oversimplification: It is far more than that.

The Digicorder is a product best described by application rather than function. It integrates practically everything a radio reporter would need to record, edit and transmit a story back to a base of operations. It is an excellent example of how digital techniques have shattered the traditional definitions of analog technological functions.

The concepts of broader use and increased efficiency must be considered when evaluating the Digicorder.

Versatile system

Exactly what the machine can do is determined by customer-selected options.

In its basic form, the Digicorder is a compact system that records mono or stereo mic/line signals onto a choice of PCMCIA-format removable media. These could be solid-state flash RAM cards or credit card-sized hard disks. The Digicorder uses ISO/MPEG Layer 2 data compression to increase recording time.

The recording can be edited internally, then output in mono or stereo. The addition of a modem and file-transfer software allows completed recordings to be transmitted via a standard telephone line to a suitably equipped PC at the studio or station.

Additional options could include an ISDN interface and software allowing for real-time ISDN transmission.

For the purposes of this review I used a standard Digicorder equipped with a power adapter, rechargeable battery (with charger) and an externally connected 28.8 kbps PCMCIA modem card. The recording medium was a PCMCIA hard disk.

The unit is stylish, robust in construction and capable of withstanding normal use. Much like the classic radio ENG cassette deck, the Digicorder is slung over the shoulder while in use. This way, the basic transport and record controls are easily accessible on the angled front panel above the large, backlit LCD display.

Functions

I/O connections are at the rear of the unit: XLR mic/line inputs, a second pair for Line Out, an ISDN jack, a 15-pin connector for optional AES/EBU digital I/O, a headphone jack, external power connector, switches for mic/line select and 12V mic powering.

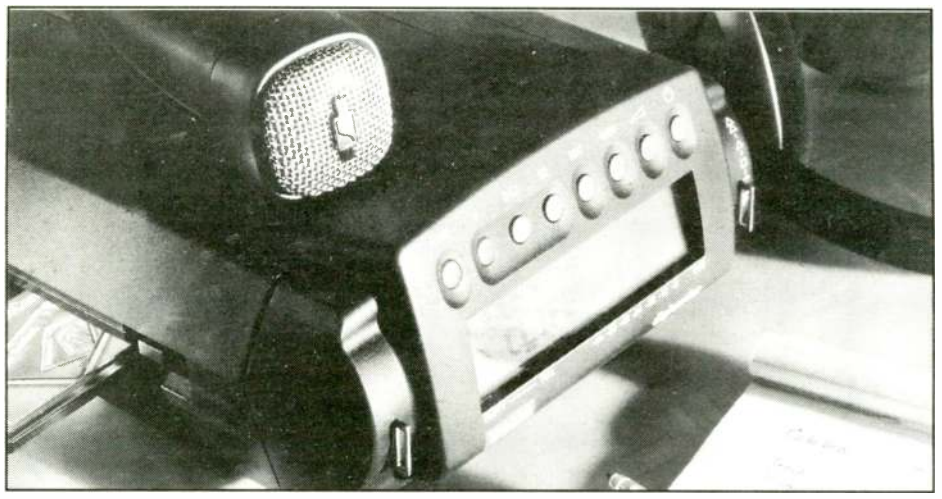
Operationally, the Digicorder is extremely simple. All the controls you are likely to need in the field are labeled clearly and are largely self-explanatory.

Initial power-up of a Digicorder takes 15 to 25 seconds, depending on the memory card inserted in it. The LCD screen identifies the recording medium, remaining record time, the track number and play time of that track.

To make a recording, press Record. The display changes to show elapsed record time and record level. On hitting Stop, you are asked if the recording should be saved.

Indicating "yes" on the Execute button saves the recording and assigns it a track number. It is now ready for playback or editing.

Accessing individual tracks or choosing a function from an on-screen menu (including Edit, Record Gain or Speaker Volume) is made by selecting the required button above the LCD screen and turning the inner jogwheel of the concentric-pair knobs to the side of the screen.



Maycom Digicorder

Simplicity

The spring-loaded outer jog control is used for shuttling through audio cuts during editing.

All important record functions that need to be readily at hand are on the front panel. Greater control requires use of the on-screen menus. The menus are three or four layers deep but are arranged simply.

A quick glance at the layout in the manual explains how the menu is structured, and I did not need to refer to it again for normal machine operations.

To keep things simple, the design lets you lock out some menu selections so that the user cannot access them in the field, but can do so in a supervisory position. This might include modem/ISDN functions, mono/stereo operation and the ISO/MPEG Layer 2 data compression.

Ten levels of Layer 2 compression are provided between 32 and 192 kilobits (kb) per channel. This selection significantly affects record time: the Digicorder manages 1,400 minutes at 32 kbps and around 230 minutes at 192 kbps.

The Digicorder also can record uncompressed linear audio in either WAV or AIFF format.

I used 64 kbps for most of the testing, which is a good compromise between audio quality and record time (in excess of 700 minutes). The Digicorder also supports 32, 44.1 and 48 kHz sampling rates.

Rugged

A recessed slot on the left side of the Digicorder houses two PCMCIA slots for the recording media. The evaluation machine was equipped with a 340MB PCMCIA hard disk card, although a range of other sizes is available.

PCMCIA flash RAM cards also can be used, but they are several times more expensive than the hard disk option. Unless you want almost absolute immunity against physical knocks, the hard disk seems the more sensible solution.

I used the Digicorder slung over the shoulder while walking, running up stairs and gently shaking it, none of which caused any problems with the hard disk. A heavy knock did cause a slight jump, but the disk is far more resilient than one might expect.

Throughout the tests I was achieving about 60 minutes of battery life from a fully charged NiCad battery, with plenty of advance on-screen warning of the battery's eventual discharge.

Editing functions are easy to use. The Digicorder allows compilation, insert, delete and copy functions. Editing audio in the back of a cab, airplane seat or a hotel room would seem fully available to the user. The only snag is the charge cycle of the battery.

Once editing is completed, the modem or ISDN option is selected, a physical connection is made and the required telephone/ISDN number is recalled from the Digicorder menu and automatically dialed.

With the connection back to the studio established, the file is transmitted automatically along with a security code identifying the sender.

Any interruption in the signal is identified at the studio end and instructions to resend the missing section are carried out automatically. Alternatively, on returning to the studio, the PCMCIA card can be removed from the Digicorder, plugged into the master PC and accessed directly.

In the two weeks I evaluated the Digicorder, I found it easy to use and extremely versatile. It performed faultlessly.

The recently added ability to handle live, real-time ISDN links extends its utility far beyond that of a simple portable editor/recorder. It is very much like a portable radio studio.

The Digicorder must be evaluated in the context of its wider abilities. It does not compete directly in cost with a simple analog or digital recorder; a more accurate comparison would be between the Digicorder and a small mobile studio, where the costs are totally different.

Viewed as part of a wider strategy, particularly in the newsgathering area, the Digicorder offers very exciting possibilities.

□□□

The author would like to thank Alfred Fox of Lumina, the U.K. agents for Maycom, for his help in arranging the telecommunications aspects of this Digicorder review.

Keith Spencer-Allen is a free-lance consultant, writer and recording engineer based near London and a frequent contributor to Radio World International.

For information from Maycom, contact Hein Schillings in the Netherlands at 011-31-481-377740; or circle ***Reader Service 80.***

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PRODUCT EVALUATION

Turn PC Into Processor: DSP-FX

by Bruce and Jenny Bartlett

ELKHART, Ind. So many great sounds in one package! What is it? The DSP-FX, a digital signal processor card and software you install in your Windows PC. The card becomes whatever signal processor the software tells it to be.

It is just like using a digital reverb or Harmonizer. But there is more.

Scenes on the screen

A group of controls and displays appear on screen. You can adjust the controls with your mouse to change the effects parameters.

For example, in the Reverb program you can change the reverb time, room size, and high-frequency absorption. The effect changes in real time as you adjust the knobs.

Why would you want to turn your computer into a signal processor, instead of using a dedicated unit? First, effects upgrades are cheap and easy because they are in software, not hardware. All you need do is put in a new disk to upgrade the effects or add new ones.

New effects are in development all the time and some can be downloaded from the Internet. The product has a longer life because of these software upgrades. And you get many more effects out of a single piece of hardware.

Then, adjusting parameters is much easier on a large computer screen than in a tiny LCD window. No more paging up and down to find what you want.

Having said that, there are some drawbacks. For example, you are tying up a computer. And it may be harder to have that computer within easy reach.

The good news is, you can run a sequencer program or hard disk recorder at the same time DSP-FX is running.

Minimum system requirements are a 386 PC and one 16-bit slot per card.

My review disk came with five main effect types, or "plug-ins."

They are reverb, multi-tap delay, chorus, analog tape flanging, and pitch shifting. Each type of effect has dozens of preset sounds, all of which you can edit and save.

The sound quality of the effects is excellent. Part of the reason is the 32-bit floating-point processor. It adjusts the signal headroom to match the incoming signal levels, so all 32 bits are used at all times. Consequently, the dynamic range is an amazing 1,535 dB.

The on-screen display is called the Visual Pro Audio Display. It is similar for each plug-in. On-screen knobs and faders can be controlled by mouse, MIDI fader system, or an optional DSP-FX controller.

Also on-screen is a display of colorful circles, rectangles or boxes that are a visual analogy of the effect. They are well thought out. The color, size and position of the display elements correspond to the sound of the effect. As you change parameters, the circles and boxes change position, size or color.

continued on page 23 ▶

Express Software

▶ continued from page 17

features. As I thought about it, I realized I really do not use EQ or AutoMix very often when mixing four-track stereo anyway.

If you are going to need those features, Spectral offers the big brother to Express, "Producer."

Building the system

You will need a 486-66 or better PC-compatible computer (Pentium is recommended), 16MB RAM, 30MB program space on local hard drive, Windows 3.1 with DOS 5.0 or better or Windows 95. A graphics accelerator card is also a good idea.

Speaking of cards, you will need the Prisma card, which requires a full-length 16-bit ISA slot. It goes for less than $3,000. You will also need one of the Spectral AD/DA converters, with models offering various features starting at just over $1,000.

Of course, let us not forget the new Express for Prisma software itself, which sells for a very reasonable $395.

I am impressed with the way Spectral designed its new software, to work with the same hardware for an easy upgrade path.

You can simply step up to the more sophisticated Producer or Prismatica software, or up still further with the very high-end Studio Tracks XP software. They all recognize your work files, making switching from one Prisma application to another a breeze.

After playing around with Express for 30 minutes, I felt comfortable enough to start working with it on a radio spot. I finished it fast and on the first try. Let me tell you, that is exactly what we need to keep up with a rapidly expanding facility, increasing production demands and additional employee training sessions.

Express for Prisma came along at just the right time to make our jobs a little easier and a lot faster.

□□□

Dave Green is director of production services for Paxson Communications of Orlando. He can be reached at (407) 661-1100.

DIGITAL DOMAIN

Getting 'Intelligent' With Macs

by Mel Lambert

LOS ANGELES Every now and again, I like to turn my reflective gaze upon a powerful item of add-on software which, in terms of usefulness, just makes you want to slap your forehead and mutter that immortal line: "Now, why didn't somebody think of that before!"

One of the items is from a company that I have mentioned before in these pages. I have since discovered this manufacturer also produces some extremely elegant forensic software that is being used routinely by certain government agencies to clean up otherwise totally unintelligible audio recordings.

I could tell you more, but you might not hear from me again for a while.

Getting smart

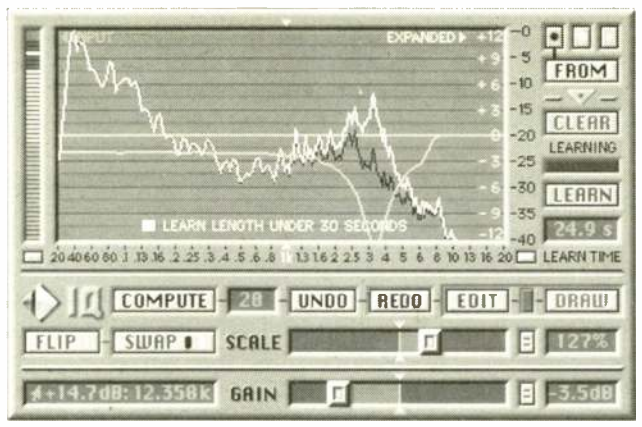
Intelligent Device aptly named the IQ Intelligent Equalizer. It "learns" and automatically alters the spectrum of any signal to match any other signal or template.

One useful application might be to teach the system the overall transfer function of a favorite announcer microphone using pink noise. The software can then adjust frequency response automatically as age and atmospheric pollution take their toll on sensitive microphone parts.

Or perhaps you want to recreate or mimic the sound of a particular studio or voice-over booth with which you are familiar. Simply have the software learn the overall frequency vs. amplitude response and then replicate it later.

It would also be possible to match the overall spectrum of a station promo or ID to that of a reference mix or even a commercial CD. Imagine a music jingle your production department creates in-house that could be made to sound more like a Top-40 mix.

IQ is designed as a standalone program that uses the DSP power of a standard TDM (time division multiplexing) card plugged into an Apple Macintosh PC. It analyzes the sonic spectrum of any mono or stereo track, and then constructs a complex FIR (finite impulse response) digital filter that matches the spectrum of the new material to the original.



Two operation modes are available: Intelligent or Manual. Intelligent Mode involves a simple, three-step process. First, IQ needs to be "educated."

For this, use a vocal sound you want to match, a CD music track or a model from your station IQ Library.

Having learned the desired spectrum of the reference audio and then the spectrum of the material to be corrected, the software proceeds to design a true mono or stereo FIR curve-fit algorithm that runs as a real-time TDM plug-in. This can be inserted anywhere in the Digidesign Pro Tools audio path.

According to system designer Edmund Pirelli, "No matter how complex the filter curve may be, IQ does not introduce any phase shift nor ringing; no mush or boominess, no transient slur, no brittle high-end. In fact, if the reference model is tighter than the tracks being processed, your new tracks should actually tighten up accordingly."

In Manual mode, the user can hand-draw any imaginable complex IQ curve, or use the alternate graphic equalizer interface. A library utility allows reference templates and manual correction filters to be stored and later recalled.

The other item of processing power that has attracted my attention is an updated version of the Waves C1 Compressor/Gate.

This is a dynamic processor capable of frequency selective compression, expansion and gating.

The C1 is also a software plug-in for Digidesign Sound Designer or Digidesign TDM/SD II systems, as well as other native applications.

In addition to classic wideband and side-chain modes, C1 features a band-split configuration.

A setup library is also provided with more than 80 presets that perform two simultaneous, independent processes. These can be de-essing and gating, compression and frequency specific enhancement or de-hiss and EQ.

One feature unique to Waves plug-ins is component assignment. A clever bit of DSP resource management splits the processing functionality so that more than one plug-in or its components can share the same circuitry.

For example, the C1 consists of four different modules: Compressor, Gate, SideChain filter and IDR (Increased Digital Resolution, an audio dithering algorithm).

Version 2.1 enables five different combinations of these modules in either stereo or mono.

Creating an image

From the same firm, the new PS22 StereoMaker plug-in creates a stereo image from mono sources and also enhances the spread of stereo signals. PS22 is said to avoid problems common with previous enhancement processes, in that it has virtually no unpleasant "phasiness," low coloration, high tonal accuracy and good mono compatibility.

And, unlike conventional systems, PS22 works not just on mono but also on stereo inputs. A graphical display shows image position as a function of frequency. Ingenuity personified.

More information is available from: Intelligent Devices, 7 Hickory Ridge, Baltimore, MD 21228; telephone: (410) 744-3044; and e-mail at intdevices@aol.com

Waves is at 6716 Central Ave, Suite 8, Knoxville, TN 37912; telephone: (423) 689-5395; and e-mail waves@waves.com

□□□

Mel Lambert has been involved in production and broadcast on both sides of the Atlantic for 20 years. He is principal of Media&Marketing in Los Angeles, a consulting service for the professional audio industry. Reach him via mediapr@earthlink.net or (818) 753-9510.

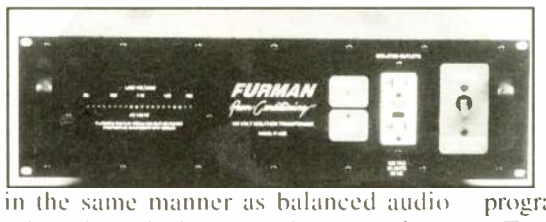
PRODUCT GUIDE

Companies with new product announcements for Studio Sessions Product Guide should send them to Radio World, c/o Studio Sessions Editor, P.O. Box 1214, Falls Church, Va. 22041

Furman Balanced Power

Furman Sound introduces the IT-1220 Balanced Power Isolation Transformer.

The IT-1220 can provide 20 A of 120/60V single-phase balanced AC power to radio studios, production rooms and editing suites. It reduces hum and noise



in the same manner as balanced audio cables, by reducing ground currents from power supply filtering and by radiation from supply cables into sensitive signal sources such as microphones.

Balanced power for technical power applications is recognized in the 1996 National Electrical Code, Article 530, and the Furman IT-1220 conforms to those specifications.

Additional features include a self-checking AC voltmeter, extreme voltage shutdown circuit and a soft-start circuit preventing large inrush surge currents.

For more information, contact Furman Sound at (415) 927-1225 or circle ***Reader Service 121.***

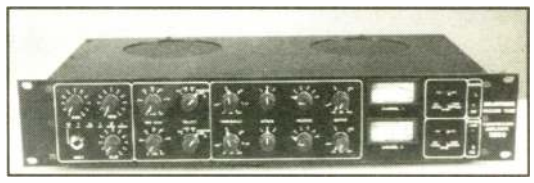
Drawmer Compressor

Drawmer Distribution has the 1960 Vacuum Tube Compressor, a two-channel soft-knee compressor/amplifier for professional use.

The 1960 accommodates line or mic level signals and provides 48V phantom power for condenser microphones. Compression threshold is continuously variable between infinity and -24 dB.

There are three attack speeds and six release rates; the latter consists of four fixed release times and two program-dependent rates.

Two VU meters are provided, switch-



able between displaying gain reduction or output level.

The two channels can be used independently or stereo-linked. A sidechain feature allows connection of additional devices such as EQs.

For more information, contact Drawmer's U.S. distributor QMI at (508) 429-6881, or circle ***Reader Service 233.***

Sounds and Circles

▶ continued from page 21

Gary Garritan, a record producer and artist near Seattle, says that the DSP-FX is "a fantastic piece of gear." He used it in his latest recording. He was using a Lexicon PCM70, but preferred the DSP-FX.

"The sound is every bit as good or better," Garritan said, "and there's a great degree of control. To graphically see what you're doing is very beneficial."

Garritan does a lot of orchestration, and he likes how the display helps him place instruments front-to-back in a mix.

Another satisfied user is David Gleason, a Bay area engineer who has worked with Boyz II Men, Mariah Carey, and Kenny G.

DSP-FX does give an extraordinary amount of control. In the multitap delay, for example, you can adjust the level of each successive echo with individual faders. Other parameters are delay, feedback, dry/wet ratio and panning.

Reverb parameters include room size, room liveliness, stereo spread and high-frequency absorption. In the chorus effect, there are tweaks for the delay, depth, modulation frequency and panning. Many effects bounce around in stereo.

You can automate events with a PC MIDI sequencer or with an external sequencer (even one running on a Mac).

In use

At first, the unit I tested was slightly noisy, about 6 dB more noise than an Alesis MidiVerb III. The DSP-FX picked up a quiet, high-pitched whine from adjacent computer cards. When I removed them, the whine stopped and the noise level matched that of a MidiVerb III.

Note: the DSP-FX that I tested is the entry-level model with unbalanced I/O phone jacks. A quieter version is the DSP-FX AES/EBU Converter with balanced XLRs.

I found the DSP-FX easy to install and use. The software installed in a few minutes with no address or IRQ conflicts. The presets are well-named and useful. Some examples are "Cathedral," "Rock arena," "Classic flange," "Leslie," "Big tom tom," and "Guitar — Classic '70s Metal Lead."

There are tons of presets, so you should have no problem finding a suitable effect for your mix.

Also, you can adjust the parameters of each preset. Customize it to your taste, then save your custom preset.

The pitch-shift presets are especially cool. "Smear" actually smears the sound in a way that is hard to describe. "Magic" adds an arpeggio of funny notes. You can create three-part harmony, shift pitch up to an octave (up or down), or make a Darth Vader voice.

Some other settings in the software include sampling frequency, number of delays, MIDI channel, MIDI device, mono/stereo and output level.

Besides its practical use in the studio, I think the DSP-FX is an excellent learning tool. You can train yourself what each parameter sounds like in great detail, because there are readouts of delay time and so forth.

You might use dedicated processors for most of your mixdown work, but employ the DSP-FX when you need to get exactly the right effect sound. It can be a special tool for creating custom effects. Or use it as your main effect for its quality sound.

In sum, the DSP-FX is a well-executed package that offers many advantages over conventional effects boxes. Future plans for the company include conversion into a sound card for hard-disk recording.

The basic system — including the DSP card and one effect plug-in — lists for $799. The Studio System with five types of effects is priced at $1,299. Individual FX plug-ins cost $199. Also available are digital I/O and a MIDI controller.

Power Technology is at 100 Northill Dr., Bldg. #24, Brisbane, CA 94005.

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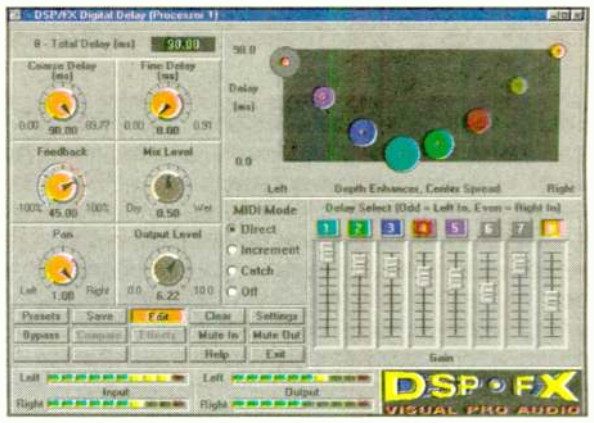
Bruce Bartlett is a mic engineer, writer and recording engineer, and the author of "Practical Recording Techniques" published by Howard Sams. Jenny Bartlett is a technical writer. Bruce can be reached at (219) 294-8388.



The DSP-FX Delay Plug-in in Action

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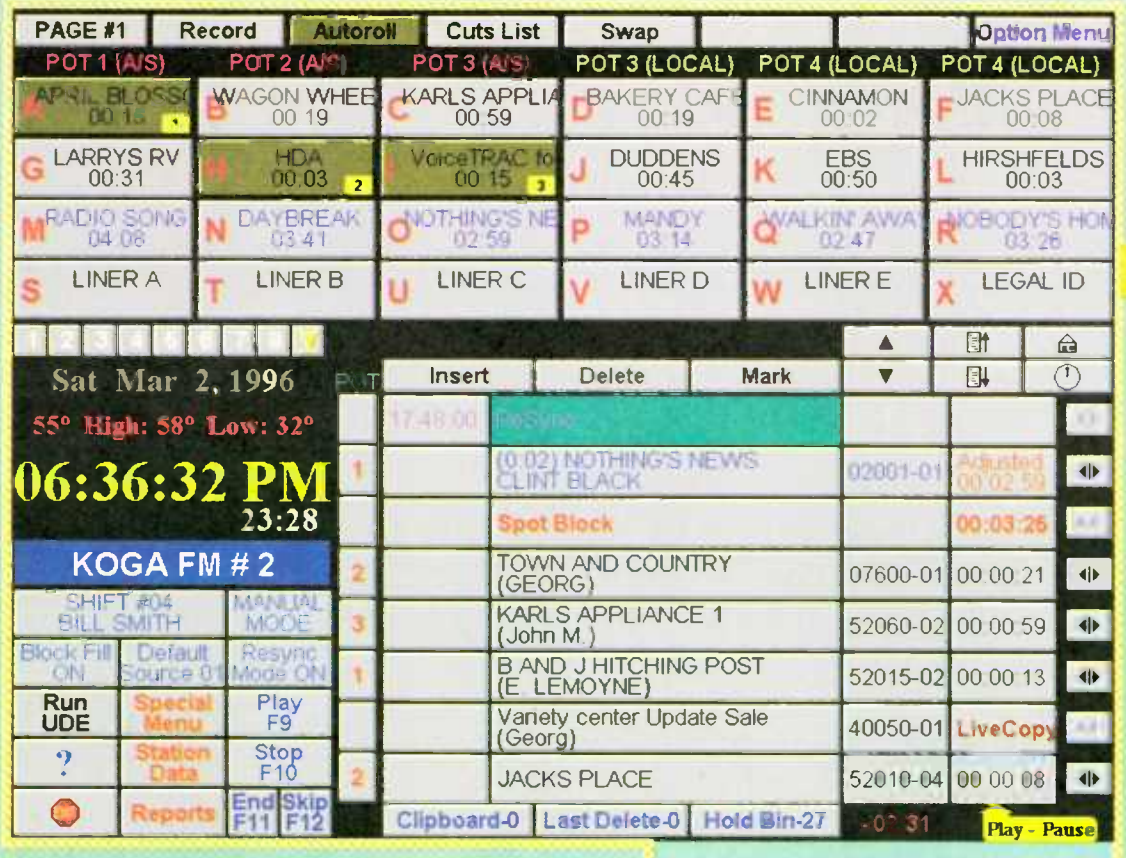

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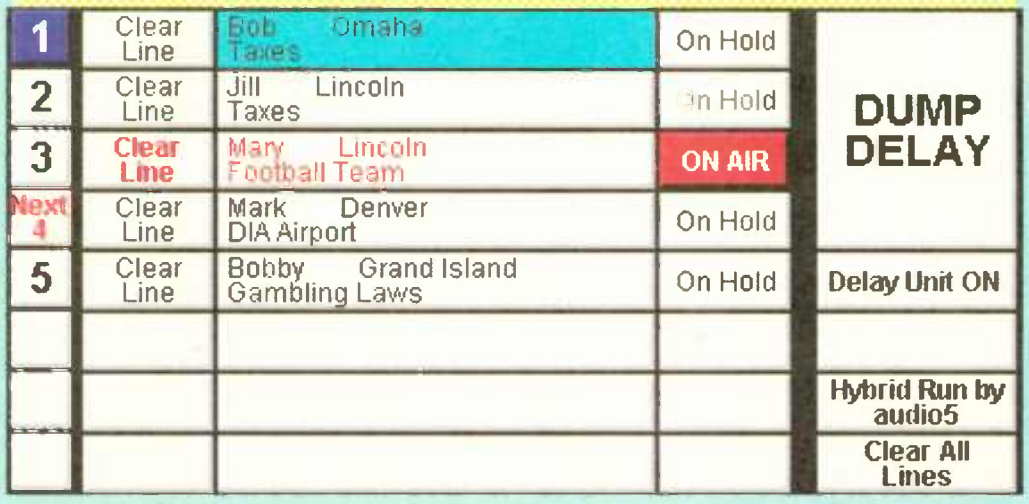

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"Somewhere in Time" See Page 30.

Stations Cope with Hurricanes

by Brian Holmes

WILMINGTON, N.C. Just about any area of the country is susceptible to major disasters, including earthquakes, ice storms or tornadoes. Radio can play a major part in preparing for such disasters and, perhaps as important, act as the voice of the community after the disaster.

Coastal North Carolina was hit by three major storms in the opening months of the 1996 Atlantic storm season: Tropical Storm Arthur, Hurricane Bertha and Hurricane Fran. Radio managers in this area know the meaning of the saying, "When you think the worst can't happen, it does."

Hurricane Fran brought down the 360-foot tower of WBLA(AM)-WGQR (FM) in Elizabethtown last month. Part of the tower collapsed on top of the building; another gouged a two-foot hole in the ground. Three staffers in the building that night were unhurt.

Fran Damage at WBLA(AM)-WGQR(FM)

General Manager Lee Hauser said WGQR is operating on a temporary tower, using a two-bay ERI antenna, with approximately 80 percent coverage. WBLA was expected to be off the air until erection of a new tower would allow both stations to resume normal operations, which he hoped would take place by Nov. 1.

Stay on the air

How can stations prepare for such events?

Dennis Deason, vice president and general manager of AOR-formatted WSFM(FM) and country WKXB(FM) in Wilmington, said keeping your station on the air during a disaster is the ultimate public service a station can perform. He said if you cannot serve your listeners, they will find another station that will.

"Once you go off the air, people start searching. When you're lying on the floor in the hall of your home and the windows are shaking and the house is roaring, you want to know what's going on. If you go off the air, they're going to go down that dial looking for the next person that's on the air. That's why you don't want to miss a beat," Deason said.

"You become the communicator for 300,000 people," said Hannah Dawson Gage, general manager of Wilmington ratings leaders, AC-formatted WGNI(FM) and urban WMNX(FM). After three storms just this year, both Gage and Deason have plenty of

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Texas Station Plays All Beatles

by Alan Haber

DALLAS It's a good day, sunshine, especially for all the lonely people who are lonely no more: Fab 105FM is "gear," as they used to say back in the Sixties, and on the air in Dallas/Ft. Worth.

In the song "Tomorrow Never Knows," John Lennon sang "Turn off your mind, relax and float downstream," which turns out to be pretty good advice for getting the maximum "dig" factor out of the all-Beatles radio station.

The lads, the covers

The formerly dark KTCY(FM) came on the air at 8:55 p.m. on Aug. 10 with "Here Comes the Sun." Running on two 9GB hard drives, the station is beaming 25 kW worth of Beatles, Beatles, Beatles. Owner Tony Rodriguez complements his over-the-air signal with a cyber-signal that hits the Internets World Wide Web at *http://www.planetcasters.com*

Fab 105 is advertiser-free, at least at present; the station currently airs only public service announcements for the environmental organization Friends of the Earth. The station will start including advertising "at some point," says Rodriguez.

A whole lot of Beatles music can be heard on Fab 105 including the full range of the Beatles and solo Beatles catalogues. Rodriguez, who programs the station, also airs

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Broadcast Basics: An RW Primer

Part I

by Ed Montgomery

This is the first installment in a multi-part series intended "to make the new generation of FM broadcast station managers aware of the equipment for which they are responsible and to help them periodically review how the equipment is operating." You can receive continuing education credit from Northern Virginia Community College for completing this course; all information will be published in RW. Complete the registration form shown and return it to NVCC by December 1.

ALEXANDRIA, Va. The past 25 years have seen drastic changes in the technical operation of FM broadcast facilities. Today's plant may operate totally unattended or partially automated through the day. Often, it operates in the background — until dead air occurs. Panic ensues, as managers call on anyone who has the smallest vestige of knowledge about the facility. The staff on duty in today's broadcast facility must know something about how the audio and radio transmission system operates.

This new responsibility emerges from the deregulation of the broadcast community. Now, one owner can own several broadcast properties within the same market or nearby markets. The archetypal chief engineer, employed at every broadcasting station, is no longer necessary. Transmitters are reliable, rarely drifting off-frequency or causing adjacent channel or harmonic interference through overmodulation.

Most of the time, a transmitter will run unattended with no problems. However, a member of the management team should visit the transmitter site, observe the studio-transmitter link and inspect the audio chain periodically. This type of inspection is invaluable to the engineer when a problem does occur. Inspection often reveals problems before they become a serious threat to station operation.

Telephone conversations with the engineer or the company contracted to perform the maintenance are far more informative if the station personnel know something about the air chain. In some cases, the engineer can determine whether the problem can be solved locally, or whether the defect must be repaired by the equipment manufacturer. Informative phone conversations can also help the staff determine whether the FCC must be notified.

Managers and staff also should know the limitations of the broadcast system in use. Frequency Modulation (FM) is not, and never was, a panacea for broadcasting. It did reduce noise in radio transmission and was an early, successful experiment with noise reduction, but it is not perfect.

FM operates in the Very High Frequency (VHF) portion of the spectrum. These frequencies have a wavelength of about nine feet. We know that AM radio, in the medium wave spectrum, is affected by large structures like bridges, buildings and tall electrical transmission lines. VHF can be affected by much smaller objects.

In fact, you can walk across a room and cancel the radio signal going into an FM receiver. In an automobile, cancellation can occur when another vehicle passes or when you pass an object that is a length equal or related to the wavelength of the radio wave. The signal bouncing off these objects may arrive at the receiving antenna out-of-phase with the signal arriving directly from the transmitter, causing signal loss. This is known as multi-path interference.

The type of broadcast antenna, the location of the transmitter and the type of terrain can affect broadcast coverage. The Effective Radiated Power (ERP) of a station results from antenna system design, antenna height and transmitter power. The combination of these elements can determine how well a broadcast facility covers its assigned community. An owner should understand the process of selecting the best transmitter site. He or she should also understand the responsibilities incumbent upon a tower owner or antenna space leaser.

FM technology permits the transmission of sub-carriers or alternate channels of information that a station can use to generate extra revenue. Subsidiary Communications Authorization (SCA) allows the transmission of music, voice or data. FM managers should understand how the use of SCA affects their broadcast signal. Potential leasers may approach the station with a request to use its SCA channels; the station management may wish to solicit such leasers.

The current climate for broadcasting is one of opportunity and personal responsibility. Management teams have more freedom to experiment with formats and transmission systems than in the past. They should have a working knowledge of how the FM broadcast system operates.

This series will not convert the reader into an engineer instantly, or turn managers, sales people, receptionists or anyone else on the premises into engineers when problems develop.

It does not eliminate the need for an engineer who keeps your equipment operating as manufacturers intended it to. The purpose of these articles is to make the new generation of broadcast station managers aware of the equipment for which they are responsible and to help them periodically review how the equipment is operating.

Managers who are educated in the purpose of the equipment and possible changes in operating parameters can more quickly contact the company or individual responsible for the technical operation and communicate any problems to them.

This allows the technical staff to take preventive or corrective measures before the station is obliged to operate in monophonic transmission, run at low power or shut down.

If you wish to receive continuing education credit from Northern Virginia Community College for taking this class, please note that all information for this course (BCST502.01N) will be published in this series in **RW**. Northern Virginia Community College will not have back issues or any other information regarding this course. **RW** cannot provide back issues.

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3.						
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You can contact me for assistance at:
Ed Montgomery, Lab Director
Thomas Jefferson High School
for Science and Technology
6560 Braddock Road
Alexandria, VA 22312

I am available on e-mail at: emontgom@lan.tjhsst.edu

Class registration should be completed by Dec. 1.

□□□

Ed Montgomery is lab director at Thomas Jefferson High School for Science and Technology in Alexandria, Va. and a part-time radio engineer. He has also taught college-level broadcast engineering technology and written educational columns for RW.

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.

Let Your Internet Fans Hear You

by Alan Haber

ALEXANDRIA, Va. You say you want a revolution? Well, you've got one in the making up here where monthly access runs about 20 bucks, and there's not a whole lot you can do about it. In our little alcove of cyberdom we like to call Haberspace, broadcasting on the Internet is a reality, and it's here to stay. If your station hasn't already begun shooting its signal out into cyberspace, it will. It's inevitable, really.

Here at the ever-busy, ever on the cutting-edge, ever happy to spread the cyber-word global Haberspace headquarters, we're asking the musical cyber-question, "How easy will it be for listeners around the world to hear your station?"

The musical answer, courtesy of Bill Haley and the Comets, is a resounding "Pretty easy, actually!" The whole shebang starts with your station, however: You have to decide whether you're going to send your programming out to listeners via RealAudio at *http://www.realaudio.com* or StreamWorks at *http://www.streamworks.com*, the two major audio players on the Internet. Once you've made that decision, you can really get cooking, and so can your listeners.

Several things

So, let's get cooking. Got your spatulas and spice rack ready? Howzabout a nice, cool beverage? Okeydokey. I think I'm going to dispense with the usual station stuff this time around, and get real deep-like into this broadcasting on the Internet thing. Hey, it's just about my fave subject going!

Alright, now ... let's get serious. You'll need to think about several things once you've committed to broadcasting on the Internet.

Most importantly, you must let your listeners know you're beaming your signal into cyberspace. Do this in your print advertising, in on-the-air spots, and on the World Wide Web through the various search sites like Yahoo *(http://www.yahoo.com)* and AltaVista *(http://www.altavista.digital.com)*.

Get your station's cyber-home, and a blurb about its live Internet broadcasts, listed on every apropos site on the Web you can find. Make sure your live broadcasts are linked from RealAudio or StreamWorks' site, depending, of course, on which one you use (Timecast, the RealAudio guide at *http://www.timecast.com* is, by the way, an especially good place from which Web surfers can link to live radio broadcasts). Be sure to hit Internet newsgroups, too, the types that cover the kinds of music your station plays, or, if your station is news or news/talk, the kinds of topics discussed on the air.

Make it easy for your listeners to hear you on the Web by giving them a head start on getting the necessary player software. Simply place a link on your station's home page to the RealAudio or StreamWorks site, so your listeners don't have to hunt around to download their players.

You might even make setup instructions for the appropriate player available to listeners in your station's listener-targeted

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PROMO POWER

Is Your Client a Friend or Foe?

by Mark Lapidus

WASHINGTON Pushy. Cheap. Cold. Selfish.

If you made comments like this about any ethnic or religious group, you would be facing legal charges. Yet, I have heard many programmers and sales people use these adjectives openly to describe clients. Too many stations have adversarial relationships with the very people who hold the key to their success. With keen competition from other media and condensed account lists because of multiple station ownership, this is the time to challenge the notion of the client as the bad guy.

Clients are perceived poorly by radio people for the same reasons you may be treated unkindly when you are a customer for any given product. A client is simply a customer who wants to get his or her way. Universally, customers want the best possible product, the greatest value and service with a smile! Realizing that there is absolutely nothing wrong with this attitude is the first step toward admitting that clients are no different than you or me. They are just misunderstood customers.

I'll bet that right now a guy in a flashy suit is trying to close a local dealer on a remote that won't work.

How can stations better deal with clients who want their way? Stations must have an annual program and marketing plan that is flexible, yet driven by programming. If program directors and promotion directors don't drive the bus, a sales department has no choice but to get behind the wheel.

For example: Joe's Auto Parts has $20,000 for the first quarter and "wants a big promotion." They are not sure what they want, but they want something. Herb, your top sales guy, tells this story to the general sales manager. She goes to the program director. He goes to the promotion director. In 10 minutes they dream up something that they think Joe's Auto Parts might like.

The program director is mad because this is going to add more clutter to his station. The promotion director hopes it will never happen because he knows it was not the best of ideas. The sales manager and the sales guy pray it *will* happen because they need the billing, but they are not going to be happy with the client if he rejects the concept or wants to "waste" more of their time on the details.

Instead, the station should have many carefully planned promotional activities and program sponsorships for sale. Sure, the client may not buy these planned promotions because none may strike his fancy, but at least you will know right away. If you cannot adjust one of your pre-set promotions, the sales department has the responsibility to find another client. Rather than allow Joe's Auto Parts to set your agenda, sometimes you should just let the business walk. This is a tough call for any general manager, but it is also another starting point in painting the client as something other than an evil manipulator of programming.

What about value? Sure, clients want a great bargain, but not at any cost. The fact that another station in your market has no rate integrity doesn't mean you have to lose or blame the client. Always remember: clients are concerned about more than just the cost-per-point or cost-per-spot. They want good placement in the correct dayparts. They want assurance that spots will not be bumped. They want service with a smile.

But most of all, they want results. If a schedule doesn't work, it doesn't matter how inexpensive the spots are. Taking business that you know is not appropriate is short-sighted, especially in small and medium markets, where unkind words spread like fire.

For example, a female-targeted, 25-49 soft AC has no business trying to sell motorcycles. You may laugh, but I'll bet that right now a guy in a flashy suit is trying to close a local dealer on a remote that won't work. If you are dealing with a large weekly bump list, something is wrong with your daily reports and grid structure. Also, that last 15 percent of your inventory is worth a lot more than your ordinary rate!

Another question worth 10 minutes during a sales meeting: Do your salespeople know what frequency makes a decent schedule on your station?

Service with a smile! We are fortunate in our business that we have time to build a solid relationship with a client. Retailers have tremendous difficulty doing this because they see their customers infrequently. Salespeople are typically taught how to get appointments, how to overcome objections, how to do presentations of ratings or competitive information and how to close a sale. Not much time is spent on how to develop a relationship. This is odd, because a relationship helps you get on business and keeps you there even when the rating chips are down.

Simply put: relationships must be built slowly. The first step is trust, which you can build by sharing common interests. The second step is personal knowledge of a person's circumstances, like position and family. The third step comes when your client accepts you as an authority on your subject (advertising). The fourth step doesn't have to happen in successful business transactions, but it sure is wonderful when the relationship blossoms

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OFFBEAT RADIO

'Somewhere in Time' Bridges Years

by Dee McVicker

DETROIT Music divides generations. The young and their elders have been at odds over what's rhythm, what's not, and how loud it should be, no doubt since humans began rapping on log drums.

A syndicated nostalgia show out of a high school station in Detroit is a notable exception. "Somewhere In Time" revisits the airwaves of yesteryear with Big Band music and old-time commercials, but it also has an appeal that transcends age.

With support staff and talent ranging in age from 14 to 95, the show has more than just violins and remember-whens.

Tom Wilson and Sarah Swanson are hosts of 'Somewhere in Time.'

Father to daughter

Consider the host and co-host of "Somewhere In Time," broadcast on WDTR weekdays at 7 a.m. and Thursdays at 12:30 p.m.

Tom Wilson, a 66-year-old estate planning attorney, was an all-night platter pusher in the Detroit market in the prime of the Big Band era. He fondly remembers ribbon mics, 78 rpm turntables and what was on the turntable at the time: Spike Jones, the Mills Brothers, Artie Shaw, Benny Goodman. Three years ago he returned to the airwaves to host "Somewhere In Time" with co-host Sarah Swanson, whom he calls the "gee whiz" girl.

Swanson, 20, is a student at the University of Michigan, Dearborn. Although she is often wide-eyed at the stories about old-time radio (hence Wilson's nickname for her), she is not a broadcast novice. She is a communications major with high school broadcast experience. Her repertoire includes digital workstations, lapel mics and music with a good bit of its own swing.

Not surprisingly, the hosts engage in a lot of generational ribbing. "People think of it as a father or grandfather talking to his daughter," said Wilson.

The shows are unscripted and spontaneous. They typically open with a guess-who question about a band, singer or era and include music and commercials from the '40s and '50s and other sound bites of the time. Listeners hear the likes of Tommy Dorsey, Duke Ellington, Shep Fields, Garry Moore and Durwood Kirby. On Thursdays, the show features pipe organ music.

Some of the music is from Wilson's private library of 33-1/3 records and digitally re-mastered compact discs. Others come from public domain or from old-time recordings. At last count, the show had over 1,000 old-time commercials.

"We even play a cigarette commercial every once in a while, explaining of course that it is for educational purposes," said Wilson.

Noted personalities and guests take part on occasion. Richard E. Osgood, a 95-year-old radio veteran known in these parts as the dean of Detroit radio, talks about the people of his radio days. He started in 1935 at WXYZ in Detroit, and can recall many insightful conversations with the Lone Ranger and the Green Hornet.

Jack the Bellboy spins a few tales and records on the show. Now 85, he was the top DJ in the city in the late '40s and '50s. He quit radio when his employer required him to play Elvis Presley. Local celebrity Bill Kennedy, 88, telecommutes from Florida as the show's movie commentator, a tradition started 27 years ago. Quick-wit B. Franklin Steiner, also 88, furnishes great quotes to close each "Somewhere In Time" show. One of his most famous: Eat, drink and re-marry.

The show, now syndicated to 40 public stations, is intended to be educational as well as entertaining. For example, the show recently focused on George Gershwin and his Rhapsody in Blue, which many consider the transition between classical and American popular music.

The usual banter between host and co-host threaded through the Gershwin show. Ad-libbing, Swanson named a litany of Gershwin characteristics, including his 15-cigar-a-day habit and his penchant for ice cream (a quart a day). Swanson related that Gershwin would stick his head in a special machine about the size of a refrigerator, apparently to promote hair growth. Noting a similar balding condition on Wilson's head, she suggested this might be something for him to try.

Fox trot to hip-hop

The duo often takes to the road to visit retirement and convalescent homes. He goes as he is; she wears a poodle skirt and saddle shoes. Usually they start by dancing the fox trot; then, in what Wilson describes to the crowd as today's music, Swanson breaks into hip-hop dancing, "an athletic event" compared to the tamer dancing of his era, Wilson points out.

Swanson will "inject a youthful, inquisitive question that a person my age wouldn't think of. It's a fresh voice," Wilson said.

Swanson admits she doesn't listen to Big Band music at home, but she is developing a taste for it. "I like that the music is upbeat, and it doesn't make you think of all the bad things that are happening in the world," she said.

□□□

Dee McVicker is a free-lance writer and regular contributor to ***RW****. Reach her at (602) 545-7363 or roots@primenet.com*

Hurricane Lessons

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experience handling these situations.

Deason said planning in advance is critical. What stations must prevent is loss of power.

"A generator is something you obviously need. You may only use it once but that one time could be the difference in serving the public," Deason said. Loss of power brings loss of air conditioning, loss of elevator service, and in some buildings loss of water pressure.

Both managers have hurricane plans for their stations, including instructions for announcers to help prepare listeners for the storm, and instructions on how the station itself should prepare.

Emergency checklist

An emergency supplies checklist for the station includes not only bottled water, first aid kit and flashlights, but also extra copy and fax paper, extra cellular phones, blankets, sleeping bags, petty cash, and station vehicles filled with gas. Also, no radio station in a storm zone should be caught without a battery-operated radio.

Other lists within the plan include contact names and numbers of emergency management, police and fire personnel for each city and county within the coverage area, and lists of shelters that are available to residents. Station managers and news directors should develop a relationship with government emergency personnel ahead of time. That resource will come in handy when the storm is bearing down and you and your listeners need reliable information quickly.

Experienced managers create a list of employees who would be needed at the station. Stations might arrange to have on hand at least two announcers per station, one of which should be the the news director, as well as the general manager and at least one other person for on-air assistance and two people to answer business lines. Gage assigns the staffing of business lines to her sales people.

Deason's regular announcers stayed on the air during Bertha. For Fran, management sent them home.

"We like to send them home early enough so as not to cause any more problems. We wanted them home safe with their families and not at risk." At that point, Deason and News Director Jim Whitmeyer handled coverage of the storm themselves.

Time to drop format?

Both managers agree that a time comes at which a music station must decide whether to drop its regular format. Gage said her stations essentially change format to all-news once winds in the area approach 55 m.p.h. They didn't return to music until four days after Fran hit.

Stations must also decide if and when to stop airing commercials.

"We kept running spots until the worst of the storm hit ... more to give the announcers time to regroup than anything else," Gage said. Deason dropped commercials when he dropped music.

WGNI and WMNX are housed in a two-story brick building which Gage said is very safe and has weathered each storm with no problem. In fact, she said a lot of her staff's families waited out the storm at the stations.

WSFM and WKXB are housed in a bank building but plans are underway for a radio-only facility. Deason recommends low-profile brick buildings with no peaks, gables or severely pitched roofs: "It may not be the most attractive building but it'll be the most practical."

Fran caused Deason's stations to evacuate the seventh floor studios and go to Plan B, which was thought out well before the storm. The New Hanover County courthouse, three blocks down the street, housed a media center for television, newspaper and radio where Deason had set up a Marti unit in advance. This allowed them to broadcast from there.

"Something that radio and television stations should want to do is get with your emergency management director and say, 'What is your procedure, how do you handle getting information to the media and do you have a media center there,'" said Deason.

Tom Ditt, North Carolina Public Information Officer for the Division of Emergency Management and state EAS coordinator, said in the past four years, his state has seen four hurricanes, four major ice storms, two flash floods and one large tornado outbreak.

> **'You were there when your listeners needed you the most.'**

"This is when radio is at its best, but start planning before a disaster because it will happen."

"Listeners all told us that it was just calming, hearing a familiar voice on the radio," said Deason. "This kind of coverage leaves a lasting impression, more than any promotion or money giveaway. You were there when your listeners needed you the most."

In the next issue of **RW**, station managers discuss the equipment needed before, during and after hurricanes.

□□□

Brian Holmes is the evening air personality for oldies WSRZ(FM) and operations manager of all-news WSPB(AM) in Sarasota, Fla. He is also an anchor for Metro Traffic-Tampa and a radio columnist for Music Forum Magazine in Tampa. Reach him at (941)388-3936 or via e-mail at Raydiodude@aol.com

Put Yourself on the Web

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newsletters and magazines, and/or make setup a topic of discussion on one of your public affairs programs that deals with the Internet (if you don't already have one, that is, and if you don't, why not?).

Keeping in mind that tons of RealAudio and StreamWorks players are in use today (downloads of RealAudio's basic player and StreamWorks' 2.0 player are free), it would be surprising to find a radio listener who is tuned into the Internet who doesn't already have one of them. Microsoft's brand-new Internet Explorer 3.0 is available as a free download at *http://www.microsoft.com* and has support for RealAudio built in.

Now, listening to your station on the Internet is easier than ever with the release of the latest generation of the RealAudio player, which, it should be noted, is not free (it's $29.99 and well worth the price).

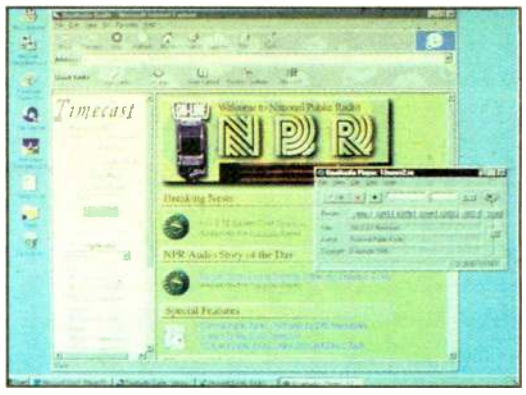
The brand-new RealAudio Player Plus improves on the basic player in a number of key, groovy ways. First of all, the Player Plus offers six pre-set buttons which allow listeners to store the URLs of their favorite RealAudio-enabled stations and audio offerings on the Internet. Then, a click of the mouse and - *voila!* - listeners are tuned in! Whatta blast!

The Player Plus also offers a handy scan button, which takes listeners on an audio tour of RealAudio-enabled sites, including radio stations, giving a 10 second taste of each. When listeners come upon something that catches their ears (your station, perhaps), another click of the "scan" button keeps them listening.

The new Selective Record feature allows listeners to record your signal while they're on-line and play it back off-line (if a station has this feature disabled, the player tells you so). The list of sites offering recordable audio (*http://www. realaudio.com/products/playerplus/record.html*) is not long but I bet it will be soon.

Really, the Real Audio Player Plus is pretty much pure perfection: it's easily installed and operated. What's more, the accompanying "Getting Started Guide" is written clearly and is understandable even to beginning Web surfers. It's well worth the cost to listeners.

So. Get cooking! Put a hunk o' butter on the skittle! Slice that bacon! Uh, now let's not get carried away ... we're eatin' healthy these days. Hold the butter. Hold the bacon. Gimmee a nice hot heapin' bowl of oatmeal! Now, that's breakfasty!



Timecast, Here Featuring NPR

Oh, yeah. One more thing before I hit the cyber-road: Start broadcasting on the Internet and see what you (and your listeners) have been missing! Join the Internet broadcasting revolution! And don't forget to keep e-mailing me at *zoogang@earthlink.net* so you can keep me up-to-the-minute and up-to-date on your station's cyber-activities. Is your station broadcasting on the Internet? Tell us about the experience.

And come back and visit us next month for lotsa radio stuff on the Web, y'heah? We'll be cookin' up a storm (lotsa oatmeal, in other words)!

Client

▶ continued from page 29

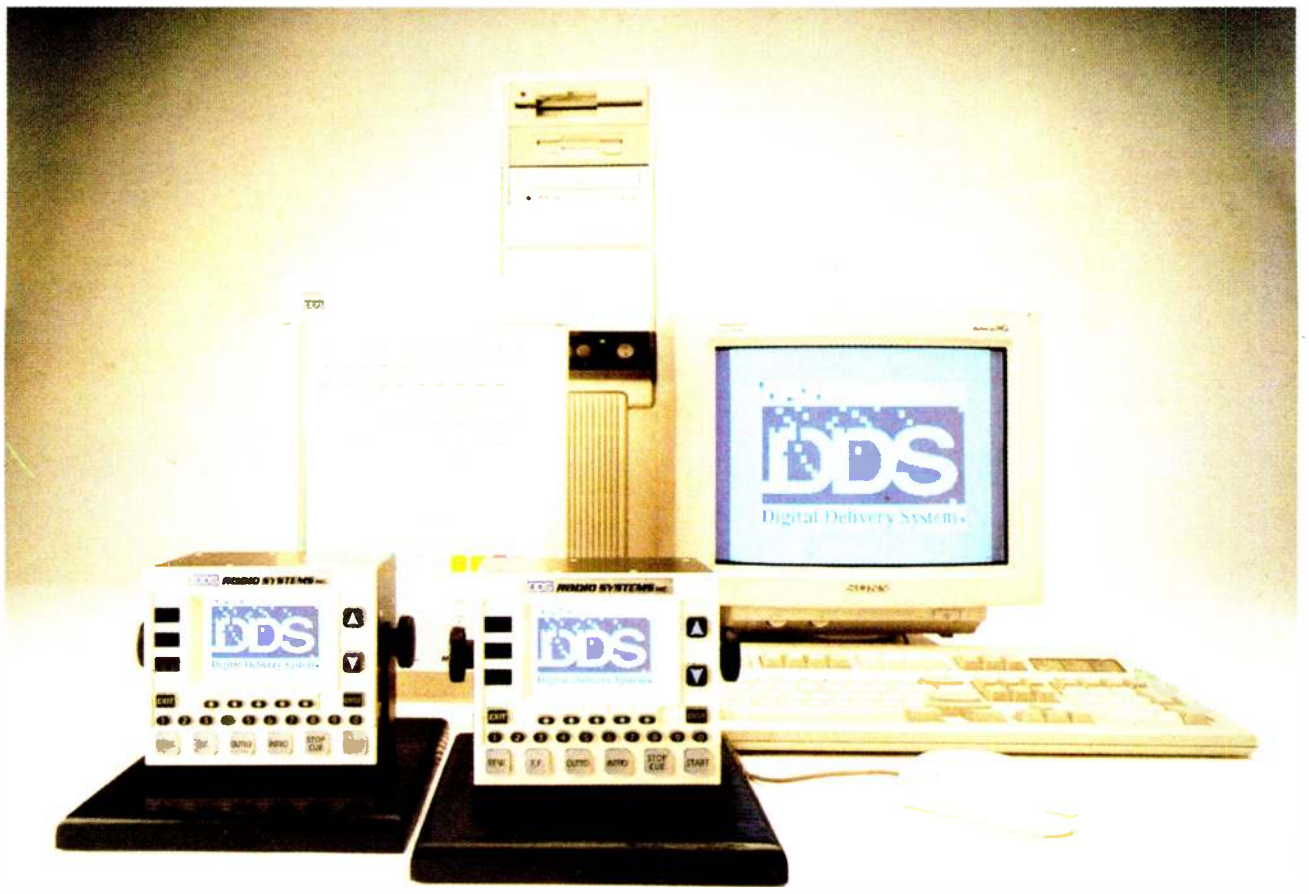
into a friendship. The best salespeople I know seem to do this instinctively, but it can be taught.

Last, let's not exclude programming and promotion from the client relationship process. Program and promotion directors should go on regular client calls to meet, greet and explain what they do. And yes, jocks need instruction on appropriate behavior with clients.

Ambitious. Intelligent. Warm. Important. Could we begin to use these words more frequently to describe clients? Only if we try.

□□□

Mark was until recently VP/Marketing, for Liberty Broadcasting. This 23-year vet would like to be VP of Something again real soon! Offer him work today at (703) 764-3994.



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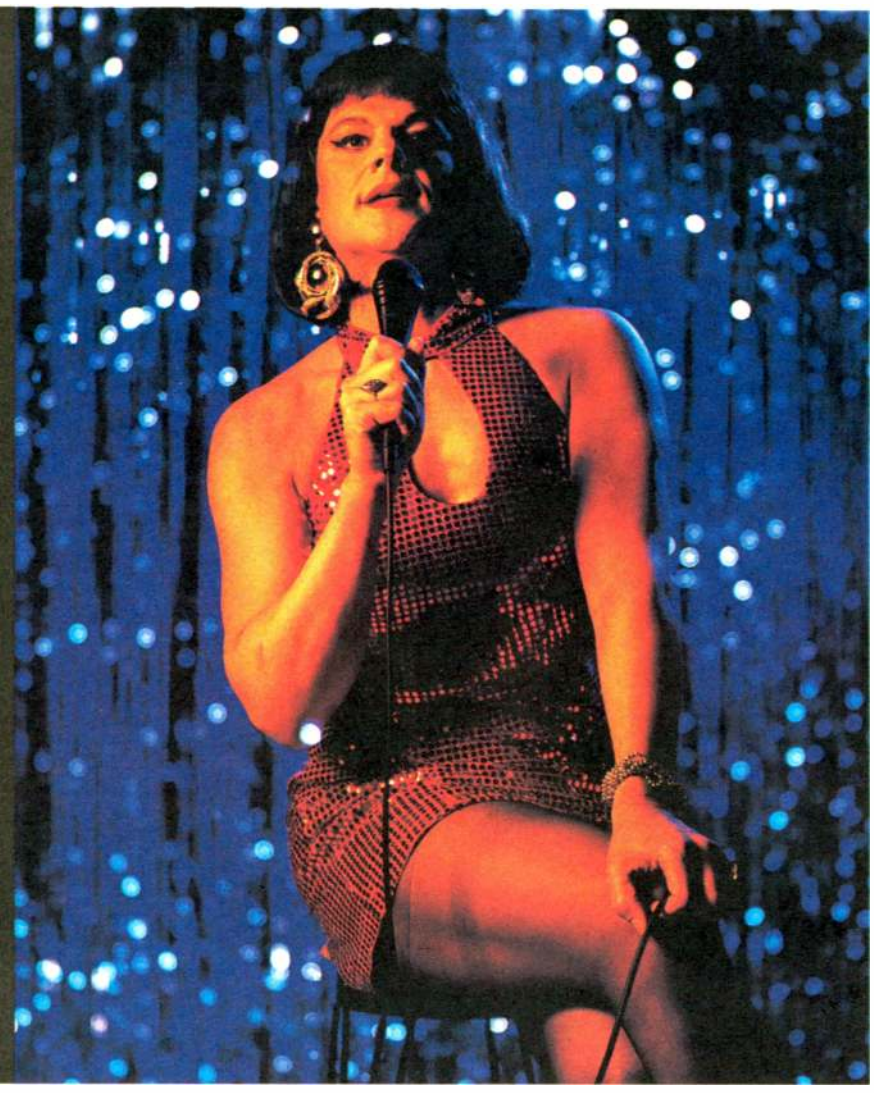

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Circle (7) On Reader Service Card

Texas Beatles

▶ continued from page 26

many covers by other artists, including some rare ones: "Hey Jude" performed by Tiny Tim, William Shatner's show-stopping rendition of "Lucy in the Sky with Diamonds" and Frank Sinatra's version of "Something." Listeners can also groove to Beatles covers from a diverse sampling of popular artists ranging from Guns N' Roses and Cheap Trick to Natalie Cole and Blues Traveler.

Rodriguez, who also owns Spanish-language KRVA(AM) and KRVA-FM in the Dallas/Ft. Worth area, is trying to turn everybody on ... to the Beatles, whom he clearly loves. He is hardly in love with format radio, though; he says it disappoints him. "Radio's got to come back to its roots," he says. Radio has "been too overprocessed, overanalyzed."

Radio, he suggests, has become "a broker of entertainment, but, really, the heart's gone." Enter all-Beatles radio.

The Fab 105 rotation has approximately 600 songs; Rodriguez plans to keep adding songs, but he says he does not think in terms of numbers. "I think of it as keeping the programming fresh," he offers. "When you do this kind of format, all the rules are different. It's a balance between the desire to hear a Beatles hit versus the amount of burnout potential."

Fab 105 runs without live announcers; Rodriguez may expand and add some pre-recorded segments to his on-air mix.

He says he has contacted Apple, the Beatles' management company, for the rights to use the group's image in conjunction with his station.

A Lennon thing

Rodriguez, a fan of the Sixties, says he is trying to bring the positive messages from that era into the 1990s. "One of the greatest ones," he says, "is peace and love. ... Love could fix or improve every problem on this planet. To quote ... the Beatles, 'all you need is love.'"

Love, indeed.

Chris Bjork, who helps Rodriguez run Fab 105, says "We play Beatles music because it makes people happy, and we think that's a cool thing. If it makes people happy, then maybe it'll make other people happy, and we can do a John Lennon thing and bring peace to the world just by playing Beatles music. That'd be cool."

Rodriguez said Fab 105 will continue as long as there are people listening. In the words of the Fab Four, "The love you take is equal to the love you make."

Fab 105 hopes to be making a whole lot of love available to listeners in the Dallas/Ft. Worth area for a long time.

PERSONNEL LEVEL

Bring Good Manners to Work

Part II

by Sue Jones

SPRINGFIELD, Va. Lack of basic business manners often embarrasses those who lack them. The situation is compounded if you are unaware of your faux pas. People who possess good business manners find irritation in interacting with those who do not. Poor business manners, observed by your boss or others who have influence over your advancement, could have serious impact on your career development.

Part I of this article in the Sept. 18 **RW** covered table manners, respect for all people, office gossip, and borrowing office supplies and items at the station. Basic Business Manners Part II focuses on interpersonal etiquette.

Time is money — theirs

Respect the time of your co-workers and boss. The next time you must talk with someone, observe what he or she is doing before you begin to speak. If the person is deep in thought or working to meet a deadline or to complete a project, an interruption for something that could wait can be aggravating at least, and possibly delay or complicate the timely completion of a task. For example, you would not ask the engineer to take a look at your headphones which seem to have a short, while he is busy aligning a tape machine so production work can be completed. Nor should you attempt to talk with the jock while she is about to go on the air with the details of an upcoming remote.

You can respect the time of other staff members in several ways. Leave a note, a voice mail or e-mail message letting the person know that you need to talk with him. Tell him the subject matter of your discussion so that he can be better

continued on page 41 ▶

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A unique capability of Digilink III is its ability to operate two studios from a single workstation. The most common application would be to use one workstation for both on air and production studios. The DL3 is placed in the production studio while a PCAT computer running Arrakis remote control software is placed in the on air studio. The production studio has complete single play-record-edit capability while the on air studio can independently use dual play for on air. While not a redundant system, it does provides a dual studio workstation solution for under $11,000.

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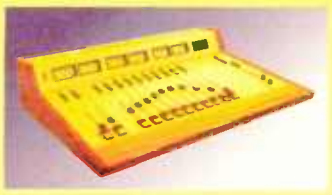

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As illustrated in the Sony Worldwide Networks master control studio on the right (one of seven Arrakis studios in the Manhattan, New York complex), Arrakis can provide complete major market studios with Arrakis consoles, digital workstations, video-audio switchers, furniture, and system prewiring.

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SIGNAL-TO-NOISE

A Portable Radio Without Peer

by Frank Beacham

NEW YORK Somehow, the idea of calling the new Bose Acoustic Wave Music System a "boombox" seems a bit insulting. Sure, the elegant, 15-pound portable radio/CD player fits the product category, but this music machine is like no boombox I've ever used or heard before.

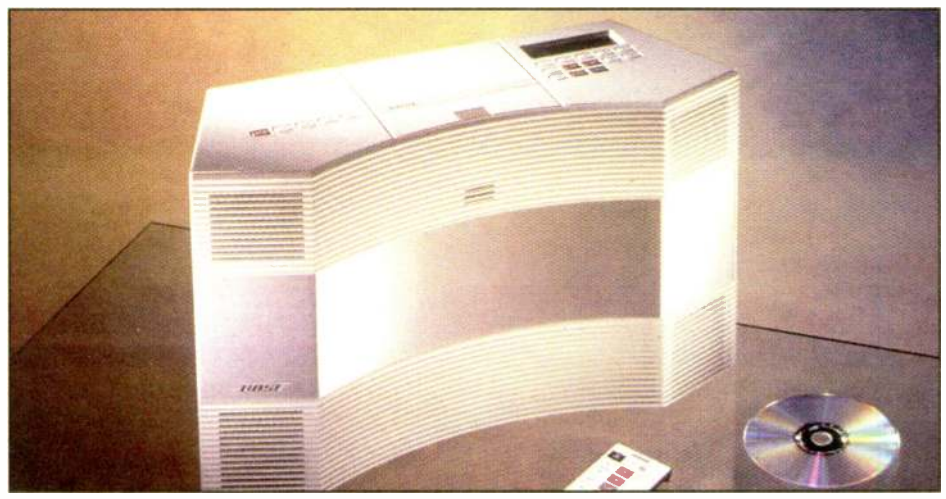
First of all, Bose may very well have built the best portable radio that money can buy today. The AM/FM tuner in this new, third generation Acoustic Wave system is dramatically improved over previous models. Better even than the tuner section in the popular tabletop Bose Wave Radio.

And then there's the sound. At first most people do a double take when they hear this system. One does not expect a portable to sound like this. There's a deep, rich bass that's usually associated with full-size stereo music systems, not a box about the size and weight of a school kid's backpack.

Better audio

The improvements in the new Acoustic Wave portable, however, don't stop with the tuner. The latest model has significantly improved audio performance, a new CD player and a slim remote control that handles all functions from up to 20 feet from the front and six feet from the sides of the unit. A neat new feature called Continuous Music Option switches on the radio tuner once a CD is finished playing.

The new music machine uses an updated version of Bose waveguide speaker technology. First introduced in 1984, waveguide is based on the controlled interaction of sound waves with a moving surface. This interaction takes place inside the waveguide, a mathematically formulated tube inside of which a loudspeaker is placed. The waveguide in the new portable, which has been redesigned since previous models, is nearly seven feet long and is folded numerous times to fit inside the 10-inch x 18-inch x 6-inch enclosure.



The Bose Acoustic Wave Music System Series III

Bill Short, a Bose engineer who helped design the original waveguide technology, said the new Acoustic Wave portable features several improvements that enhance the total response of the system. In addition to the redesigned waveguide, improved tuner and CD sections, he said the tri-amped sound system now has improved signal processing that helps maintain high quality audio even as the amplifier reaches overload.

Also integral to the design of the box is operational simplicity. All controls are basic. Tone controls are absent. The only way to "tweak" the sound is by physical placement of the unit in different positions throughout the listening environment.

Great in New York

"The idea is to try to make the unit relatively intelligent so the user doesn't have to worry about controls," said Short. "We dislike tone controls because people use them to do the wrong things."

We tested the new Acoustic Wave system in radio reception-challenged New York City. Most tuners don't make it in the overcrowded, RF jungle of Manhattan. This is not because signals are too weak but because they are too strong, close together and/or obstructed by tall buildings. It's safe to say that if a radio can make it New York City, it can make it anywhere.

The new Bose tuner performed exceptionally well, comparing favorably with the best tuners we've ever used in the city. In fact, on several hard-to-get stations, the Bose tuner outperformed the GE SuperRadio III, the receiver many consider the best on the market today, in a side-by-side comparison. This new tuner also clearly outperforms the smaller Bose Wave Radio, which we tested earlier in New York City.

The Acoustic Wave's outstanding tuner, coupled with its excellent sonic performance, makes it a portable without peer. The new credit card-sized remote control allows effortless tuner scanning and offers 10 presets. There are also remote controls for the unit's full-featured CD player and a switch that allows selection of an outboard device connected via the auxiliary input.

The Bose system can easily be carried from room to room using the molded inset handles. It can be plugged into AC, powered by a rechargeable power pack or powered by D-cell batteries in its customized power case. Other options include a pedestal with inputs for VCR, cassette deck or other music source and a microphone for use as a portable public address system.

The tri-amped sound system now has improved signal processing that helps maintain high quality audio.

Though the Acoustic Wave system is an exceptional portable and it outperforms many larger bookshelf music systems, it's no sonic substitute for a good quality, full-size high fidelity music system. That's where the downside of the Acoustic Wave comes in — its price.

The basic unit costs $1,079. Fully loaded with all accessories, the system reaches a whopping $1,679, a price comparable to Bose's own Lifestyle home music systems. And don't expect to find this system discounted.

It's sold only at Bose factory stories or direct to end users at list price.

For most consumers, the price tag may be a bit steep. But for a radio station wanting to show off the sonic quality of its programming on remotes or at fairs or trade shows, I doubt there's a better portable FM/AM receiver available at any price.

For information on the Bose Acoustic Wave Music System, call (800) 919-2673.

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Frank Beacham is a New York-based writer and producer. Visit his web site at: http://www.beacham.com. Mail: 163 Amsterdam Ave. #361, New York, NY 10023. E-mail: frank@beacham.com

re·li·a·ble (ri lī′ə bəl), *adj.*

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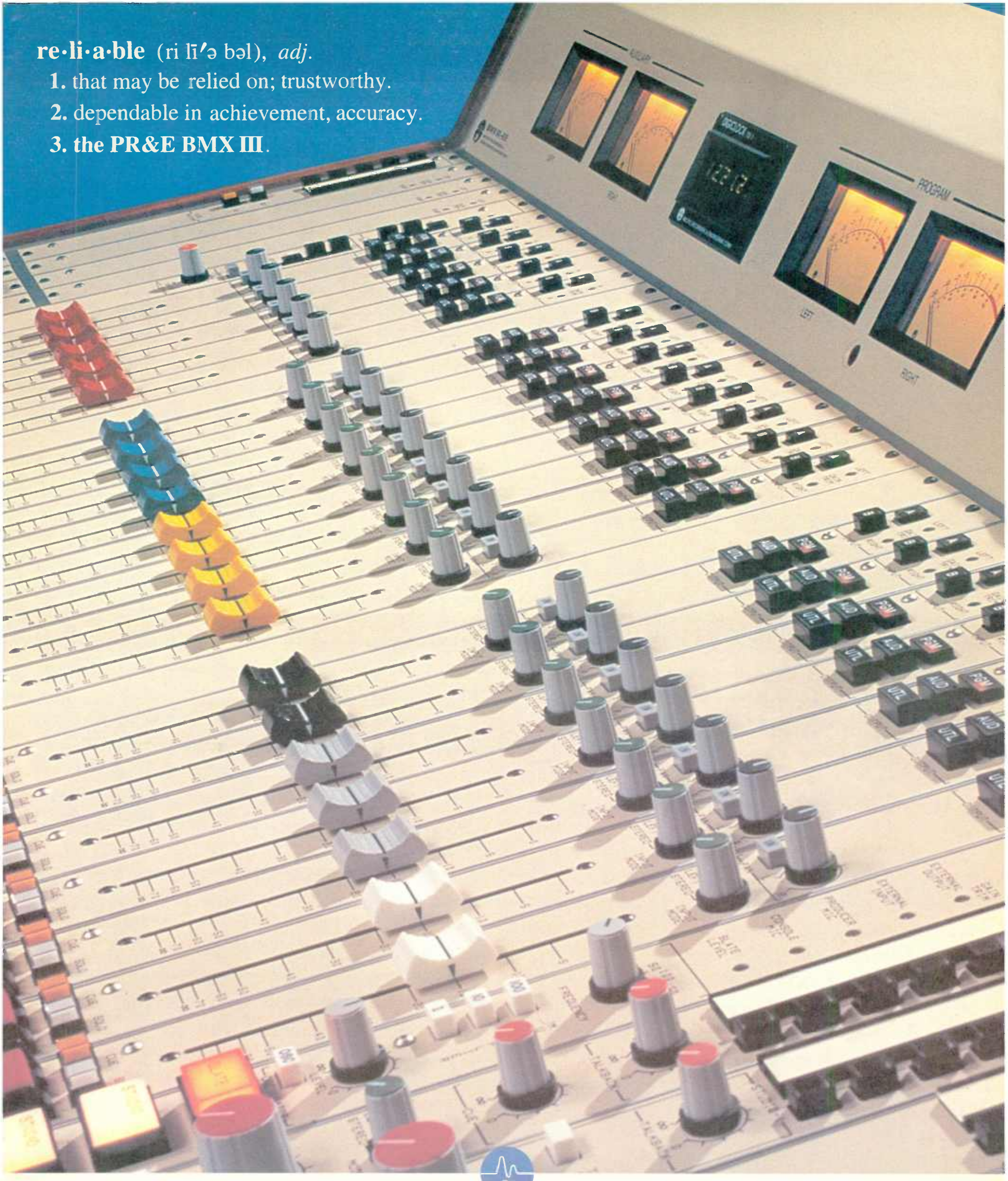

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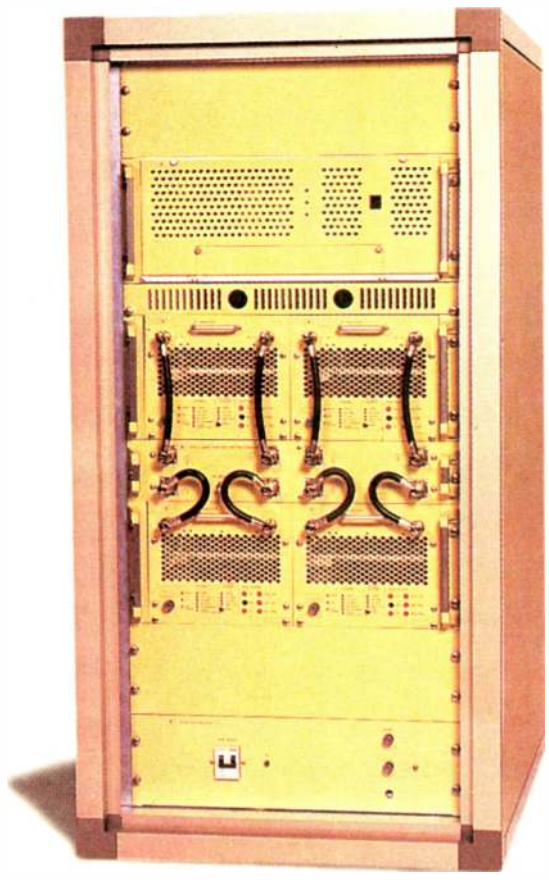

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The (Polite) Point

▶ continued from page 35

prepared to talk with you. The discussion will take less time and probably be more productive.

Have a direct purpose for talking with your co-workers or supervisor. If you must discuss several items, write them down so that you can cover them in one discussion rather than calling or interrupting again. The staff members will appreciate your sensitivity to their time and workload. Your supervisor will make a mental note of how organized you are.

Get to the point when you speak. Rambling dialog can be confusing and time-consuming. If you want to convey information, state it directly and succinctly, being careful of appropriate sensitivities. If you must ask for assistance, politely request it. Ask "Will you have time to help me write the promotion plan today?" rather than talk for three or four minutes about how much work you have to do and why you need help.

Remember that "chit-chatting" in your neighbor's office or work area does not count as work. Neither of you is productive. When the boss observes the idle conversation, it leaves a negative impression of all participants. In an age when LMAs and mergers force managers to take a good hard look at everyone's productivity, you may just talk yourself right out of a job.

Protect yourself

What can one do to discourage the co-worker who wants to tell you all about last night's hot date, complain about her supervisor, or find out about your personal life? Try putting file folders on the chairs in your work area to discourage lengthy chats. Keep working on the task at hand instead of looking up and engaging in conversation. If your co-worker has a legitimate question or piece of information, you can stop and talk. When your talkative co-worker takes a breath, politely say that you have to complete the task at hand by a specific deadline and must keep working to meet it. It is up to you whether you want to add that you would like to talk about the subject but perhaps at a break or lunch time. Alternatively, say: "We will have to talk about this later."

If none of the above work, simply stand up. Most people understand this strong body language signal to mean that the discussion or meeting is over. If your visitor continues to talk, advise him that you have a meeting in five minutes or that you are in urgent need of a visit to the restroom. Then leave your work area for a few minutes.

Be sensitive to noise levels and what you say. In today's open-environment office space, even low or soft sounds are easily heard. Discussions in hallways are audible in the nearby offices; discussions in open-door offices can be overheard by someone passing in the hall. The best rule is never say anything at the office you would not want to have printed or broadcast on "60 Minutes."

If you have a voice that carries well, make one of your business goals this month to reduce the volume of your voice. Try to conduct your conversations away from other work areas. If your station has cubicle workstations, be aware that they are not soundproof. If you are telling the latest political joke to your friend and he erupts in uproariously loud laughter, the person on the other side of the cubicle wall trying to conduct a business conversation on the phone will not be laughing.

Get to the point when you speak.

Leave your gum at home or save it for after work. Unconscious gum smacking and popping can drive your neighbor to madness. The same is true for humming or whistling. What seems pleasant to you may irritate others.

The same rule applies to eating at your desk or common work area such as a conference room. You may be dying to have a spicy dish with a strong aroma. However, your neighbor may not share your tastes and resent that she is forced to endure yours. Make sure you dispose of your coffee cups, soda cans and eating utensils properly.

Strong perfumes and after-shaves applied too liberally can trigger allergic reactions. A good thing carried to an extreme is a liability. The same is true for clanking jewelry. Bangle bracelets constantly clinking can annoy the most composed office mates.

Today's workplace rules concerning smoking are changing fast. Some states have passed anti-smoking laws for public buildings and work environments. Many organizations have made their work sites smoke-free. If you work for a station that allows smoking on the premises, be considerate of those non-smokers around you with allergies or who do not want to be around second-hand smoke for health reasons. Smoke outside or in designated areas.

The basic rule: be thoughtful and considerate of those who work close to you. Know how your actions may affect those close to you. Demonstrating consideration for the time of other staff members is a practical business habit that will serve you well throughout your career.

□□□

Sue Jones is a principal in Bisset Communications, a communications management firm located in the Washington area. Contact her at (703) 505-4999.

Kinetic City Kids Chase Science

by Sharon Rae

WASHINGTON These days, a radio drama program is unusual in itself. "The Kinetic City Super Crew" is even more unusual: it targets children.

With the help of a $3 million grant from the National Science Foundation, the American Association for the Advancement of Science created the high-speed, science-packed radio show for kids.

Joe Shepherd, senior producer of the program, said the 30-minute series trails six kids as they solve mysteries using deductive logic, research, on-site investigation and teamwork.

The Kinetic City Super Crew

"We use a lot of sound to paint a picture," said Shepherd. "(The program) is very layered. We edit the show on a multitrack computer editing system so we have sort of infinite control over the sound. We write the scripts geared toward having a lot of sound in them."

How does such an animal appeal to TV-tuned youngsters with ever-diminishing attention spans? Despite some doubters, Shepherd said the program is an effective way to transfer the message.

"I think it's because kids are very entertained by it. It doesn't talk down to them and it doesn't say (enter booming voice here): 'This is an educational program, get out your pencils.' It's a fun story with kids having adventures on this train and going to exotic locales and meeting really weird characters."

As a bonus, every mystery the Kinetic City Super Crew solves is grounded in real science.

Every show opens with a phone call from someone with a problem.

The Super Crew, with the help of a fast-talking computer named Alec, travels the globe on the supersonic KC Express Train in search of answers. Their promise: "When you want the facts, we hit the tracks!"

Whales and Wales

Despite Alec's unstoppable flow of information, the Super Crew must do the really hard work.

"For example," said Shepherd, "the crew fires up Alec, who comes to life with all sorts of cool electronic sounds, and asks for information about whales."

Alec proceeds to tell the kids that Wales is part of the United Kingdom.

"The kids say 'No, whales! Like the fish!' and Alec says 'Oh, you should have been more specific.'"

"This teaches kids thinking skills and how to focus what they want to know and how to ask questions and do research," said Shepherd.

"So it doesn't hit kids ... over the head. But when they listen, they understand that when you are asking somebody for information, you have to be specific and you have to have a little base of information before you start doing your research."

The show, aimed at children eight to 12 years old, also challenges the imagination simply through the medium of radio, in effect creating the "theater of the mind."

"The Super Crew doesn't morph into brawny dinosaurs, call on supernatural powers or rely on martial arts," said Executive Producer Bob Hirshon. "Instead, they tap into a super power that's truly available to all kids: the super power of the mind."

Critical thinking

Hirshon emphasized the show has just enough science to get kids interested.

"Kinetic City is an adventure show that teaches kids to think critically and skeptically about science ... Every show has a single theme and it might be biodiversity, light and color, brain chemistry, nutrition or astronomy ... It makes kids more scientifically literate."

A "home crew hands-on experiment" gives listeners an opportunity to take part in the show. For example, the crew might try creating a geyser with an empty salad dressing bottle, water, Alka-Seltzer and pressure.

"What we do is strive to make the science transparent, said Shepherd. "We've had varying success with that, but we try to avoid having the kids end up in a situation where they're sitting in an office talking to an engineer about rockets.

"We strive to move the story along with situations that are full of sound. So instead of being in an office talking to a scientist, they'll go to a truck and tractor pull, and run into somebody as a result of the plot who leads them to the answer of the mystery. And it doesn't have to be a scientist, just somebody who's an expert

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FEEDLINE

Grasp AM Directional Systems

Part V

by W.C. Alexander

DALLAS In the first four parts of this series, we examined the fundamentals of AM antenna systems, discussing the various configurations of AM antennas along with many of the terms we use in this work. We looked at groundwaves, efficiency, top loading, current distribution, vertical radiation, base impedance and ground systems, among other things. If you did not catch the previous parts of this series, I encourage you to go back and read them before going on with this one.

Why directionalize?

In an ideal world, all AM antennas would be non-directional, with a circular radiation pattern. We would select transmitter sites to produce a strong signal to the population to be served and a minimum waste of signal into unpopulated areas. Population centers would be evenly spaced, with medium and large cities separated by good distances. In this ideal world, the number of stations would be small enough that all stations could live together on the band without causing interference to one another.

In our world, things just aren't that way. We choose transmitter sites as a compromise among cost (land is much cheaper away from the city), location and permissible use. As Mr. Murphy usually has it, seldom does a station find a site available in the most desirable location. Population centers are often clumped together, as on the East Coast, and the number of stations is high, over 4,800 at last count. The band seems overcrowded, with only 107 channels on the regular AM band. Interference between stations is common. All this trouble started when the second AM station signed on the air!

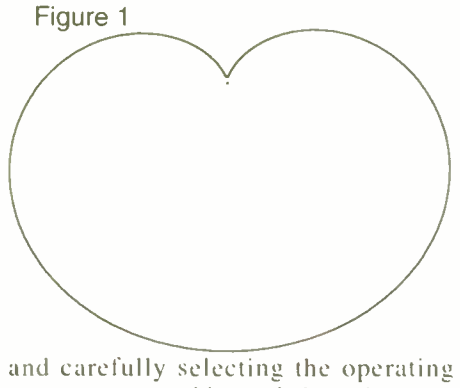
To help overcome some of these problems, the broadcasting industry in its infancy introduced directional antennas. The first were used to direct the signal into areas where coverage was desirable. Later, stations also used directional antennas to protect co- and adjacent-channel stations from interference. As the band became more crowded, planners used directional antennas to "shoehorn" new stations wherever a hole existed. The result ... well, the current AM band, with all its overcrowding and interference problems, is the result. The FCC describes it as a "mature" band.

Consider that a 20:1 groundwave protection ratio (26 dB) is required between co-channel stations, and 6 dB is required between first adjacent channel stations. In the middle of the AM band with average values of conductivity, the 0.5 mV/m contour of a typical station transmitting with 1 kW will lie about 45 miles from the antenna site. The 0.025 mV/m contour (1/20 of 0.5 mV/m) of the same or a similar station will lie at a distance of about 140 miles from the antenna site. Assuming that two typical 1 kW co-channel stations both have non-directional radiation patterns, they cannot, then, be located closer than 185 miles and still maintain the required groundwave protection to one another.

If one of these stations uses a directional antenna to reduce its radiation toward the other, the stations can be located much closer together. The maximum radiation permissible from one station toward another is expressed in mV/m at 1 kilometer at the appropriate azimuth. Engineers call this value the maximum permissible radiation (MPR).

Seldom is a groundwave allocation problem as simple as one station protecting just one other co-channel station. Usually, many stations are entitled to protection. By using a directional antenna

Figure 1



and carefully selecting the operating power, we can achieve a balance between coverage and interference protection.

The problem gets even more complex with respect to nighttime allocations. In most circumstances during the day, we need only consider the groundwave signal. At night, however, the skywave signals become a factor. Not only must radiation be limited in the direction of protected stations, but we must also consider the vertical angle or theta, the angle above the horizon that will result in a reflection of the signal off the ionosphere so that it arrives in the vicinity of the protected station. Limitations on nighttime radiation (still called MPR) are almost always expressed in mV/m at 1 kilometer at a specific value or range of values of theta.

For example, the MPR from a particular nighttime facility toward another might be 35 mV/m at 1 km at a theta range of 16 to 24 degrees. This would indicate that the radiation on that azimuth could not exceed 35 mV/m at 1 km for any vertical angle between 16 and 24 degrees. This is where the function of theta of the antenna, discussed in Part II of this series, comes into play.

From all this, you can see that determining a directional pattern is a complex affair. Seldom is this process as simple as protecting a single station. Allocation pictures often resemble jigsaw puzzles. Because different conductivities have an effect along the various radials, the task of finding a pattern to fit the situation can be difficult.

A two-tower pattern

In a directional antenna, the radiation pattern is created by controlling the amplitude and phase of the RF current in each element of the array. The resulting field at any point is the vector sum of the individual element radiation components. In locations where the fields from the various elements are in phase with one another, the fields add; where they are out of phase, they subtract. In most locations, the fields are not perfectly in or out of phase, and in the case of arrays with more than two elements, there is a combination of addition and cancellation at most points.

Consider a simple two-tower directional array. Let us assume the elements of our array are spaced 90 degrees apart on a north-south bearing, and that the ele-

continued on page 45 ▶

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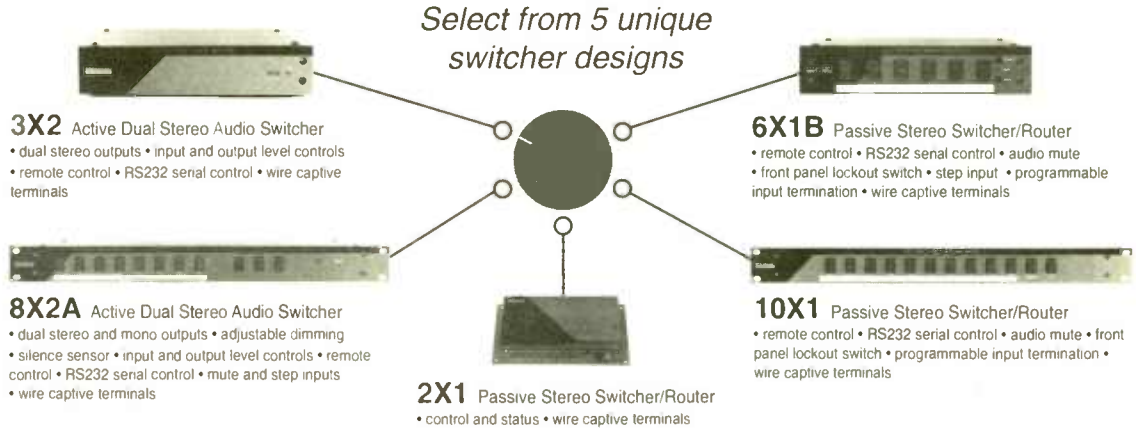

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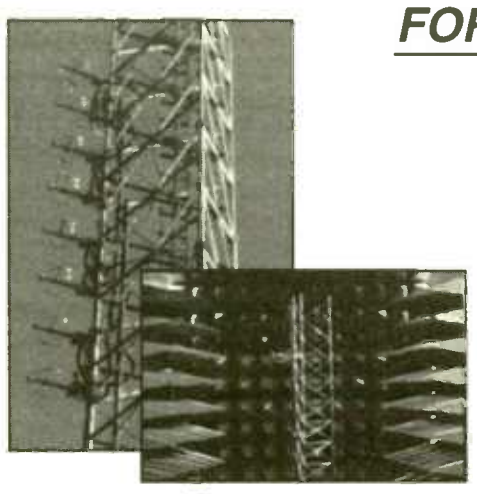

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AM Directionals

▶ continued from page 43

ments are driven with equal currents (1.0 ratio) with the phase of the current to the southern tower lagging by 90 degrees. If we stand at an observation point some distance from the array on a bearing of zero degrees True (due north), equal fields will arrive at the observation point from each point.

Table 1

Tower	Ratio	Phase	Spacing	Orient	Height
1	1.000	0.0	0.0	0.0	90.0
2	1.000	-90.0	90.0	180.0	90.0

Table 2

Tower	Ratio	Phase	Spacing	Orient	Height
1	1.000	0.0	0.0	0.0	90.0
2	1.000	0.0	180.0	180.0	90.0

Because the elements are spaced 90 degrees apart, the field arriving from the southern element will arrive 90 degrees later than the field from the northern element (90 degree lagging space phasing). Add to that the 90 degree phase delay in the southern element current, and the field arriving at our observation point from the southern element is 180 degrees out of phase with the field from the northern tower. This results in complete cancellation of the fields from the two elements.

Now consider the same array but move our observation point to a location due south of the array. At this observation point, equal fields will arrive from each of the two elements, but because the southern element is 90 degrees closer, its field will arrive 90 degrees ahead of the field from the northern tower (90 degree leading space phasing). Because the current fed to the southern element is delayed by 90 degrees, that cancels the 90 degree leading space phasing, and the resultant field from the southern element arrives in phase with the field from the northern element. The fields completely add, so the resultant field at the observation point is equal to $F_1 + F_2$.

At other points around the array, neither complete addition nor complete cancellation will occur, and vector addition of the arriving fields is used to determine the resultant field. See page 43, Figure 1 shows the resulting directional pattern of our two-tower array. The theoretical parameters for such an array would normally be as shown in Table 1 above.

If the phase of the two elements is reversed (i.e., the phase to the southern element advanced 90 degrees rather than retarded), the pattern will be reversed, with complete cancellation to the south and addition to the north.

Now consider the same simple two-tower array, but let us increase the spacing to 180 degrees and feed the two elements in phase with one another (0 degree phase shift). At an observation point due east of the array, the equal fields from the two elements will arrive at the same time, since the observation point is equidistant from both elements. Because the phase of the currents in the two elements is the same, the fields from the two elements arrive in phase and thus completely add. The same is true at an observation point on the west side of the array.

If we move to an observation point north of the array, equal fields will arrive from the two elements, but the field from the southern element will arrive 180 degrees behind that of the field from the northern element. Because the currents in the two elements have the same phase, the fields arriving at the observation point will be completely out of phase and will thus cancel. The same is true at an observation point due south of the array.

Figure 2 shows the resulting directional pattern of this two-tower array. The theoretical parameters for such an array would normally be as shown in Table 2.

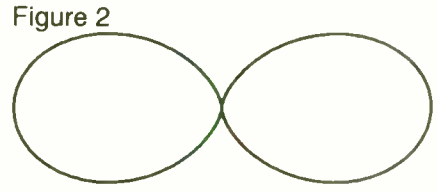
By altering the currents in the two elements and making them unequal, we produce a condition with neither complete cancellation nor complete addition at any point around the array. As a result, nulls are somewhat filled and lobes are not as large.

When we alter the phase of the current in the elements, the resulting instantaneous phase of the fields from the elements (current phase plus space phase) will vary, producing patterns of different shapes. The same is true of changing the spacing of the elements.

The design engineer can vary all these parameters — current, phase and spacing — in addition to moving the bearing of the line of towers to achieve the desired pattern.

If more nulls or broader nulls are needed, additional elements are added to the array. For each additional element, another pair of nulls is created. By placing

Figure 2



nulls close together, a broad arc where the radiation is suppressed can be created. The possibilities are limitless.

In the next part of this series, we will take a more detailed look at multi-element directional arrays and how the vector addition of the arriving fields takes place. Put new batteries in your calculator and get set!

□ □ □

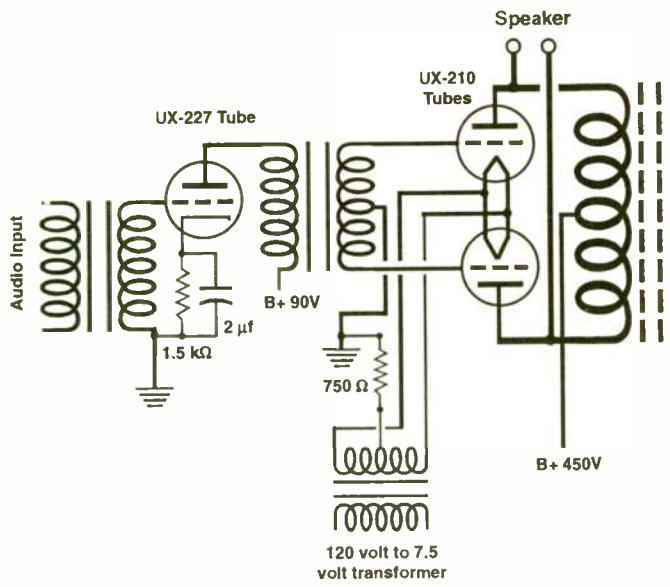
Cris Alexander is director of engineering for Crawford Broadcasting in Dallas. Contact him at (214) 445-1713 or via e-mail at 76440.1670@compuserve.com

ROOTS OF RADIO

Radio Receiver Circuits of 1928

by Ronald Pesha

Figure 1



QUEENSBURY, N.Y. Batteries, dry or rechargeable or a combination of both, powered most home receivers in the early 1920s. But dry batteries, in multiples of 22-1/2 V up to a maximum of 135 V, exhausted quickly under heavy current demands. Low-voltage "A" batteries powering filaments died even faster, typically requiring three replacements to every high-voltage or "B" battery replacement. Rechargeable "A" batteries reduced costs in the long run, but were messy and troublesome. However, their legacy remained throughout the tube era, for 6.3 V and 12.6 V filament ratings are multiples of the 2.1 V rating of a lead-acid cell.

A Class B amp

By the late '20s, vacuum tubes designed to operate from the household lighting circuit became commonly available. With their high-current AC filaments and ability to operate with several hundred volts on the plates, audio outputs in the tens of watts became practicable. The magazine Radio Broadcast, published by the Doubleday book company, printed a construction article for an AC-operated Class B audio amplifier in its February 1928 issue.

Heavy transformers (by Thordarson, even then a familiar manufacturer) were specified throughout ... except it is not an output transformer, it is an output choke. Refer to Figure 1. The amplifier impresses the full 450 V B voltage on the speaker voice coil, though the potential is the same at both ends so no current flows to displace the speaker cone from its neutral position. Just don't touch the speaker terminals!

The two-page article says nothing about the nature of the load presented to the vacuum tube plates. Without the characteristics of Thordarson Push-Pull Output Choke T-2420 at hand, one must assume that the amplifier functioned satisfactorily with a then-acceptable distortion figure.

At least one vendor advertising in the periodical offered a solution. The Sterling Manufacturing Company of Cleveland described its $5 output transformer: "Connected between radio set and loudspeaker, absolutely prevents the high voltages by 'B' Power Units from ruining the speaker." And, presumably, the human operator.

A conventional Class A circuit utilizing a cathode-type tube (UX-227) and the then-common all-transformer coupling provides a low source resistance to the output stage. Apparently operating near to pure Class B, the Type 210 tubes were biased almost to cutoff with the 750-ohm resistor in the 7.5 V filament supply center tap (the tubes had no cathodes). The article states that, when idling, the tubes draw about 20 ma each, which results in a drop of 30 V across that resistor. Operating Class B, no audio passes through this resistor, so it needs no bypass capacitor.

Physically, the 210 had four big pins on its base, with a little non-electrical pin on the side to lock it, bayonet-style, into its socket. This pin, standard on many early vacuum tubes, was similar to the pins on a BNC connector.

Four pins were adequate for your basic triode with filament, grid and plate. The separate cathode added a fifth pin, and with it additional complexities. This new "screened-grid" tube needed explanation in 1928, and the "laboratory staff" of Radio Broadcast supplied it.

The 'grid cap'

A tetrode offers the possibility of higher voltage gain than a triode. The screen grid took over a tube base pin, and the control grid moved to a metal connector atop the tube's glass envelope. Old-timers remember the "grid cap" with its shielded flexible lead providing physical separation for the grid to enhance the tube's stability and freedom from oscillation.

The laboratory staff reported on stability problems of a broadcast band RF amplifier. As in all vacuum tubes, the plate to grid capacity fed amplified RF back to the control grid. Because of the screening effect this capacity is far less than in a triode, but the tetrode also offers higher gain than a triode, exacerbating the problem.

"The tube can only be satisfactorily used in circuits containing very complete shielding and very complete filtering in the battery supply leads." The diagram that accompanied the original article shows a "trf" or tuned radio frequency amplifier, three RF stages with two screen grid tubes followed by a triode and each completely encased in a box-like metal shield. The plate lead carrying the amplified signal from each vacuum tube moves to the following stage through a grounded copper tube!

The staff then designed and assembled an r-c coupled audio amplifier, again using two of the new screen grid tubes and a triode output. At audio frequencies oscillation is not a problem, and they appear elated at the voltage gain of 2200. However, they found the tubes microphonic. Physical movement vibrated the internal tube elements to audible effect from the speaker. Not familiar with the microphonic problem? Consider yourself fortunate. You're a member of the solid-state generation!

□□□

Ronald Pesha is Associate Professor of Broadcasting at Adirondack Community College, Queensbury, N.Y. Reach him at (518) 743-2200 ext. 567, or by fax at (518) 745-1433.

Super Kids

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in their field."

That, according to Shepherd, shows kids that science is not just a "white-coated guy on a pedestal," but a part of everyday life.

"By placing the kids in situations where we can weave in layers and layers of sound, such as a truck and tractor pull, we can just go crazy with the PA system and the music and the crowd and the trucks," said Shepherd.

"And it creates this very exciting atmosphere where the people who are listening are grabbed, and the context is not just fluff. It's a story line and a plot that centers around a scientific problem or a solution that comes out of science."

Not just pocket protectors

"We've found that a lot of the listening kids do is in the car ... on the way to school or swimming lessons or whatever," said Shepherd. "We try to avoid the Barney effect. We want the parents to be able to enjoy the show and not go 'EWWWW!' or 'Well, my KID likes it, but ...'

"So we try to make the humor sort of two-tiered and we throw in some jokes that the kids may not always get so their parents are entertained too."

Producers of the show aim in particular to capture the imaginations of minorities and girls, groups that they feel are typically underrepresented in science and math. Creators also hope to change the attitudes many kids have about science and scientists (they don't all wear pocket-protectors and have Coke-bottle-bottom glasses).

The "Kinetic City Super Crew" series began airing in November 1994 on 25 U.S. radio stations. Some 50 radio stations now carry the program; approximately half are affiliates of Radio AAHS, the all-kids radio network out of Minneapolis.

The show airs in several of the top markets in the country including Los Angeles, Washington, Dallas and Baltimore.

Several episodes have been translated into Spanish at the University of Puerto Rico for broadcast on Spanish-language radio stations in the United States and Latin America.

□□□

Sharon Rae is principal of Rover News Services in Michigan. Reach her at e-mail: SCohon@aol.com

WORKBENCH

Dr. Ferd Cures Your Wart Blues

by John Bisset

SPRINGFIELD, Va. Robert Johnson, who works with NASC in Poughkeepsie, N.Y., e-mailed a request for information about "an extender that allows plugging those small black warts into an outlet strip, without covering up the adjacent outlets."

The Dr. Ferd Wart Remover consists of a female molded AC socket attached to about 8 inches of zip cord, terminating in a male plug. You plug the AC transformer, the "wall wart," into the extension so the wide dimensions of the wall wart won't extend over the adjacent AC plugs on your outlet strip.

I don't know about you, but I never seem to have enough AC strips, especially under console furniture or in turrets. The Wart Remover ensures that the wall wart only occupies one outlet. As for their availability, try BSW or Harris. The Wart Removers are less than 10 bucks a piece.

★★★

Joe Stack, Capital Cities/ABC, shared some experiences with the workhorse ITC Series 99. Joe has seen the nicked pinch roller cause the splice finder to false, as we related recently. He also shared a fix that you can obtain from ITC, or build yourself.

The jocks at a station Joe serviced a number of years ago burned up three erase coils on the recorder. The solution was to add an erase coil temperature sensor. It was a simple circuit that used a thermistor, an LED, a couple of resistors, a relay and a transistor. It worked off the cart machine supply and was mounted inside the unit, right behind the switch panel.

The operation was simple: when the temperature got too high on the erase coil, the relay pulled in and disabled the push-button that controlled the Cart Erase function (the relay NC contacts were in series with the push-button). The LED lit to tell the jock that the Erase function was disabled.

The beauty of the circuit was that it reset itself as soon as the temperature dropped. The station never lost another erase coil. The modified erase coil and circuit were replaced with the factory kit, when it became available a couple of years later. For more information on the upgrade, contact ITC at (800) 447-0414.

★★★

Speaking of cart machines, I've been impressed with the novel ways engineers have put retired machines to use. In a future Workbench, we'll show you plans to tie a cart machine's left and right channels into a phone line.

So what's the big deal? The machine toggles between the left and right channels when an event occurs. Touch-Tones recorded on the cart dial the engineer's pager, then enter a coded message. In one example, the left channel signifies when the remote transmitter generator is on-line. After the weekly test, the right channel is toggled into the telephone line, again paging the engineer and entering a different code showing the switch back to the power company.

For an engineer, what are a few more beeps anyway? And if the beeps can help you keep track of your generator tests, or when the transmitter site is on-line with emergency power, then you're ahead of the game.

So now it's your turn. If you've turned that old clunker into something other than a concert information line or a means of running an ID from the transmitter site during a maintenance session (do we even have time to do these anymore?), let us hear about it. Send your submission, no matter how simple, and let the editor of RW buy you a tank of gas. Sorry, she doesn't do windows!

★★★

SANY@SERVTECH.COM saw our deglitching fix for the Henry Engineering TELECART-II, and wrote to tell about his attempt to order six TELECARTs, first from a local distributor, then directly from Henry Engineering. Both informed him that the TELECART had been discontinued.

We experienced the same problem recently. A client's TELECART got zapped by lightning, so they ordered what they thought was a replacement TELECART. When we arrived to install it, we found that a Henry DIGISTOR had been sent in place of the TELECART.

Hey Hank, I know we're in the digital age, but plenty of us still have working cart machines (you know an ITC-SP never dies!). How about a choice? We'll keep you informed.

★★★

Harry Larkin of RF Specialties of Pennsylvania passes on this tip to anyone

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Learn Your 'Real' Station Story

by Lee Harris

CASTAIC, Calif. Jan Lowry probably knows more about the history of your station than you do, especially if it is more than 40 years old.

Lowry runs an outfit called Broadcast Pro-file. For more than 25 years he has compiled stunningly detailed histories of thousands of radio stations, from the fabulously famous to the ridiculously obscure. Lowry performs his magic by sifting through dusty government files in Washington, unearthing ancient trade journals and periodicals and, in many cases, conducting on-site research.

Lowry's work is so meticulous that his conclusions often conflict with what the staff of those stations believe to be fact. As Lowry explains it, "record-keeping in the earliest days was hit or miss, and there was some deception as station owners fought to stay on the air. Also, personal recollections often suffer from the passage of time."

WINS ... -FM?

I was first tempted to order a Broadcast Pro-File when I noticed among the thousands of offerings a listing for WINS-FM, New York City. I have worked at WINS(AM) for several years, but nobody had mentioned a co-owned FM and none of the veteran employees with whom I checked could recall any mention of such a facility.

The short but detailed Pro-file for WINS-FM explains. The Crosley Corporation, then owners of WINS(AM), filed for 105.1 MHz in 1949 and received a construction permit in March of the following year. But according to the Pro-file, a suitable antenna location could not be secured (lack of tall buildings?) and the folks back at Crosley Headquarters concluded that an FM station in New York City would not be a profitable

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Specify Bonded

▶ continued from page 47

buying shielded audio wire. When specifying wire, ask if the foil shield is bonded to the outer vinyl jacket. Bonded types will save you an extra stripping step, because you will remove both the shield and the jacket in one motion. This might seem like a minor point, but if you are building a studio and you must strip each cable end twice before you even get to the conductors, the time and fatigue can add up. Many wire manufacturers do not specify this feature in their wire descriptions, so ask.

★★★

A couple of months back, we had a really informative SBE presentation here in Washington from a guy I'll call Mr. Generator. Walter Billings owns and runs a company that services generators called Total Engine Service and Supply, or TESSCO. Although his service area is primarily the Middle Atlantic region, his service strategy can be adopted anywhere.

Walt takes a pro-active rather than reactive role in generator service. He now services all our contract stations because he's honest, and he has spotted problems that the other guys have missed. His service visits are spent gathering information, spotting trends, and minimizing down time. Many of his checks can be performed by the broadcast engineer.

Topping the list is the routine inspection of fluids, oil and coolant levels in particular. Larger generators are designed to burn a little oil, so the oil level will naturally decrease as the generator runs. As for the radiator, if it needs additional coolant, add only a 50/50 mixture of coolant and water.

While you're "under the hood," inspect the cooling system for leakage, loose hose clamps and hardened or cracked hoses. During the visual inspection, also include the fan belts. They should not be loose, nor cracked. Insure that none of the wiring is cracked or burned, and that terminals are tight. Also inspect the electrolyte (water) level in the battery; if it is low, add distilled water only. Look over the engine for any signs of oil, coolant or fuel leakage.

Walt's company buys and sells new and used generators, so if you're in the market, give him a call at (410) 633-4621.

Speaking of generators, have any engineers working with a propane-powered generator come up with a way of monitoring the propane level in a tank with no gauge? If so, share your thoughts with us. You'll find the numbers below.

□□□

John Bisset is a principal in Multiphase, an engineering services company based in Washington. Reach him at (703) 323-7180. Tips for this column are encouraged, and published submissions qualify for SBE recertification credit. Fax them to (703) 764-0751, or send e-mail to WRWBENCH@aol.com

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Jan Lowry Knows Your Station

▶ continued from page 48

venture. By June of that same year the CP was returned, citing "a lack of interest in FM" in the market.

The construction permit application indicated that Crosley would have to cough up $42,450 to build the facility. Crosley officials had no way of knowing that by 1996, the going price for an FM in New York would be something north of $80 million.

Because WINS-FM died in the womb, its Pro-file runs only three paragraphs. Nobody affiliated with the current operation of WINS(AM) had so much as an inkling of this early foray into FM, so despite its brevity the document met with the kind of enthusiasm that greeted the discovery of the Dead Sea Scrolls.

Mr. Lowry also gave me the WINS(AM) Pro-file to flesh out my order and demonstrate what he can do.

Down to the minute

The Pro-file of WINS(AM) runs six pages and details every change of call letters, frequency, power, antenna configuration, transmitter location, studio location, ownership network affiliation and general manager from 1924 to the present day. Not only do you get exact dates; in some cases you even get the hour. For instance, the Pro-file reports that WINS began an affiliation with the Mutual Broadcasting System at precisely 9:30 a.m. on Aug. 28, 1961.

Among the revelations in this thoroughly researched report: in 1932 WINS operated an experimental television station on a frequency of 2035 kHz; in 1946 WINS increased its power to 50 kW using left-over parts from WLW's 500 kW superpower RCA transmitter; and when Westinghouse bought WINS in 1962 it decided to shut down WBZA in Springfield, Mass., rather than sell it, to comply with FCC ownership limitations.

To some, including many of the employees at the station in question, this information clearly is of no consequence. However, if you live and breathe radio, this is fascinating stuff. You can picture the engineers and executives of the 1930s poring over blueprints and FCC forms as they scrambled to improve their position in the burgeoning radio business. It was the golden age of radio, and there were fortunes to be made, even at second-tier independent stations like WINS.

What of the man who compiled this and similarly detailed reports for thousands of radio stations, alive and dead? Surely Jan Lowry must be a spell-binding storyteller, with a deep well of fascinating sagas. Perhaps, but Lowry insists that there is no "personality" behind Broadcast Pro-file.

Accidental tome

"It is its own personality," said Lowry, who adds that his magnum opus developed largely by accident. Lowry was conducting research for a book on broadcasting history in the Los Angeles area, when his note-taking apparently got out of hand.

"Massive files of information were gathered over the years as an afterthought, as scribblings in the margins to research on the Los Angeles book." That book has now grown to more than 1,300 pages, and Lowry is seeking a corporate sponsor to help get it published.

In the meantime he continues to crank out those fascinating Pro-files. If you work for a "heritage" station you're virtually assured that you will find your call letters in the catalog. A report on a listed station costs $12. If the station is not listed, Lowry will compile a custom report for just $18. The amount of work that will go into that report is way out of proportion to the price, which lets you assign a cash value to what is obviously a labor of love.

For a catalog, send $1 to:

Broadcast Pro-File
28243 Royal Road
Castaic, CA 91384-3028

□□□

Lee Harris is morning anchor at all-news WINS(AM) and a former station owner. He is also president of Harris Media, a website design and hosting firm. Contact him via e-mail at lee @harrisnet.com

USER REPORT

Stabiline Perfect Fit at WBBR(AM)

by Rene F. Tetro
Chief Engineer
WBBR(AM)

NEW YORK I know there are more than a handful of radio engineers who can identify with the challenge of maintaining proper AC voltage at the transmitter site, especially when faced with an overcrowded power grid from the local utility company. It was precisely this situation that developed into a persistent operational problem for the engineering department at WBBR(AM) in New York City.

Stabiline WHR Voltage Regulator Series

Enter the Stabiline voltage regulator from **Warner Electric/Superior Electric**, which can be configured to fit the power and phase requirements of virtually any transmitter site.

Dramatic difference

At WBBR we extensively investigated various voltage control products on the market, and decided that the Stabiline WHR unit best suited our needs and presented the greatest benefits. I can now say that, after two years of faithful service, the system has made a dramatic difference in transmitter site operation by eliminating the wild voltage fluctuations and phase differences we had experienced.

Let me backtrack for a moment.

The WBBR transmitter site is located in the New Jersey meadowlands, across the Hudson River from New York City. Beginning long before Bloomberg Communications purchased the facility from the now demised WNEW(AM), the site experienced a high level of AC main problems. We are the very last customer on our utility grid, a grid that includes a major natural gas pumping station, the Continental Sports Arena, and several large industrial companies. These large demand customers have heavy machinery that regularly cause problems on the grid. These include: low voltage, major voltage spikes and surges, and an instability of phase-to-phase voltage.

We inherited from WNEW two 50 kW transmitters, the main Nautel Ampfet 50 (circa 1989) and an auxiliary Continental Electronics 317C (circa 1968). Both are fed from the problematic three-phase, 480 V line.

What WBBR required was a constant 480 V on each phase. What we were receiving were varying voltages of anywhere from 430 V to 490 V on any individual phase. It was extremely rare to actually have each phase maintain the same voltage.

Breaker trips, transmitter power supply problems and "unhappy" three-phase motors were normal for WBBR. After six months of tolerating what rapidly became an unbearable situation, we turned to the three-phase, 480 V, model WHR voltage regulator, with surge protection option, for a solution. It took our electrical contractor, Forest Electric, less than one day to install the system after its arrival. It was not very long before WBBR's transmitter engineer, Bob Janney, and I had it up and running.

Problems vanished

Problems that had been a running headache for WBBR vanished immediately. The output voltage regulator was clean and stable. No more "unexplained" breaker trips and stressed power supply components. No more phase-to-phase instability.

The Stabiline three-phase regulator essentially works like this: a control module on each phase monitors the incoming voltage and makes the necessary adjustments to maintain nominal voltage on that phase. The big advantage here is that the tolerances are user-adjustable, so the engineer can maintain tight control, as desired, for his individual operation. In the case of WBBR, we have set up the system to maintain each phase within 2 percent of 480 V.

Our experience at WBBR has shown us that a voltage regulator is an absolute necessity in today's broadcast marketplace.

A side benefit we had not planned was a noticeable improvement in the signal-to-noise ratio of each transmitter due to the tighter control of their power supplies. In the case of the main transmitter, the noise level was reduced to -60 dB, an improvement of about 7 dB. A similar amount of noise reduction was noted in the auxiliary transmitter.

A key option I would highly recommend is the transient suppressor. This will protect the transmitter and its associated equipment from line disturbances (spikes/surges) due to such things as load switching and lightning.

Our experience at WBBR has shown us that a voltage regulator is an absolute necessity in today's broadcast marketplace, particularly as power demands outpace a utility company's ability to maintain capacity. Of all the various voltage regulation systems we investigated, the Warner Electric/Superior Electric Stabiline WHR system was the best for our needs. The range of modular features and options can be configured to meet just about any need. Single-phase systems are also available.

Operational and maintenance cost savings, increased transmission system efficiency and reductions in off-air time all add up to make the Stabiline WHR voltage regulator a valued addition at the WBBR transmitter facility.

For more information, contact Ted Gladis in Connecticut at (860) 585-4556; or circle ***Reader Service 101.***

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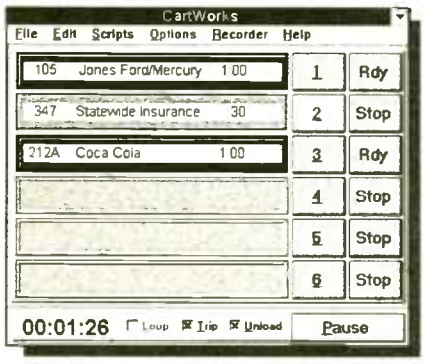

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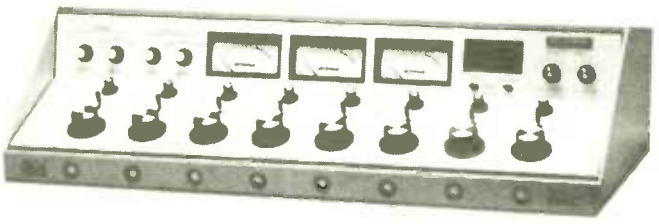

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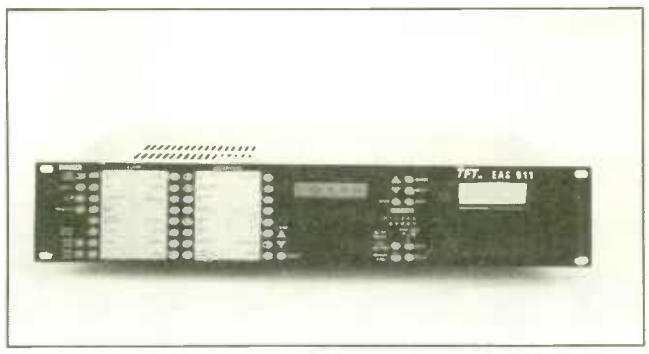
USER REPORT

TFT EASy to Learn and Operate

by Greg Kintz
Station Manager
Radio Baha'i, WLGI(FM)

HEMINGWAY, S.C. One of the most pressing decisions facing all radio stations in the next few months is which EAS to buy. There are several competing approaches to implementing the EAS protocol. We are all wrestling with price and ease of use. At Radio Baha'i, we decided that the **TFT** EAS 911 was the best system for us.

To test our decision, we brought in our newest group of volunteers/trainees, who are in their first week. After being shown only once, they were able to operate and encode the EAS 911. One of them — who is not at all technically oriented — said it was easy. It was obvious we had the right EAS product.



TFT EAS 911

No comparison

This past spring at NAB I compared the TFT with other units. Although they had some good features, I felt the TFT was easier to use for the on-air operator. We purchased the system from Bradley Broadcast Sales, who delivered it near the end of June.

Although most of the time, our station will only decode and forward messages, there are times when it will be necessary for the operator to encode a message. In the event of a call from a local public safety official, it is vital to prompt the operator through this important encoding process with speed and accuracy. The TFT approach guides the operator easily through every encoding or manual forwarding step with sequentially lighted keys.

All of the controls are displayed in front of the operator, so there are no menus to scroll through or figure out. Basically, the TFT EAS 911 holds the operator's hand as he or she selects the correct event, location and duration.

All of the systems comply with the FCC regulation. The real consideration is how easy it will be for the people operating the system.

For routine training, front panel "practice" and "help" keys speed the process of familiarity so that when an actual emergency occurs, an operator knows what to do.

When consumer devices become available in the near future, quick encoding will be even more important. This way the public can benefit directly from your broadcast station should you be requested to transmit a local alert due to fires, floods, explosions or chemical accidents.

For example, say there is a severe thunderstorm watch in effect for the next two hours for Georgetown, S.C. It must be quickly sent to the public because the storm may cause local flooding.

The operator starts by pressing "password," then numeric keys light up and the LCD prompt for password entry.

Next, lighted keys for events flash and the operator presses "flash flood." Two additional keys flash to ask for "watch" or "warning." A location is encoded by pressing the front-panel button corresponding to "Georgetown County," and finally the duration of two hours is incremented with two up/down arrow keys.

Guided instruction

The display then prompts to "send header," and the "send hdr" key flashes. Once the EAS header is sent, the two-tone attention signal is automatically sent with the proper length, and the printer begins printing a confirmation. The display then prompts "send EOM," and that key flashes. The operator completes the EAS message after any voice announcement with a simple press of the "send EOM" key.

The printer records all the actions for logging and recording.

The decision of which EAS to buy should be based on the operator and user, not on the engineer. All of the systems comply with the FCC regulation. The real consideration is how easy it will be for the people operating the system. Regardless of how slick the engineer or manager feels the interface is, actual user simplicity and reliability are why we chose TFT.

For more information from TFT, contact the company in California at (408) 727-7272, (800) 347-3383; fax: (408) 727-5942, (408) 727-6312; or circle ***Reader Service 79.***

USER REPORT

Thoughtful EAS Endec from Sage

by Rick Prime
Director of Engineering
Family Stations

OAKLAND, Calif. Time is running out quickly. The FCC deadline for the installation of the new EAS equipment is January 1997. With a network of more than 40 radio stations, three TV stations, and over 120 translators, nothing seems to happen as fast as we would like.

EAS equipment must interface to our satellite-delivered automated format. There is always a learning curve with any new piece of equipment, to say nothing of the new EAS system. I carefully checked out all of the features of the **Sage** Endec.

No matter how much you read sales brochures and listen to salesmen's pitches, I have found that you do not find the problems until after you have purchased the units and have to make them work.

Easy to learn

Ease of use was of the utmost importance. Our board operators and announcers take EAS seriously, but there is always a turnover and learning curve. I was frankly intimidated by the 47 button competitive EAS unit, and impressed with the ease of operation with the four button ATM format of the Sage Endec.

The proof in the pudding comes when you go to install new equipment only to find out it does not work exactly the way you thought.

I am pleased to tell you that the Sage Endec is a breeze to install. The manual is superbly written. Sage put a lot of thought into this manual.

I especially liked the first chapter,

The Sage EAS Endec

Quick Start, with a big sign that said "Read this section." In a mere seven pages, you are presented with what you need to know about EAS, how to bench-test the unit, hook it up and make it work.

I suggest you take the Sage Endec home, recline in your easy chair, place it in your lap, and start playing with the menu system. I can not express to you how neat this really is. The menu system is outstanding.

In just a few minutes you will be sending tests as you monitor them on the internal speaker. I did this for an hour, jumping from one menu to another, enabling this and that, and referring to the manual when I got stuck. This is the way to figure out how EAS works.

The Endec has so many features I do not think you will realize what you can do with it until you dig into the menus. The internal printer is just plain slick. Paper loading is easy; print quality is good. The back-lit LCD screen is comfortable to read, even if you are over 40 years old.

At this point I had to see what was inside, so out came the screwdriver and off came the top. The construction looks straightforward and neat. One circuit board and a printer module reveal a good, clean design throughout. The XLR connectors on the back provide audio in/out of the unit.

Thoughtful design

Everywhere you look, you will see thought has gone into the design of the Endec. For example, the front panel RS-232 port and back terminals unplug, so you do not have to unhook all the wires just to hook them back up in the wrong place. I do not expect the Endec will break down often. When I opened it, I touched each chip and voltage regulator. Nothing was running hot, or even warm. Modern technology is fantastic, with LSI

continued on page 54 ▶

USER REPORT

Mondosphere Upgrades with CCA

by Paul Kleinkramer
Director of Engineering
Mondosphere Broadcasting

BAKERSFIELD, Calif. Last year, Mondosphere Broadcasting upgraded the license class of KRAB(FM) in Bakersfield, Calif. This required building a new site and installing a new and more powerful transmitter. I had to decide whose transmitter to buy. Fortunately, I chose the right one.

For years, as a contract engineer at radio stations around the central coast of California, I was impressed by how few failures there were among the CCA transmitters I serviced. When a rig did end up off the air, I could always fix it with easily available parts. There was never any waiting around or babysitting irate program directors and general managers, while some one of a kind "capton sheet capacitor" or toy-like "muffin-fan" came by Fed-Ex.

Over the years I found that CCA transmitters are designed to get on air easily, stay on and get back on air quickly, without great hardship for the engineer or radio station. I also found that CCA transmitters continue broadcasting in spite of environments where summer building temperatures soar over 110 degrees, dusty intake air is the rule and main power condition and regulation are terrible. I have seen some other manufacturers' transmitters balk under these conditions. CCAs take them all in stride.

CCAs simply keep running at peak performance with a minimum of care.

Quick and easy installation

Our transmitter, a CCA Electronics Model FM12000G1, arrived on time as promised by CCA Electronics. After a brief examination to check for loose connections and damage in shipment, we proceeded to install the transmitter. We were able to install the it in a very short time; connections were simple and direct. We found the documentation, including the technical manuals for the transmitter and exciter, to be well written and helpful.

The transmitter was powered on low and allowed to operate for nearly half an hour just to check it out. No adjustment of the transmitter was necessary at this step. Readings were very close to the factory readings.

After assuring ourselves that all was well, we went to full power. The transmitter came up to full power (our TPO) without difficulty. We did adjust tuning controls just to acquaint ourselves with the transmitter operation. We found the tuning controls for both IPA and PA to be smooth and non-critical. Minor changes in tuning produced specified PA efficiency. This is what we expected with the grounded grid design pioneered by CCA many years ago. We have found that this design, inherently broadband, also provides excellent synchronous noise performance.

We learned later that CCA tunes its transmitters in production for minimum synchronous noise as part of the overall tuning and adjustment procedures. Complete factory test results were provided for our transmitter.

Multiple demands

Due to the more relaxed FCC rulemaking lately, our company has several stations in each of our markets. With one engineer per market station group, our engineers now have multiple studio and transmitter sites to care for single-handedly. I can not afford a transmitter that demands lots of time in maintenance and repair. If our engineer must spend time in the delicate care and feeding of a cranky transmitter, he simply will not have the time left for the proper maintenance of all the other equipment in our facilities. CCAs simply keep running at peak performance with a minimum of care.

It is for these reasons that when it came time to buy a new transmitter for KRAB, I made the best choice for our stations, engineers and me: I bought CCA.

For more information from CCA, contact the company in Georgia at (770) 964-3530; fax: (770) 964-2222; or circle ***Reader Service 140.***

TECHNOLOGY UPDATE

HOLLYANNE

GREELEY, Neb. The HU-961 from **HollyAnne Corp.** is a combined Emergency Alert System (EAS) encoder/decoder that permits broadcasters to receive, store, transmit and initiate EAS messages required by the FCC's new rules (effective Jan. 1997).

Using the new EAS digital protocol, the decoder receives and processes incoming EAS messages. The HU-961 can be programmed to alert the operator only to messages preselected by station management as important to the station's listeners. It also interfaces with automated broadcast stations with minimal effort. The encoder section generates all the EAS codes necessary to allow the station to initiate emergency and test messages.

Three audio inputs and one RS-232 1200 ASCII data input are standard on the HU-961, more than competitive units and exceeding the number required by the FCC. It may be coupled to the (optional) RR-962 radio receiver module. This module includes digitally tuned AM, FM and/or Weather band radio boards.

The decoder section is capable of both automatic or manual operation. When the system is in the automatic mode, only events preselected by management will activate it. These events include national warnings and

weekly and monthly tests. The manual mode allows the HU-961 to monitor incoming messages and alerts the operator to messages preselected by management.

In both modes, it stores incoming digital messages for review by station personnel. The encoder section is easily programmed to originate EAS emergency or test messages (using a 286 PC or better). The message area can be as small as one-ninth of a county or as large as the station signal area.

The company says the HU-961 "delivers the goods at a fraction of the cost of competitive encoder/decoder units."

For more information from HollyAnne Corp., contact the company in Nebraska at (402) 426-4841 or (888) 4-EAS-INFO; fax: (402) 426-8574; or circle ***Reader Service 91.***

Sage Endec Is Choice For Family Stations

▶ continued from page 53

and DSP chips allowing complicated circuits in small packages.

The Endec is a software-defined piece of hardware that can be made to do exactly what you want. If there are any changes to the EAS system plan (the FCC is talking about adding additional event codes, and your local area may want to add FIPS codes), or you want something to work differently, you only have to change the software. The Endec allows software changes through the front-panel RS-232 port. You could even define the way the three relays operate through the menu system. It is only software and easy to change.

We bought Sage Endecs for all our stations and I know we made the right decision.

There are a few accessories that are available with the Endec that add to its flexibility such as full-feature remote control, including an 80-character back-lit LCD display, and numerous one-button functions that can be controlled over RS-232 or RS-485 up to 2,000 feet. A modular receiver unit can be configured based on your monitoring requirements with an AM/FM, VHF or UHF receiver module. The receiver can hold up to three modules and give up to six audio outputs.

For stations with multiple facilities operating in the same location, an auxiliary relay panel will allow up to four stations to use an Endec individually or together.

Last, a multicolored LCD sign is available, which will scroll the emergency messages in the studio or the newsroom.

In conclusion, I think the Sage Endec is just plain neat, easy to install and use. The manual was written in a way that allows you to get up and running fast. We bought Sage Endecs for all our stations and I know we made the right decision.

For more information about Sage Electronics, contact Gary Tibbot of Harris Corp. at (800) 622-0022, or circle ***Reader Service 108.***

USER REPORT

Nautel Powers Denver Stations

by Rodger Tighe
Chief Engineer
KOSI(FM), KKHK(FM), KEZW(AM)

DENVER During the fall of 1995, Tribune Broadcasting purchased the 99.5 MHz station, formerly KVOD(FM) now KKHK, to combine with its Denver KOSI(FM)/KEZW(AM). With the acquisition, there was the opportunity to improve the 99.5 MHz facilities by moving from its metro Denver tower to the existing KOSI site, 7,600 feet above sea level, on Lookout Mountain. With such a move, KKHK's 1 mV/M coverage would increase tremendously.

The **Nautel** transmitters were selected for the project for reasons of reliability,

Nautel's FM20 Transmitter

solid state construction, digital exciters, efficiency and size. The transmitters had to be reliable as there would not be room in the existing KOSI building for two 20 kW tube-type transmitters and two medium power standby transmitters for the two stations.

Proven record

KOSI and KEZW had installed two Nautel solid-state transmitters over the previous two years and both had been totally problem free. The Nautel FM20s carry on the "soft failure" design philosophy found in other Nautel transmitters. The FM20 is comprised of parallel combined Nautel FM10 transmitters, meaning that one half of the transmitter can be down for service without being off the air.

Beyond this, each of the FM10s utilize 36 300 W power amplifiers, grouped in blocks of six, combined through Nautel's patented 60 degree hybrid combiner to provide up to 11 kW output. This unique combiner provides high isolation between amplifiers without the complexity, reject loads and losses associated with conventional 90 degree hybrid combining systems. Loss of a 300 W power amplifier would result in an almost imperceptible drop in total power output. A complete 1800 W PA block can be removed for service without taking the entire transmitter down.

Power supplies in each of the FM10s are redundant as well. Each of the six 1800 W PA blocks has its own regulated power supply. The transmitter's main power transformer is a "12 phase" design resulting in a near unity power factor and low harmonic currents on the incoming AC line.

The KOSI/KEZW facilities had been pioneers in converting to digital audio and were digital to the output of the digital STL. It seemed only logical that the digital chain be extended to the transmitter exciters. The two transmitters were supplied with redundant, automatically switched Nautel NE50 exciters with AES/EBU digital inputs.

The first transmitter arrived early in February and was on the air with KOSI light rock programming two days later. Absolutely no trouble was encountered in the installation. Two weeks later the old KOSI transmitter was removed and a new Dielectric Constant Impedance Counter was installed to combine the 99.5 and 101.1 MHz transmitter outputs into a common antenna.

Next, the 99.5 MHz Nautel FM20 was installed. The next few days were spent running rigid line between the transmitters, combiner, patch panels and reject loads. In late March, the new two-station directional antenna arrived and was installed.

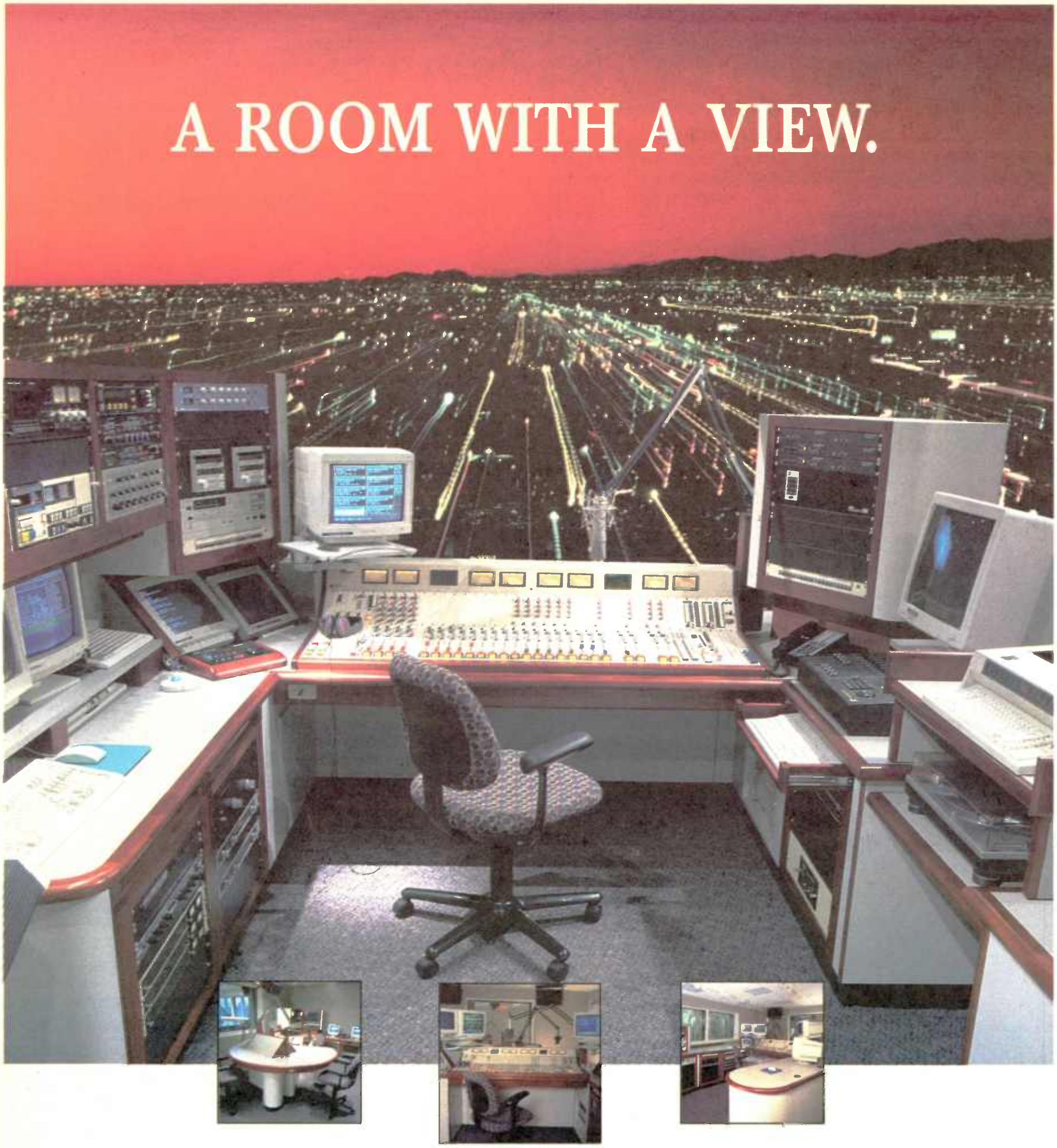
Energy efficient

The KOSI FM20 runs at 21.5 kW and the KKHK FM20 at 15.0 kW because the eight-bay three-fourths wavelength spaced Dielectric antenna has higher gain at 99.5 MHz than at 101.1 MHz. The power bill for the two transmitters is only about 40 percent higher than it was for the KOSI one-tube type transmitter, proving the overall efficiency of the Nautel transmitter to be excellent.

The only failure was an intermittent one in one of the digital exciters. Nautel replaced the suspect board and there have been no further problems. There has not been a single failure of any of the power amplifiers utilized in the two transmitters. In summary, this was the construction project of a lifetime and Nautel came through as promised.

For further information from Nautel, contact Gary Manteuffel in Maine at (207) 947-8200; fax: (207) 947-3693; or circle ***Reader Service 200.***

A ROOM WITH A VIEW.



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USER REPORT

KCRW Broadcasts Loud and Clear

by John C. Huntley
Chief Engineer
KCRW(FM)

SANTA MONICA, Calif. At KCRW(FM), we constantly evaluate the quality of the signal broadcast. Our goal is a perfectly received signal throughout the coverage area. The **Radio Designs Labs** ACM-2 is a tool that we use to prevent our transmission system from creating additional "multipath type" artifacts within our coverage area.

The Radio Design Labs ACM-2 is an amplitude modulation monitor for use in FM broadcast transmission systems. The device is in two parts. The first is the ACM-2 itself. The second is a precision diode assembly that is connected to a sample (BNC) port on the transmission line. The two are connected by a short length of RG-58 cable. The ACM-2 provides a linear LED display with an indication of AM noise level below an equivalent 100 percent AM modulation.

Noise level safeguards

Also provided is a logic level (+12 VDC) alarm output when the AM noise level exceeds a user set (front panel) level. There are also samples of equivalent RF level, a DC output that is calibrated to the front panel display that can be connected to a remote control for metering, and a connection on the front panel for an oscilloscope or other device (amplified speaker) to observe the AM noise components.

The Los Angeles market consists of a coastal plain separated from surrounding valleys by a series of "ridges." The KCRW transmitter is located at 200 feet on a tower whose base is 1,700 feet above sea level on one of the ridges. The situation is perfect for the creation of "physical" multipath. Tuning for lowest AM noise is critical for KCRW where the signal broadcast is stereo and includes two subcarrier tenants and an RBDS subcarrier.

In order to describe why this is such an important tool at KCRW, I need to briefly describe AM noise. AM signals present in FM broadcast systems are of two types. One type is steady state signals usually related to power supply filtering (a.k.a. "hum products" at 60 Hz and harmonics related to the transmitter power supply type). This type is called "asynchronous AM noise" as it is not related to the modulating signal.

An increase in the level of this signal can be a symptom of pending power supply problems. Pops and crackling in the AM noise signal can indicate other physical arcing problems within the transmitter.

The second type of AM noise is called synchronous AM noise because it is directly related to, and in synchrony with the modulation of the FM carrier. This

continued on page 58 ▶

TECHNOLOGY UPDATE

GORMAN REDLICH

ATHENS, Ohio The **Gorman-Redlich** EAS Encoder-Decoder is now available for sale.

The system offers auto interruption of program audio to insert EAS F.S.K. header codes and signal, plus two minutes of stored digital audio. The audio storage is expandable to four-and-a-half minutes. Features include a 25-pin printer port for an external parallel printer, 52 rear terminals for connection to automation or other gear, and four standard audio inputs, expandable to six. It offers five two-way RS-232 ports, one of which is dedicated to a computer input. The others could be used with a modem or remote sign board in the on-air room, or a character generator.

The system has a 40-character display, used with a keypad switch to set modulation levels on your transmitter and to set audio input levels for the stations being monitored. The keypad is also used to compose EAS messages.

For more information from Gorman-Redlich, contact the company at (614) 593-3150; fax: (614) 592-3898; or circle ***Reader Service 92.***

Approval to Come?

Four manufacturers hold FCC type acceptance for their Emergency Alert System (EAS) encoder-decoders — Sage, HollyAnne, TFT and Gorman-Redlich. At least two other companies await certification.

Multi-Technical Services (MTS) and Burk Technology both have products ready for sale that can not be purchased until approval by the FCC.

Both companies hope for type acceptance shortly.

For more information from Multi-Technical Services, contact the company in North Carolina at (919) 553-2995; fax: (919) 553-0437; or circle **Reader Service 105.**

For more information from Burk Technology, contact Bill Gould in Massachusetts at (508) 486-0086, (800) 255-8090; e-mail: control@burk.com; or circle **Reader Service 122.**

ACM-2 Is an Important Tool

▶ continued from page 57

type has the potential to create insidious multipath like problems with the received signal. Common causes of this transmission defect are narrowly tuned components of the FM transmitter or tuning of the FM transmitter that results in an FM passband that is not centered on the carrier frequency.

Loss of signal

Each of these problems result in the loss of some of the signal components created by modulation of the carrier. This causes small, but measurable changes in the amplitude of the FM broadcast carrier signal. The energy lost is converted to heat. Please note that severe mistuning will result in more apparent problems.

A change in the output power or changes in final current of an FM transmitter that is directly related to modulation indicates mistuning or something that should be corrected immediately.

The ACM-2 prevents FM multipath artifacts.

The result of the mistuning described above is that the transmitted signal may not contain all the components to be fully reconstucted by the FM stereo receiver or tuner. This is analogous to physical multipath which results in the destructive summation of two signals and an incomplete reconstruction of the stereo signal.

The Radio Design Labs ACM-2 has several features we find useful. The first is a BNC jack on the front of the unit that allows the connection of an oscilloscope to observe the AM noise components.

We put it to another use, connecting it to an ampifier speaker. This allows us to observe not only the volume of the AM components but the nature of them. While a similar result can be obtained by connecting the speaker directly across another sample diode (i.e., a "Bird" sample element) the calibrated nature of the ACM-2 front panel metering in conjunction with the sound of the AM component makes for rapid verification or ease of tuning the transmitter.

At KCRW we make use of nearly all the features available in the ACM-2. We have installed ACM-2 at the transmitter sites for KCRW, KCRU and KCRY. All are connected to the remote control for that site.

The alarm closure is connected to the remote control through a reed relay. There is an amplified speaker available at all the sites.

At KCRW we tune for minimum AM noise rather than peak power. This is important, as the point of minimum AM noise is seldom, if ever, the point of peak power output. The point of minimum AM noise has never been more than 5 percent below the point of peak power. When we started to use the ACM-1 (ACM-2's predecessor) and tune for minimum AM noise, the complaints of crosstalk from the KCRW program into the subcarrier tenants fell off and have remained minimal.

The Radio Design Labs ACM-2 is one tool we use to guarantee that the KCRW transmission system is not contributing to reception problems in areas where there is a severe multipath environment.

For more information from Radio Design Labs, contact the company in California at (805) 684-5415 or (800) 281-2683; fax: (800) 289-7338; or circle ***Reader Service 109.***

TECHNOLOGY UPDATE

LPB

FRAZER, Pa. LPB has designed the FM Advantage stereo transmitter, a phase-locked loop, frequency synthesized, frequency agile transmitter that will meet or exceed all FCC requirements and pass FCC certification requirements. The unit will be set to frequency using a set of four rotary DIP switches located on the printed circuit board. The FM transmitter will be in a stand-alone housing for connection on the exterior to audio sources via a one-eighths inch stereo connector.

Applications include advertising systems, rebroadcasting systems, travel information, in-home radio, wireless links and more.

This is a fully agile transmitter capable of broadcasting from 87.9 MHz to 107.9 MHz with end-user selectable frequencies. This frequency selection uses four rotary switches within the chassis of the unit for field adjustment if necessary.

FCC Part 15 requires field strength within 88-108 MHz be at or below 250µ v/m at a distance of 3 meters from the antenna. Depending on receiver quality this should provide a coverage radius of 100 to 200 feet, in stereo, and 500 to 600 feet to car radios in mono.

For more information from LPB, contact John Devecka in Pennsylvania at (610) 644-1123; fax: (610) 644-8651; or circle ***Reader Service 78.***

USER REPORT

Harris Combination Scores Big . . .

by Chip Morgan
Owner
Chip Morgan Broadcast Enterprises (CMBE)

SACRAMENTO, Calif. CMBE was retained to design and build studios and transmitter sites for a new class C FM station in Denver several years ago. A long battle between many applicants ended with Evergreen Communications Company winning the construction permit for what became the legendary KXPK.

The transmitter site was originally proposed at Mt. Morrison, but we moved it to Squaw Mountain for several reasons. One was that we could use a non-directional facility at that location. Many Denver stations are directional to minimize radiation toward a government "quiet zone" near Boulder, Colo. Another reason was that the site had excellent coverage toward the city of license in Evergreen, Colo., and also toward Denver.

This site is located well over 10,000 feet above sea level, and the center of radiation of the new facility ended up at 10,764 feet. A tall tower was not required. What was required was a reliable transmission system, one that could handle the altitude and the extreme temperatures of the Rocky Mountains and had built in redundancy.

After much consideration and many long conferences with Ken Perkins (who lives in the station's city of license and is a Harris broadcast salesperson), we chose a special new system that utilized the then-new **Harris** DIGIT exciter, two HT-30 FM transmitters and a switchless combiner. Switchless combiners were fairly common in TV plants at the time, but we were told that this was the first use of an FM switchless combiner in the US.

In addition, the entire station was built using digital technology except for the console (none was available in digital at the time), but more exciting was the use of this new technology on what is said to be the highest FM broadcast site in the United States, according to Tom Baran, site owner.

The switchless combiner is designed so that the station never has to go off the air for maintenance or to switch transmitters. While this station uses two high-power Harris transmitters for a TPO of 53 kW, the technology can work at any power level. Because there is no mechanical switch, changing transmitters is quick, reliable and causes no off-air time.

A single exciter feeds two transmitters of equal power into a pair of 3dB hybrids connected together through a high-power phasing section . The first hybrid is a splitter with its inputs in phase. If both transmitters are in phase (from the common exciter) and equal in amplitude (power output of the transmitter) the output ports of the splitter hybrid will also be equal in phase and amplitude.

The second hybrid works the same way, but in this case we want all of the power to go to the antenna and none to the reject (dummy) load, unless we need it to for testing or if there is an imbalance in the system. In order to feed all of the combined power to the antenna (not the reject load) a 90 degree phase shift must be inserted into one of the transmission lines between the two hybrids.

The secret to the switchless combiner scheme is to use three 90 degree phase shifters in the interconnecting links. One is a fixed "line stretcher" that gives the 90 degree phase shift required for normal conditions. The two others are in a dual motor driven "common case line stretcher" that provides a very smooth transition from one operating mode to another. During a "switch" the motorized phase shifter slowly changes the lengths of the

continued on page 61 ▶

TECHNOLOGY UPDATE

CROWN

ELKHART, Ind. Crown **Broadcast**, a division of Crown International Inc., has announced an addition to its family of low-power, high-quality FM transmitters and exciters — a highly efficient 2 kW amplifier.

The broadband amplifier is 75-80 percent efficient across the band with no tuning required. It features a responsive protection mode where problems with output devices, over temperature, high SWR and high current simply reduce the output power to a safe level until repairs take place. In addition, the 500 W power modules are hot swappable to keep the station on the air while either replacing or servicing the module. The separate DC power supply is power factor corrected to provide 90 percent efficiency as well as compliance with future regulatory requirements.

The amplifier weighs less than 50 pounds and the power supply allows redundant configurations. The size and weight efficiency means that both units can be shipped overnight to any location and makes installation easier. The new amplifier and power supply may be combined with an exciter.

For more information from Crown Broadcast Sales, contact the company in Indiana at (800) 294-8050; fax: (219) 294-8222; or circle ***Reader Service 89.***

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.

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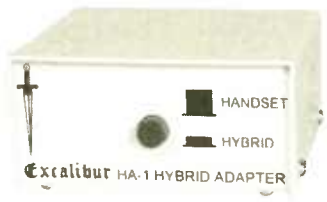
READER SERVICE NO 36

Excalibur Electronics

HA-1 Hybrid Adapter



The HA-1 Hybrid Adapter allows you to use your favorite broadcast hybrid with almost any telephone — old, new, single line, multi-line, etc. Since the HA-1 hooks up through your telephone instrument's handset connector, no connection to the telephone line is needed. With the HA-1's front panel push-button out, your telephone functions normally. With the button pushed in, the handset is disconnected and your hybrid is now on line; nothing could be simpler or easier. The performance of your hybrid will be the same as it would be if hooked up directly to a C.O. line.

EXCALIBUR ELECTRONICS, INC., CHANTILLY, VIRGINIA
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READER SERVICE NO 85

NEW EXPANDED COVERAGE

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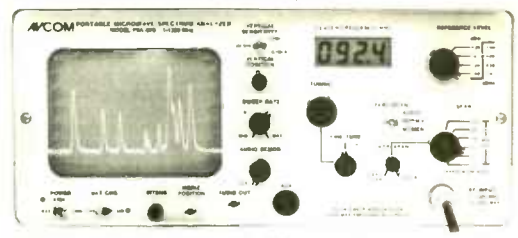
For more information, write, FAX, or phone



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READER SERVICE NO 222

USER REPORT

ECOing Across the Philippines

by Wilfredo Hernandez
Director of Engineering
Manila Broadcasting Company

MANILA, Philippines The Manila Broadcasting Co. began laying plans to be the first radio "super station" in the Philippines about a year before our planned launch date. Yes, this is an everyday occurrence in the United States, but we were pioneering new ground here.

We faced the additional pressure of making sure our equipment was top drawer. We were part of a milestone in this country's broadcast history and we had to equip it properly.

We meticulously researched every piece of equipment, using our satellite up- and down-links, audio processing and RF chain. Our plan was to feed 15 network stations from our Manila headquarters via satellite and simultaneously broadcast our signal across the Philippines.

Several factors considered

When deciding on which transmitters would be used at all network sites, we weighed several factors.

First was reliability. Some of our stations are in remote locations, making access difficult. The manufacturer we chose would also have to prove to our satisfaction that their equipment could operate in the environment in which it was placed and withstand erratic power fluctuations.

Secondly, we looked at quality of workmanship and parts availability. The workmanship of the transmitter had to meet industry standards.

Having had experience with U.S. transmitters from virtually all manufacturers, we decided that the transmitters we chose had to be constructed with commonly available parts. This way, no matter what happened to the manufacturer or who bought the company in the future, we would be able to buy parts.

We had several terrible experiences with proprietary parts that were available only from the transmitter manufacturer, resulting in delayed shipments and down time.

Lastly, we looked at price. We wanted to purchase 13 kW and three 25 kW transmitters, one for the flagship station and network headquarters here in Manila. We expected to pay a reasonable price for the transmitters, but we were not willing to pay higher prices just for the brand name on the transmitter door.

MBC relied heavily on the experiences with all transmitter makes at MBC. When we completed our research our answer was clear: only **Energy-Onix** met our criteria.

We had several Energy-Onix and other manufacturers transmitters already in the field, both the older MK model and the ECO series. The power ranges ran from 3.5 kW to 25 kW. Our field records indicated a high level of reliability.

Energy-Onix uses a triode tube in grounded grid configuration with zero bias designed by Bernie Wise in 1962. We have found this to be a more reliable transmitter design that gives longer tube life. In addition, the smaller number of parts in the circuit increases reliability. In this design there is no bias or screen supply, none is needed. Energy-Onix high-voltage power supplies operate at a lower voltage than a transmitter with a tetrode tube, making them safer to operate.

We chose the ECO-10 for our satellite stations and MK-25 for two other sites and an MK-25 for our flagship. Energy-Onix has since come out with the ECO 22 and 25 which feature a 2 kW solid state driver. Had they been available at the time of our purchase, I am sure our decision would have leaned in their favor.

Eagerly awaited

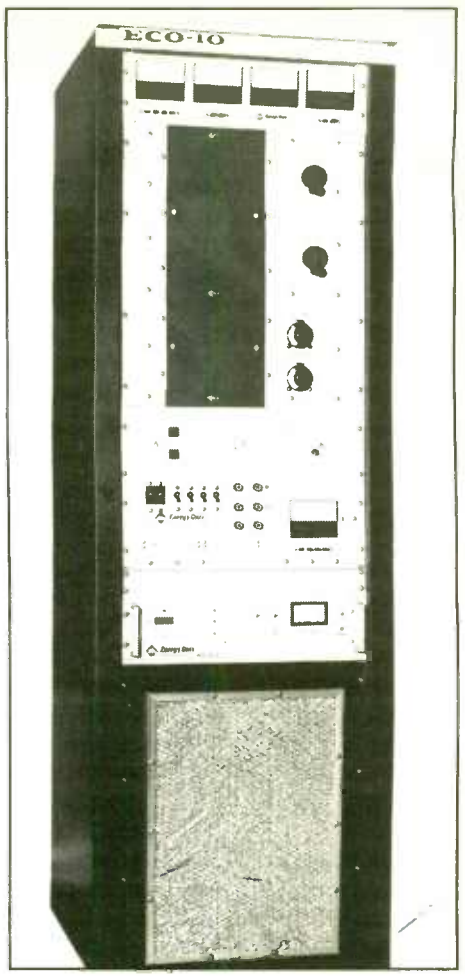
We eagerly anticipated the arrival of our new transmitters. Experience told me I should expect no problems with installation or turning on the transmitters. Energy-Onix usually plugs in and turns on with full power achieved in moments, after an initial control system check out to ensure no damage occurred in shipping.

Energy-Onix documentation has always been very good, but the manuals with our new ECO transmitters contained more detailed drawings and had an easier flow to them which made them even better for our field engineers. I learned that a new CAD system purchased by Energy-Onix made those improvements possible.

Energy-Onix after-sale support is outstanding. This includes what would be after hours technical help in the United States. Due to the time difference it is daytime here when it is nighttime there. When a problem has occurred the technical staff's response has been immediate.

We are proud of our achievement as the first satellite-fed network in the Philippines and very secure with our selection of Energy-Onix to provide our transmitters.

For more information from Energy-Onix, contact Ernie Belanger in New York at (518) 828-1690; fax: (518) 828-8476; or circle ***Reader Service 93.***



The ECO-10 from Energy-Onix

. . . And Works Like a Charm

▶ continued from page 59

transmission lines of the two transmitters where they feed onto the second hybrid. In various positions of the "switch" all the power from one or the other transmitter can be fed to the dummy load or to the antenna. In the normal operating condition, both transmitters are fed to the main antenna. In test conditions, both transmitters can be fed to the dummy load.

At the output of the second hybrid, one output port feeds the antenna, and another feeds a reject load (just like a "standard" combining system). As long as the signals are 90 degrees out of phase at the input to the second hybrid, all of the signal goes to the antenna.

There is no audible change in the signal while switching from transmitter A to B or when combining both transmitters.

Bill said that the transmitters tuned up just fine, the switchless combiner worked like a charm and everybody including Ray Skibitsky (our client) was happy with the way it performed.

During the equipment test period we found several intermodulation "spurs" which we eliminated with a bandpass filter from Jampro between the switchless combiner and the custom five-eights wave JBBP antenna. The site is co-located with another 100 kW station and the spurs were anticipated.

So the system ended up to be very interesting from an RF standpoint. It is comprised of a digital exciter, switchless combiner, bandpass filter and broadband antenna. In addition, we built an on-channel booster using the Harris Digit, an RF amplifier and a combiner/master antenna to serve Boulder, Colo.

The switchless combiner system has been in operation twenty four hours a day seven days a week for several years. Greg Benson, a ex-CMBE engineer who now works directly with KXPK, reports that it has been easy to maintain and has always worked perfectly from an RF standpoint. Greg's only concern is that the control system that comes with the system can't automatically detect which transmitter is off the air in the event of a failure and switch the correctly operating transmitter to the antenna for 50 percent power instead of 25 percent power. However, a remote control system can handle this, and operators or engineers can make the switch by remote control or locally.

Our client's previous experience with another powerhouse FM station in Denver was that transmission systems tended to be unreliable in the Rocky Mountains. The Harris switchless combiner made us heroes at KXPK.

For more information from Harris Broadcast, contact the company in Illinois at (217) 222-8200; fax: (217) 224-1439; or circle ***Reader Service 95.***

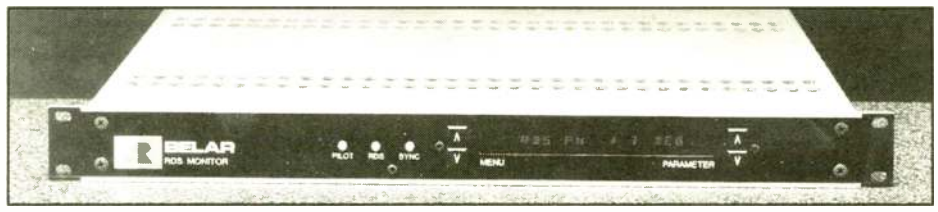
USER REPORT

Belar Monitor Optimizes RBDS

by Dennis J. Martin
Chief Engineer
KBIG(FM)

LOS ANGELES The RBDS signal, by design, is respectably robust even at low injection levels. However, to ensure reliable performance in the field, it is more important to accurately adjust several parameters. Although alternative methods are suggested by encoder manufacturers, we have found that a full-featured RBDS monitor simplifies and speeds setup and guarantees solid, long-term results.

The **Belar** RDS-1 is a microprocessor-based RDS/RBDS monitor that measures virtually every component of the complex signal including injection, phase error, block error rate, basic RBDS data, paging information and group data. Menus selected by two pairs of push buttons, and data appear on an internal 20-character alphanumeric display. Three front-panel LEDs — pilot, RDS and sync — indicate the presence of the 19 kHz pilot and RBDS subcarrier, and whether the RDS-1 is locked to the RBDS data stream (sync LED).



The Belar RDS-1

Although it is designed to interface directly with the Wizard line of digital monitors, it can be connected to any composite source capable of supplying 2.8 to 5.7 V P-P into 100 k ohms. Initial calibration is simple: switch on the main modulation monitor's calibrator and adjust the RDS-1's "ADJ" potentiometer for 100 percent total.

Measuring injection

Like any subcarrier, one of several important parameters is injection level. The U.S. RBDS standard recommends a peak deviation of the FM carrier by the unmodulated RBDS subcarrier of +/- 2.0 kHz, which equates to 2.6 percent. Without a dedicated monitor or costly spectrum analyzer, the user must remove all modulation and attempt to measure injection on the station's modulation monitor. In any case, accurately reading 2.6 percent is difficult.

The Belar RDS-1 solves the problem by providing an injection level function that resolves to 0.1 percent from 0 to 12.7 percent. Hence, adjustment can be quick and precise under full-modulation conditions.

The standard also specifies that the RBDS subcarrier be phase-locked to the third harmonic of the 19 kHz pilot, and that the phase angle not exceed +/-10 degrees. One method is to use a single- or dual-trace oscilloscope and attempt to reference the phase of the RBDS subcarrier to the pilot. And it is doubtful that the resulting phase angle will be within 10 degrees.

Here again the RDS-1 excels, in part because it is the only RBDS monitor that measures phase error. Simply select the phase measurement function and adjust the encoder until zero degrees is indicated. Error is displayed over a +/-30-degree range, even with full modulation.

Although the standard does not require a measurement of block error rate, we have found it to be a critical parameter to confirm. As its name implies, it is a measure of the error rate of the RBDS data in percent, and relates to the "health" of the signal. Under ideal conditions, it should be zero and we have found that zero percent is achievable even using injections below 2.6 percent.

Troubleshooting

Assuming proper orientation of the encoder, errors most likely would be caused by spurious components from either the stereo generator or an adjacent subcarrier (such as 67 kHz). Whatever the source, the interference should be investigated and cured, perhaps by adding a filter to the offending culprit, and the Belar RDS-1 makes troubleshooting fast and reliable.

Because incorrect time and date are common listener complaints, the RDS-1 computes and displays local time and date based on information you enter during initial setup. This feature verifies that your encoder offset from Universal Coordinated Time is correct.

Basic RBDS data is examined by merely stepping through a few menu choices. For example, PI is the Program Identification in hexadecimal and decoded formats; PS shows the 8-character program service name; PTY displays the program type code and decoded text; TP and TA indicate the state of traffic program identification and traffic announcement indicators; M/S is the music/speech indicator state; DI shows the decoder identification; AF is alternate frequency information; and RTx is a scrolling display of radio text, where x = Type A or B.

Advanced measurement functions include GPS data (state, city and grid); transparent data and in-house data channels; paging information, which includes MMBS detection, network group, paging interval and radio paging data; and group data in hexadecimal and ASCII formats.

Remote communication

Because the RDS-1 is a microprocessor-based analyzer, it can be interrogated remotely through its RS-232 port, or its unit interface, which links it to other monitors in the Wizard family of products.

Outputs of RDS data and clock, regenerated 19 and 57 kHz, pilot and subcarrier are provided along with relay closure outputs of pilot, RDS and Sync LEDs.

We have found RBDS to be a relatively low-maintenance auxiliary service. But just as proper stereo performance depends upon a high-quality monitor, RBDS operation can only be optimized and maintained by using a dedicated analyzer like the Belar RDS-1 RDS/RBDS monitor.

For more information from Belar, contact David Hirsch in Pennsylvania at (610) 687-5550; fax: (610) 687-2686; e-mail: sales@belar.com; or circle ***Reader Service 102.***

USER REPORT

Snow Forces Change at KSYZ(FM)

by Mike Elliott
Certified Broadcast Engineer
Elliot Broadcast Services

LINCOLN, Neb. It was a late winter blizzard that forced KSYZ(FM) to replace its 25 kW FM transmitter after 90-plus m.p.h. winds filled the transmitter with snow. All transformers, the tube cavity, in fact nearly every component of the transmitter was soaked with water from melting snow. In order to get the station back on the air at full power as quickly as possible, a replacement transmitter was needed.

Over the past year, our company had installed 20 kW and 30 kW transmitters from **Broadcast Electronics** and had been very happy with them. Our first call was to Chris Kreger from R.F. Specialties of Missouri. Chris worked closely with Broadcast Electronics and had our new FM-30B transmitter on site in less than 72 hours.

Easy installation

Installation of the FM-30B went very quickly. Broadcast Electronics faxed us detailed dimensions and installation documentation in advance. When the transmitter arrived at the site, the moving company easily positioned the transmitter and power supply cabinets. We had the RF "plumbing" precut and ready to connect. Remote control and metering connections were simple to wire, thanks to easily accessible and clearly labeled terminal strips. Another nice feature is the standard screw terminal strips, you do not have to make up special connectors or cables.

Electrical connections with many transmitters can be one of the most difficult jobs. The Broadcast Electronics FM-30B power connections are easily accessible in the power supply cabinet. It is a straight run from conduit entrance to the power terminal board. We added a supplemental surge protector inside the transmitter power supply cabinet. Mounting and connecting this protector was equally simple.

It was now time for the moment of truth. With all wiring and RF connections completed, the tube installed, and a complete inspection of the transmitter, we applied AC power to the transmitter. We checked the AC power readings with the built-in three phase AC power line voltage meter. The MVDS and status indicators all looked fine. We pushed the filament on button, expecting to hear the blower start, but it did not.

A quick look at the MVDS display screen confirmed that the transmitter controller was trying to start the power but would not turn the filaments on due to low/no air pressure. We checked the AC power phase sequence detector, which confirmed our suspicions. The electrician had wired the three-phase power out of sequence. A change of the AC wiring had the phase sequence happy.

Once again, we pressed the filament on button. Instantly the blower started, positive cavity air pressure was detected, and the filaments turned on. We adjusted the filament voltage and allowed the tube to warm up for about 30 minutes.

Now the big test.

On air with full power

We pressed the high voltage On button and watched the transmitter output power supply smoothly rise from zero to exactly 100 percent power. KSYZ(FM) was back on the air at full power, thanks to a well-designed transmitter from Broadcast Electronics and

continued on next page ▶

USER REPORT

QEI's High-Tech, Simple Solution

by Mark S. Pallock
Consultant
KCFY(FM)

YUMA, Ariz. KCFY(FM), a contemporary Christian music station in Yuma, recently purchased a new FM transmitter. After two weeks on the air, the transmitter suffered a major failure. As a result, we had to do some pretty fast shopping (by this time we were operating with the driver module into the antenna). For about the same price as many tube type transmitters, we were able to buy a complete solid state transmitter, a **QEI** Quantum.

The KCFY QEI Quantum 3.0 solid state rig is a surprisingly simple transmitter for all of its high technology.

The transmitter is housed in QEI's great Red Box, is 58 inches high and composed of a 300 W FM exciter/driver that feeds a splitter and drives the input of a 600 W FET PA amplifier.

The QEI Quantum

The Quantum series is available in power increments of 1.2 and 9.6 kW in 600 W increments to the 6.0 kW level and 1.2 kW increments between the 6.0 kW and 9.6 kW levels.

This will allow the station to buy precisely the amount of power required and operate at maximum efficiency. The outputs of these modules are summed together in a cableless combiner module and form a neat compact package. I am amazed at how much room there is inside the cabinet.

The installation of this transmitter was the easiest I have done because no special interface was required to hook it up to the remote control. This is a basic plug and play box. We literally connected the transmission line, the AC and the remote control, and we were on the air in about 3.5 hours.

Yuma is about a five-station market and the great exciter delivers CD quality for KCFY making it by far the loudest, cleanest station in the market.

The owner of the station has visited the transmitter site every couple of days since the installation in August, and the power output meter has not moved more than 1 percent in all this time.

For more information from QEI, contact Jeff Detweiler in New Jersey at (800) 334-9154, (609) 728-2020; fax: (609) 629-1751; or circle ***Reader Service 103.***

Well-Designed BE Transmitter

▶ *continued from previous page*

the thorough final test every transmitter goes through at the factory.

The transmitter has continued to run perfectly (except for a lightning hit which destroyed one of the tube socket arc gaps) ever since. This transmitter site is not air conditioned, however the superb airflow of the transmitter cooling system keeps the transmitter operating temperature within reasonable limits. The cooling system in the FM-30B is also substantially quieter than the 25 kW transmitter it replaced.

Some features that appeal to us, include the folded half-wave cavity (which means no plate blocker) and no sliding contacts, two completely independent IPA amplifiers, and a built-in synchronous AM noise measurement point.

We also like the "soft start" feature and automatic VSWR foldback, which becomes a necessity with the ice storms in Nebraska. The extensive remote metering and status indications give us a true picture of transmitter parameters and site conditions via our remote control.

Okay, you have been wondering how a transmitter got filled with snow? When the old unit was installed, the transmitter exhaust was direct-coupled to an exhaust fan to rotate in reverse, forcing snow into the transmitter cabinet via the direct coupled exhaust duct. Once the transmitter cabinet had been filled with snow, it continued to be forced out of all openings in the transmitter cabinet inside the meters on the front of the transmitter. We have yet to determine how snow got in those sealed meters.

When power returned after the storm subsided, the transmitter turned the primary AC power back on, shorting out transformers and almost everything else inside the transmitter. Our new exhaust system is not direct coupled to the transmitter, and the building now has louvers that close during power outages.

For more information from Broadcast Electronics, contact the company in Illinois at (217) 224-9600, fax: (217) 224-9607; or circle ***Reader Service 97.***

MARKETPLACE

Recently Introduced Products for the Radio Broadcast Professional

Comrex Hotline

Sometimes it is impractical to install a special circuit like ISDN for a one-time remote. However, usually a plain telephone line is available. Wouldn't it be nice if, on that plain line, you could have high quality two-way audio? The Hotline does it with up to 10 kHz two-way audio on a standard telephone line.

For more information from Comrex, contact the company in Massachusetts at (508) 263-1800; e-mail: info@comrex.com; or circle ***Reader Service 94.***

ST-NG1 noise generator

The Radio Design Lab ST-NG1 is a true random noise generator, providing white and pink noise at mic and line levels. This noise generator has a noise passband of 20 Hz to 20 kHz and has gain controls for both noise sources.

The ST-NG1 produces no repetitive frequency or amplitude pattern. Like other products in the "Stick On" series, it offers several versatile mounting options.

For additional information from Radio Design Labs, contact the company in California at (800) 281-2683; fax: (800) 289-7338; or circle ***Reader Service 119.***

ESE Self-setting clock

ESE introduces the new LX-5112. This 12-inch analog clock is designed to operate as a time code reader, a stand-alone clock or an impulse clock. The LX-5112 is capable of setting itself automatically to the correct time. The clock is able to synchronize with an alternating 12 or 24 V impulse signal, or to act as a stand-alone clock. Features include: time zone offset, battery back-up, error indicator and more.

For more information from ESE, contact the company in California at (310) 322-2136; fax: (310) 322-8127; or circle ***Reader Service 139.***

TECHNOLOGY UPDATE

CONTINENTAL

DALLAS Continental Electronics Corp. offers the 802D FM Exciter using digital signal processing (DSP) technology. The PC platform utilizes a standard motherboard as the foundation for a reliable, expandable system. The PC controls system operation, diagnostics, user interface and other background tasks.

Added to the PC is a powerful floating point digital processing board, using four Analog Devices Sharc chips.

The Sharcs perform the actual signal processing — FM generation, interpolation, stereo generation, pre-emphasis, composite processing, audio processing, SCA generation and filtering. Additional functions are also performed when future software upgrades are available.

Rounding out the unit is a direct conversion board which converts the digital output form the Sharcs directly to the operating frequency. This approach minimizes the analog circuitry compared to competitive designs resulting in a cleaner signal.

The 802D is software expandable and upgradeable over a serial cable from another PC direct into the internal "hard disk" drive. The 802D comes standard with separate analog inputs for stereo composite and SCAs, analog inputs for left and right audio and two analog inputs for SCA audio. AES/EBU digital input is available as an option.

Continental Electronics Corp. specializes in the design, manufacture and testing of high-power RF transmission equipment used in broadcasting, communications, radar and scientific applications around the world.

For more information from Continental Electronics Corp., contact Steve Claterbaugh in Texas at (214) 381-7161; fax: (214) 381-4949; or circle ***Reader Servie 100.***

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.

AMPLIFIERS

Want To Sell

Longevin 210A power supply w/plug in jack, very stout, $50. E Davison, 217-793-0400.

Scott 299 tube amp, $150; Pioneer spec 4, 150 w.p.c. rack mount, $250; Soundcraftsmen pro amp 450 w/p.c. Mosfet rack mount fan cooling, $325, all excel cond. R Cobb, Solid State Recdg, 1044 Lightfoot Rd, Wimauma FL 33598. 813-634-1940.

Crown D-150A stereo monitor amp, gd cond, $250/BO. H Jeschke, Fellowship Press, 5820 Overbrook Avve, Philadelphia PA 19131. 215-879-6300.

McCurdy DA-507 dist amp system (2), for parts only, $100 ea. D Leutz, KKBN, POB 708, Twain Harte CA 96303. 209-586-1988.

Want To Buy

WANTED
HiFi/Commerical tube amps, compressors, mixers, horn speakers. Altec, McIntosh, JBL, EV, WE, Tannoy, Marantz, Ampex, etc. 405-737-3312 FAX: 3355

Dynaco tube amps, Mark III, IV, Stereo 70, Harmon-Kardon Citation II & a McIntosh Mc40, U.S. 6550's, British KT88's tubes, manual for Marantz model 8 amp. R Cobb, Solid State Recdg, 1044 Lightfoot Rd, Wimauma FL 33598. 813-634-1940.

Distribution amplifier, mono 1, 600 ohm input, 4 or more outputs. A Slaugh, Ski Areas of NY, 2144 Currie Rd, Tully NY 14159. 315-696-6550.

Marantz 1 audio consolette preamp, single or pair & model 6 stereo adapter. P Chance, Imperial Analog, 925 Clinton St, Philadelphia PA 19107. 215-574-8147.

ANTENNAS/TOWERS/ CABLES

Want To Sell

EF Johnson 145-102-13 AM antenna changeover switch, $135. P Willey, WBTN, Historic Rte 7, Bennington VT 05421. 413-663-3419.

Jampro Penetrator, 1 bay FM, tuned to 103.9, $1500/BO; Phelps Dodge CFM-LP-2 2 bay FM tuned to 104.9, $1500/BO; Shively 6813 3 bay FM tuned to 103.9, $2000/BO. S Avery, KRAS, 731 N Balsam, Ridgecrest CA 93555. 619-371-1700.

RCA/Dielectric DCR Series (11) deicer transformers, $200 ea/BO all. B Weiss, KUDL, 3101 Broadway #460, Kansas City MO 64111. 816-753-0933.

500 point stainless tower, dissapator, $400; Potomac 19 2 tower monitor, w/remote meter panel, $1000. D Rose, KDUC, POB 432, Barstow CA 92312. 619-256-2068.

Scala HDCA-10 Yagi antennas (5), 10 elements, on 94.3 mHz, $175 ea +shpg; Jampro JSCP-4 end fed high pwr FM antenna on 94.1 mHz, $2500 or BO; Cablewave HCC-300 3" Heliax, 2 lengths ea about 125', w/connectors both ends, working cond when removed from service, $450 ea/BO +shpg. J Sands, KJMZ, 702-868-7222.

Andrew 7/8" foam, 175', new, $500. R Coleman, WHHK, 937 SE 2nd St, Box 222, Galva IL 61434. 309-932-2288.

Cablewave 1140', 3-1/8", 20' sections, $225 per rigid 20' section. D Ingles, KNYD, POB 1924, Tulsa OK 74137. 918-455-5693.

Cablewave (Phelps/Dodge) 3-bay w/heaters, 95.9, $1800/BO. PMA Marketing, 414-482-2638.

Harris/ERI FMS brackets, 4 stainless steel brackets for antenna pole mount, $75 ea; Andrew LDF7-50, 190', LDF7-50A 1-5/8", (2) 47R3 connectors; (2) 87R connectors; coax, $1400, connectors, $75 ea; Jampro JSCP-2 3" input, $1800; Harris/ERI FMC 4-A 5 kW w/heaters & mounting brackets, will tune to your freq, $3200. J Gray, WCAK, 10 Trinity, Ft Thomas KY 41075. 606-781-5715.

500', 36" face, 110mph wind load. 706-733-8201, Clarence or Mark.

ERI high power 4-bay rototiller FM antenna with radomes 92.3 mHz. Shively 6810 eight bay with radomes, new never used, 100.1 mHz. Priced to sell!! 816-628-5959.

NEW & USED: 1-5/8 & 7/8" coax cable, on spools, will cut to length, guaranteed. Goodrich Ent, 11435 Manderson St, Omaha NE 68164. 402-493-1886.

Want To Buy

Low power 4-bay FM antenna on or about 96.5 mHz. B Campbell, KRIG, 1740 SE Washington, Bartlesville OK 74006. 918-333-7943.

AUDIO PRODUCTION

Want To Sell

ADC D5700 sound effects filter, hi & lo poss sections, 100 Hz to 5 kHz in 8 steps, LC type, $125. E Davison, 217-793-0400.

Eventide H-949 Harmonizer; Drawmer 201 gate; Panasonic 3500 DAT; Gates M-5576 vintage tube line amp; bi-amp spring reverb; AudioArts 4200-A EQ; Telefunken V-72; Altec plug in transformers. T Coffman, 619-571-5031.

Gemini PMX 3000 mixer, rackmount, 5 line, 2 phono, 2 mic inputs, 7 band EQ, 3 outputs & cues, built in delay; Shure M267 mic/line mixer w/limiter, & Realistic 10 band stereo EQ, all for $200, like new. C Marion, JCR Radio Prod, 3911 Glendale St, Philadelphia PA 19124. 215-289-8295.

Orban 8100A, stock, $3500; Cobalt Blue card 5 for Orban 8100A, $450; Gentner RCF-2 card 5 for 8100A, $450; Gentner Audio Prisms, pair, $750 ea; Gentner Digital Prisms w/digital laser-stereo gen/limiter & optical encoder, $1500; ibanez HD 1000 harmonizer/delay, $200. S Bush, Bountiful Bdctg, 3595 S 1300 W, Salt Lake City UT 84119. 801-264-8250.

Phase Linear auto correlator 1000, $50; B&K sine squarwave gen, $75. R Cobb, Solid State Recdg, 1044 Lightfoot Rd, Wimauma FL 33598. 813-634-1940.

Audimax IIIS (1), BO. J Natoli, WBTC, 125 Johnson Dr, Uhrichsville OH 44683. 614-922-2700.

Digidesign Session 8 digital audio workstation valued at $3995, new, still in box, never used, won at NAB, will sacrifice for $2700. B Updyke, WRGN, RR#3, Hunlock Creek PA 18621. 717-477-3688.

Drawmer DS-201B freq sensitive stereo gate/ducker, $500 ea; Drawner DL441 quad compressor/limiters, $850 ea, all units in mint cond. M Ravain, Trinity Recdg, POB 2479, Flagler Beach FL 32136. 904-439-3671.

Dynaflex NR units (2), gd cond, $200 ea; Symetrix TI-101 telephone interface, gd cond, $150; dbx 155 4 chnl tape NR system, modified, $100; (2) UREI 527A graphic EQs, $100 ea. D Leutz, KKBN, POB 708, Twain Harte CA 96303. 209-586-1988.

Eventide H-910 harmonizer, factory refurbished, $350/BO. J Winters, Winterssound, 45 E Washington St, Elizabethtown PA 17022. 717-367-1119.

Eventide H3000 D/SE harmonizer in mint cond, pitch change, delays, flanging, vocoding & much more, $1850. D Popp, Colors Audio, 93 Marvin Ave, Akron OH 44302. 330-869-5644.

Yamaha SY-55 61 key music workstation, 8 trk sequencer built in, touch sensitive & aftertouch, excel cond, pedals & original box, $795/BO; Teac PB-40 patch bay, like new 1/4 front & back, $100/BO. W Dougherty Jr, WLD Recdg Std, Music Valley, Rt 1, Mill Spring MO 63952. 573-998-2681.

JBL 4333A 15" speaker, $950/pair; Vintage recond tube mic pre's & mixers, $300-$700; ADC new patch bays, 1/4" 52 points, $169; ADC TT bays, $129 up; ADC new TT or 1/4" TRS cords, $9; Furman 1/4" to 1/4" patchbays, $95 ea; like new tape, 1/2"x2500' 456, $15 ea; 1" 456, 226, 250, $25 ea; Rane ME15 graphic EQ, $150; Digitec 3.6 sec delay, $150; new pwr dist/filter rack mt, $75. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

Want To Buy

Neve, API, MXR, Lexicon, mic pres, EQs, delays, compressors, harmonizers, reverbs. T Coffman, 619-571-5031.

Pultec Mavec tube type sing chan mic pre & EQ unit, need manual & schematic, copy OK, will pay. Ed, 412-621-8000.

Compressors & EQ's, tube & solid state. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

AUTOMATION EQUIPMENT

Want To Sell

BE 1600, will sell all or part, call. P Deen, WAJQ, 208 Douglas St, Alma GA 31510. 912-632-1000.

IGM EC System, (3) 48 tray stereo Insta-Carts, 24 stereo Go-Cart & computer, $2000/system, may sell separately; Sentry FS12B System, (2) 48 tray stereo Insta-Carts, (2) 24 stereo Go-Carts, (4) 42 Go-Cart machines & computer, $2500/system, may sell separately. C Mandel, KAMP, 626 Main St, El Centro CA 92243. 619-352-2277.

Schaefer 903-E automation system w/(4) Carousels, (6) Audi-Cord E-31-R PB cart machines, 3 tones, & manuals, just removed from service, $4000/BO +shp. Ron or Brad, WADJ, Box 1330, Somerset PA 15501. 814-443-1330.

Sentry FS-12 w/hard disk system & 24 Pioneer 6 pack CD players, gd cond, very little use, $3500/BO w/crating + shpg. J Sands, KJMZ, 702-868-7222.

Cetec 7000, CPU, source cards, cables, Carousels, audio files, liquidating complete system, BO. E Moody, KJEM, 216 N Main, Bentonville AR 72712. 501-621-3880.

Gates RA1 controller, $50; SMC 352 Carousel, $100; Schafer 903E, $500 ea; SMC ESP1 pwr supplies, $100 ea; CSI touchtone decoder, $200 ea; Gates 5S cart player, 1 rack, $200. D Rose, KDUC, POB 432, Barstow CA 92312. 619-256-2068.

SMC ESP-2 automation system w/remote control, (2) mono monitors, (5) 350RS Carousels, 450 Carousel, (3) 721 dual PB, 710 PB, 790 R/P attached to DT-6 data terminal, (4) Scully r-r PB, gd cond, working when removed from service, $3000/BO. G Hornung, KRGI, 3205 W N Front St, Grand Island NE 68802. 308-381-1430.

Want To Buy

Digital DJ or DJ lite. B Campbell, KRIG, 1740 SE Washington, Bartlesville OK 74006. 918-333-7943.

CART MACHINES

Want To Sell

BE Spotmaster 10 cart deck, $900. P Deen, WAJQ, 208 Douglas St, Alma GA 31510. 912-632-1000.

FS12B System, (2) 48-tray stereo Insta-Carts, (2) 24 stereo Go-Carts. (4) 42 Go-Cart machines & computer, $2500 for complete system, might consider selling individually. C Mandel, KAMP, 626 Main St, El Centro CA 92243. 619-352-2277.

IGM EC System, (3) 48-tray stereo Insta-Carts, 24 stereo Go-Cart & computer, $2000 for complete system, might consider selling individually. C Mandel, KAMP, 626 Main St, El Centro CA 92243. 619-352-2277.

ITC Delta 1 (3), mono, play, triple tones; (3) BE 3100P, mono, play, triple tones; ITC Delta PD II, mono, play; (2) ITC Delta PD II, mono, R/P; wood cart racks 100 capacity, Fidelipac carts. Kevin, KMCM, 1404 E 332 Minnesota St, St Paul MN 55101. 406-232-5626.

ITC 3 deck, mono; Gates mono & stereo; Audi-Cord stereo PB. P James, 419-782-8591.

ITC Delta stereo, 6 PB, 1 R/P, Bay View Bdctg, 4359 S Howell Ave #106, Milwaukee WI 53207. 414-482-1959.

ITC SP mono play, vgc, $295; Augicord 2 deck stereo play, vgc, $425; ITC 3D Series, mono play 3 deck, vgc, $695. P Willey, WBTN, Historic Rte 7, Bennington VT 05421. 413-663-3419.

ITC Delta 1 (3), mono, play, triple tones; (3) BE 3100P mono, play, triple tones; ITC Delta PD II, mono, play; (2) ITC Delta PD II, mono, R/P, wood cart racks, 100 capacity, Fideleipac carts. Kevin, KMCM, 1404 E 332 Minnesota St, St Paul MN 55101. 406-232-5626.

CART MACHINES...WTS

BE Spotmaster Series 2000 rec/PB in fair cond, $100. D Leutz, KKBN, POB 708, Twain Harte CA 96303. 209-586-1988.

ITC PD-II, may need minor repair, $95 +shpg. C Bucy, Cisco Snd, POB 16583, Lubbock TX 79490. 806-792-1662.

SMC 792 stereo recorder, $100; Audicord 520 R/P mono, $300; BE 3200P mono cart player, $150; Audicord R/P stereo E26, $300; Sparta 4525 stereo player, $100; Sparta 4525, $200; ITC Premium delay record, $500. D Rose, KDUC, POB 432, Barstow CA 92312. 619-256-2068.

ITC Delta - new pinch rollers: Mono playback (2), record/play (2), stereo record/play (1). MOTIVATED! Spotmaster series 2000 record (1). Wes, 818-798-9128.

ITC upgrade pb to record, amps only, no deck, 3 tone, stereo, $175, or mono, $125. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

ITC record amps, 3 tone, stereo, $250 or mono $150. W Gunn, 619-320-0728.

Marathon test carts: #301 head cleaner cart, #302 torque tester, #303 speed indicator set, #303 speed cart only, $10 ea. M Crosby, 408-363-1646.

STL alignment carts: C0030-FI (NAB), C0031-F1 (IEC), C0234-2-FI (stereo IEC), X1235-1-FI (3150 Hz flutter), unused, $30 ea. M Crosby, 408-363-1646.

Want To Buy

ITC, BE, Fidelipac cart machines: single, triple, mono, stereo, play & record/play. Call M O'Drobinak @ 619-758-0888.

CD PLAYERS

Want To Sell

Denon 951FA, $500. Bay View Bdctg, 4359 S Howell Ave #106, Milwaukee WI 53207. 414-482-1959.

Pioneer CAC-V3000 300 CD capacity auto changer, $2750. J Phillips, 414 Washington Ave, Defiance OH 43512. 419-782-8591.

Pioneer PD-M502 single 6-pack cd players (6), gd for CD computer automation, like new in original box, $150 ea; Marantz CD-74 CD player w/RC430 remote rcvr, $100. D Leutz, KKBN, POB 708, Twain Harte CA 96303. 209-586-1988.

CONSOLES

Want To Sell

Arrakis 10 chnl, 1 mono, 1 stereo. Bay View Bdctg, 4359 S Howell Ave #106, Milwaukee WI 53207. 414-482-1959.

BE 4M50 4 chnl mono board, works gd, $250; Fostex 350 8 chnl mixer w/meter panel, $350; BE 8M150 8 chnl 16 input mono board program, aud, cue works gd, $650. P Deen, WAJQ, 208 Douglas St, Alma GA 31510. 912-632-1000.

LPB Signature III 12 chnl stereo console, $1950. M Osborne, WKSQ, POB 9494, Ellsworth ME 04605. 207-667-7573.

CCA Ultimate III 10 chnl stereo/mono, just removed from service, gd cond w/documentation, $1500. B Suwalski, WPNA, 408 S Oak Park Ave, Oak Park IL 60302. 708-848-8980.

Cetec AS-30B 5 chnl console w/TT, complete & in gd cond, $1250; Microtrack Sport IV remote mixer, fair cond, $150; Teac 3 Tascam Series 8 chnl 4 trk mixer in fair cond, $250. D Leutz, KKBN, POB 708, Twain Harte CA 96303. 209-586-1988.

Collins 212F-2 mixer w/manual, BO. J Gray, WCAK, 10 Trinity, Ft Thomas KY 41075. 606-781-5715.

Harris stereo 80, $800; Sparta AS40B 8 chnl, $350; LPB Signature 8 chnl, $1200; ATI 8 chnl for parts, $200. D Rose, KDUC, POB 432, Barstow CA 92312. 619-256-2068.

Neotek Series 1, 16x8, excel cond, patch bay, $3200. B Ganslen, Ganslen Audio, 1250 Valencia, Lewisville TX 75067. 214-436-2206.

Spotmaster 5 chnl 5M11 mono console, no manual, working when removed, $300, pick up only; Spotmaster 8 chnl SBES 100 stereo console, no manual, working when removed, $300, you pick up only. L Spivey, WSNR, 1121 South Main, Hartford KY 42347. 502-298-3268.

Soundcraft 600, 32x16, w/patchbay, mint, $6950; Tascam 512, 12x8 mixer, $750; Tascam 520, 20x8x16 mixer, $1750; Allen & Heath SYNCON 28x24, great sound, $8000; Ramsa 820 mixer, $2200. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

Want To Buy

Tascam or Otari 2 or 4 trk r-r, slider stereo on-air consoles, mono cart machines, etc, should be in excel cond. Media Arts Center, 1-800-723-4698 or FAX 860-677-1141.

DISCO-PRO SOUND EQUIPMENT

Want To Sell

EV 2-way mobile loudspeakers (2) for music PB sound reinforcement, 15" cast frame woofer & titanium driver/horn, black road-carpet covered, steel corners, handles & rubber feet, 800 W peak power handling, excel cond, $295 ea. B Fisher, KPOK, POB 829, Bowman ND 58623. 701-523-3883.

Portable DJ outfit, 2 CDs, 2 cassettes, mixer, speakers, $1000. D Rose, KDUC, POB 432, Barstow CA 92312. 619-256-2068.

Want To Buy

Sony MZ2P portable MD player, Walkman style. D Stewart, 203-357-9000.

FINANCIAL/LEASING SERVICES

LIMITERS

Want To Sell

Harris MSP-95 FM composite processing unit, stereo gen, needs minor repair, as is, $1500/BO. S Avery, KRAS, 731 N Balsam, Ridgecrest CA 93555. 619-371-1700.

Orban 8000; Texar Audio Prism; Gates AM limiter & compressor. P James, 419-782-8591.

Texar Audio Prisms, $800 ea. Bay View Bdctg, 4359 S Howell Ave #106, Milwaukee WI 53207. 414-482-1959.

Audiomax 4450A, $200; Harris MSP90 AM AGC, $300; Inovonics 270 mono, $300. D Rose, KDUC, POB 432, Barstow CA 92312. 619-256-2068.

UREI LA-3A, works, BO. J Gray, WCAK, 10 Trinity, Ft Thomas KY 41075. 606-781-5715.

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, 214-271-7625.

MICROPHONES

Want To Sell

Altec M-54 (2) omni condenser mics, never used; 201-A pre-amp & 43-a capsule, $250/pr. R Cobb, Solid State Recdg, 1044 Lightfoot Rd, Wimauma FL 33598. 813-634-1940.

Shure SM5B, $500; Sennheiser 421, $250; RE-20, $250. Bay View Bdctg, 4359 S Howell Ave #106, Milwaukee WI 53207. 414-482-1959.

Shure SM-7; AKG 451-E. T Coffman, 619-571-5031.

Shure SM33 (2) & (2) SM 54, $50 ea. E Davison, 217-793-0400.

Luxo mic arms (2), $50/both +shpg. L Spivey, WSNR, 1121 South Main, Hartford KY 42347. 502-298-3268.

Sony ECM-55B, (2) Lavilier mics in case, great shape, $100 ea. G Hultman, Hultman Media Srvc, 300 Limpy Creek Rd, Grants Pass OR 97527. 541-474-6466.

Sennheiser MD421-U5, clean, $300. M Crosby, 408-363-1646.

Want To Buy

RCA 77 & 44; Neuman, Sennheiser, EV, Altec, Coles. T Coffman, 619-571-5031.

AKG 414 or CAD E-200 in gd cond. W Dougherty Jr, WLD Recdg Std, Music Valley Rt 1, Mill Spring MO 63952. 573-998-2681.

Want To Buy

UREI or Teletronix LA2A, LA3A, LA4A, 1176, Gates, RCA, Collins, Altec, dbx 160, 165, all types, working or not. T Coffman, 619-571-5031.

CONSULTANTS

MICROPHONES...WTB

RCA 77-DX's, 44-BX's, WE KU-3A's On-Air lights, recording lights. Top price paid. Fast response. Bill Bryant Mgmt. 2601 Hillsboro Rd. G12, Nashville TN 37212. 615-269-6131. FAX: 615-292-3434.

RCA 77-DX's & 44-BX's, any other RCA ribbon mics, on-air lights, call after 3PM CST. 214-271-7625.

Sennheiser, Neumann, AKG, many models. W Gunn. Box 2902. Palm Springs CA 92262. 619-320-0728.

MISCELLANEOUS

Want To Sell

ADC Bantam patch bays, 3 row in new cond (2), $100 ea; equipment racks, many avail, some new some used, various makes & sizes & cond. J Reichard. WIAV TV 2501 Breenway Ctr Dr. Greenbelt MD 20770. 301-345-2742.

Panasonic KX-T616 electr modular switching phone system, 6 lines x 16 stations, uses standard phones, music on hold, paging, call reporting & all manuals, working when removed from service, $700. B Croghan, KLTW, POB 2770, Sierra Vista AZ 85636. 520-458-4313.

Rane RE-27 1/3 oct EQ w/pink noise; **UREI LA-22** compressor limiter 2 ch; **UREI LA-10** compressor limiter 1 ch; **JBL M-644** 4 ch noise gate; (2) **EV XEQ-2** elec crossover EQ; (200) **TDK SA-SM60N** new audio cassette tape; **Middle Atlantic** rack 72"x19", black; (8) **Ampex 489-DM 126** 42 mins; (10) **Ampex 467-R15** DAT tapes; (4) **Sony PDP-15** DAT tapes. B Hernandez, 11419 Turkey Flat Dr, San Antonio TX 78245. 210-675-5149.

UTC A-21 & ADC 114F & 114E transformers. $15/ea: GE & Sylvania 6J7 & 6V6 GT tubes. E Davison. 217-793-0400.

Erko SCA rcvrs, gd cond. SCA, BO. R Coleman, WHHK, 937 SE 2nd St, Box 222, Galva IL 61434. 309-932-2288.

RECORDERS

Want To Sell

Phillips CDR, like new, $2400. R Swafford. IAM Satellite Radio. 610 A.E. Battlefield #238, Springfield MO 65807. 417-887-7788.

Ampex 440B 3-3/4 & 7-1/2 in vgc, mono 1/2 trk w/sel sync (2), $275 ea. J Reichard. WIAV TV. 2501 Greenway Ctr Dr, Greenbelt MD 20770. 301-345-2743.

Nagra 4.2L pilot tone model, vgc, BO. C Kocsis. Knobs On. 7315 Oriole Ave. Springfield VA 22150. 703-913-9143. chrisk@access.digex.net.

Ampex 440C-8, mint cond, manuals, test tape, roll around console, $3000; Mitsubishi X-80 2 trk flight cases, vgc. $650. B Ganslen, Ganslen Audio, 1250 Valencia, Lewisville TX 75067. 214-436-2206.

Audi-Cord DL mono cart reproducer, like new, w/manual, $650. B McKittrick, 331 Mulberry St, Catasauqua PA 18032. 610-264-5295.

Carver PDR-10 CD rcdr, mint w/full inputs & outputs w/optical, balanced, unbalanced, mic, stand alone rcdr. BO over $2000. S Nelson. Clarion Prod. POB 2883. Littleton CO 80161. 303-789-4494.

Dictaphone 5402, complete pair of 911 40 ch rcdrs & controls. BO. C Bucy. Cisco Snd. POB 16583. Lubbock TX 79490. 806-792-1662.

Otari MX4040 4 trk r-r w/remote, excel cond. $1500; Tascam 44 4 trk r-r tape deck w/remote, vgc. $1500; ITC 750 Series r-r PB only, deck in fair cond. $100; Ampex PR-10 r-r deck w/MX-10 Ampex mixer, fair/operates, $150; Sony 250 r-r deck, needs heads aligned, gd cond, $100; Sony TC-8 8 trk cartridge rcdr, needs work, $100. D Leutz, KKBN, POB 708, Twain Harte CA 96303. 209-586-1988.

Otari ARS1000 player. $350: Revox A77, $150: Ampex 350 player. $150: ITC 750 player. $150: Otari 5050, not working. $500. D Rose, KDUC, POB 432. Barstow CA 92312. 619-256-2068.

Sanyo stereo cassette deck, works but needs new heads, $10 +shpg. W Dougherty Jr. WLD Recdg Std. Music Valley Rt 1. Mill Spring MO 63952. 573-998-2681.

Scully 284B-8, fair cond, works. $3500; MK8511 for parts. $75: Ampex AG440C, has click but works, $200. H Sewell. Oakridge Music. 2001 Elton, Haltom City TX 76117. 817-838-8001.

Scully 280-4 4 trk 1/2" recorder in roll-around cabinet, gd working cond, $800/BO. F Badeaux, The Musik Faktory. 1812 Procter st. Port Arthur TX 77640. 409-982-7121.

Sono-Mag 250 (3). BO. J Natoli. WBTC, 125 Johnson Dr. Uhrichsville OH 44683. 614-922-2700.

Tandberg 12-41 7" reel rcdr, 4 trk stereo, 1-7/8, 3.75, 7.5 IPS, working OK. $150/BO. H Jeschke. Fellowship Press. 5820 Overbrook Ave. Philadelphia PA 19131. 215-879-6300.

Tascam 34-B r-r 1/4" tape deck. $1000. R Coleman. WHHK. 937 SE 2nd St. Box 222. Galva IL 61434. 309-932-2288.

Crown SP 724 & SX 724, 10" reel, 4 trk stereo, 7.5 & 3.75 IPS in travel cases, working when removed from service in 1988, $350/both or BO. H Jeschke, Fellowship Press, 5820 Overbrook Ave, Philadelphia PA 19131. 215-879-6300.

Otari MX70's 16 trk 1", mint, 150 hrs w/video layback system, $6950; Tascam ATR60-2 in stand, $1200; Tascam ATR60-8, $2750; Tascam 58 8 trk, $1950; Tascam 38 8 trk, $1650; Otari 5050-8 Mk III, $2200; Ampex 440C-8 1", $2900; Ampex 1200 PURC cards, $400 ea; nakamichi 550 portable cassette, $250; Custom locator for ANY deck, $495. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

Revox A77 recdrs (2), both need work, $50/ea. M Crosby, 408-363-1646.

Want To Buy

Any older DAT machine for PB use only, must indicate real time, for proofreading, $200-300 range. L McKeever. 515-254-1738.

Otari CB-120 autolocator. Grant 816-931-8735.

Ampex machines, record electronics, mixers. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

Ampex ATR100 taperecorders for parts. Circuit cards, heads, motors, machine parts, or electronic parts. Call 818-907-5161.

Moseley PCL-505C pair on 950.50, not modified, $750. J Sands, KJMZ, 702-868-7222.

Telfax GX-440 remote mixer, as new, $795. P Willey, WBTN, Historic Rte 7, Bennington VT 05421. 413-663-3419.

2-line Comrex, $1000; Shure mixer, $400. T Balistreri, WAUK, POB 51332, New Berlin WI 53151. 414-784-2863.

Comrex LX-T encoder for single line freq ext, like new cond. $500. A Slaugh, Ski Areas of NY, 2144 Currie Rd, Tully NY 13159. 315-696-6550.

Marti RPC-40L solid state, 2 frequencies, $1100. R Coleman, WHHK, 937 SE 2nd St. Box 222, Galva IL 61434. 309-932-2288.

Moseley SCD-8 subcarrier demod 185 kHz. $200; Moseley TR55A 101.7 telemetry rcvr, $200; Burk TC8 remote w/relay panel, $700; Moseley 303 STL, $800. D Rose, KDUC, POB 432, Barstow CA 92312. 619-256-2068.

Moseley MRC-1600 set up for STL-TRL(TSL) link, excel, $1850; Gentner VRC-1000 w/VRC-2000 software upgrade, like new, $2150. D Leutz, KKBN, POB 708, Twain Harte CA 96383. 209-586-1988.

Wegner 1601-50 mainframe w/1605, (2) 1945's, 1621, 1622, (2) 1646 plug ins, excel cond, $500 +shpg; Johnson SCA tuner w/manual, $50 +shpg. L Spivey, WSNR, 1121 South Main, Hartword KY 42347. 502-298-3268.

Want To Buy

Low cost freq extender system, any make, single line, no frills needed. B Croghan, KLTW, POB 2770. Sterra Vista AZ 85636. 520-458-4313.

Marti VHF or UHF solid state xmtr & rcvr, type accepted, prefer RPT 40. B Croghan, KLTW, POB 2770, Sterra Vista AZ 85636. 520-458-4313.

Broadcasting equipment: from the 20's-50's, WE, RCA, Gates; amps, boards, mics, compressors, remote amps, EQs, speakers, tubes; extensive list of tube equipment, call for info. J Phillips, 414 Washington Ave, Defiance OH 43512. 419-782-8591.

Collins IC 6 audio console; CG-25R 25Hz generator; (5) Otari ARS-1,000 open reel machines; Wagener 1816-24 freq agile satellite rcvr. C Mandel, KAMP, 626 Main St, El Centro CA 92243. 619-352-2277.

Comdial Executec 8 station capacity, 3 outside lines, PBX & phones, $750; Conex CS 25A tone sensor & Conex tone gen, $225. P Deen, WAJQ, 208 Douglas St, Alma GA 31510. 912-632-1000.

ADC Pro Patch 48pt patch bays (4), new, custome ordered w/24 pr Gepco snakes, normals brought out to punches on rear, never used. $425 ea: Patch bays, 1-1/4" TRS/1-TT used, $25 ea. (2) Orban security covers, $5 ea. ITC 99 Series rack shelf, $25. Dean. Rock Shoppe Prod. 10027 Church Rd. Dallas TX 75238. 214-343-0879.

AMCO equip rack, 70"x25"x23", no back door, black w/vinyl woodgrain accents, vgc. $500: equip rack, 82"x20"x14" with back door, very heavy, $200. B Suwalski, WPNA, 408 S Oak Park Ave, Oak Park IL 60302. 708-848-8980.

1964 Rock-O-La stereo juke box, gd cond w/manuals, $1500. D Leutz, KKBN, POB 708, Twain Harte CA 96303. 209-586-1988.

Nikko AM-FM tuner, $50; Schafer racks, $100; General Radio 1931B AM mod mon, $200; Telfax TFX31 sports mixer, $400; Extel printers, $50 ea. D Rose, KDUC, POB 432, Barstow CA 92312. 619-256-2068.

Samson TX-3 beltpack xmtr, ant & (2) mic connectors, chnl 7. $150. G Hultman, Hultman Media Srvc, 300 Lumpy Creek Rd, Grants Pass OR 97527. 541-474-6466.

Schafer racks (3), 66.5" high, 22" wide, 17" depth. BO. J Natoli, WBTC, 125 Johnson Dr. Uhrichsville OH 44683. 614-922-2700.

Technics digital stereo tuner, very little use, one chnl dead, $15 +shpg. W Dougherty Jr. WLD Recdg Std, Music Valley Rt 1, Mill Spring MO 63592. 573-998-2681.

Want To Buy

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.

RECEIVERS & TRANSCEIVERS

Want To Sell

Wegener 1601 mainframe, many cards, analog, $1500/BO; Zephyrus 300 series analog radio satellite rcvr, $1500/BO. S Avery, KRAS, 731 N Balsam, Ridgecrest CA 93555. 619-371-1700.

Otari 5050, as is, $1000; ITC 3D stereo 1 deck out, $450; ITC 3D stereo, working, $600; ITC 3D stereo working w/record amp, $900; ITC mono record amp, $50. S Bush, Bountiful Bdctg, 3595 S 1300 W. Salt Lake City UT 84119. 801-264-8250.

Otari ARS 1000 DC stereo PB (3) w/25 Hz cue detector; (3) ITC 770, stereo PB w/25 Hz cue detector; (3) Technics RS-1506-US P/R, 4 trk stereo; two person programmers, 3A w/auto sequence. Kevin, KMCM, 1404 E 332 Minnesota St, St Paul MN 55101. 406-232-5626.

Otari ARS 1000 DC stereo PB (3), w/25 Hz cue detector; (3) ITC 770, stereo PB w/25 Hz cue detector; (3) Technics RS-1506-US P/R, 4 trk stereo; two person programmers, 3A w/auto sequence. Kevin, KMCM, 1404 E 332 Minnesota St, St Paul MN 55101. 406-232-5626.

Tascam 34B 4 trk, excel cond, new motor, $750. Bay View Bdctg, 4359 S Howell Ave #106, Milwaukee WI 53207. 414-482-1959.

Teac A3340S 4 trk 1/4" r-r w/simul-sync, vgc, $400; Teac 40-4 4 trk r-r, vgc, $400; Revox PR77, for parts, $75/BO. J Winters, Winterssound, 45 E Washington St, Elizabethtown PA 17022. 717-367-1119.

Tascam 122, stereo, 3 heads, 1-7/8 & 3-3/4 ips, VU meters, rack mount, 5-15/16x13-9/16 w/full manual, no head wear, immaculate cond, $450; Marantz PMD 360 stereo, 3 heads, 1-7/8 ips, VU meters, full manual, no head wear, low mileage, 120V or mattery operation, immaculate cond, $250. S Lawson, KAK Prod, 928 Hyland Dr, Santa Rosa CA 95404. 707-528-4055.

Ampex AG602-2, stereo, rack-mounted, $250; (2) Ampex Sampsonite cases for 600 Series, mono, brown, $50/ea; stereo, grey, $50. M Crosby, 408-363-1646.

New & used Ampex 350 style tape transports, motors & parts, various prices. M Crosby, 408-363-1646.

Otari MX70 16 trk 1", like new, 150 hrs, $5950; MX70 video layback system, $900; gd used 1/2"x2500' 456 tape, $20; 1"x2500' 996 & 250, $35; Nagra III sync rcdr w/SLO resolver, $695/both; Nakamichi 550 great port cassette, $250; new 2" MRL short test tapes, $229. W Gunn, Box 2902, Palm Springs CA 92262. 619-320-0728.

REMOTE & MICROWAVE EQUIPMENT

Want To Sell

Comrex 2-line, $1500; Shure mixer, $400. T Balistreri, WAUK, POB 51332, New Berlin WI 53151. 414-784-2863.

Gentner SPH3 telephone hybrid. $200. S Bush, Bountiful Bdctg. 3595 S 1300 W. Salt Lake City UT 84119. 801-264-8250.

Marti 30 W UHF xmtr w/rcvr, $1500; Moseley STL 5010 & 5020 set, excel cond, $5500; Telefax remote sports mixer, $750. Bay View Bdctg. 4359 S Howell Ave #106. Milwaukee WI 53207. 414-482-1959.

Moseley 505C STL 10 W: Marti PRT25: McMartin RPT2 w/rcvr & new battery: marti M30 166.76 xmtr & rcvr: Moseley TRL-1 xmtr & rcvr, 1 W 450 mHz. P James, 419-782-8591.

REPAIR SERVICES

SATELLITE SERVICES/EQUIPMENT

Want To Sell

Fairchild Dart 384 satellite system, $2500. S Bush, Bountiful Bdctg, 3595 S 1300 W, Salt Lake City UT 84119. 801-264-8250.

Zephyrus 7000 Series, SCPC sat rcvr, working when removed; new Zephyrus 300 Series tone decoder; Wegener 1601 mainframe sat rcvr, works; (2) Wegener rcvrs, one never used, one used 1.5 yrs; TFT EBS encoder & decoder w/AM rcvr. Will sell or trade any for a programmable FM exciter. J Richardson, KXIO, 1414 W Main St, Clarksville AR 72830. 501-754-2076.

Resort community Northwest Michigan, #1 station in county, perfect MA/PA operation, $300,000. 1-800-678-4768.

FM Translator CP in the Atlanta GA area, 10 W ERP. Neil, Immanuel Broadcasting Network, POB 1000, Cartersville GA 30120. 770-387-0917.

2.5KW AM with 40 county coverage in Central KY medium market. All equipment, tower/transmitter, etc. Selling to pursue other interests. Serious only. 606-744-0884 & leave message.

STEREO GENERATORS

Want To Sell

Comstream Uplink KU System (2) w/codec, modem, 2.4M dish, 2 W RF amp, pwr controller, UPS, rcvr & all cabling, in service, avail immed, $16K ea/BO. B Victor, Premiere Radio Network, 15260 Ventura, Sherman Oaks CA 91403. 818-377-5300.

Wegener 1600 satellite rcvr set up for SMN star station format, BO. P Hunn, WZZZ, 604 Meadowbrook, Fulton NY 13069. 315-598-8952.

Orban Optimod 8000A, $1200. Bay View Bdctg, 4359 S Howell Ave #106, Milwaukee WI 53207. 414-482-2638.

SOFTWARE/ DATABASES

Want To Sell

STATIONS

Want To Sell

10K AM in N.C. AZ. 520-774-0864.

TAPES/CARTS/REELS & CD's

Want To Sell

Oldies library on ITC/Scotch carts, used once, never on air, $3000. Dean, Rock Shoppe Prod, 10027 Church Rd, Dallas TX 75238. 214-343-0879.

Approx 5000-6000 45s, some LPs, from 50's thru 80's, gd cond, cataloged, sold as collection only. $3950. D Leutz, KKBN, POB 708, Twain Harte CA 96303. 209-586-1988.

Fidelipac Gold Master carts, music lengths, excel cond, $.50 ea + shpg in 100 lots; 10" music reels, $1 ea +shpg. E Moody, KJEM, 216 N Main, Bentonville AR 72712. 501-621-3880.

KLEI's famous Hawaiian LP collection from 1945 thru 1976, plus Standard Transcriptions big band 12" Shorty collection 1000-1058 along w/other LP's, will not divide, $1950 +shpg. C Fuller, VOICES, 241 Douglass Way, Bolingbrook IL 60440. 630-739-0044 during business hours.

Microtran table top tape degausser, handles 1"-2" tapes, $150/BO; mechanical tape timers, Lyrec & Seike/Spotmaster, new & used, M Crosby, 408-363-1646.

Pams Jingles reference tapes from the years of 1951-1976, avail from every radio market in the US, Canada & Europe, call after 3PM CST, 214-271-7625.

Want To Buy

MOR-Adult music libraries on CD or reel. E Moody, KJEM, 216 N Main, Bentonville AR 72712. 501-621-3880.

Pre-recorded 2 trk, in-line or stagtgered heads, open reel tapes by RCA, Mercury, etc. including master dubs. P Chance, Imperial Analog, 925 Clinton St, Philadelphia PA 19107. 215-574-8147.

TAX DEDUCTIBLE

Non-profit, non-commercial educational FM needs a 1.5 - 2 kW xmtr & production studio equipment, donations only, we'll pay/arrange shpg. V Drumheller, WSJI, POB 895, Cherry Hill NJ 08003. 609-424-8981.

TEST EQUIPMENT

Want To Sell

Audio Precision System One, 2 chnl, Bur-Gen option, (2) interface cards, HP 8 pen color plotter, all manuals, cables, software & updates, mint cond. D Campbell, 352-378-6275.

Fluke 45 dual display multi-meter; **Sencore VG91** universal video gen; **Sencore SC3080** 80 mHz waveform analyzer; **Sencore** TVA-92 TV video analyzer; **Sencore VC-93** all format VCR analyzer; **Sencore CR-70** beam builder & CRT analyzer & restorer. B Hernandez, 11419 Turkey Flat Dr, San Antonio TX 78245. 210-675-5149.

Sencore SG-165 AM/FM stereo analyzer, excel cond, w/manual & accessories. $500 +shpg; Stoddart NM-20 field intensity meter w/pwr supply, unknown cond, $100 +shpg; HP 350B attenuator set, 5 W - 600 ohm, missing one banana jack, $25; HP 200CDR wide range oscillator, $50 +shpg. L Spivey, WSNR, 1121 South Main, Hartford KY 42347. 502-298-3268.

TUBES

Want To Sell

4CX250B, 833C, 4-400, 3CX1500A7, 807, 4-125A, 4CX350A, 4-1000, EIMAC, AMPEREX, RCA. Westgate 800-213-4563.

Want To Buy

TURNTABLES

Want To Sell

Technics SP25 TT & arm, $250. S Bush, Bountiful Bdctg, 3595 S 1300 W, Salt Lake City UT 84119. 801-264-8250.

Technics SP-15 3 speed w/tonearm (3). Kevin, KMCM, 1404 E 332 Minnesota St. St Paul MN 55101. 406-232-5626.

Technics SP-15 3 speed w/tonearm (3). Kevin, KMCM, 1404 E 332 Minnesota St. St Paul MN 55101. 406-232-5626.

Ramko w/tonearms & cartridges, $150; Techniques SL1200MK2, $350. D Rose, KDUC, POB 432, Barstow CA 92312. 619-256-2068.

TRANSMITTERS

Want To Sell

BC5P 2.5 kW, $4000 & Collins 20V 1 kW, $1000, working when removed from service, FOB, Durham NC & Blacksburg VA. V Baker, Positive Radio Group, 540-961-2377.

Bext P10 programmable portable 12 volt 10 W FM exciter, $1695. B Dougan, KAFR, POB 47473, Phoenix AZ 85068. 602-548-1054

Cetec/Sparta 1.5 kW FM in gd cond w/stereo gen w/o exciter, $3500. J Arzuaga, WLAZ, Clermont FL. 787-895-0000.

CCA FM5000D w/Collins 310Z exciter on 94.1 mHz, set of new spare tubes, works but needs some work, $3000/BO; RCA BTF-1 1 kW FM xmtr, no exciter, BO; CCA 660 exciter, on 94.1 mHz, built in SCA & stereo gen, $200; Harris stereo gen module for TE-3 exciter, $50. J Sands, KJMZ, 702-868-7222.

Collins 830-IFB 10 kW FM xmtr, 25 yrs old, used as main for 17 yrs, avail w/wo 310-22 exciter, in decent shape, BO. J Linn, WITF, POB 2954, Harrisburg PA 17105. 717-236-6000.

CSI 500 W AM: AEL 2.5 kW FM; Harris SX-1, SX-1A 1000 W AM; RCA 3" coax 4 port relay; RCA 1500 dummy load. P James, 419-782-8591.

Gates BC1H1 1000 W AM, new 807 tubes, needs some work, pick up only, $1000. P Deen, WAJQ, 208 Douglas St, Alma GA 31510. 912-632-1000.

Harris FM 2.5H3, excel cond, $5000; Harris FM MX-15 exciter, $1500; EQI 1983 675T3500 exciter, $7500. Bay View Bdctg, 4359 S Howell Ave #106, Milwaukee WI 53207. 414-482-1959.

QEI 675T300 xmtrs (6); QEI 675 exciters (7); (2) Belar FMM4 monitors; QEI 691 monitor; (2) TFT 884 monitors; Orban 412A limiter/compressor (2); (2) Bird 4522 wattmeter; WBS 10 chnl mono console; ITC 3 deck mono (3); ITC 1 deck P/R (3). Mr. Cournover, 819-477-3077.

Tepco J-317 translator, $1300; TTC translator XL10FM 10 W type N connectors. S Bush, Bountiful Bdctg, 3595 S 1300 W, Salt Lake City UT 84119. 801-264-8250.

Collins 550A-1 500 W AM tube type xmtr, both 1070 & 860 crystals, manual, lots of parts, runs well, garage kept, as is you haul, $600. L Spivey, WSNR, 1121 South Main, Hartford KY 42347. 502-298-3268.

Harris FM20H3 20 kW FM xmtr, on air w/MX15 exciter, $15000. E Moody, KJEM, 216 N Main, Bentonville AR 72712. 501-621-3880.

LPB RC 25B 25 W AM, $200; AEL 2.5 KD, 2500 W AEL, no exciter, tuned on your freq, $3000. J Gray, WCAK, 10 Trinity, Ft Thomas KY 41075. 606-781-5715.

Energy-Onix MK-22 22-kW FM transmitter with exciter. One year old. Like new. Priced right!! 816-628-5959.

Used equipment for sale: Belar SCM-1, Belar RFA-1, Belar FMS-1, Belar FMM-1, Moseley MRC 1600 system, TFT EBS receiver/generator, Gentner patch panel, and Harris racks. Call Transcom Corporation 800-441-8454 or 215-884-0888.

Want To Buy

McMartin AM/FM xmtr, any model, exciter or stereo modules. Goodrich Ent., 11435 Manderson, Omaha NE 68164. 402-493-1886.

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. Simply send your listings to us, following the example below. Please indicate in which category you would like your listing to appear. Mail your listings to the address below. Thank you.

Please print and include all information:

Contact Name _____

Title _____

Company/Station _____

Address _____

City/State _____

Zip Code _____ — _____

Telephone _____

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.

I would like to receive or continue receiving **Radio World** FREE each month. ❑ 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
- ☐ F. Recording Studio
- ☐ K. Radio Station Services
- ☐ G. TV station/teleprod facility
- ☐ H. Consultant/ind engineer
- ☐ I. Mfg, distributor or dealer
- ☐ J. Other _____

II. Job Function

- ☐ A. Ownership
- ☐ B. General management
- ☐ C. Engineering
- ☐ D. Programming/production
- ☐ G. Sales
- ☐ E. News operations
- ☐ F. Other (specify) _____

WTS ❑ WTB ❑ Category: _____
Make: _____ Model: _____
Brief Description: _____
_____
_____
_____
Price: _____

WTS ❑ WTB ❑ Category: _____
Make: _____ Model: _____
Brief Description: _____
_____
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_____
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

SERVICES

ABOUT OUR EMPLOYMENT SECTION

HELP WANTED

Any company or station can run "Help Wanted" ads for $1.95/word or buy a display box for $60/column inch. Payment must accompany insert, use your MasterCard or VISA; **there will be no invoicing**. Blind box numbers will be provided at an extra charge of $15. Responses will be forwarded to listee, unopened, upon receipt. Call 800-336-3045 for details.

POSITIONS WANTED

Any individual can run a "Position Wanted" ad, FREE of charge (25 words max), and it will appear in the following 2 issues of Radio World. Contact information will be provided, but if a blind box number is required, there is a $15 fee which must be paid with the listing **(there will be no invoicing)**. Responses will be forwarded to the listee, unopened.

Mail to: **BROADCAST EQUIPMENT EXCHANGE**,
PO Box 1214, Falls Church, VA 22041 Attn: Simone Mullins

EMPLOYMENT

HELP WANTED

Sales Engineer /Broadcast Antenna Products

Scala Electronic Corp. is seeking a candidate with a strong technical background to promote sales & support customer product & service needs in the broadcast industry worldwide. Experience in the design or operation of TV & FM transmission systems is highly desirable. Candidates with experience in technical sales, knowledge of industry specific antenna systems & applications, familiarity with FCC rules & regulations, strong technical & interpersonal communication skills are preferred. Travel required. If you are self-motivated, results driven & professional, enjoy the advantages you'll discover by joining our successful & growing company, whose quality products & services have remained at the forefront of the broadcast communications industries for over 40 years. Scala is a well established world leader in antenna technology, dedicated to providing its employees with excellent benefits & a professional, friendly work environment. Located in the beautiful, scenic Rogue Valley of Southern Oregon. For immediate consideration, mail or fax cover letter & resume to: Human Resources Mgr, Scala Electronic Corp., POB 4580, Medford, OR 97501 fax: (541) 779-3991. EOE

SCALA
PROFESSIONAL ANTENNA SYSTEMS FOR BROADCAST AND COMMUNICATIONS

Radio Equipment Sales Openings

Well establish East coast broadcast equipment supplier has sales department openings for:

Two sales engineers capable of configuring high end studio systems, hard disc storage systems, and complete transmitting systems. Positions require heavy digital and system design experience as well as good written and verbal communication skills. Hands on experience with Wheatstone consoles and Broadcast Electronics transmitters, and Digital hard disc storage systems preferred. Positions require prospecting, seeking out and closing sales and is not a telephone order taking position. Possible relocation and willingness to travel is required.

One telephone order person to handle accessory and support product sales from our main office in Glen Falls, N.Y. Send resume's to or contact Rich Redmond, at Northeast Broadcast, P.O. Box 1179, So. Glens Falls, N.Y.12803 (518) 793-2181

Sales Engineer Wanted

Aphex Systems, the leader in broadcast and pro audio signal processing, seeks a unique individual to fill its newly created Sales Engineer position. Duties include key account management, training, field applications and trade shows. Extensive travel, competitive compensation and benefits, and the chance to grow with an exciting company with proven technology. We are looking for a self-motivated, self-directed individual with a mix of strong technical chops, people skills and business savvy. Sound like you? Fax or mail your resume with a request for the Sales Engineer job description.

APHEX SYSTEMS
No phone calls please

Julie Garcia
11068 Randall Street
Sun Valley, CA 91352
Fax (818) 767-2641
Equal Opportunity Employer

Greater Media's

central New Jersey radio stations, seek a qualified **Chief Engineer** to head a department of 3, at one of the country's top suburban radio operations. WCTC is 24 hour news/talk/sports and WMGQ is A/C. Both stations have a heavy remote schedule. A highly experienced and motivated pro is needed to manage the technical operation of these major market facilities. Competitive salary/full benefits. EOE. Resumes w/salary history to

Andrew Santoro VP/GM
WCTC/WMGQ
Box 100
New Brunswick, NJ 08903
or FAX 908-249-7562

For details on space availability contact Simone at 1-703-998-7600 Ext.154

POSITIONS WANTED

Syndicated Nostalgia Radio Host with large audience looking for new opportunities. Ed, 201-791-4610.

26 yr old w/FCC license seeks any position w/Washington DC stations, reside in Adelphi, MD. Call for audition tape or resume. Albert, 301-434-8914.

30 yrs exper in management, sales and production, lots of proven money-making ideas, work well with people, will relocate. Write to: Radio World, POB 1214, Falls Church VA 22041. Attn: Box # 96-10-16-1 RW.

A better bottom line! I'm seeking opportunity to make a small market radio station in the SE successful. Many years in business, high integrity. Write POB 14706, Greenville SC 29610.

Board op/weekend on air seeking smililar position in Southern US, 2 yrs exper, demo tape upon request. Robert 405-323-4844 or 772-5939 (Sun).

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