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Vol 19, No 1

Radio's Best Read Newspaper

January 11, 1995

RBDS Encouraged for Emergency Alerts

by Thomas Pear
and John Gatski

WASHINGTON Although the FCC did not mandate any one type of technology for its new Emergency Alert System (EAS), it endorsed the use of the Radio Broadcast Data System (RBDS) in its recently released "Report and Order," mentioning the technology numerous times in the text.

The Report and Order (FCC Docket 94-288) said: "Given the significant potential for RBDS, we encourage FM broadcast stations to provide emergency warnings via subcarrier using RBDS."

"We are encouraging the use of RBDS for FM," said EAS Chief Dr. Helena Mitchell, echoing the commission's report and order during a demonstration of new EAS technology last month at FCC headquarters. She explained that during field tests of proposed EAS technologies in 1993, the FCC staff was impressed by RBDS' performance.

Automatic turn-on

What has the commission impressed about the 57 kHz RBDS subcarrier's performance is the technology's ability to turn on receivers during an emergency, alerting

listeners to disasters that occur at times when they normally do not have their radios or televisions sets turned on.

The FCC quoted one of the EAS's written commenters in its report and order, who said: "no emergency alerting systems will be meaningful if it cannot automatically

turn on devices in people's homes, cars and public places..."

Although the FCC is not requiring stations to use RBDS technology nor receiver manufacturers to include the turn-on feature if they do, Mitchell boldly predicted, that many homes will be equipped by 1997

with a receiver that can automatically be switched on.

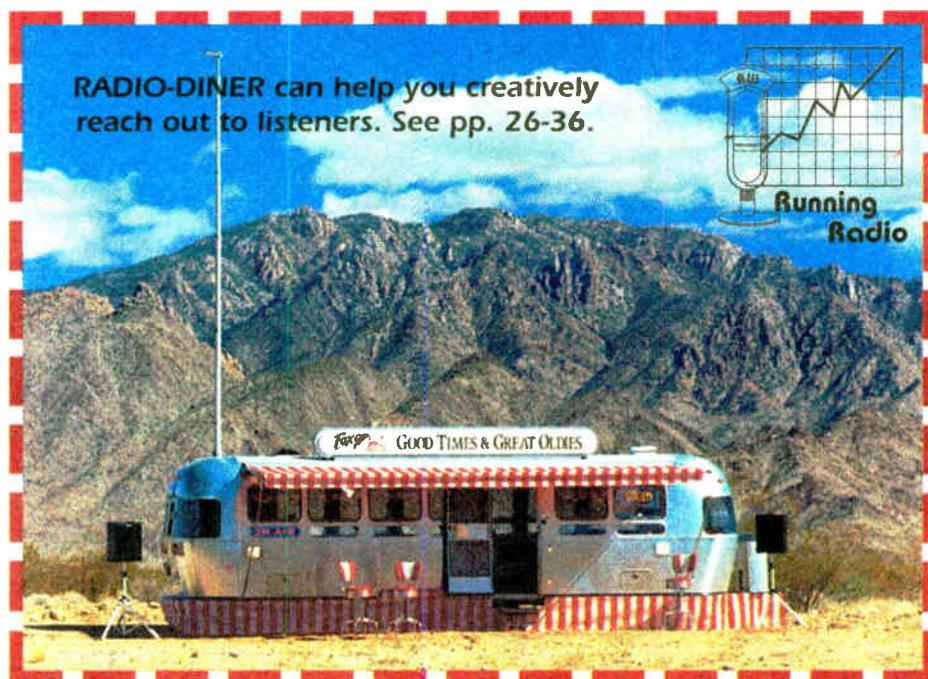
The report and order also said that RBDS can perform a number of other functions covering EAS and non-EAS information. Well over 200 radio stations are already using RBDS in the U.S. for its receiver text functions. This function allows a radio station to provide station call letters, scrolling text messages, automatic switching to a different transmitter and station selection by format—provided the receiver is RBDS equipped.

Equipment manufacturers

Jerry Lebow, president of Sage Alerting which incorporates RBDS technology in its Sage 1 Emergency Alerting System, displayed a sign at the demonstration with a picture of New Jersey that reads "one down and 49 to go." New Jersey has the Sage system up and running along with Jefferson County, Texas. Consumer audio manufacturer Denon also displayed its latest line of RBDS receivers and tuners along side Sage's EAS equipment.

Lebow was pleased that RBDS equipment was encouraged by the FCC for EAS use, but disappointed that the technical requirements were "minimal."

continued on page 11 ►



AMs Increase Power Output To Better Cover Their Markets

by Thomas Pear

WASHINGTON Approximately 65 stations across the country are taking advantage of 1991 FCC rule changes that allow class B stations, previously class III stations, to upgrade their signals as long as they do not interfere with other licensed facilities or stations holding valid construction permits on the co-channel and adjacent channels.

One reason for allowing stations to power up, Group W Director of Engineering Glynn Walden said, is that there was never any real justification for not allowing the stations to run a stronger signal in the first place.

"There is no legitimate reason for putting a cap on those stations," he said.

The FCC concurs with Walden. When creating the new rules, the commission found that allowing stations to increase their signals would not adversely affect other stations on the same signal because "proposals for an increase in power would have to comply with all applicable interference provisions of the rules."

KFWB in Los Angeles, a Group-W owned station, is taking advantage of the

relaxation of FCC AM power restrictions. The news/talk station is increasing it 5 kW frequency to 50 kW night and day with a directional array.

Washington talk station WWRC is also increasing its daytime signal from 5 kW to 50 kW with a directional array. The station will remain at 5 kW at night and retain its current nighttime contour.

Most of the other stations taking advantage of the new opportunity, however, are increasing to more moderate power levels like 10 kW or 20 kW, FCC AM Branch Supervisory Engineer Son Kim Nguyen said.

As AMs take advantage of the expanded band, the FCC probably will see even more applications to power up. Because the expanded band is less crowded, some of the station are relocating to pursue a strengthened signal.

After five years, when stations on the expanded band no longer have the opportunity to simulcast on both bands, adjacent channels on the original band will be freed up for other stations desiring to strengthen their signal, according to the FCC.

continued on page 17 ►

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NEWSWATCH

Radio Advertising Bureau Elects Officers

NEW YORK The Radio Advertising Bureau's (RAB) Board of Directors elected new officers during its recent semi-annual meeting, held in San Diego.

The new officers are John Dille, chairman; Herb McCord, vice chairman and Skip Finley, finance chairman.

The board also extended the contract of RAB President Gary

Fries to the year 2001.

Michael Rau to Leave NAB

WASHINGTON Michael Rau, the National Association of Broadcasters (NAB) senior vice president of science and technology, is leaving the powerful broadcasting lobbying organization after 13 and half years.

"I have mixed feelings about leaving the great people here,

but I've reached a point in my career where I would like to have some new challenges," he told RW.

Rau, who officially leaves the NAB Feb. 8, will be heading a new subsidiary for E.Z. Communications and developing business in electronic communications and data broadcasting.

The NAB is looking at both internal and external candidates to fill Rau's position, which includes serving a type of NAB ambassador, said NAB

spokesman Doug Wills.

Rau's work with the NAB entailed speaking engagements around the globe as well as developing standards for emerging technology. His educational background includes a bachelor's in physics from Clarkson University in Potsdam, N.Y., and a law degree from the Catholic University of America here in Washington.

"His shoes will be hard to fill," Wills said.

Rau's departure comes after

numerous other departures from the NAB's science and technology department. Other who have resigned during the last year and a half are former NAB Director of Engineering Ken Springer, former NAB staff engineer Andy Butler; former NAB Senior Vice President of Conventions and Exhibits Rick Dobson; former NAB Recruiter-Personnel Specialists Julie Perez and former NAB President of Radio Membership Donna Leonard.

Commission Seeks New EAS Logo

WASHINGTON Although the FCC recently switched its emergency warning system from the Emergency Broadcast System to the Emergency Alert System, the commission is still in search of a EAS logo.

continued on next page ►

Index

FEATURES	
Expanded Band: Too Few Too Late? by Harry Cole	12
Early Innovation Using FM Subcarrier by Read Burgan	13
Techniques to Measure Impedance by Jim Murphy	14
Scrutinizing the FCC's EAS Ruling by Harold Hallikainen	17
Interactive AM Programming Via the 'Net' by Dee McVicker	18
Theory on the Equalization of Phone Lines by Tom Vernon	19
Workbench by John Bisset	22
RUNNING RADIO	
DINER Serves Up Promotion Dollars by Alan Haber	26
Motivate Your Staff with Praise by Sue Jones	27
Holmes Series a Hit with Today's Listeners by Richard O'Donnell	28
Make a Good First Presentation by Don Surath	31
Radio on Demand Enters Info Highway by Judith Gross	33
Involve Morning Team in Promotions by Mark Lapidus	36

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Public Files are Important

Last in a series

by Thomas Pear

WASHINGTON It is easy for broadcasters to neglect their public inspection files as they busy themselves in the day to day operations of their stations.

However, a file that does not adequately cover station operations since the last renewal period seven years ago could cost broadcasters as the next round of renewals begins.

Larry Eads, the chief of the FCC's audio services division, estimated that failure to maintain a proper file is the number three reason for license renewal deferments, behind EEO violations and RF violations respectively.

"My guess... is that many broadcasters simply get caught up in day-to-day operations of their businesses and it is very easy for them to lose sight of the federally mandated requirements," he said.

Eads pointed out that sometimes stations change owners and the new owners are stuck with insufficient files left from previous owners. Sometimes station owners forget to check for an adequate public file before purchasing, he said.

If a new station owner inherits a bad file, or if files have just been neglected, they can reconstruct files through old program logs and other records as long as it is noted on the renewal form that the public file has been reconstructed.

"Stations could and should attempt to reconstruct files," Eads said. "They should also put a statement on the renewal, however, when a file has been reconstructed."

Generally, if stations do an adequate job of reconstructing, the FCC will allow the renewal application to pass, but "I don't want to send the message of 'don't worry about it, just reconstruct your file a few days prior to renewals,'" Eads said.

Stations that fail to maintain adequate files are still in violation of the law, but a station with a reconstructed file is more likely to gain a favorable response from the FCC than stations with inadequate files.

Publicly accessible

A public file must stay in the community of license, and Eads noted that some stations with studios outside their communities of license often choose to keep their files in local libraries or in a local attorney's offices.

The file must also be accessible at no charge to the public during normal business hours, meaning if a station's business hours are 9 a.m. to 5 p.m. Monday through Friday, the file must be available to walk-in inspectors during the same hours. However,

continued on page 8 ►

EAS chief Helena Mitchell last month announced a contest in which the general public can design possible EAS logos and the FCC will pick one winner.

"We are searching for a new image that will be publicly recognized," Mitchell said.

Although there is not a prize per se, the winner of the contest will go down in history as the designer of the EAS logo, a nice feather in the cap of anyone considering a career in graphic design, art or even a broadcasting related field, she noted.

The winning design, according to Mitchell, will project a clear resolution when broadcast over television. A busy looking design, then, will not suffice.

A good way to test a potential design is to copy it on a fax machine. If it is resolute there it should be resolute when broadcasted on television, the EAS chief noted.

To enter a design fax it to Mitchell at 202-418-2817. The cut-off date is Feb 22.

For more information call 202-418-1220.

Republicans Appointed to Commerce Committee

WASHINGTON Ten Republicans were named to the House Committee on Energy and Commerce, which has jurisdiction over most broadcast issues.

The new committee members are Representatives Christopher Cox (Calif.), Steve Largent (Okla.), Richard Burr (N.C.), Brian Bilbray (Calif.), Ed Whitfield (Ky.), Greg Ganske (Iowa), Daniel Frisa (N.Y.), Charlie Norwood (Ga.), Rick White (Wash.) and Tom Coburn (Okla.)

Representative Steve Largent (Okla.) was assigned to the committee because of his seniority, but will actually serve on the budget committee. He can still vote on critical issues that are brought to the commerce committee.

The National Association of Broadcasters (NAB) says it is critical for broadcaster to stations in the representative's district to contact them as soon as possible to establish a rapport.

"As broadcaster we do have concerns about legislation that pops up from time to time," NAB Spokesman Doug Wills said.

For more information call NAB government relations at 800-424-8806.

Entries Open for '95 Crystal Awards

WASHINGTON Entries are now being accepted for the National Association of Broadcasters' (NAB) 1995 Crystal Radio Awards Competition, which recognizes radio stations that provide outstanding community service.

Ten winners will be announced during a special luncheon at next year's NAB convention.

Entries are restricted to community service efforts that were made in 1994. Although previous award winners are eligible to win again for the first time in the history of the awards, last year's winners are ineligible for this year's crystal awards.

Entries cost non-NAB members \$75 and NAB members can enter for \$50. The cut-off date for entries is Feb. 6.

For more information call Doug Wills or Lynn McReynolds at 202-429-5350.

Klem Named Arbitron Midwest Manager

CHICAGO Robert Klem was recently promoted to midwestern manager of Arbitron from account executive.

In his new position, Klem is responsible for sales of Arbitron radio products and services in the midwest.

Klem came to Arbitron in 1988 from Aurora, Ill., where he was a sales manager for WMRO(AM).

Kinetic Purchases WRCQ-FM in North Carolina

FAYETTEVILLE, N.C. Kinetic Communications recently agreed to purchase Fayetteville station WRCQ-FM in from Metropolitan Broadcasting Associates for \$2.8 million.

The purchase was brokered by Michael J. Bergner of Bergner and Co.

Jon C. Peterson, the head of Kinetic, also owns Bainbridge, Ga., station WMGR-FM and Tifton, Ga., station WOBB-FM. The two stations serve as a duopoly for the Albany, Ga., market.

NAB "Fly-In" Feb 6 & 7

WASHINGTON The National Association of Broadcasters (NAB) has scheduled its "Fly-In" for Feb. 6 and 7 at the ANA hotel in the nation's capital.

This year's meeting, which is open to NAB member radio groups that own or operate three stations in three separate

markets, will cover topics like national ownership limits, duopoly rules and the how the new Republican-controlled Congress will affect the radio industry.

The deadline for registration is Jan. 16. For more information call Lori Long at 202-429-5350.

Eric Hauenstein Named to NAB Radio Board

WASHINGTON The National Association of Broadcasters recently announced that Eric Hauenstein has been named to a network representative seat on the NAB Radio Board.

Hauenstein is the vice president and general manager of Jones Satellite Network in Englewood, Colo.

Two Pennsylvania Stations Sold

BALTIMORE Michael E. Schwartz, Aaron Daniels and Frank Iorio recently closed on their \$1.9 million purchase of Beaver Falls, Pa., stations WKSS-FM and WBVP(AM) from a company titled "The Baltimore Radio Show."

Beaver Falls is just outside of Pittsburgh and the three entrepreneurs hope to gain some advertising revenue from the Pittsburgh market, according to Michael J. Berger, who negotiated the purchase.

The purchase marks the first station purchase for Schwartz, Daniels and Iorio as a group. It also marks the exit from radio by The Baltimore Radio Show. ☺

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Digital Continues to Dominate Change

WASHINGTON By the time you read this page, Christmas and New Year's Eves will have come and gone. From where I sit now, though, Christmas is just around the corner and New Year's Eve is on its heels.

When this time of the year rolls around, I, like most, enjoy looking back on the past 12 months and wondering what the next 12 will bring.

In the radio business, this has certainly been a year of change and growth. Managing Editor John Gatski, who recently attended the AES gathering in San Francisco and who also covered the World Media Expo show for both RW and the World Media Expo Daily, has really been a front row observer of much of the technological change sweeping through the business as well.

As he and I have compiled, distilled and disseminated information for you this year, the biggest ongoing change we have discerned continues to be the industry's continual conversion to digital.

Yes, there are still a lot of stations that use carts, analog reel machines and even play records, but the overwhelming emphasis in the industry is on digital.

From CD players to digital media carts to digital workstations to digital STLs, the transfer from analog is well on its way.

NAB's John Marino credits the economic factor as the impelling force behind this trend. "The big thing that is driving this is the drop in prices," he said.

At the major trade shows this year, MiniDisc recorders from Sony, Denon and Otari were targeted at radio broadcasters. These MiniDisc machines put up to 70 one-minute cuts on a 3-inch recordable magneto-optical disc.

The same was true for digital audio workstations. At AES, three major manufacturers, Roland, Sonic Solutions and Studer introduced "broadcast versions." Other companies in the market, including

Korg, AKG, Microtechnology, Pacific Recorders, Fostex, Sadie, Spectral Synthesis, Digidesign and a host of PC workstation software vendors, are seeing the potential of the broadcast market.

Several companies also are now making digital codecs for ISDN and other transportable audio systems so stations can now move audio via the phone line or modem.

All this digital equipment, according to manufacturers, is in response to broadcasters realizing the benefits of higher-quality audio and increasing efficiency through non-linear editing, which can be a real timesaver in the production room.



Unheard of a few years ago, Yamaha this year introduced an all-digital mixer that retails for \$2,000. This product, too, was aimed at the broadcast as well as the home and pro-audio markets.

The NAB's Marino said that broadcasters, although enthusiastic about digital equipment, are cautious about products from vendors that do not have a long-term reputation. They tend to choose the digital gear from established companies or wait a while for new company products to develop a reputation before making a purchase, he added.

★ ★ ★

And speaking of World Media Expo, the first combined show proved itself beneficial in many ways, but as with any first effort, there were things that could have been better.

For starters, World Media Expo

changed the character of the fall NAB Radio Show. Proof of radio's inherent soundness as an industry was evident in the radio/audio pavilion—it boasted more exhibitors than ever before—topping 1993's Dallas gathering by roughly 25 percent.

Equipment manufacturers were pleased to now need to attend only one gathering instead of the four they had to attend in the past. SMPTE, SBE and RTNDA were in the "supershow" mix and brought with them their attendant members.

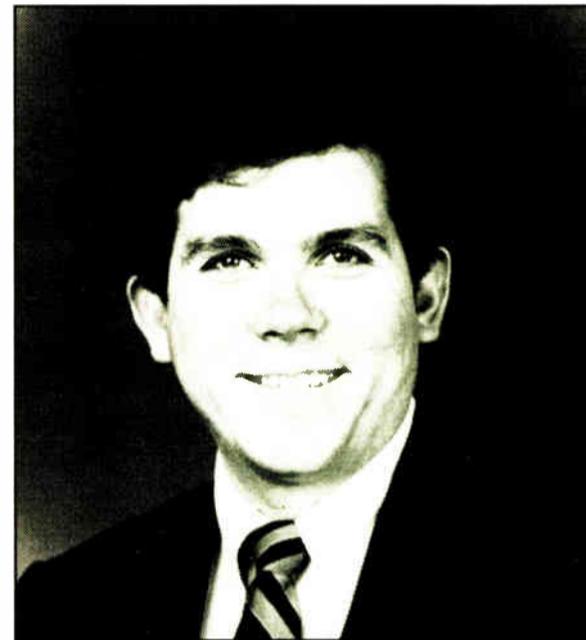
The trap lurking beneath the surface for NAB is a real one, though. Much of the growth and momentum of the association's spring show is clearly headed in the professional video direction. Fewer and fewer radio station managers and engineers are attending the spring gathering—opting instead for the fall show, which has been more attractive in that it has been an all-radio event.

The NAB Radio Show, with its record-breaking radio/audio pavilion exhibit, was in danger of being dwarfed by television. The combined exhibit floor hosted 230 video companies to radio's 221, occupying 75,800 square feet of exhibit space to radio's 53,400 square feet.

Much of it has to do with the booth size of the video guys (they have those huge highly visual and highly cre-

ative booths) and the amount of money they have to spend versus the money some of the audio guys have. But, if your position on the floor was relegated behind some large stack of video screens, you were hurt.

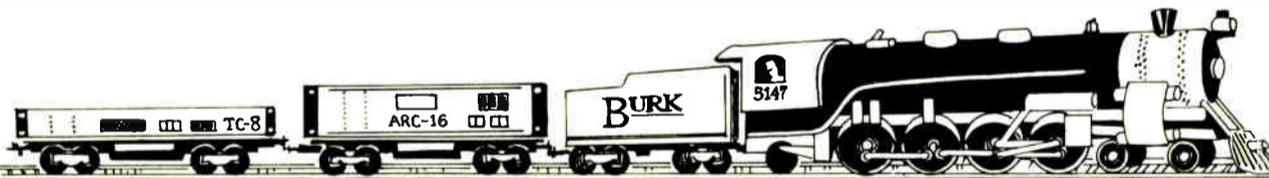
I've sounded this alarm before, and the NAB has reassured me and RW that radio will continue to have a separate identity and a dominant one at the fall gatherings. We'll be watching to make sure they do.



Paul Donahue is starting the new year with a brand new job. Donahue, vice president of operations for Gannett Radio and co-founder of USA Digital Radio (you know, the Project Acorn crew) has been recruited for the post of chief executive officer of VirteX Communications. "This is a great new opportunity for me," he said.

VirteX provides digital audio, digital video, multimedia and data solutions for broadcast companies, media companies, program syndicators, advertising agencies and record companies. VirteX recently completed its purchase of California Digital.

Paul will continue to consult with Gannett on digital audio broadcasting and other special projects.

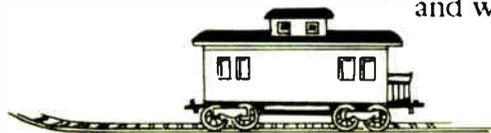


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Digital Radio Testing Fair

Dear RW,

Judith Gross's article in the Dec. 14 issue leaves the impression that the testing of digital audio radio systems by EIA and the NRSC may be unfair. Nothing could be further from the truth.

The development of multipath testing parameters has taken over one-and-a-half years to come to fruition with collaborative efforts of well-respected broadcast and manufacturing industry engineers and scientists. This included a measurement program to characterize the VHF channel, derivation from those data of reflection time delays, and the respective signal amplitudes, and assembling that into specific multipath simulations that challenge DAR system performance within the limits of laboratory hardware. Each step along the way was fully aired before the DAR and DAB subcommittees, including system proponents.

As you reported, even 11th hour "second guessing" of the test parameters was accommodated by expanding the multipath tests for another three weeks. The due process and openness procedures followed by the EIA DAR and NRSC DAM subcommittees have ensured that all views have been aired and accommodated.

But multipath performance is only one element in the matrix. Equally important are overall system audio quality, performance with impairments such as noise, co- and adjacent-channel interference and—the critical hurdle for IBOC systems—AM and FM compatibility. The tests will comprehensively answer all these and more questions about DAR systems.

EIA and the NRSC continue to accommodate the substantive technical concerns of proponents and others participating in the DAR and DAB subcommittee's

activities. The tests have been designed to fairly challenge the limits of system performance under uniform conditions. With this objective impartial technical basis we can accurately judge the relative merits of the proposed systems and make informed policy decisions on how best to implement digital radio in the United States.

Randall T. Brunts, Delco Electronics
Co-Chairman of the NRSC DAB
Subcommittee
Chairman of the EIA DAR
Subcommittee

Alfred Resnick, Capital Cities/ABC Inc.
Co-Chairman of the NRSC DAB
Subcommittee

Licensing Simple

Dear RW,

As I read through the article titled "FCC Structure to be Improved, 'Reinvented' I was looking for clues that it was a humor piece. Finding no such clues, I had to conclude that the author of the piece is totally ignorant about the FCC's processes.

It has been more than a decade since any station—big or small—has had to "spend hours filling out tedious renewal packages." Since the early 1980s, license renewal applications have been "post cards" that take at most 15 minutes to complete. It is true that stations must also file EEO reports and ownership reports along with their license renewals, but these too are relatively simple forms that can be completed quickly and easily. The suggestion in the article that a station can expose itself to a competing application at renewal time by "missing renewal application elements" is simply not true. All stations are exposed to the risk of a competing application at renewal time, but exposure is not increased by the omission of some information. (The period of exposure is extended, however, by the failure to file an application when due).

What needs to be streamlined in the audio services division of the FCC are not application forms or instructions, but how formal and informal objections to renewal and other applications are handled. This is where the process gets costly and drags on seemingly forever. The problem of processing delays will not be solved by subjecting FCC staff members to training programs to enhance their writing abilities or by reducing the number of data bases.

What is needed is a wholesale restructuring and streamlining of how the FCC deals with objections to applications. There are indications that officials at the FCC from the chairman's office down through the divisions chiefs and even the staff are giving serious thought to such restructuring and streamlining and there is reason to hope that something positive may actually come of this. But so far, all there has been is talk.

David Tillotson
Attorney at Law

Editor responds: The FCC has acknowledged numerous times that the renewal process is relatively easy.

Empower Your AM Station

The AM band has had its share of champions and detractors throughout its history. But, throughout all of its ups and downs, no one person could dispute that if you program it right, and have the power to take care of propagation, AM works.

It's encouraging to hear about WWRC, KFVB and others taking advantage of technically sound and legal ways to enhance their station's signal, thus enhancing future growth of both listenership and revenues.

The 1991 FCC rule changes allow class B stations (previously class III stations) to upgrade their signals as long as they do not interfere with other licensed facilities. These changes allow stations to better serve markets that have grown significantly in recent years. Prior to the 1991 rule, station power was confined despite listener-ship growth in the suburbs.

Case in point is Group W's KFVB Los Angeles. KFVB is increasing from 5 kW to 50 kW night and day with a directional array. This move will allow it to effectively serve areas of its city of license it could not reach before—providing a stronger service to its community—and providing keener competition to other outlets in the market (including KFI, KNX and KWKW). A healthy, competitive environment can only increase AM's share of the pie in that market.

Or as WJIB's owner wrote so enthusiastically elsewhere on this page, "Radio is radio. If you put something good, interesting and different on AM, it works well... AM is charged."

Technical concerns were well cared for in the 1991 rules. They protect adjacent stations and stations on the same frequency because those protection ratios must be maintained. But as some stations migrate to the expanded band and give up their existing frequencies after five years (or sooner), even more stations can apply for an increase in power.

Often regulators are taken to task for not regulating enough or for writing too many rules. In the case of the FCC's 1991 AM rules, the agency seems to have ruled in the best interest of the AM band. It is up to creative broadcasters to take advantage of this power increase opportunity.

—RW

However, if a station cannot truthfully answer yes to a question—if it has failed to fulfill some type of FCC mandate such as maintaining an adequate public inspection file—then the FCC expects a reasonable explanation and this can be tricky. In other words, the process is relatively simple for stations that have fully complied with FCC regulations, but it can be a Pandora's box for stations that have failed to comply. Apparently some stations across country agree that the licensing process can get complicated, so they defer their renewals to an attorney.

Also, the discussion of "missing renewal application elements" is to stress that stations want to be in good standing with the FCC during a time when they are vulnerable to cross applications.

Leave Illegals Alone

Dear RW,

I have been reading RW for several years now and seeing quite a bit about illegal broadcasters popping up on the FM band only to get shut down by the FCC.

If these individuals are so determined to spend their hard earned money to purchase equipment to broadcast, so be it. Give them a license and let them broadcast.

Apparently they are doing it for the love of radio, unlike corporate entities who broadcast for the love of money. A small powered FM station will serve tiny communities far better than the big guys with a 100 kW signal who serve large areas and are oblivious to small communities. Their main concern is the biggest city with the most people and clients, so they have a place to locate their sales offices.

I think its about time the FCC let small broadcasters do their thing. In the future I want to read more about how the government takes drastic action against a drug dealer than how it shuts down a radio signal from a nearby house.

Frank J. Vela, Chief Engineer
WTBH-FM, Chiefland, Fla.

AM Alive

Dear RW,

AM is dead, so say the AM-naysayers. And there are a lot of them. But radio is radio. If you put something good, interesting and different on AM, it works well.

I would even venture to say that the recent incredible shift of power to the Republican Party in part was due to AM radio carrying Rush Limbaugh's daily program during the past few years, which encouraged thousands of AM listeners to go to the polls this past election. Can FM do that? I suppose it could, but so far it hasn't. Democrats, largely FM-children, so far have never established a liberal viewpoint program on AM that is of the same magnitude as Rush, and as a result, were caught unprepared.

Radio is radio. If you put something good, interesting and different on AM, it works well. At Beautiful Music WJIB(AM) serving the entire Boston market, after only 28 months with this format, WJIB has more than 1,000 letters in its public file from listeners praising the value of WJIB to them; letters most of which were written for no other purpose than to tell the station of its importance. AM is charged.

Bob Bittner, Owner
WJIB(AM) Cambridge, Mass.
WKBR(AM) Manchester, N.H.

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**Next Issue of
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SBE's Kelly Reveals Philosophy, Plans

by Dee McVicker

INDIANAPOLIS The Society of Broadcast Engineers (SBE) is viewed by many as the great technical equalizer in what is becoming a deregulated industry. Its presence is felt in the field, in convention sessions, and at the Federal Communications Commission (FCC) as a strong technical and educational force.

SBE President Chuck Kelly, the director of international sales at Broadcast Electronics, is a strong supporter of SBE's educational role in broadcasting. Kelly first joined SBE during his radio engineering days and now presides over the non-profit society that is 5,000 members strong with 102 chapters in the United States. SBE provides on-line information services, frequency coordination, technical sessions, engineering certification, and other engineering-related services for its members. There are currently 3,500 individuals with SBE engineering certification.

Within the past few years, the SBE crossed international borders and its members are now located in 26 countries; SBE sister affiliations are located in Canada, Mexico, Brazil, South Korea, Uruguay, India and the Philippines. Here, in an excerpted interview with Chuck Kelly, is a little more insight into the organization and its president.

RW: *SBE is probably more visible in the industry today than at any other time, which is why it's easy to forget its charter. What is the SBE's primary charter today?*

Kelly: To my way of thinking the most important job of SBE is education.

RW: *What areas of educating broadcast engineers need to be emphasized?*

Kelly: I think there are two areas. The first area is changes in technology. Digital is a part of that. DAB is a part of that. HDTV is a part of that. All those technologies—digital storage, digital

editing, digital transmission—are parts of that. And that's a very key point, but it's not necessarily the most important point because in my opinion there's a changing role of the broadcast engineer in stations today.

He's not just the person somebody calls up when something breaks. He's got a broader perspective. By that, I mean he's involved in more areas of station operation, and he's more a part of the management team. It used to be that staffs in stations were very large, but because of competitive pressures, we've seen downsizing in both television and radio. And what that means is that the people who survive in each category of job in a station have to work more seamlessly with each other.

RW: *Are we also seeing this changing role because technology has become more dependable?*

Kelly: I think that's part of it, but frankly, I think the biggest thing is economy. Look at the staff sizes of stations five or 10 years ago versus today. Staff sizes are smaller and there are a lot more, for instance, contract engineers.

RW: *What about making that transition from employee engineer to contract engineer?*

Kelly: There is marginal experience required if you make the transition from being a staff or chief engineer to being a contract engineer... about running a business, about billing, about insurance, about liability. You don't need to know that if you're a chief engineer of a station, (but) you need to know that if you're a contract engineer. Those are all things the SBE helps educate on.

RW: *What, exactly, is SBE's role in standards setting?*

Kelly: We haven't considered ourselves a standard setting organization. We haven't really gotten into that arena for

a multitude of different reasons. (But) SBE does get involved in representing the needs and the interests of the broadcast engineers before regulatory bodies, for instance, the FCC. If you look at the way things were 20 years ago versus they way they are today... (The FCC) used to be chock full of engineers and today, people's backgrounds are in other areas. Therefore, we believe that one of the functions SBE has is to be a resource for the commission on technical issues. We have an FCC liaison



Chuck Kelly

committee of top-notch people from throughout the industry which represents the interests of broadcast engineers before the Federal Communications Commission. They watch every rule-making, (and) we file very routinely on many, many issues.

RW: *What about SBE's increasingly visible role in trade shows?*

Kelly: Let me explain shows. SBE has always and will always continue to have regional shows. Excellent examples: Syracuse, Pittsburgh, Seattle, these are shows that have gone on for years and

years and years. They serve the people in that area very, very well. They provide an opportunity for the vendors and the members to get together and talk in a cost-effective fashion. And, they provide an opportunity for some really excellent technical training to go on (because) as I said, our charter is education and shows is one major way we can do that.

But let me carry that thought one step further. Several years ago, it's got to be eight or nine years ago, we took a regional convention in St. Louis and made it a national convention... It was never designed to be something that we fund our organization with. It was designed to be a service to the members by providing education and a service to our sustaining members, like manufacturers, to provide them an opportunity to meet the members. And that's the way we always ran it.

Some years we made money, and we put it into a scholarship fund, and other years we lost some money. Being a volunteer professional society with very few income sources, those years we lost money caused grave concern within the organization. So what we did last year is negotiate an agreement with the NAB. And what that agreement basically says is we provide the technical seminars at both the spring and fall shows.

In other words, we combine our annual convention into the World Media Expo so we have nothing to do with the trade show exhibit floor part of that but we provide all the technical sessions. So this year forward and for the life of the agreement, we provide the technical sessions in cooperation with the NAB. That's all in keeping with our charter to provide education.

RW: *Isn't SBE also becoming more visible internationally?*

Kelly: The last couple of years we've really grown internationally. We have chapters in the United States, we also have chapters internationally in various places. We also have another way in which we are internationalized. There are other organizations similar to SBE around the world, and we affiliate on a peer-to-peer basis with those organizations, agreeing to share all public information, to share when we do proceedings, when we come up with new certification programs. We share that information with our sister organizations abroad and they do the same with us. It becomes a worldwide resource of broadcast engineers, so this field is not one that stops at borders. There are no Faraday shields around the United States.

RW: *What is one of the most important things people should know about SBE?*

Kelly: That this is an organization made up of volunteers. There is some paid staff in Indianapolis, but the board of directors, the officers, the chapter chairman, the certification chairman, the frequency coordination chairman—all of these people are volunteers and do it for the love of the industry. I think there's a really good feeling about being involved in something you believe in, about giving back to an industry that has been good to you.

□ □ □

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GUEST COMMENTARY

Broadcasters Must Heed Electrical Codes

by **Richard D. Thompson**
Principal Consultant
Thompson Associates

LOS ANGELES I am offering the following comments in reply to the cover story in your Oct. 5 issue.

To begin, the situation reported is not a local issue. Los Angeles County, the cities of Los Angeles, San Diego and San Francisco, and the states of Oregon and Washington all have similar legislation that requires all electrical equipment to be listed. Other municipalities around the country have similar ordinances. The basis of the ordinances are the Federal Occupation Safety and Health regulations CFR-29 or OSHA. Here in California it is Title 8 and enforced under CALOSHA.

The FCC regulations do not supersede the federal OSHA regulations. In fact, there is at least one specific reference — 73.508-C of the FCC regulations. It states as follows:

"Transmitters...must be constructed with the safety provisions of the current national electrical code as approved by the American Standards Association.... Studio equipment properly covered by an underwriter's certificate will be considered as satisfying safety requirements."

The National Electrical Code (NEC) is the ANSI standard referenced. The reference is ANSI/NFPA 70, and the current 1993 code was adopted on August 14, 1992.

The FCC regulations cover the specifics of RF radiation, spectrum and frequency issues. The electrical power supply of the transmitter or, for that matter, any other radio, television or audio device needs to meet the NEC or the electrical code enforced by the local government. The FCC does not evaluate products for fire, electric shock and/or personal injury hazards.

What the Los Angeles County inspector was enforcing was in fact not just local law but the federal or state OSHA regulations. You must be aware that Sub-part S of 29 CFR addresses electrical safety in the workplace. This federal law requires that all electrical equipment to which an employee may be exposed be "acceptable to the Assistant Secretary of Labor."

The definition for "accepted" permits three conditions.

*Condition 1 — Accepted or certified or listed or labeled or otherwise determined to be safe by a Nationally Recognized Testing Laboratory (NRTL).

There are four NRTLs that the Department of Labor has recognized. They are:

Underwriters Laboratories Inc. (UL)
Electrical Testing Laboratories (ETL)
Canadian Standards Association (CSA)
Maryland Electrical Testing Laboratories (MET)

• Condition 2 — Requires the manufacturer of equipment where there are no existing standards to submit the product to a third party qualified for investigation and testing for the electrical safety of the equipment based on the National Electrical Code.

• Condition 3 — Applies to the one-of-a-kind product again where no standards exist. Here the employer must retain in perpetuity all safety testing documents and engineering data developed in-house

or by the manufacturer for any future OSHA inspection.

As you can see, Condition 1, the listing of products by an NRTL, is the most common. We often hear of this as "UL approved"; however, neither UL nor any of the other NRTLs approve a product. They provide a "listing" or "certification" of the product.

Recently, UL developed, with industry input, a new testing standard, UL 1419 Professional Video and Audio Equipment. The scope of this standard covers all A/V equipment used by "trained personnel" and

"in areas of controlled access." Upon reading your article, I contacted Anthony Bodetti, UL's engineering group leader for UL 1419 at UL's Melville office. It was determined that the testing of transmitters and similar radio and recording products would be covered by this standard.

It should be understood that UL did not arbitrarily decide to write a safety standard for professional video and audio equipment. It was the broadcast industry that requested UL to develop a safety standard specifically for broadcast equipment.

Chief engineers must now be aware that, as station management under OSHA rules, they are liable for any accidents and injuries that occur to a station's employees. Fines begin at \$7,000 for each violation. Willful disregard can result in a felony and jail. Many consultants are now including a statement that the equipment they specify must be "listed" or the manufacturer will be responsible for any fees or field testing.

What about the existing transmitters? Are you going to have to replace them

continued on page 8 ►

Value

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DESIGNS THAT MAKE THE DIFFERENCE



Maintain a Good File

► continued from page 3

if a request to see a file is made by writing or by phone, stations are free to refuse, according to a National Association of Broadcasters (NAB) "Helpfax."

Although a station may not charge a fee to anyone merely looking at its public file, it may charge a reasonable fee for copying records. Copies must be provided within seven days of their request.

Stations may request identification from file inspectors, but they may not require file inspectors to reveal the organizations they represents or even if they represent an organization at all. Stations are also

not permitted to make anyone looking at public files to specify which documents they are reviewing.

Files should contain a broad range of material regarding station operations, but some of the more critical documents are quarterly issues and program lists, which indicate significant issues of local concern that stations have covered in their programming.

"Basically each quarter, by the 10th of the following month, we expect them (stations) to have provided a list of significant issues in their communities they have addressed," Eads noted.

Although stations are free to address local public issues in a manner of their choosing, the commission wants to know what programs addressing local issues were aired and when they were aired.

The FCC wants public files to contain copies of all station applications and related pleadings filed before the commission for seven years. Employment reports must also stay in files seven years, and records of political broadcasts must be kept for two years. Time brokerage agreements stations made must remain in files during the term of the agreements.

According to the National Association of Broadcasters, other materials that need to be included in files are:

- Ownership materials including: ownership reports and information pertaining to stations ownership and license control. These must be kept in files for seven years.
- Citizen agreements, where stations promise performance in noncommercial aspects their operations, must remain in file seven years.
- Letters from the public, except where complainants have requested that complaints be excluded from stations files, must stay in public inspection files three years. ☺



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Intraplex's Codecs

by Whitney Pinion

WASHINGTON Although combining multiple functions into a single piece of equipment is not a new concept for codec manufacturers, Intraplex, with its new Series 4400 switched audio codecs, has merged numerous functions into a unit the size of a book, at a price that is lower than that of codecs with similar capabilities.

Designed specifically for remote broadcasts, the Series 4400 codecs include a simultaneously operating ISO/MPEG II encoder and decoder, a G.722 encoder and decoder, an ISDN terminal adapter and a BONDING-compatible multiplexer.

They also incorporate a U interface, which means that the units can be plugged directly into the Telco ISDN wall jack. Some competing codecs with ISDN terminal adapters offer the four-wire S/T interface. In other words, users have to purchase an NT-1 box to connect to the two-wire network. The Series 4400 codecs have an NT-1 box built in.

Another feature of the Series 4400 that should endear it to its users is the remote software upgrade. Any feature enhancements and changes can be sent to the codec remotely.

"We expect to add significantly to the capabilities of the product during its life," said Jack Kelly, vice president of marketing. "For users, these features will be just a phone download away."

At the core of these codecs is the Philips Electronics Musicore digital signal processor for ISO/MPEG Layer II encoding, which Kelly called "leading-edge technology." Philips Musicore has been around for a few years, but only in code form.

"We're seeing more general purpose equipment, more functions packed into one piece of equipment," Kelly said. He noted that other companies, such as Comrex, Telos and RE, are creating multipurpose units. Intraplex, he said, is "taking the next logical step by packaging a number of functions and offering it at a significantly lower price."

The company plans to offer the "plug and play" Series 4400 codecs in the first quarter of 1995 for \$3,495.

Kelly compared the all-encompassing nature of new codecs to modern computer processing chips. "You used to buy an enormous computer,"

he said. "Now all of those functions have been condensed into a single chip."

The market for the Series 4400 and similar codecs is "silently exploding," Kelly said. In addition to the ease of use that these small, multifunction units offer, the accessibility and relative cheapness of digital telephone lines are making digital technology more attractive to broadcasters.

"For the same \$30 a month you pay for a 2400 baud modem, you can get 128,000 bits per second," Kelly said. "You can even do remote concerts on a dial-up basis with much better sound." ☺



Heeding Electrical Codes

► continued from page 7

with a listed unit? No, as most of the transmitters were installed before the adoption of UL 1419, they are grandfathered. This concept allows an old house

with knob-and-tube wiring to remain. However, when you upgrade the installation, you must then meet current building and safety codes. This means that the new transmitter must be listed.

Manufacturers who are not part of one of the NRTLs' follow-up services should contact them and begin discussion on how their products can be listed. Understand that as a manufacturer you can include your entire product line or a range of custom equipment in the overall profile. Similar equipment can be evaluated cost effectively as "families" or "series" under investigation.

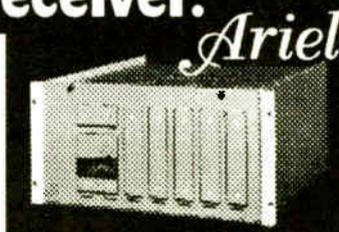
What do you do if the inspector comes and the new equipment is not listed? All of the NRTLs have a field evaluation service in which one or more of their engineers will come to your station and conduct a field test and evaluation. There is a fee, plus expenses, that will be charged to the customer. If the equipment passes, then a field evaluation label is applied to that product. This evaluation applies only to this specific item and site. Similar items from the manufacturer are not included.

I hope that I have briefly explained the facts on this issue. Manufacturers should begin to address the listing of their product. If they have done their homework prior to submission to a laboratory, the costs will be reasonable—certainly less than the attorney fees they may have to pay if something goes wrong. Listing will reduce their product liability, and their customers can reduce their workers' compensation premiums. As I understand it, UL has already listed more than 1,000 products in accordance with their standard, UL 1419. ☺

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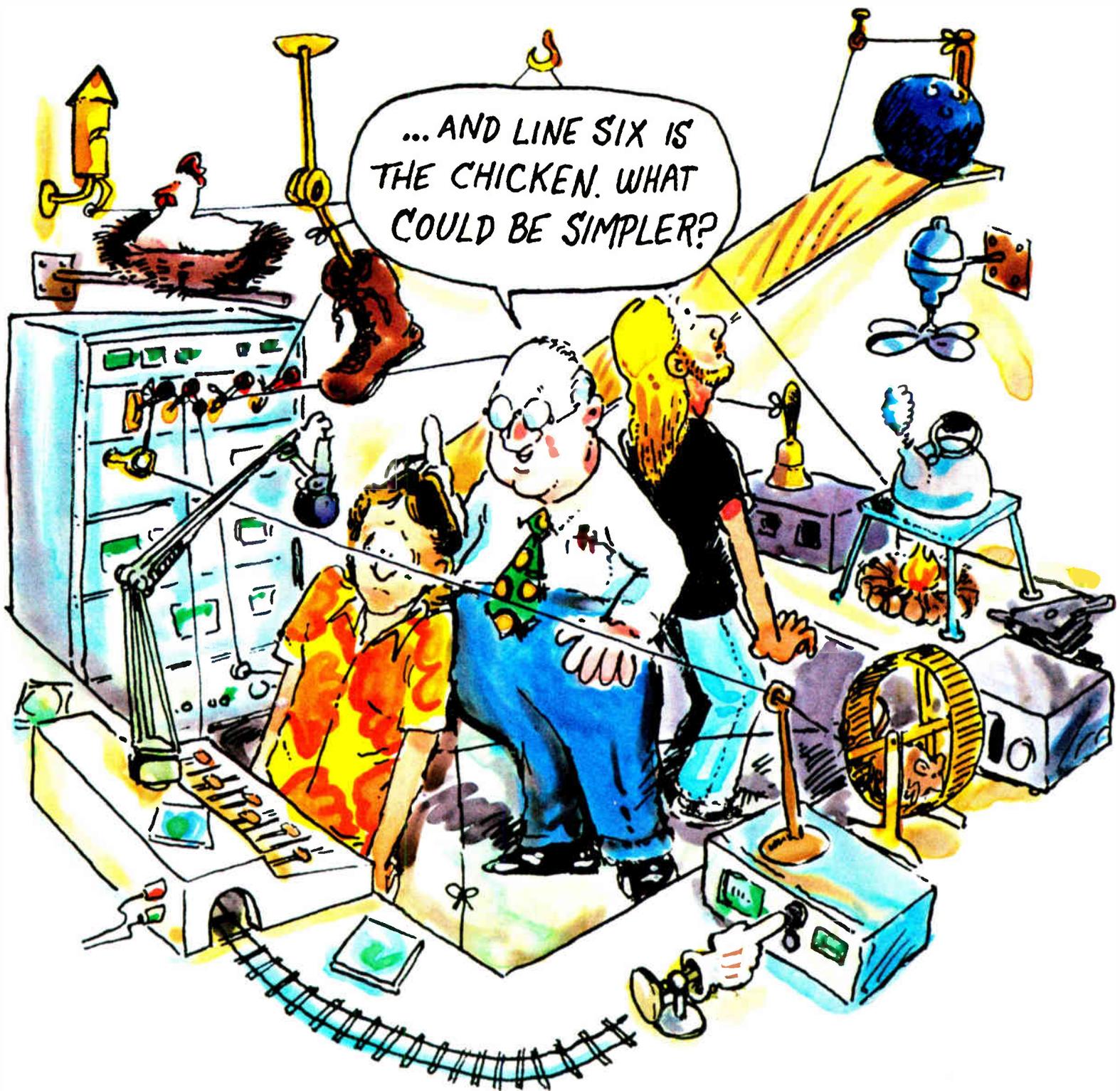
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FIRST IMPRESSION

Music Choice Service Now Cableless

by Frank Beacham

NEW YORK At a press luncheon recently, Charles Steinberg, president of Sony's broadcast equipment division, made an interesting comment for a man who leads one of the world's largest manufacturers of professional video production equipment.

Steinberg said he was excited about the service he is getting at home on his new 18-inch satellite dish. Most surprisingly, he said, is that one of his favorite new services over Hughes' DirecTV is the one without any video pictures at all. It's called Music Choice.

Formerly named Digital Cable Radio and formerly only available through cable television systems, Music Choice is now part of the programming lineup of the hottest new national television technology start-up in recent memory.

Real satellite radio

Ironically, this same system is also the first real incarnation of satellite delivered radio.

Music Choice, now carrying 28 channels of premium audio over direct broadcast satellite (DBS), claims it is not competing with conventional radio broadcasting. But

after experiencing the programming and the technology, I now understand why

I understand why many in the traditional radio industry are shaking in their boots at the very mention of satellite radio.

many in the traditional radio industry are shaking in their boots at the very mention of satellite radio.

The first thing everyone notices about the programming on DirecTV is how

clear and compelling it all sounds. Even the news has extra punch. This is because all of the sound—on all 150 channels—is digital. Anybody who tells you digital audio does not make a difference to the audience has his or her head buried in the sand. It changes everything, and I suspect

that on a subconscious level, it's far more important than picture quality.

Uninterrupted music

Once you get over how great DirecTV sounds, then you navigate to the Music Choice channels. It's here that you adjust quickly to the concept of no commercials and no DJs. Despite all that research one hears about listeners actually wanting to hear commercials, Music Choice quickly convinces you of the merits of a subscription service. Most of the Music Choice's channels are tightly formatted, commercial-free, talk-free all-digital radio stations that operate 24 hours a day.

The pure music formats on Music Choice are Hit List (top 40), dance, hip hop, urban beat, reggae, blues, jazz, contemporary jazz, new age, eclectic rock, modern rock, classic rock, metal, oldies, soft rock, love songs, progressive country, contemporary country, country gold, singers and standards, easy listening, classical favorites, classics in concert, contemporary Christian and gospel.

Beyond the all music channels are two "plus" channels that enhance the jazz and rock offerings. Jazz Plus delivers 24 hours a day of concerts, artist profiles, music mixes and special programming. Among the regular offerings are Riverwalk and Crescent City Sounds for Dixieland and blues and the Larry Carlton Show and Musical Starstreams for contemporary jazz and new age.

Rock Plus brings the same mix of special programming to rock aficionados. Here there's acoustic rock on World Cafe, alternative dance music on Grove Radio, new artists and trends on The Import Show and Out of the Box, interviews on Up-Close and hard rock and metal on Masters of Metal in Concert. Rock Concert features major acts in live performance and The Legends of Rock A-Z is a weekly anthology hosted by Doors keyboardist Ray Manzarek.

The Music Choice program lineup on DirecTV differs slightly from that delivered over cable television systems. For example, "Tu Alternativa Musical," a channel featuring pop and rock by Latin American artists on cable, has been replaced on DirecTV by "For Kids Only," a channel of songs and stories for children. Cut from the DirecTV lineup are channels titled "Body and Soul" and "Underground Rock."

These differences, a Music Choice spokesman said, are due to a slightly smaller channel capacity between the satellite and cable delivery systems.

A nice seasonal addition to the Music Choice lineup is a special holiday music station. During the past Christmas season (from Nov. 25 to Jan. 1), the added channel offered a mix of holiday music ranging from artists like Bing Crosby and Nat King Cole to Harry Connick Jr. and Gloria Estefan.

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RBDS and EAS

► continued from page 1

TFT Director of Marketing Darryl Parker pointed out that the FCC's positive comments on RBDS is not necessarily an endorsement of the Sage system. TFT's EAS 911 decoder and EAS 912 encoder also has the ability to turn on receivers, Parker said.

"RBDS is not a company," Parker said. "It is a standard." He pointed out that the report and order mandates a system that is capable of transmitting messages "in the main audio channel." The document goes on to say that stations may use RBDS as "a subsidiary communication services."

However, Lebow noted that his system is an in-band system that includes RBDS technology as an extra feature.

"In the unit we showed at the press conference, we had WRSAME encoders and decoders," he said.

The Sage system does, however, have a higher price tag than most other systems, costing about \$1,500 if stations have a 286 computer and \$2,500 if stations do not have a 286. In comparison, TFT's system cost about \$750. Some low-end systems could cost as low as \$600.

Stations who have trouble financing the conversion to EAS, regardless of the desired system, may be able to utilize federal funds available through the Federal Emergency Management Agency (FEMA), depending on upcoming budgets cuts from the newly elected Republican congress, said Beverly Baker, the chief of the FCC compliance and information bureau, formerly the field operations bureau.

Costs

"We're hoping the manufacturers will go along with the number (cost estimates) they have tossed out originally," NAB engineer and Director of Technical Conferences John Marino said. "We want to make sure that broadcasters don't get the bad end of the stick and have to spend a for-

tune of money to replace existing equipment."

The FCC requires stations to be EAS ready by July 1, 1996. Existing EBS equipment must be capable of decoding a shortened eight second version of the two-toned alerting signal by July 1, 1995.

Stations can buy time for themselves by upgrading their existing EBS equipment for this summer's shortened tone deadline and waiting another year before replacing all their EBS equipment. Wind River Broadcast Center is offering EBS modification kits for about \$100 "It's for that one-year transition period." Wind River General Manager Jim McDonald said.

Since the FCC's original mandate last November was non-proprietary, not requiring any one company's EAS equipment, many manufacturers were waiting to get a copy of the report and order in order to begin production of their own systems.

"We have about five or six other manufacturers," Mitchell noted. As a matter of fact the \$600 cost estimate for low end equipment came from those "other" manufacturers, she said.

Technical specs

In technical terms, the FCC solidified previously released guidelines that stipulated a digital architecture that replaces the daisy chain network with multiple source alerts. Stations can be directly hooked into numerous state and federal emergency management agencies. The new rule also reduces the alerting tone down to eight seconds; creates unobtrusive weekly tests; has the ability to issue alerts in other languages; makes provisions for the hearing and visually impaired and will prohibit the false use of codes and alert signal.

One of the more significant mandates in the report and order is a mandatory protocol that uses a four-part digital message to activate station encoders including a message preamble, originator codes that tells which agency activated the message, codes that describe the emergency event, codes that give a precise location of where the message is happening, codes that indicate the valid time period of the

message in 15 minutes segments and indicate when the message was originally released and codes that will reveal the call signs of a station passing on the message to other stations.

Improved EAS Technology

WASHINGTON One of the more enthusiastic supporters of the move to the Emergency Alert System from the Emergency Broadcast System is FCC Chairman Reed Hundt.

"It's part of the move of all communication technology to the digital age and therefore it will be compatible with all the emerging technology," he said. "Broadcasters have told us that they do not want to be required to invest in analog technology because it will soon be outdated."

The EAS' system of automatic operation capabilities will decrease chances of human error, allow stations to participate in emergency alerting without hiring additional staff and replace the daisy chain alerting system with "a technique of simultaneously notifying all stations at the same time."

"We don't have to have one person calling another person in a phone tree, which has been the historic method," he said.

Hundt is especially impressed with EAS technology that will kick on radio, television and other consumer devices in the advent of an emergency, alerting listeners and, if the need arises, awakening them from sleep during the night, informing them to take cover from an approaching disaster.

"It reaches more people in more ways," said FCC Chairman Reed Hundt.

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COLE'S LAW

Expanded Band: Too Few Too Late?

by Harry Cole

WASHINGTON With relatively little fanfare, in October of last year, the FCC wrapped up the first phase of its implementation of the AM expanded band rules. The lack of fanfare is understandable, given the results of the years-long proceeding are less than overwhelming.

For those of you who may have stopped worrying about AM radio years ago, let's recap a little. In the mid-1980s, the FCC, concerned about the continuing wane of AM radio, began looking at ways to beef up the service on that particular medium. The goal was nothing less than the

"transformation and revitalization of the AM broadcast service by the year 2000," according to one Commission decision.

Different tactics

This was to be accomplished through a number of different tactics, most notably by the creation of 10 new channels to be tacked onto the upper-end of the existing AM band. This new "expanded band" space would be reserved for existing stations already operating in other parts of the band; those stations would "migrate" to the expanded band. The thinking was that such a migration would relieve congestion in the old "lower" band and provide a nice clean, completely uncongested new "upper" band.

In theory this was great. Initially, the commission estimated that the new band might be able to accommodate as many as 25 to 30 stations on each of the 10 new channels. Let's see, that would be somewhere between 250 and 300 stations which would be cleared out of the lower band. That might have made a difference, even if there are nearly 5,000 AM stations nationwide.

But, as is often the case, the dramatic numbers did not pan out. As early as 1991, the commission was backing off the notion of a 25-to-30-station-per-channel capability, although the FCC was still not tying itself to a particular estimate. In 1991, all the commission would say was that the new band would "likely accommodate fewer than 200" stations.

The chosen 79

And so things pretty much sat until October 1994, when the FCC finally issued its long-awaited list of stations which would be eligible to apply for places in the expanded band. The final count? 79, count 'em, 79 stations nationwide have been invited to venture off into the expanded band.

Procedurally, each of the chosen 79 will be given the opportunity (once any petitions for reconsideration and/or appeals are resolved) to file an application for a construction permit to relocate to its designated expanded channel. If the application is determined to be acceptable for filing, it will be included on a cut-off list. While petitions to deny may be filed, no competing applications will be accepted. The application will then be processed in the normal fashion, a permit will eventually issue, construction will happen, and so on, and so on.

It all sounds nice and workable, even if the numbers are considerably smaller (like, around 70 percent smaller than initial projections, and more than 50 percent smaller than the watered-down "fewer

than 200" estimate in 1991) than we all hoped for. And in truth, the folks in the AM Branch deserve a lot of credit for struggling with a difficult problem and trying to come up with an innovative solution.

A realistic look

But let's get real. How realistic is it to think that the expanded band will cause any significant improvement in the overall scheme of things on the AM side?

The expanded-band scenario puts us in mind of a drama involving a submarine crew trapped at the bottom of the ocean.

We are talking about 79 stations in all. First, how many of those stations are really going to want to leave their established place in the established portion of the band to try their luck in a chunk of the band that the vast majority of existing receivers do not receive?

Sure, you say, receiver manufacturers will soon be cranking out expanded-band radios left and right. Maybe, but maybe not. Why would they be inclined to redesign their products just to accommodate a total of 79 stations?

And even if the receivers become available, why would the public necessarily be inclined to run out and invest in new AM radios just to pick up one or another of the 79 stations? After all, if any of the affected stations have listeners who are loyal enough to go buy new receivers, then those stations presumably are already enjoying reasonable success where they are in the band, congestion notwithstanding. Why would they want to move?

And if a station does not have such loyal listeners, isn't it likely to be near-suicidal to move to a channel where even potential listeners will be scarce, at least for the immediate (and possibly foreseeable) future?

Difficult dilemma

The expanded-band scenario puts us in mind of a drama involving a submarine crew trapped at the bottom of the ocean. The captain devises a plan which calls for a number of crew members to leave the ship to relieve the on-board congestion and make life more livable for everybody. The trouble is that it is not clear that anyone on the surface—i.e., those in a position to help—will have either the technology or the interest to

save those who leave the ship.

Could crew members who choose to leave survive outside the ship? For how long? What would happen if the technology necessary to help them wasn't available or, worse, if the people on the surface simply decided that they did not care enough?

As melodramatic as this may sound, these strike us as the types of questions which an AM broadcaster, confronted with the expanded band opportunity, should be asking. And, frankly, the correct answers are far from clear.

The one thing that does seem clear is that, while it may have looked good on paper for a while, the expanded band approach is probably not going to move

us much closer to the "revitalization" of the AM broadcast service.

If you have any questions about how the expanded band proceeding could affect you, you should consult with your communications counsel and/or your consulting engineer.

□□□

Harry Cole is a partner in the Washington-based law firm of Bechtel & Cole. Chartered. He can be reached at 202-833-4190.

Music Choice Now Cableless

► continued from page 10

receiving Music Choice over DirecTV rather than cable is the current lack of song ID information. On cable, Music Choice offers a special remote control that displays information for the current and previous song in play via a liquid crystal window on the front of the remote. The display shows channel name and number, song title, artist, CD/album title and record label.

Limited artist ID

On DirecTV, the user sees only the channel name and number for a few seconds on the TV screen and then the screen goes blank. Officials of both Music Choice and DirecTV said their systems are capable of delivering the music information on the video screen but neither could say when the feature might be added.

After experiencing Music Choice on DirecTV, I found it outright addictive. The sound quality on all channels was superb and I noticed no artifacts in the audio from the data compression used by DirecTV to deliver the digital signal. The programming is diverse and offers a broad range of music to fit the mood and occasion of just about anyone.

In my opinion, Music Choice is of better quality than traditional broadcast radio. When it's available in automobiles and to portables, the broadcast industry had better watch out.

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World Radio History

Early Innovation Using FM Subcarrier

by Read G. Burgan

LAKE LINDEN, Mich. Lyle Henry's guest commentary on digital transmission via FM subcarriers in the June 1 issue of RW brought back memories of an earlier, less high tech but nonetheless innovative use of an FM subcarrier.

The year was 1974, exactly twenty years ago. I was the director of Michigan Technological University's 100 kW public radio station WGGL-FM. We had an SCA subcarrier we weren't using, and the public schools in our area were looking for a way to enhance the educational offerings to their students.

At the same time, the Michigan State Board of Education was looking for a successor to an aborted project at WFBE in Flint, Mich., which was designed to transmit educational programming using slow-scan television on an SCA subcarrier (WETL in South Bend, Ind., was also experimenting with slow-scan TV during this period).

Slow scan project

Colorado Video Incorporated (among others) developed slow-scan television to transmit still video images over narrow-band carriers including telephone lines. It provided a visual dimension to communication that otherwise would have been limited to audio.

It enabled a limited form of teleconferencing more than twenty years ago and served as means of transmitting the images of documents and drawings before the development of desktop fax machines.

Colorado Video's model 220A converter used a rotating disk to capture a still black and white image from a video source (usually a video camera). It took seven to fifteen seconds to transmit the still image, depending on the bandwidth of the carrier and other factors. Each succeeding image was swept across the screen horizontally like a wiper blade moving across a car's windshield.

Our slow-scan TV broadcasts were a joint experimental project in cooperation with the Michigan State Board of Education, the Copper Country Intermediate School District and select school systems. To pull the project off, we needed FCC authorization for a second SCA subcarrier—one for the video and one for the audio. We already had authorization to use a 67 kHz subcarrier. We needed additional authorization to use a 41 kHz subcarrier.

Have you ever tried to explain to the FCC that you want to broadcast television on your SCA subcarriers? Eventually they got the picture (and later, so did we).

Startup costs

We also had to install two additional triple "A" phone lines to our transmitter site some twelve miles away. Colorado Video loaned us a CVI 220A converter valued at \$4,000 and an FM modem to interconnect its unit to our FM exciter. In addition, we needed two SCA receivers. Again, one for the audio (\$130) and one specially modified for the video (\$175).

A local dentist prepared a program on preventive dental care for children featuring simple graphics that would transmit easily. He narrated the presentation, which was recorded on a helical scan video recorder.

The demonstration tests were conducted

on May 29-30, 1974 at schools in Ontonogon and Calumet, Michigan. Calumet was located about twenty miles north of our transmitter site, Ontonogon about forty miles to the south. Broadcasting with an effective radiated power (ERP) of 100 kW and an antenna nearly 900 feet above average terrain, we had no trouble effecting a clean signal at the test sites (the photo is a shot of the video tape image actually recorded at the Calumet receiving site).

A technical success

Technically, the demonstration was a resounding success. Clearly it was possible to broadcast an audio-visual program of black and white still pictures over our

SCA subcarrier to virtually any site within our coverage area. While the Copper Country Intermediate School District indicated its intention to go on to regularly scheduled broadcasts, the program never proceeded further.

The local schools were unwilling or unable to provide any funding for the project. The Copper Country Intermediate School District hoped that our parent, Michigan Tech, would spring with some seed money, but that was not a realistic expectation in the light of declining enrollments and dwindling state funds.

No educational programming currently existed in a slow-scan TV format, and no one seemed interested in developing it.

The medium was limited by its inability to transmit color images or movement. In short, the operation was a resounding success, but the patient died.

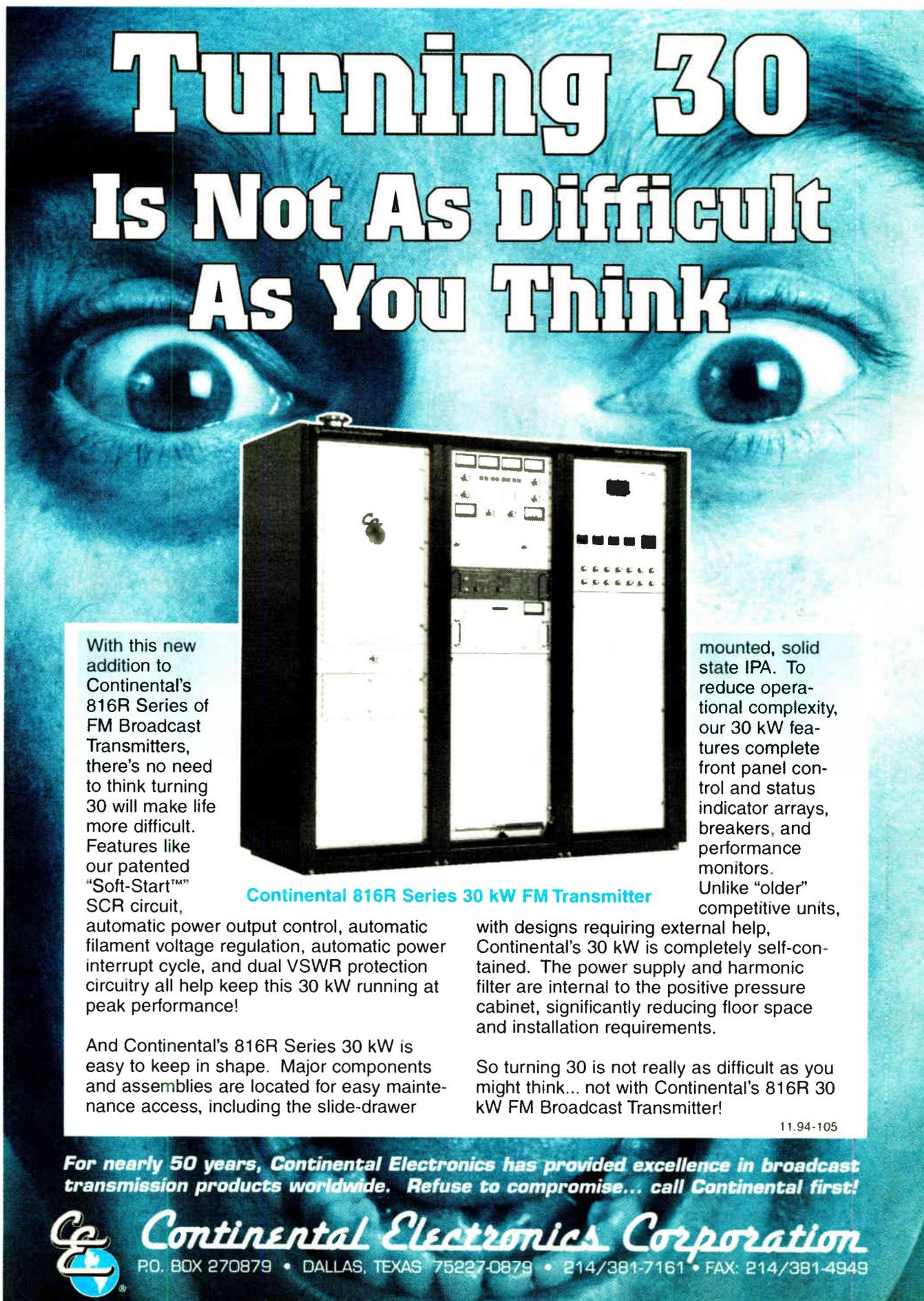
A recent article in our local Daily Mining Gazette indicates that the very same schools are now finalizing plans for an interactive TV service based on fiber optic technology. The project cost will be \$892,589 for 15 sites plus a one-time setup cost of \$25,000 per site. And a \$5,000-per-year fee for technical services.

Could it be that we will be increasingly reminded that technological innovation increases logarithmically, but the ability and willingness to use new technologies do not?

□ □ □

Read G. Burgan is a writer, producer and photographer and a former public radio station manager. He can be reached at 906-296-0652.

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World Radio History

BOTTOMLINE BROADCASTER

Techniques to Measure Impedance

by Jim Murphy

MORGANTOWN, W.Va. When you speak of impedance measurements, most engineers automatically think about complex bridges and expensive Z meters.

Although it would be handy to have these meters at your disposal, such exclusive test equipment is normally not found outside NASA or some laboratory. It is simply not cost effective to have these things gathering dust on your workbench.

Some of us toiling in the broadcasting trenches as well as those just entering the business may have forgotten a tiny bit of theory that allows us to measure impedances of not only passive devices, i.e., transformers, capacitors, resistors, but also active devices, such as cart and tape machines, and amplifiers. It is all based on an old theory called "load matching."

Load matching

In the days of vacuum tubes and transformers, the principle of load matching was an important one. In those days you were taught that every output had to be terminated into a matching input. After all, transformers require loading, and grid-based inputs must be converted to low impedance to satisfy these requirements.

Transistors, even though they were current devices, presented their own matching problems. Again, the use of trans-

formers even in the internal circuitry, was the only method of matching input and output stages.

Because of the development of operational amplifiers, the only circuits using those methods in today's technology are occasional line level devices and microphones. Most circuit infrastructure as well as systems are based on a protocol of high input impedances driven by low output impedances. So why is matching not important here? Mainly because we are not transferring power. Theoretically no current flows, so no power can be lost.

In fact, this modern method of signal transfer is superior because it permits multiple high impedance input devices to be connected to a single low impedance output without detrimental effects. In the digital world, it is known as fan-out and fan-in.

This is all mildly interesting, you say, but how can power matching help us measure impedances?

Power matching

Figure 1 illustrates the power matching theory. Note that the generator model shows an internal impedance. (Otherwise, how would you develop the voltage across?) In the example, the generator has an internal impedance of 10 ohms, across which it develops 12 volts.

With no load across A and B, no current flows, there is no voltage drop across

R(load), and output voltage is equal to generator voltage (12V).

Graphically, figure 1 shows output voltage, load current, and power across load resistances from 1 to 25 ohms. In terms of power transferred, the plot shows why

To apply our theory to impedance matching, we are interested in the A to B voltage as a function of load resistance. At 10 ohms loading, the output voltage is 6 volts. In other words, from an open circuit to a 10 ohm load, output voltage drops from 12 to 6 volts, which is a 6 dB change in level. Do not confuse 6 volt drop as 6 dB. The formula $dB = 20 (\log V1/V2)$ will work with any two voltages, and as long as the second voltage is half

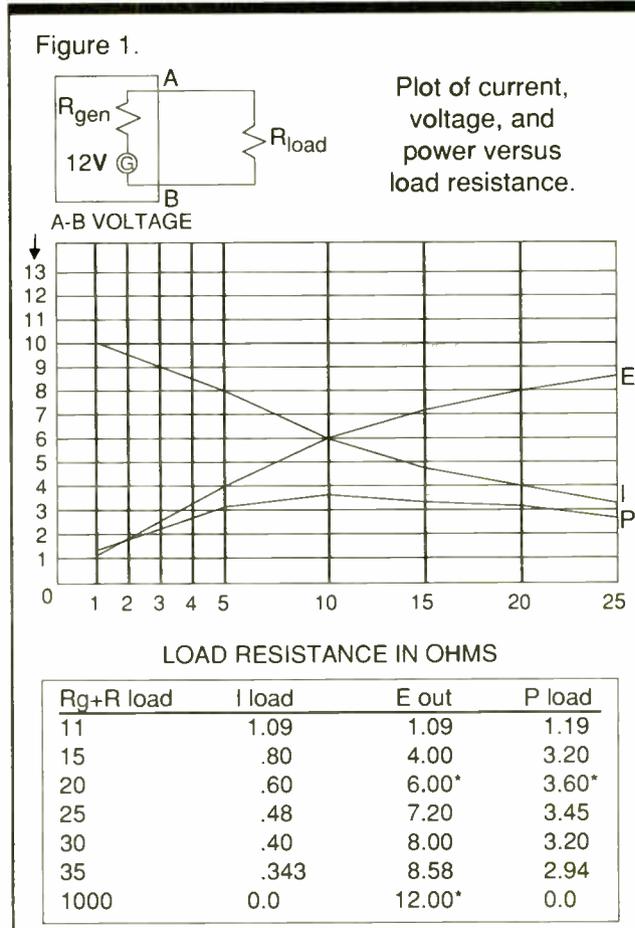
the value of the first, there will be a 6 dB drop. (The log of 2 = .3 x 20).

All you need to do is work this backwards, that is, place a variable resistor across any two terminals and adjust it for a drop of 6 dB, then measure the resulting resistance. The internal resistance of the device is the same.

Figure 2 shows a box, consisting of 3 pots or rheostats, and a couple of banana posts for the measurements. I use 50 kilohm, 5 kilohm, and 500 ohm, wired in series.

This gives me a range large enough to read anything from high impedance consumer devices to microphone impedances.

You might want to place a switch across each pot or rheostat so you can bypass the inappropriate one(s).



this occurs. When load impedance is unequal to source impedance, the current-voltage products in the circuit are lowest. Our lines show that indeed maximum power transfer (3.6 watts) is obtained when the load is 10 ohms.

Make sure you are using a high impedance AC voltmeter, especially if the unit you are measuring is unbalanced and is consumer grade.

You will also need an audio oscillator.

continued on page 29 ▶

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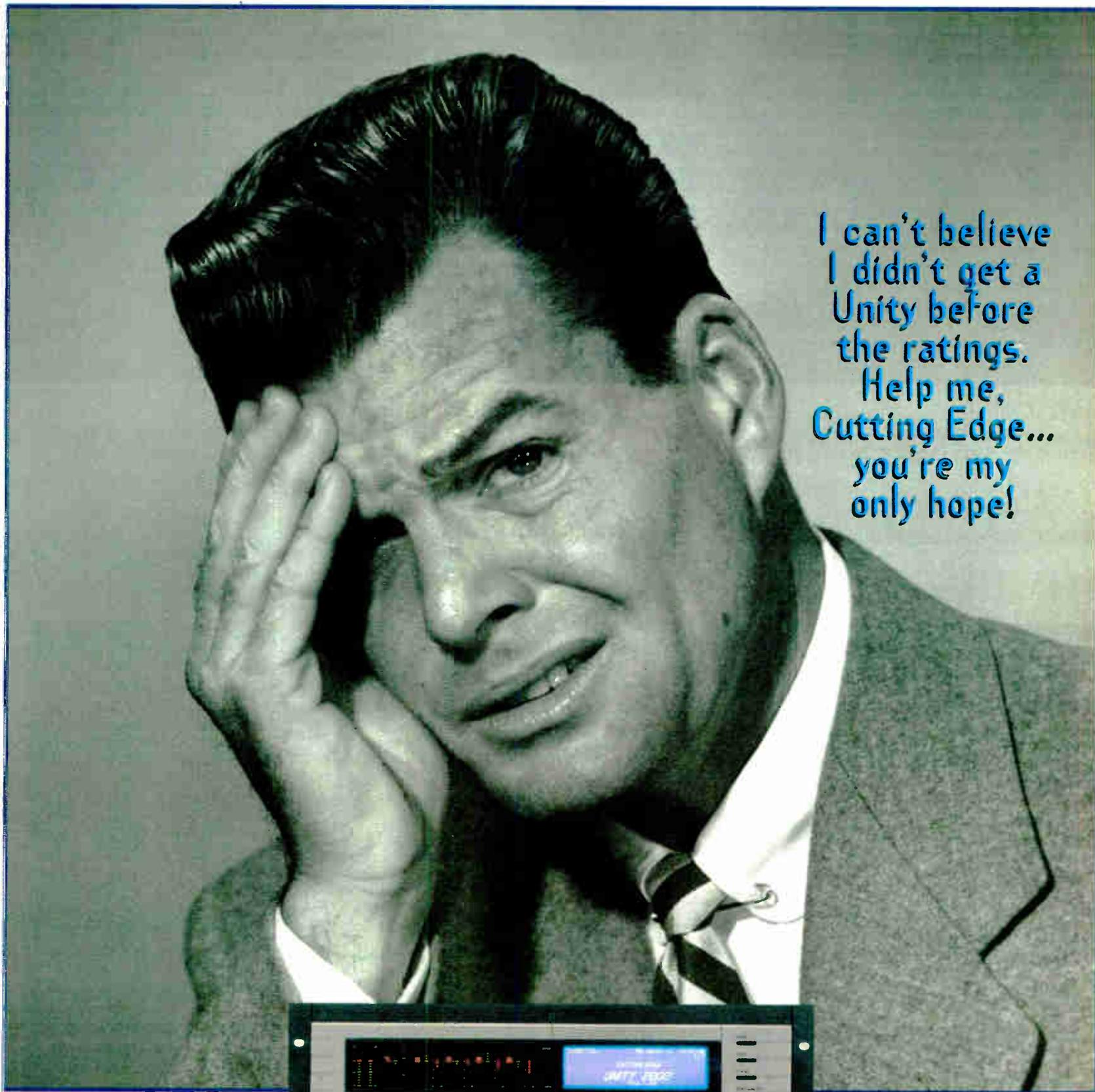
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INSIGHT-ON-RULES

Scrutinizing the FCC's EAS Ruling

by Harold Hallikainen

SAN LUIS OBISPO, Calif. On November 10, the FCC replaced the Emergency Broadcast System (EBS) with the Emergency Alert System (EAS). Many had expected this rule change to occur back in March. When the full text is released, it will be available on the H&F fax server (phone 805-541-0201). It also may be available on other services (see below).

According to the news release (available from the FCC's fax server), the new system allows broadcast, cable, satellite and other services to send and receive alerting information, multiple source monitoring for emergency alerts, automated and remote control operation, an "unobtrusive weekly test" as well as monthly on-air tests, the ability to issue alerts in languages other than English, provisions for hearing and visually impaired, prohibition of the false use of codes and the alert signal, and a mandated standard protocol for sending messages.

The current EBS only applies to broadcast stations, making those viewing cable channels (other than local broadcast) unaware of local emergency information.

It appears that those watching satellite signals directly

Table 1 - Broadcast station EAS implementation schedule

- July 1, 1995 EBS decoders to be modified to detect 8-second tone. Transmitted tone duration to be 8 to 25 seconds
- July 1, 1996 All stations must replace EBS equipment with EAS
- July 1, 1997 Two-tone signal used only for monthly test or emergency

(as opposed to through a cable system) would still be unaware of local emergency information. Consumer receivers could automatically unmute on receiving an emergency alerting signal.

Multiple monitoring

The multiple source monitoring of the new system is interesting. The existing EBS has only one input to the EBS decoder, driven by a receiver tuned to an assigned station. If that station is off the air or does not carry the emergency data, the station (and its listeners) remain uninformed of the emergency condition. I could see multiple-source monitoring including the monitoring of another local station (as with the current EBS), another input being driven by the local Office of Emergency Services, another being driven by a weather service receiver, and other inputs being driven by other local, regional, state, or national emergency information sources.

The existing alerting tone (20 to 25 seconds) would be shortened to eight to 25 seconds. This was in the original NAB proposal, in an effort to reduce "tune-out" by listeners during the seemingly endless tone.

Because the EAS uses a new digital signaling technique, it would appear that the existing alert tone is not required at all, but the news release indicates it will continue to exist.

The existing EBS is difficult to automate for several reasons. The most critical, in my opinion, is the absence of a machine detectable end-of-message indication, which would return the station to normal programming. The existing system also lacks "addressability" as to what areas in which the emergency information is to be broadcast. This is an interesting problem in that many listeners view or listen to non-local stations. Those stations may wish to carry emergency information that applies to listeners outside their city of license. In the original discussion on a new EBS system, the FCC proposed a "veto" system where an operator would have to take some action to prevent emergency programming from overriding normal programming. Such a system would easily run without an operator.

Multiple languages

The multiple-language provision is probably based on text data packets containing emergency information in different languages. A station could choose to read only those packets in a particular language.

Table 2 - On-line sources of FCC information

- FCC WWW server - Daily Digest, News Releases, etc.: <http://fcc.gov>
- Telecom Resources - Most if not all telecom resources on the net: <http://king.econ.lsa.umich.edu:70/0/telecom-info.html>
- Federal Register, Counterpoint Publishing - Free access to partial, pay for full text: gopher://gopher.counterpoint.com:2002/11/
- Federal Register, USGPO thru Columbia MO Online Info Network - Full text of Federal Register: <telnet://128.206.1.3>
- FCC Fax Server - Similar to WWW server, but seems more current phone: 202-418-2830
- H&F Fax Server - Broadcast-related documents not available on-line elsewhere: phone: 805-541-0201

False use of the EAS would, of course, be prohibited. The "standard protocol" for sending messages includes "non-proprietary digital transmission standards that are compatible with NOAA weather radio," according to the NAB Radio Tech Check.

Table 1 shows the implementation schedule for EAS. If all stations in an area are EAS equipped prior to the specified date, the stations in the area may (with FCC approval) discontinue the use of EBS and start use of EAS.

Because the new EAS is automated, it leads us to question the need for operators at broadcast stations at all. Originally, the Communications Act of 1934 required the use of licensed operators at broadcast stations ("except

those engaged solely in re-broadcasting other broadcast stations," which generally meant TV and FM translators).

In 1992, Congress passed Public Law 102-538, which removed the licensed operator requirement. The bill (H.R. 6180, which appears on page H11731 of the Congressional Record, volume 138, number 142, part IV) provides funding for the NTIA and "makes miscellaneous changes to the FCC." A small section (section 205) amends the Communications Act to remove the licensed-operator requirement.

On November 10, the FCC proposed unattended operation of broadcast stations. The news release (available from the FCC fax server) states, "In the context of unattended operation, the monitoring and control of critical parameters must be performed by equipment that could take the station off the air or contact some person designated by the licensee in the event of a serious malfunction." This sounds very much like the existing ATS rules with the exception that

the existing ATS rules do require a duty operator at the control and alarm point. At this writing, the NPRM is not yet available. When it is available, the full text will be on the H&F fax server. We may also make it available on the Internet World Wide Web.

List the parameters

It will be interesting to see what is proposed. I'd suggest any rules in this area include a list of those parameters that are considered critical enough to require near-continuous monitoring (as opposed to those parameters that may only be checked once a month or so). Currently, many stations

continued on page 18 ►

AMs Can Increase Their Power

► continued from page 1

One reason that stations are increasing their power is because the areas they are licensed to serve have outgrown their signals, and the stations are now unable to service the entire market they were licensed to service. In Los Angeles, unbridled and unmanaged growth, commonly known as urban sprawl, has pushed suburbs and other outlying areas of the city beyond KFWB's 5 kW signal. Management is hoping the 50 kW signal will bring in more listeners.

KFWB's current power contour covers about 72.6 percent of Los Angeles during the day. The increased contour should cover about 79.6 percent of the city.

At night, the raising of the station's signal should expand its contour by 12 percent, said Richard Rudman, the engineering manager for KFWB.

Then there is the issue of having a signal strength that effectively services a market. Over the years, Walden noted, slow encroachment from co-channels and adjacent channels increased interference into the KFWB's contour. Although the number of interference incidents from any one station by itself, is not noteworthy, the number of combined incidents has hindered KFWB's ability to reach listeners, frustrating them into changing stations rather than listening to competing stations.

The problem is especially noticeable in automobiles where the KFWB signal fades in and out of commuters' receivers as they drive from one end of town to another end.

Adding to the dilemma is that many automobile receiver manufacturers have concentrated their quality production efforts on the FM front ends of their receivers, neglecting and, in some cases, decreasing the quality of receiver AM reception, Rudman said.

Some automobile receivers are even designed to skip through weaker signals when scanning through stations. And in other cases, if a signal fades, the receiver will switch itself to another station.

This scenario, Rudman noted, causes his station to compete with weak automobile receivers as well as other stations.

"We are competing against features in some automobile receivers that make it hard to receive our signal," he said.

A stronger signal should help KFWB keep its

commuting audience and other listeners as less people find the fading 5-kW signal replaced with a 50 kW signal that effectively handles interference.

The Mid-Atlantic

In the Mid-Atlantic region, station WWRC in Washington cannot cover its entire market with its 5 kW signal due to low ground conductivity and because it is located in the middle of the large Eastern Seaboard market where closely spaced stations interfere with each other, said Walden and AM radio activist Peter George.

Due to the conductivity handicap, AMs in these areas need increased power to compete with FM, Walden said.

"In order to be competitive you have to have a signal that can cover the same areas as a FM," he said. "AMs that can cover the entire market can generate some ratings."

Future outlook

Don't expect to see too many AMs powering all the way up to 50 kW, Rudman said, adding that a lot of stations cannot afford the costly powering up process that involves filing construction permits with the FCC, obtaining permits from local governmental zoning boards to construct directional towers, and purchasing land for new towers.

Then there are hidden engineering costs, including RFI mitigation in neighborhoods where stations cranking 50 kW signals block the ability of nearby receivers to tune in adjacent channels. Sometimes stations end up purchasing new receivers for people living in close proximity to their towers.

Also, the FCC is becoming stricter on interference level. So in order to raise a signal, the FCC requires that stations contributing more than 50 percent RSS levels (or more than 50 percent of the interference) to other stations have to reduce that level below 50 percent. Stations contributing above 25 percent of RSS to other stations must make sure they do not increase that level when raising their power.

In cases where a station is the only contributor of interference to another station, in order to change its signal, it would have to reduce that interference by at least 50 percent to the other station, even if the interference was minimal, Rudman noted.

OFFBEAT RADIO

Interactive AM Programming Via the 'Net'

by Dee McVicker

SANTA CRUZ, Calif. It is not every day one sees the equivalent of a Model T cruising along the information superhighway. But it does happen on Sundays from 10 a.m. to noon, when a California AM station is on-line and on the air with an interactive talk program called RadioNet.

Guide to cyberspace

KSCO(AM) of Santa Cruz embarked on the information superhighway in July 1994, to combine what many perceive as

the grandfather of mass media, AM, with the newest wave in entertainment and information, the Internet. Since then, its talk show has taken off, becoming a sort of everyman's guide to cyberspace.

"We're beginner-oriented so most of our discussions are geared toward the interesting ways people are using computers," said Cynthia Zwerling, an executive producer for the show. RadioNet is the first interactive radio show of its kind to address cyberspace issues such as computer bulletin boards, multimedia, and virtual reality from a novice user's point of view.

Guests on the show come from all avenues of the computer industry, from hardware and software luminaries to "net surfers," which is Internet jargon for cyberspace users who like to cruise the Net for what's new and interesting.

RadioNet's cyberspace host, John Adams, is a self-described computer novice who acts as the jargon barometer. "John is more the liaison between people who use the Internet and those who might be kind of new and a little bit afraid to get on the technology. Whenever we start to get too technical, he plays devil's advocate," explained Zwerling.

For those hard-to-understand technical issues on the air and off the air, the station has its own resident Net surfer. Endearingly referred to as RadioNet's Silicon Surfer, John Bates "finds interesting new places on the Net, the Worldwide Web, and reports on those. He's a real surfer, so everyone thinks its kind of funny," said Zwerling.

RadioNet heat

So successful is RadioNet six months into its arrival onto the information superhighway that Zwerling wonders why the station did not do it sooner. "There's a real demand for this because this is such a hot topic right now," she said. Recently, Zwerling counted more than 350 accesses to Internet by KSCO(AM) listeners, who typically plug into RadioNet over the large on-line computer network through computer e-

continued on page 21 ►

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Scrutinizing EAS Ruling

► continued from page 17

are continuously monitoring only the antenna input power. This is possibly the least likely parameter to cause harmful interference. More likely parameters include carrier frequency, modulation, occupied bandwidth, spurious emissions, etc. I hope that the new rules finally clarify the vagueness of the current remote control and ATS rules.

If the new rules include a "failure mode analysis" on the control equipment that will cause a shutdown on the failure of the control or monitoring equipment, it may not be necessary to have any control link back to an operator. If it is possible for a station to cause interference without the automatic control system shutting it down (either because a particular parameter is not monitored or because of a failure in the monitoring or control equipment), it appears that there would need to be a method for the FCC to shut a station down. Currently, they can contact a duty operator and request a shutdown. If there is no duty operator, who do they contact?

Again, it will be interesting to see the actual NPRM. It looks like we are in for a major change in the way broadcasting works. We'll discuss the actual new and proposed rules next month.

Information sources

It is important to find original documents in trying to determine FCC requirements. More and more of these documents are available to those with computers connected to the Internet or to fax machines. Table 2 lists some of these resources.

□ □ □

Harold Hallikainen is president of Hallikainen and Friends, a manufacturer of transmitter control and telemetry systems. He also teaches electronics at Cuesta College, San Luis Obispo, and spends most weekends contradancing. He can be reached at 805-541-0200; fax: 805-541-0201 or e-mail ap621@cleveland.freenet.edu.

STATION SKETCHES

Theory on the Equalization of Phone Lines

by Tom Vernon

HARRISBURG, Pa. In the last installment of Station Sketches, I introduced the topic of maintaining leased telephone lines. Repeat coils were discussed, and the point was made that they balance the line, thereby reducing noise levels.

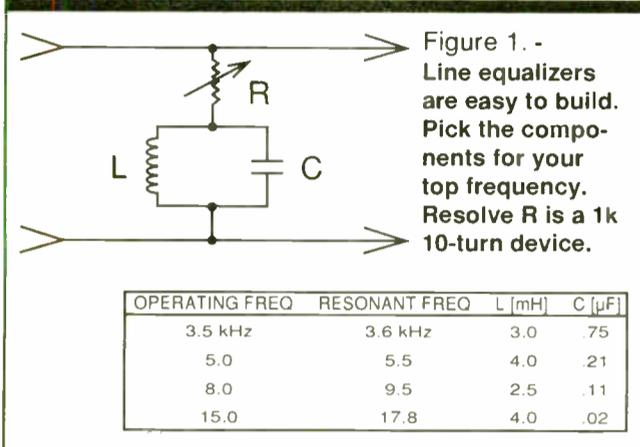


Figure 1. - Line equalizers are easy to build. Pick the components for your top frequency. Resistor R is a 1k 10-turn device.

above. Thus, for moderately long runs, ordering an unequalized pair and attempting to do it yourself may not work.

For broadcast loops, the same principles apply, but smaller-value coils are placed closer together. These loading coils have the added benefit of raising the impedance of the line to around 600 ohms, and making it more resistive.

As figure 1 illustrates, there is nothing magical about line equalizers. Their principle of operation is relatively simple. At low frequencies, the LC circuit appears as a short circuit and shunts the variable resistor across the line. At higher audio frequencies, the tuned circuit is resonant, effectively removing the resistor from the circuit.

The circuit is easy to build; just be sure to use a shielded enclosure and proper grounding techniques. The 10-turn 1 K pot may be available inexpensively through surplus catalogs, and it really does make the adjustments much easier.

Scavenge for stuff

Alternately, you may be able to scavenge a telco equalizer. The most common type is the Western

Service	Frequency	Response	S/N Ratio	Max Loss	Max THD
none	300 - 2.5	-2 to +12	64 dB	12 dB	5.5 %
3 kHz	200 - 3.5	-3 to +10	65 dB	32 dB	3.5 %
5 kHz	100 - 5 K	+/- 1	64 dB	32 dB	2.5 %
8 kHz	50 - 8 K	+/- 1	62 dB	32 dB	2.0 %
15 kHz	50 - 15 K	+/- 1	71 dB	32 dB	1.0 %

Electric KS-20159. It may be set up for 3.5, 5, 10, and 15 kHz lines. Table 2 shows the various strapping combinations that make it work.

No matter which type of equalizer you are using, the set-up procedure is the same. Assemble the test equipment shown in last month's column. Note the

importance of the resistive pad on the sending end to isolate the test equipment from any impedance variations reflected back into the coil.

To begin, set the resistor on the equalizer for maximum resistance. Adjust the generator for reference

EQUALIZER CONDITION	TERMINATING IMPEDANCE (NOTE 1)	TERMINAL STRAPPING		EQUALIZER INPUT TERMINALS	EQUALIZER OUTPUT TERMINALS TO AMPLIFIER (NOTE 2)	AMPLIFIER OUTPUT TERMINALS	LINE OUTPUT TERMINALS
		TB-3	TB-2				
5 AND 8 kHz	600 (NOTE 3)	2 TO 3	8 TO 9 9 TO 10 10 TO 11	1 AND 2	5 AND 6	19 AND 20	17 AND 18
	150 (NOTE 4)	1 TO 2	12 TO 13 13 TO 14				
15 kHz	600 (NOTE 3)	2 TO 3	7 TO 8 8 TO 9 10 TO 11	OF	OF	OF	OF
	150 (NOTE 4)	1 TO 2	12 TO 13 14 TO 15	TB-1	TB-2	TB-2	TB-2

level at the highest frequency to be used, and measure the line loss. Now go back to 1 kHz, and adjust the resistor for the same loss you measured at the high frequency. Finally, do a frequency response run, and make minor adjustments to the resistor if necessary. The response should be flat within 1 dB. See table 1 for typical characteristics for leased lines from the phone company. Your results should be similar.

The equalizer is normally placed across the line side of the coil. If you cannot get good response with it this way, put it on the drop side and repeat the process. If this fails, you are probably dealing with a loaded line that has no response above 3.5 kHz. You will have to bite the bullet and pay for equalized service.

Standard level for equalized lines is 0 VU, with +8 VU on peaks. For short distances, or when unequalized pairs are used, this level may be too high, resulting in crosstalk. In these instances, use 0 VU as peak level. This corresponds to 0.774 V RMS across a 600 ohm line.

If the phone company does not provide them, lightning

continued on page 21 ▶

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3CX3000A7	4CX350A/8321	5CX1500A
3CX2500H3	4CX250R/7580W	YC130/9019
3CX2500F3/8251		5U4G
3CX2500A3/8161		6AS7
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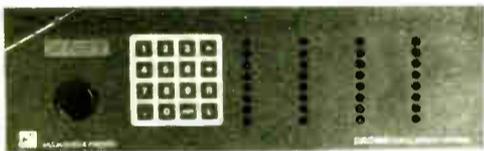
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READER SERVICE NO. 201

KSCO's Interactive AM Programming

► continued from page 18

mail and faxes. KSCO staff communicate with listeners on line through a computer terminal in the studio.

RadioNet producers can also download sound clips over the Internet from listeners, and through an Internet "home page," listeners can pull up on their computer monitors live, still footage of the show as it airs. RadioNet's "home page" is a place in Internet cyberspace where users can go to get information on the show and its guests. Listeners can download audio and video files and interact almost instantaneously with KSCO staff from their computer terminals. "We have

a video camera in the studio and we take snapshots of the show every few minutes and send them over the Net," explained Zwerling. "Listeners and people stumble on our home page from all over the country and can see what we are up to in the studio. We've been able to do a lot of different things with that, and we've already incorporated that into our contests by asking people what they see in the pictures."

High response

The staff has noticed that listener and access response is particularly high during what Zwerling calls these "theater of the mind" program segments.

User response to the program indicates a mixture of listeners. "I'm finding we have an equal number of people who are really technically savvy and people who are total beginners," said Zwerling. But, she added, "There are still so many people that call in and don't have computers and are still thinking about getting one." This segment of the population is the one the computer industry wants to hit, and is why RadioNet is a hit with sponsors such as The Santa Cruz Operation company, a UNIX operating system vendor, and large software publisher Borland International.

Eventually, the show's producers hope to take RadioNet on the road nationally, syndicating it either through satellite or Internet distribution. Currently, the station is experimenting with a broadcast of the show over Internet using the C-U See Me video teleconferencing software application. If all goes well, the show's producers will be able to transmit 10 frames/second of videotape and audio over the Net to a station in Alaska.

Overall, commented Zwerling, the station is having fun with the technology. It

is currently logged onto the Internet through a local service bureau, the Human Factor, which creates Worldwide Web "pages" for companies like KSCO that have a message to convey to a high-voltage audience. For a monthly fee, the Human Factor maintains a connection—soon to be over T1—to the Net for those

is an object-oriented cyberspace watering hole where several users converge to play a game, talk on-line, or conduct other multi-user activities. "I've never used one but I'm going to be using one coming up this week," enthused Zwerling, no doubt voicing the sentiments of many on-line RadioNet listeners.

□ □ □

RadioNet can be accessed at 1080 on the AM dial, as well as on the Internet worldwide web at <http://www.radionet.com/>

Phone Line Theory

► continued from page 19

arrestors are always a good idea. They are mandatory if lines run overhead on poles. This is an especially urgent consideration if you are feeding lines from equipment having transformerless balanced outputs.

In the case of occasionally-used lines, or audio feeds to carrier current transmitters, it may be desirable to add some form of control and talkback capabilities to these lines, and this will be the topic of next month's column.

□ □ □

Tom Vernon divides his time between consulting and completion of a Ph.D. He is occasionally sighted around WXPN in Philadelphia. Tom can be reached at 717-367-5595.



The KSCO gang involved with the 'Net'

companies interested in doing commerce on the Internet.

Down the road, KSCO hopes to beef up its on-line services through new Internet technology, starting with a MOO. A MOO

radionet/ and via e-mail at RadioNet@radionet.com.

Dee McVicker is a regular contributor to RW and can be reached at 602-545-7363.

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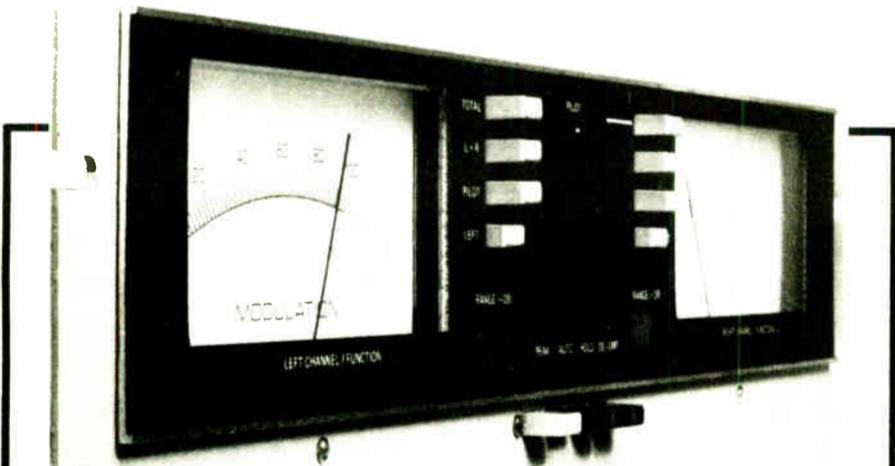
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WORKBENCH

Be Careful with Regulator Bypasses

by John Bisset

SPRINGFIELD, Va. To the audio purist, it's not just pristine circuit design and the best op-amps that guarantee good sounding audio. Power supply noise can also trash the very best intentions. If you read the applications notes on power supply regulators, you will find that bypassing the input and output of the regulator is commonplace. In reality, bypassing at the pins of the device may not be so commonplace, and the result can be high-frequency noise and distortion.

One brand-name console placed the bypass cap a few inches down the circuit board trace and not at the regulator pins, as the applications notes recommend. The lack of proper decoupling caused a 26 MHz, 2V peak-to-peak oscillation to be generated on the logic supply when measured between ground and the logic output on the rear of the supply. Because the frequency was so high, it wasn't picked up on the Simpson VOM used to test the supply outputs by the manufacturer during final QA.

The fix was simple enough: a 0.1 MFD, 50 volt ceramic bypass cap was added to the input and output of the regulator—soldered right to the TO5 case socket pins. What showed up as a hiss in the audio was now gone.

Just for good measure, additional bypassing was performed at the sockets of the other regulators as well. It's amazing what a good oscilloscope can show you. If you find yourself rusty in using a scope to its fullest, try contacting your local Tektronics sales office and find out when they plan to offer another Scope School. Of course, the school will lean toward TEK gear, but

the refresher is worth the time, and the price is right! If your SBE chapter is large enough, Tektronics might be able to arrange a Scope School exclusively for your chapter.

★ ★ ★

If you do a lot of RPU remotes, you may want to consider an SCA IFB or talkback system. John Diamantis from WTEM developed a very basic IFB, using the talkback module in his PR&E console. If you lack this feature in your console, you can construct your own using a Henry Superrelay.

The wiper of the relay feeds the SCA input. One pole of the relay feeds program or audition (this is usually the normally closed pole). The other pole feeds the mic audio, which can come as a feed from your mic processor or the mic patch point on the console. A momentary push-to-talk switch is provided on the console. Normally, normal console programming is fed to the SCA. When the switch is depressed, the control room mic is fed.

To make the system fancier, if you add a Mackie 1204 mixer at your remote site, it's possible to send the remote talent a mix-minus of the audition channel—feeding everything except the remote talent's voice. One of the extra busses on the Mackie can be used to remix the remote talent's mic and the station talkback/audio feed so the remote talent can hear themselves.

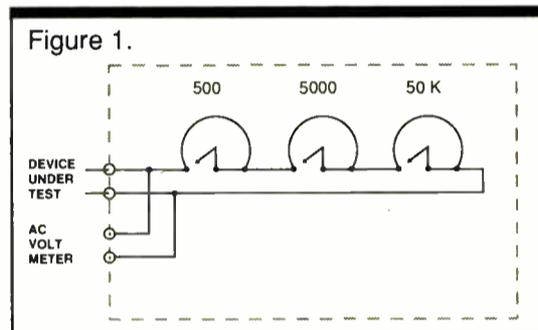
John tested both 67 and 92 kHz and found the 92 kHz to be the cleaner of the two. You do need a good antenna to make this system work, but if your station hasn't invested in a Telos Zephyr, has nothing running on the SCA, and is tired of using POTS as your talkback cir-

cuit, this suggestion is a viable alternative.

John adds that in order to overcome the noise you'll find on SCAs, it's best if you use a Sidekick or CRL SCA generator. Either box has built-in processing, which permits you to modulate heavier to overcome the noise and crosstalk. John Diamantis is Engineering Manager for the Washington Colfax stations. He can be reached at 301-468-1800.

★ ★ ★

If you want to make your promotion director's holiday, obtain some 4- or 6-inch PVC drain pipe sections and fasten them to the inside wall of the promotions van. The tubes can then be used for hold-



ing your station's rolled banners or other promotional signs. Given the cost of some of the painted banners, rolling and storing the banners this way will increase their lifespan, and give you more room for loading equipment in the van.

By drilling and installing four bolts on each end (as shown in Figure 1), rubber bands can be looped over the ends to keep the contents from shifting or falling out while in transit.

★ ★ ★

Have you ever looked at a new product and said, "I should have done that!"

That's the thought that went through my head when I read a recent letter from Mark Persons, RW friend and occasional columnist. Mark wrote to tell me about the latest product from Sine Systems. It's the TTT-1 "Time, Temperature Thing."

For less than \$600, the customer gets a rack-mounted box that announces the time, temperature, or both from a digitally stored, pre-recorded voice. For satellite-formatted stations, it's an end to "10 minutes past the hour."

Not only does the product have an application for satellite systems, but also among older reel- or cart-based automation systems. Interfacing it to your automation is simple enough—a contact closure or open collector output will make the device speak (it should be so easy to control jocks!).

When the TTT-1 is finished giving the time, temperature, or both, it gives a momentary contact closure back to the automation. M. W. Persons and Associates is offering a 30-day money-back guarantee for any TTT-1 units that are sold and the customer decides he then doesn't want. There is no restocking fee if all parts are returned in their original condition. For more information on the TTT-1, circle Reader

Service 133.

★ ★ ★

You may have received a letter from Otari President Jack Soma announcing that company's part and accessory discount campaign. A wide variety of parts have been substantially discounted, and are offered on a first-come, first-served basis. To obtain a copy of the parts inventory that is affected, call Otari Corporation in Foster City, Calif. The number is 415-341-5900.

In addition to the parts sale, Otari is offering a refurbishment special for MX5050, MX50, and AS-1000 machines. The refurbishment includes new heads, a new capstan motor, new record/erase/muting relays, and new brake drums and bands. The refurbishments carry a six-month parts and labor warranty. For more information, contact Terry Logan at 415-341-9504.

★ ★ ★

Unless you live in Florida, lightning and the related transmitter problems are furthest from your mind this time of year. In the Fall 1994 issue of Nautel's Modulation Monitor newsletter, the importance of properly grounding your transmitter site is discussed. Nautel offers a free paper on transmitter site grounding, with tips that can be adapted for any transmitter site, not just those employing Nautel transmitters.

A copy can be obtained by contacting Jeff Welton, Nautel Customer Service Technician, at 207-947-8200. Please tell Jeff you heard about the offer in RW's Workbench.

□ □ □

John Bisset is a principal with Multiphase, a contract engineering and special projects company based in Washington, DC. He can be reached at 703-323-7180. Fax submissions for the Workbench column to 703-764-0751. Printed submissions qualify for SBE Certification credit.

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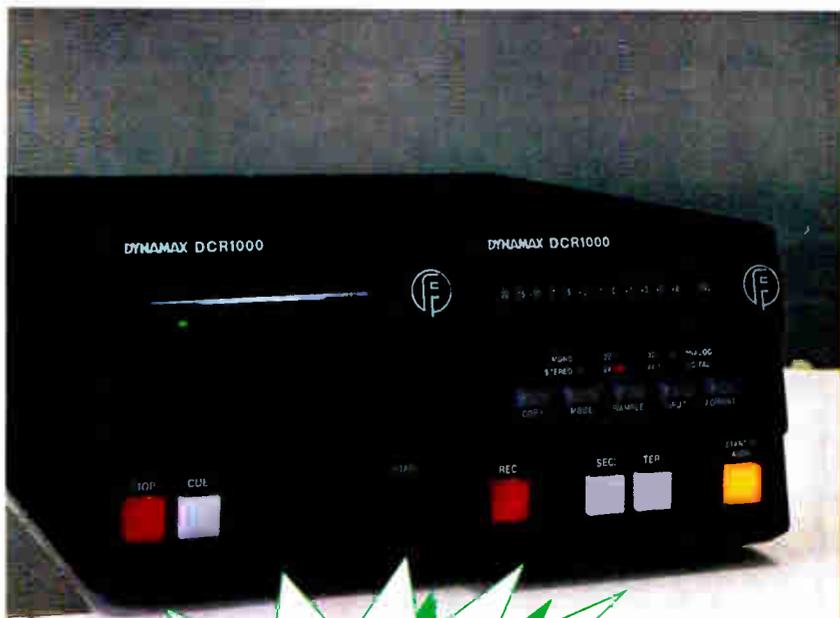
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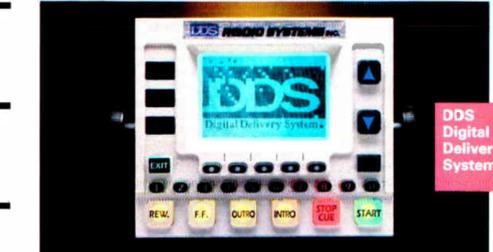
- ***Over 1,000 Workstations have been sold***
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1995 Broadcast Calendar *from Radio Systems Inc. and RadioWorld Publications*

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday					
January	1 <i>New Year's Day</i>	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16 <i>Martin Luther King, Jr. Day</i>	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
<i>Arbitron Winter Book begins January 5 and runs through April 29</i>																																			
February		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15 <i>Valentine's Day</i>	16	17	18	19	20 <i>President's Day</i>	21	22	23	24	25	26	27	28	29					
<i>Nielson February Sweeps start February 1 and run through March 1</i>								<i>National Religious Broadcasters Convention Nashville, Tennessee</i>								<i>RAB '95 Sales and Marketing Conference Dallas, Texas</i>								<i>Audio Engineering Society Convention (Europe) Paris, France</i>											
March						6 <i>Ash Wednesday</i>	7	8	9	10	11	12	13	14	15	16	17 <i>St. Patrick's Day</i>	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
<i>Country Radio Broadcasters Nashville, Tennessee</i>						<i>Arbitron Spring Book starts March 30 and runs through June 21</i>																													
April					1	2 <i>Good Friday</i>	3 <i>Easter Sunday</i>	4	5	6	7	8	9	10	11	12	13	14	15 <i>Good Friday</i>	16 <i>Passover</i>	17 <i>Easter Sunday</i>	18	19	20	21	22	23	24	25	26	27	28	29	30	
<i>NAB Spring Convention Las Vegas, Nevada</i>												<i>Broadcast Technology '95 (Indonesia), Jakarta</i>																							
<i>Nielson May Sweeps start April 27 and run through May 24</i>																																			
May		1	2	3	4	5	6	7	8 <i>Memorial Day (observed)</i>	9	10	11	12	13	14 <i>Mother's Day</i>	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
<i>Public Radio Conference San Diego, California</i>																								<i>Secretary's Day</i>											
June					1	2	3	4	5	6	7	8	9	10	11	12	13	14 <i>Juneteenth</i>	15	16	17	18 <i>Father's Day</i>	19	20	21	22	23	24	25	26	27	28	29	30	
<i>Nielson July Sweeps start July 6 and run through August 2</i>										<i>ProMax & BDA Conference, Washington, D.C.</i>										<i>Audio Technology '95, London, England</i>															
<i>Arbitron Summer Book begins June 22 and runs through September 13</i>																																			
<i>Montreux TV, 19th International Television Symposium, Montreux, Switzerland</i>																																			
July					1	2	3	4 <i>Independence Day</i>	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
August		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
<i>Beijing International Radio & TV Broadcasting Exhibit Beijing, China</i>																																			
September					1	2	3	4 <i>Labor Day</i>	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25 <i>Back to School</i>	26	27	28	29	30	
<i>World Media Expo New Orleans, Louisiana</i>												<i>International Broadcasting Convention Amsterdam, Netherlands</i>								<i>Arbitron Fall Book</i>															
October								9 <i>Columbus Day (observed)</i>	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29 <i>Distortion-Free Savings Time ends</i>	30	31 <i>Halloween</i>					
<i>Broadcast, Madrid Madrid, Spain</i>								<i>Audio Engineering Society Convention New York, New York</i>								<i>International Audio, Video, Broadcasting & Telecommunications Show Milan, Italy</i>																			
November					1	2	3	4	5	6	7 <i>Election Day</i>	8	9	10	11 <i>Veterans' Day</i>	12	13	14	15	16	17	18	19	20	21	22	23 <i>Thanksgiving</i>	24	25	26	27	28	29	30	
<i>Broadcasting India '95 Bombay, India</i>																																			
December					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18 <i>Columbus</i>	19	20	21	22	23	24	25 <i>Christmas</i>	26	27	28	29	30	31

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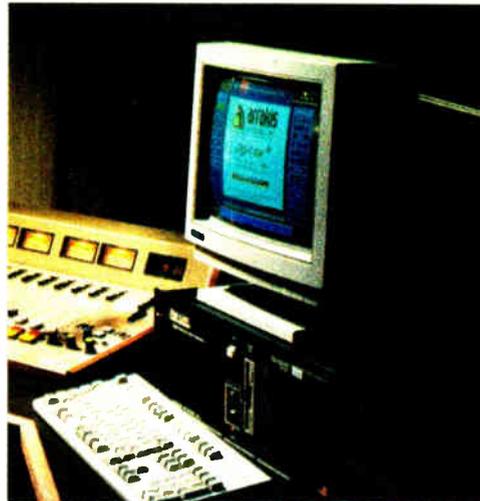
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See p. 28.

DINER Serves Up Promotion Dollars

by Alan Haber

WASHINGTON Attention, promotion-savvy broadcasters: today's blue plate special is a promotional opportunities omelet, packed with revenue producing potential and seasoned with a pinch of nostalgia.

It is the new RADIO-DINER, the brainchild of Robert T. Lewis, president of Atlanta-based Measured Marketing Inc. Modeled after the recreational vehicle trailer built since the 1930s by Airstream Inc., a manufacturer of recreational and commercial vehicle equipment, the RADIO-DINER invokes memories of ordering pie and sodas for you and your date at the same time as it presents a variety of promotional opportunities that can help increase a station's bottom line and awareness among listeners.

Measured Marketing has an exclusive arrangement with Airstream to build the Diner; the company acts as an agent for the stations who purchase the product.

The experience of being inside the RADIO-DINER is so real that you can almost smell the eggs frying and hear the table-side jukeboxes playing the latest hits.

"We think it is positive nostalgia," said Sally Beamer, director of sales for Fox 97 in Atlanta, one of the stations in 17 United States cities that have signed letters of intent to purchase the RADIO-DINER. In addition to Atlanta, other cities showing interest are Charlotte, N.C.; Cincinnati and Columbus, Ohio;

Dallas; Detroit; Fresno, Los Angeles and San Francisco, Calif.; Las Vegas; Miami and Orlando, Fla.; Minneapolis; Nashville, Tenn.; Richmond, Va.; Seattle, and Washington, D.C. Five additional markets are pending.

Speaking of the nation's capital, Mark Lapidus, director of marketing for Liberty Broadcasting, will take delivery of the very first RADIO-DINER this month; he said it will be used for Liberty's modern rock outlet WHFS(FM) and for oldies-oriented WXTR-FM in the Washington, D.C. market, and for WHFS only in Baltimore, Md.

Take a look

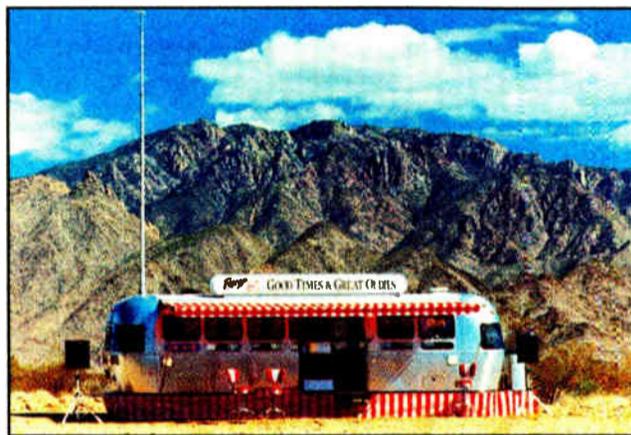
When you look at the RADIO-DINER, you immediately notice that it transcends nostalgia. Lapidus goes that observation one further: "I think it transcends oldies," he said. "I think that this diner could be used for a variety of formats. Regardless of what type of music they like, who isn't nostalgic about diners? Wherever you see them, they just kind of bring good memories to people. They bring good feelings, and I think that cuts across music in format genres."

Lewis said that the RADIO-DINER was developed "to bring radio stations back into show business on a promotion (and) programming side. (The Diner) gives them a flexibility to broadcast publicly anywhere they really want—it has onboard power in all facilities to go live." The Diner offers stations opportunities

for programming, and sales, sponsorship and vendor programs, in addition to special events marketing.

What's on the menu?

A station can customize the RADIO-DINER to suit its needs, right down to the color of the seats inside. The Diner, which can be set up in five minutes, according to Lewis, can either be pur-



chased or leased exclusively for any market. The standard aluminum-shell Diner is 26 feet long on a 30 foot trailer assembly and seats 16 guests plus station staff; optional vehicle lengths of 17, 21, 24 and 30 feet are also available.

The price tag for adding a RADIO-DINER to a station's inventory is about \$85,000, which buys a broadcaster the actual Diner, two neon signs, awnings, a decorative skirt, a 50 amp propane-powered Honda Generator (dual shore lines can also be used), and a basic interior package available in a number of styles, including doo-wop retro, country and rock.

The purchase price also includes 1950s-style V-back booths, tables, stools, and a counter, and a rear L-shaped studio cabinet package. The Diner comes pre-wired for both interior and exterior broadcast equipment (which is not included in the basic price). Eight interior speakers and a 16-foot roof-mounted backlit sign that can sport a station's call letters are among the items also included.

A basic broadcasting equipment package can run anywhere from \$15,000 to \$20,000, and would include a Will-Burt mast and Marti transmitter (RPU) package, mixing console, wireless microphone and such items as compact disc and cassette players and headphone amplifiers. Harris Allied is the equipment supplier for the RADIO-DINER. Some stations may find that they already have some of the equipment needed, which, of course, would reduce their equipment cost.

David Burns, studio product manager for Harris Allied, said the company can supply "virtually anything among the 350 lines that we offer to the broadcast community, and as needed by them and their customers on a case-by-case basis." He added that Harris Allied can offer "total turnkey installation if the end customer so desires."

Measured Marketing provides sales training for stations to help them acquire advertising and sponsorships that can decrease the percentage of the total cost of the Diner the station has to shoulder itself, and, of course, how to make money with it. Annual operating costs could run anywhere from \$7,000 and up—the actual figure would vary depending on whether the Diner was purchased or leased, if the station already owns a towing vehicle, how much equipment was purchased, etc. Maintenance would run about \$3,000 a year; insurance, about \$2,400.

The costs associated with the RADIO-DINER could more than be offset by the potential revenue the Diner could generate; Lewis said that "A good sales manager can develop a very good sales plan (that can be executed) to develop between \$150,000 and perhaps \$300,000" of targeted revenue each year.

Measured Marketing will group all stations

taking ownership of the Diner into the unwired Diner-Promotion Network, which will facilitate promotional programs on a regional, national, or market-by-market basis; these programs could include product sampling and other activities. Lewis said that he expects to have 20 stations in the Network signed on and active by the end of July.

Birth of the Diner

Lewis had been a sales manager at an Atlanta radio station. "We were pushing the envelope of vendor programs, and seeing the dollar potential of doing better street promotion, better sampling," he said. The station's morning show was called "The Breakfast Club." "At that time," he remembered, "we were trying to come up with the possibility of maybe putting the morning show into a diner in the marketplace—the Breakfast Club diner." And thus the idea of the RADIO-DINER was born.

Why a diner and not something else? Lewis points to the surge of Americana sweeping through the country. "It does not matter if it is a rock station or if it is a country station—retro is... embraced right now," he said. "People are going back to almost a complete drive towards the past being fun. It is easier, more positive, less stressful, so this leans on all those feelings. This vehicle embodies a very positive past, if you will."

The RV trailer on which the RADIO-DINER is based was created by Wally Byam, the owner of Airstream; according to Larry Metz, director of commercial products for Airstream. The Diner should be able to hold its own, no matter the kinds of weather Mother Nature throws at it. "They should stand up real well," he said.

The RADIO-DINER is quite a different

continued on page 34 ►

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MANAGER'S NOTEBOOK

Motivate Your Staff with Praise

by Sue Jones

BURKE, Va. "There are two things people want more than sex and money... recognition and praise."* Money is a motivator, but it is not always the best one. People want to feel they make a difference. A sincere word of thanks at the right time can motivate an employee and remain in his or her memory far longer than a raise or bonus that is easily forgotten after it is spent.

Start this year off with resolving to find creative ways to reward the entire staff effectively, build morale, and stick to your budget. Before we look at some of the ways to recognize exceptional performance, let's look at some things to remember to do when you deliver verbal praise.

- First, tell the staff member that you are going to let him or her know how he or she is doing.
- Tell the employee what he did right. Be specific and cite the praiseworthy activity.
- Tell the person how good you feel about his efforts and how it helps the station and other people who work there.
- Encourage him to do more of the same.

These concepts should be a part of any of the recognition activities that you choose to use. There are several ways to recognize staff for an excellent performance. Here are some ideas to get your creative mind started.

Thank You

Thanking a staff member for a job well done can take several forms:

- As general manager, you or your department managers should publicly congratulate employees who do a good job.
- A verbal "thank you" can be a tremendous motivator if properly delivered. Be sure to use the four principles listed above.
- A handwritten note can be kept to be read over and over. Most people display them in their work area. A simple handwritten thank you note on a piece of

notebook paper, on your letterhead, or on formal thank you cards written within minutes of becoming aware of a staff member's special efforts can be very meaningful to a staff member.

- Post a thank you note on the employee's office door or entrance to his or her work area in a conspicuous place where co-workers will see it.

Personal touch

- Have the station owner call an employee and thank him or her for a job well done. Better yet, have the owner visit the employee at his work area to deliver the thank you in person with a handshake and pat on the back.

- Call the staff member into your office just to thank him or her. Don't discuss any other issues.

- Send a thank you note to the employee's home to congratulate him on the good work.

- When a staff member has to work extra or long hours (i.e., engineers troubleshooting problems from midnight to 6 a.m., or a DJ having to put in personal appearances at remote broadcast sites), send a thank you note to the employee's family thanking them for their understanding and support.

- If a staff member has contributed something that helps others get their job done, ask five other employees to go up to the person sometime during the day and say "[Your name] asked me to thank you for [the task or achievement]. Good Job!"

Here are a few examples of low-cost ways to thank staff members.

- Award extra days off for completing a promotion successfully, exceeding sales quotas for the quarter by 20 percent, or saving the station money by controlling expenses, accomplishing quarterly goals 10 percent below budget. Just about everyone can use some extra time off.
- Bring donuts for the staff once a month at a pre-arranged time (9-9:30 a.m.) on

the last Wednesday of the month. Sit with the staff and have coffee and donuts together. Informally discuss any topic or issue they wish to discuss for that half hour or hour. Do not take telephone calls or allow other business interruptions during this time with the staff. It may take a couple of donut hours before the employ-

Find creative ways to reward the entire staff effectively.

ees feel comfortable enough to relax and be informal. However, the time invested could be worth gold in terms of building morale, getting to know your staff better and understanding other important things in their lives.

- When paychecks are distributed, write a note on the envelope recognizing an employee's accomplishment. Slip a \$20 bill into the envelope. I guarantee this will be your best-ever return on investment.

- Other low-cost appreciation ideas include a magazine subscription of the employee's choice; flowers, balloons or fruit baskets; tickets to events; massage, facial or manicure; a round of golf or a limousine ride to work and home for a day.

Free lunch

Treat important contributions and extra effort with a free lunch. Here are a couple of ideas.

- Arrange for a star employee to have lunch with the station owner.
- Create "Free lunch on the Boss" coupons on your computer. You and your department managers should carry them with you so they can be handed out on the spot when you see a job well done. Allow the recipient to choose the date time and

place as an added benefit. Re-arrange your schedule if necessary and if possible to accommodate the requested time.

Instant Rewards

There are several types of instant rewards that you can have available when you know that an employee has done an exceptional job. Examples might include getting a compliment from a client about how well a sales representative is handling the account listener compliments about the DJs or the receptionist making an extra effort to help a client or other staff members complete their jobs.

The instant rewards could be a \$20, \$50, or \$100 bill to be given to the employee as soon as

possible after you are aware of the special effort. Other possibilities would include dinner for two, hotel weekend escapes, or gift certificates from local merchants. All of these rewards could be trade items that could be effective rewards for a job well done.

Employee Awards

Establish the Most Helpful and/or Nicest Employee Awards to be awarded semi-annually or annually. Employees vote for the employees they think should win the titles, like the Academy Awards are determined. The owners should present the framed certificates or trophies along with a significant cash or trade item award. This reward also promotes team effort and cooperative spirit.

This is just a brief list of ways to recognize and reward your staff that will show your appreciation for jobs well done and special efforts. With a little creative thought, you can probably think of more.

* Mary Kay Ash, Founder, Mary Kay Cosmetics

□□□

Sue Jones is a senior manager for Computer Data Systems Inc. in Rockville, Md. She can be reached at 703-323-9391.

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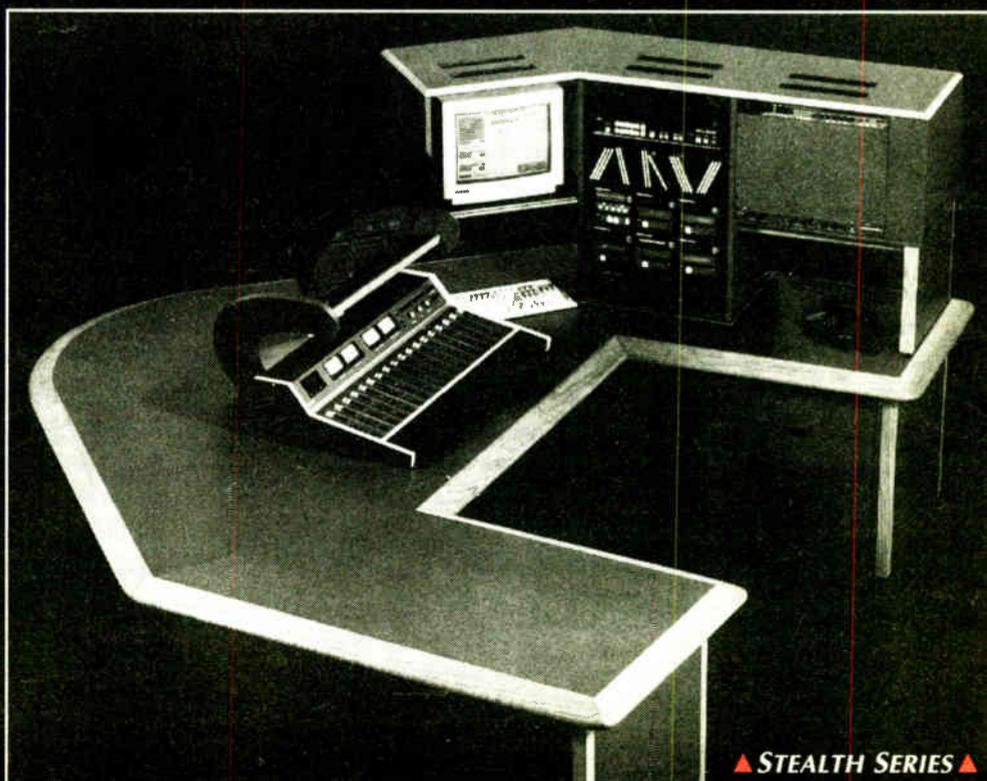
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World Radio History

Holmes Series a Hit with Today's Listeners

by Richard W. O'Donnell

HONOLULU Can you name the only classic radio series to hit the Publishers Weekly audio best seller list?

If you said Jack Benny, the Shadow, or Lux Radio Theatre, you are wrong. Not even Orson Welles' celebrated Mercury Theatre—and that series included "The War of the Worlds," probably the most famous radio show ever—managed to make the Publishers Weekly list.

What vintage radio series has become a best seller in today's expanding audio market? If you guessed the old Sherlock Holmes radio series, starring Basil Rathbone and Nigel Bruce, you are absolutely correct.

Classic revisited

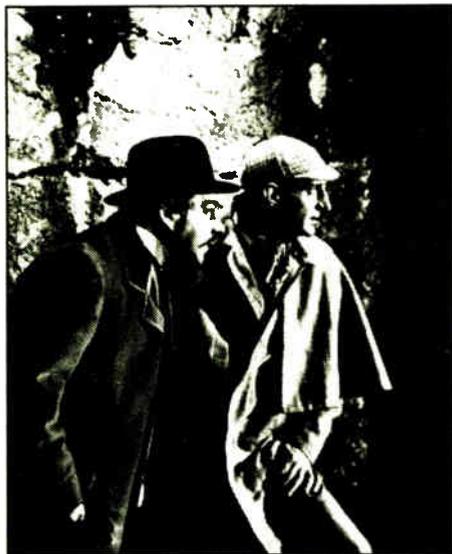
The first episodes of the series were released in 1988 by Simon and Schuster Audio under the banner of "The New Adventures of Sherlock Holmes."

"Originally, only a few of the half-hour shows were supposed to be released," said Robin Jones, spokesperson for Simon and Schuster. "But the demand for the tapes was so great, we kept on releasing the Rathbone/Bruce shows, until we ran out of them."

In November 1994, Simon and Schuster released the last of the tapes. In all, 26 cassettes with two programs on each, were sent to book stores in the United States and abroad. That's a total of 52 of the vintage shows.

"Sherlock Holmes ranks second to Star Trek as the most popular audio series we ever released," said Thomas Spain, acquisitions director for the tape distributor. "We have been delighted with the success of Holmes, and wish we had more tapes to offer. Unfortunately, we have been unable to locate any more."

For the record, successful audio series are rare indeed. Normally, these tapes feature well known actors reading excerpts



Nigel Bruce and Basil Rathbone

from current best-selling books and famous classics.

"Dan Ross, our former acquisitions

director, was the one who acquired the Holmes series for us," said Spain. "He heard a couple of the shows on an old vinyl record and decided they would be ideal for a series. Ross contacted a group of Los Angeles Sherlock Holmes buffs known as 221A Baker Street Associates and they managed to find the 52 shows for us."

The Sherlock Holmes programs with Rathbone and Bruce were on the air from 1939 to 1946. In all, there were 213 episodes.

Splendid adventures

"In 1939, Rathbone and Bruce appeared in two Holmes movies," said long-time Sherlock fan Stanton Young. "Both 'The Hound of the Baskervilles' and its splendid sequel, 'The Adventures of Sherlock Holmes' were big hits, but there were no plans for the two actors to make any more movies in the series."

"However, in 1939 they did do a Sherlock Holmes radio series on NBC. I think it was, and the show caught on. Thirty-nine weeks a year, they were on the air, and the show got high ratings and was renewed. Evidently, somebody at Universal in 1942 learned about the popularity of the radio show, and, at that point, it was decided to produce a series of the Sherlock Holmes movies. Basil Rathbone and Nigel Bruce were teamed again as Holmes and Watson. Without a doubt, it was the popular radio show that set the stage for the now legendary movie series, which is still shown regularly on TV."

Newer adventures

The early radio shows featured the original stories penned by Sir Arthur Conan Doyle. Later on, new adventures by Edith Meiser, a prolific writer, were used.

In 1945, Denis Green and Anthony Boucher took over the writing chores, and they created "The New Adventures of Sherlock Holmes," the 52 stories in the audio collection.

Stories in the audio collection include such half-hour gems as "The Notorious Canary Trainer," "The Demon Barber," "The Headless Monk," "The Babbling Butler" and "The Tell Tale Pigeon Feathers," to name a few.

The final two tales released in November were "The Haunting of Sherlock Holmes" and "The Baconian Cipher."

Rathbone is not heard on all of the tapes. On four of them, veteran actor Tom Conway teamed with Bruce after his long-time colleague retired from the radio series.

Successful pairing

A critic once wrote the person who decided to team Rathbone and Bruce as Holmes and Dr. Watson should be considered a "genius."

It was Hollywood writer Gene Markey who suggested Rathbone for the role of the great detective. He was the producer of the two Holmes films made back in 1939. Both of the original films were turned out by Twentieth Century Fox. It was the fabled Darryl F. Zanuck, head of the studio, who signed British character actor Bruce for the role of the good doctor. The rest is history.

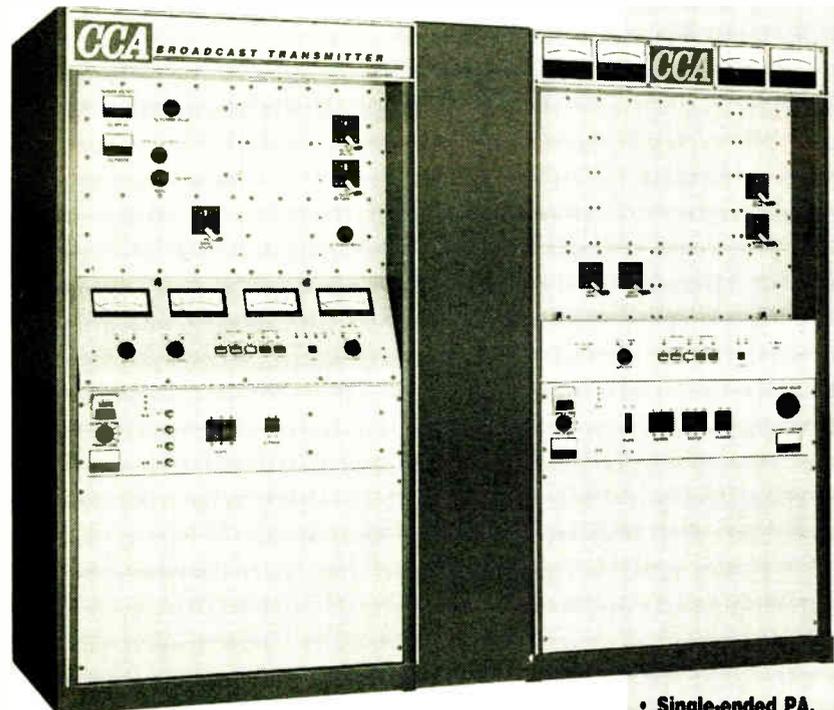
Why was the Rathbone/Bruce team so successful? The two actors certainly rate most of the credit. Robert W. Pohle Jr., and Douglas C. Hart, in their book, "Sherlock Holmes on the Screen" wrote: "We Holmesophiles know that the image will never die; Sherlock Holmes will always be at least partly Basil Rathbone."

continued on next page ▶

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Reader Service No. 150

As for Bruce, Pohle and Hart stated: "Bruce's interpretation of Dr. Watson has become 'definitive,' despite the fact his interpretation is quite a different character than Arthur Conan Doyle created. Nevertheless, Bruce made such an indelible impression as Watson that almost all impressionists who have done Watson since 1939 have really been doing Bruce."

A tidbit of interest. Sherlock Holmes is the most popular character in the history of English literature. He is known in every corner of the world, even in remote villages not on the map. His adventures have been translated into every major language.

Another item of interest. There have been more films made about Holmes than any other fictional character. At last count, there were more than 190 of them and more are on the way.

Still another item. Sherlock Holmes has probably been played by more different actors on radio than any other character. Rathbone, Conway, John Stanley, and countless other performers have played the part on American radio. In England, the list of actors who played the role on the BBC is a long one.

And because Watson is essential to any Holmes story, a lot of actors have played him too. He is probably in a dead heat with Holmes.

Life goes on

Basil Rathbone, a great actor, felt the role of the great detective was limiting his acting career. Prior to Holmes, he had a long list of exceptional performances. According to The Film Encyclopedia, he was "the American screen's finest villain, and most memorable Sherlock Holmes." Quite a combination.

After completing his final Holmes movie, "Dressed to Kill," the actor in 1946 quit both the film and radio series. This proved to be a colossal mistake.

This move caused hard feelings between

Bruce and Rathbone, but over the years, the wounds healed. At the time, NBC was contemplating a Sherlock Holmes television series. This was a future project, but lucrative contracts had been offered to both stars. Bruce was willing, but Rathbone wanted no more of Sherlock Holmes.

Rathbone enjoyed some success on Broadway during the fifties, but his career went downhill after that. He died in 1967 at the age of 75.

Career notes

Bruce, who was 58 when he died in 1953, finished his career playing character roles in films and on the radio. He wanted to continue playing Watson on the radio, but without Rathbone, the series was doomed. He did play the part for a while when actor Tom Conway took over as Holmes, but the old magic was gone.

Ironically, Rathbone made two attempts to revive Sherlock Holmes in the early 1960s. His first attempt, a stage play, sold tickets and was an excellent production, but it flopped because of a weak plot. Later, he tried to revive Holmes as a TV series, but without Nigel Bruce, the product was not as marketable as it might have been.

His career as Sherlock Holmes had ended. Without a doubt, the two actors would have been astounded by the tremendous success their Holmes and Watson series have enjoyed.

The movie series, at one point, was rated by TV Guide as "the most popular ever presented on television."

And now their old radio series has become a major success on audio cassettes, and is still going strong.

Rathbone on Bruce: "He was the ideal Dr. Watson, not only of his time, but possibly of and for all times. There was an endearing quality to his performance that humanized the relationship between Holmes and Watson."

Bruce on Rathbone: "At times, I am almost convinced, he is the great detective. Basil Rathbone is Sherlock Holmes

as far as I am concerned. No actor will ever match him."

□ □ □

Richard W. O'Donnell is a semi-retired

writer living in Honolulu, who formerly wrote an "off-beat" news column for the Boston Globe. He can be reached at 808-456-8578.

Impedance Measurements

► continued from page 14

The requirements are not stringent because all you need is a 1 kHz tone of useable level. Connect the oscillator to the unit under test.

Connect only the AC meter to the output or secondary, and adjust for a convenient reading on a dB scale. This is only a relative reading, so we are not interested in any absolute value.

On your box, set all pots to maximum. Connect it across the circuit along with your meter. If you see a significant drop, up to 6 dB, your circuit is something near 55 kilohms. Otherwise, start adjusting your controls, highest first. Work down and find the control that works best in lowering your reading 6 dB from the unloaded reading. Adjust as precisely as you can, then disconnect your box, and measure the terminals. The resistance you read is the impedance of the amplifier or device.

Suppose you suspect that an amplifier with a 600 ohm output is double-terminated. Simply connect your box, make the adjustment, and read the resistance. If your output shows 200 or 300 ohms, you have additional loads somewhere.

You might be saturating an output transformer or an output circuit might be current-limiting. A problem like this could damage the equipment or cause clipping to the signal, or both.

Other measurements

It is a good idea to run a response test on any isolation transformers you plan to use. This can show different impedances at various frequencies, a nonlinearity which will modify your signal slightly. A few of these units in your path can severely degrade your audio.

Be careful when measuring speaker outputs. The level should be kept at or below 1 volt to limit the current to about 250 mA into 4 ohms. Even at this low level, you will need a 1/2 watt potentiometer to be safe.

Using this theory you can check the loading effect of any input when connected to any output. Simply note the unloaded AC reading, then connect the unit. The reading should remain about the same. If it drops very much, the input is presenting a noticeable impedance. As an example, if a 10 kilohm load is connected across a 600 ohm circuit, your signal would drop only 0.5 dB. This would confirm a bridging load.

Of course, if you are sure of the value of one of the impedances, the other impedance is easily estimated by watching the change in meter readings.

Take a few minutes to build this project and I'm sure you'll find many devices to measure. You'll probably come up with even more ways to use your junkbox Z meter.

□ □ □

Jim Murphy is director of engineering of the West Virginia Radio Network. Reach him care of RW.

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Products & Services Showcase

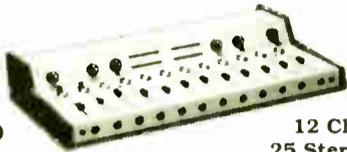
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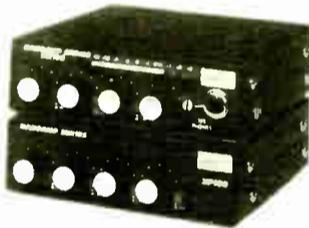
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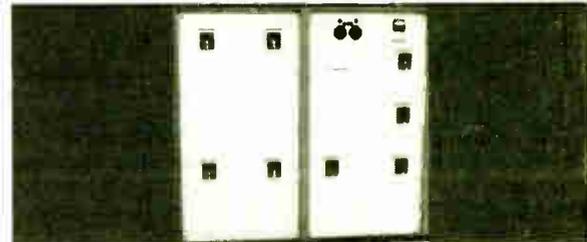
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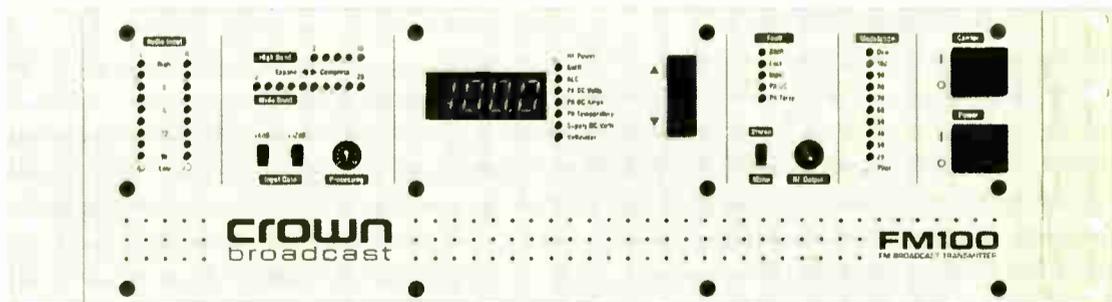


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READER SERVICE NO. 194

Make a Good First Presentation

by Don Surath

SAN FRANCISCO You've accomplished your first goal. Your cold call to a new prospect won a face to face meeting. Now you must establish a strong personal rapport with the prospect, learn about his or her target market, how it has been effectively reached in the past, sales goals for the upcoming year, and the investment committed to reaching those goals.

Call to confirm

If you confirm on the day of your appointment, plan to speak only to the receptionist (whose name you learned in your initial phone conversation). Re-establishing the bond developed in your initial phone conversation begins here. Let him or her know you're leaving now, will be there in 30 minutes, and can't wait to meet her in person. Your appointment is confirmed and a last-minute cancellation is avoided. A call to the prospect could invite such an unhappy event. The receptionist is a new member of your team who is anxious to meet you because you're one of the few salespeople to treat her as a human being.

An exception to the no-call rule is when you are traveling a long distance. On those occasions check with your client before embarking to prevent several hours of wasted travel time.

When you arrive on time, thank the receptionist for her help with a station souvenir. Make the time spent waiting for your appointment valuable by spending quality minutes getting to know her. Check to see if there are any pictures of children in view. Everyone likes to brag about little Johnny. Try to ask, "What's it like working here?" The answer to the working conditions question will help you better formulate an effective strategy in your upcoming meeting.

A great way to break the ice at a first prospect meeting is to bring in a special coffee cake. When you enter the prospect's office say, "I have this fabulous bakery around the block from my daughter's school. I want to share my favorite cake from there with you and your staff." While you are talking about the cake, take it out and cut it. Worst case, the prospect hates cake. Just say, "no problem, feed it to your staff. If they're anything like ours, there'll be a feeding frenzy and you'll be a hero." Best case, the cake is a hit and the two of you can share bakery stories while getting acquainted.

An added advantage to presenting the cake is discovering if the prospect likes receiving gifts. Some companies have a strict policy against gratuities. Knowledge of where your prospect stands on the gift issue can be crucial to your success.

Learn the business

Now that the ice is broken, it's time to learn about the prospect's business. Business owners usually welcome an opportunity to tell about their accomplishments. Asking, "How did you get started in this business?" or "May I see the rest of your store?" may impart valuable information while placing the prospect in a receptive mood.

While your prospect is talking, show you're listening by restating what you

hear and add leading questions like, "Did you say in our phone conversation that your business was rated number one in its field by the local newspaper? How did that happen?" This builds a mental picture of the business while establishing you as someone who understands it.

Get specific

To discover more specific data like sales figures and ad budgets, say now, "May I ask a few specific questions about your business?" If the prospect is reluctant to divulge sales figures, ask for smaller numbers like, "how much business do you do in a day? week? month?"

If you already have an idea, guess a figure. Most people will respond to an educated guess. Without these figures you may waste time and effort on a poor prospect. Don't risk changing the mood in the room to find your answer. Explain that you want to find if there's common ground between the prospect and your station. You can understand that sales figures are proprietary.

If you've done your homework, you should already know the percent your prospect's industry spends on advertising. With that figure and your estimate of annual sales, you can compute the size of the advertising budget. If the budget is

sufficient to continue, ask, "Can you remember a time when you had a great advertising campaign?" Whatever made that campaign great can be the basis for your campaign.

Station overview

If the meeting is going well you'll learn all you need to know before saying a word about your station. When you finally discuss your station, it should be in the broad context of the entire market. A quick overview of the station's strengths with an example of a success story in a related field will be effective here. Save your media kit until the last possible moment. Don't give the prospect an unnecessary distraction.

Several things can happen at this time.

continued on page 34 ▶

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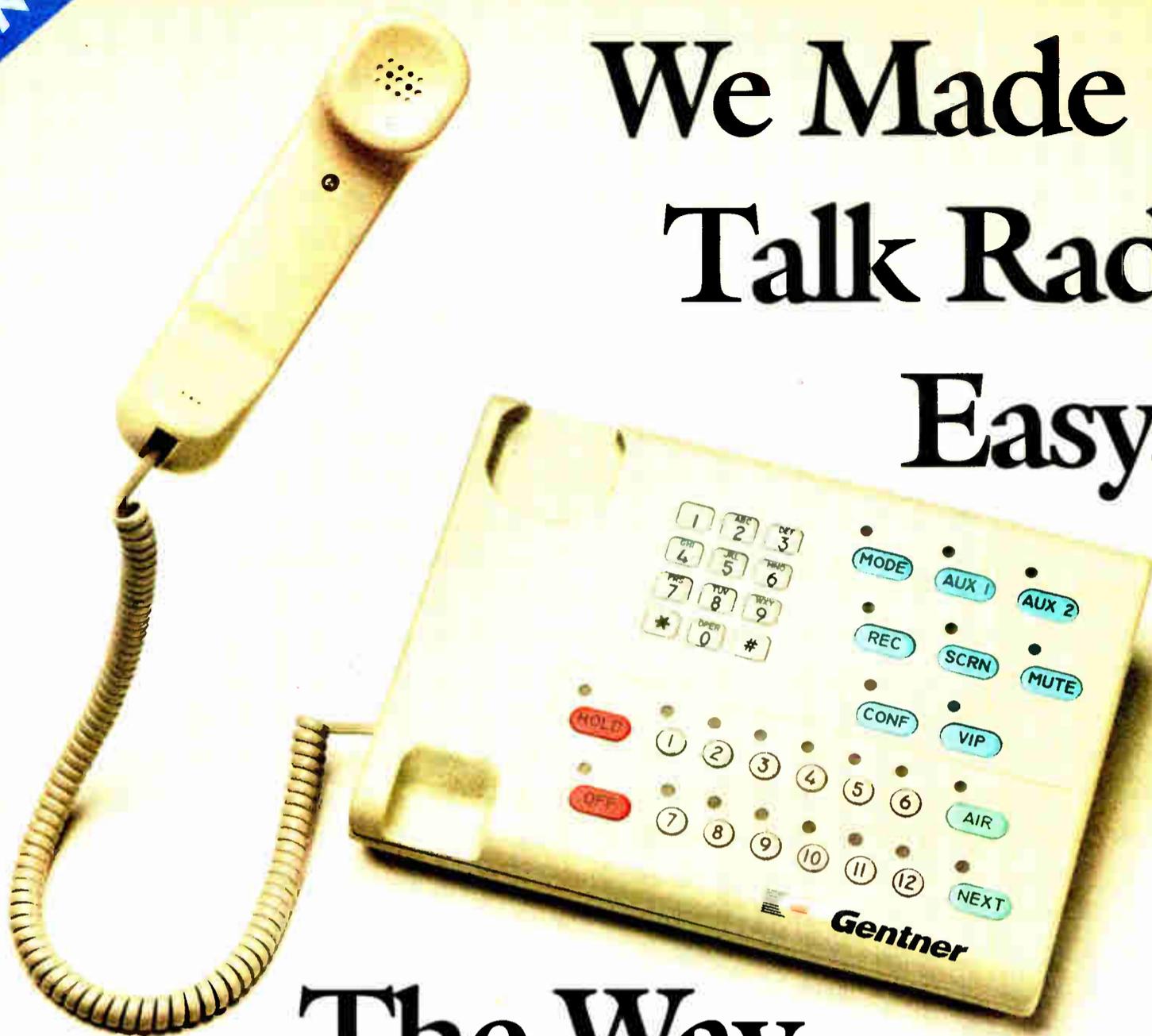
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TECH TALK

Radio on Demand Enters Info Highway

by Judith Gross

NEW YORK Radio on demand is here. Now PC users can add a card that will not only get good FM stereo reception and RBDS, but let you record anything from the radio into your hard drive (providing you have a sound card for your PC).

And AM radio reception may not be that far behind.

The whole thing began when Alan Box of E-Z Communications and co-chair of the NAB Futures Committee began some informal chats with Greg Riker of Microsoft.

The questions was, with everything from MIDI to TV reception going into PCs, why couldn't somebody tune to the radio right from his or her computer?

It turns out he or she can. The informal conversations fed into a research project Microsoft has been conducting to see if there's a market for what Riker calls "radio on demand." But with the interest of a second manufacturer, the idea has turned into reality.

What you want, whenever

Like video on demand, radio on demand means a PC user could program a computer to "capture" the types of programming and information desired and make it available on the user's timetable.

"It's actually information-on-demand; in effect, your own personal radio station," said Riker in a talk at this year's World Media Expo. He noted that potential customers said they would actually pay for such a service, and even sit through commercials, if it were followed by a feature or music they wanted.

At this point, Riker noted, the idea was simply ongoing research, with the aim of perfecting listener "profiles" to see what types of services would sell.

But enter a company called Advanced Digital Systems of California. ADS was already in the audio-and-video-via-computer field. In fact, the company manufactures technology that puts TV reception into Compaq computers.

"We already had an idea to put an FM receiver into a PC," says Mike McCoy, President of ADS. "Then we begin investigating RBDS and found that might be a link to make the concept profitable."

The result is Radio Rock-It—an add-in to an IBM-compatible PC that provides stereo FM reception as good as any FM tuner; a five-band equalizer, an RBDS decoder and even 3D sound.

Listen and record

Not only will Radio Rock-It let you listen to FM on your PC, but if you have a sound card (which a majority of PC owners do these days), you can actually record something from the radio into your computer's hard drive.

So, for example, let's say you always want to have the latest traffic report being sent over RBDS to play back when you feel like listening to it. You set up the file, and when the report is aired your PC now has the ability to capture it.

Voila! Radio on demand.

Radio Rock-It can also capture Radiotext. And, McCoy notes, with a sound card, it acts as a "sound enhancement device" for your PC. You can add a CD-ROM and play your favorite music CDs. And you get 3D sound because the card has been designed

with SRS Labs 3D sound capability.

To use Radio Rock-It, a 386 IBM-compatible PC is needed. The add-in card fits into an ISA bus slot.

McCoy says ADS is marketing Radio Rock-It through computer outlets and computer mail order houses. The company planned to start shipping at the end of December. One of the best features is the cost. At \$249 per card to start, Radio Rock-It might be suitable for radio station promotions.

Right now, Radio Rock-It receives only FM stations. McCoy pointed out that that's mainly because RBDS is available for FM, but not AM. Also, AM is much more

interference-prone in the computer environment, but McCoy thinks there's a market for a plug-in AM receiver.

"We're definitely looking into it. AM talk radio is hot right now so we'd really like to do it. I can see a lot of PC users recording 'Rush' to listen to later," McCoy says.

Not every single radio manager who heard Riker's talk at the World Media Expo was completely thrilled with the idea of listeners recording specific programs for later listening. Some of them pointed to the concerns of TV stations over time-shifting of TV shows with VCRs.

The question seems to be, will listeners

use radio on demand to narrow their listening and ignore commercials? If they do, how will advertisers react?

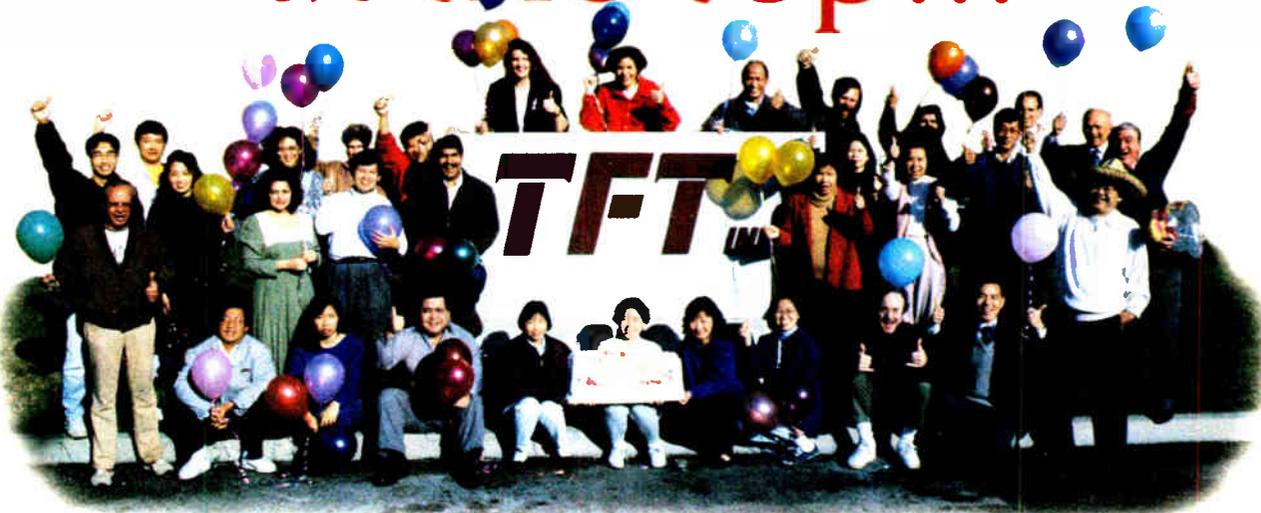
But in the immediate future, radio in a PC is one way to give radio's mature technology an on ramp to the information superhighway.

And the Futures Committee isn't stopping at a radio receiver in a PC. Box notes that the committee continues to explore more high-speed data options, in which ADS has also voiced an interest. The aim will be to let stations increase revenues by becoming a convenient source of "information-on-demand," whether through RBDS, high-speed data or whatever.

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Judith Gross runs her own writing/PR consultancy, JG Communications. She can be reached at 718-392-3288.

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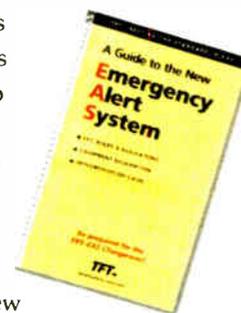
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Diner Delivers Goods

► continued from page 26

type of promotional vehicle (pardon the pun) for a radio station. What makes the Diner unique? First of all, the station takes ownership of it, said Lewis: "It becomes their own piece of real estate."

Lewis noted that the Diner has "a very magnetic appeal, so it not only allows a station to go out and be public, but it goes out and leaves a very, very fun impression. It says success, it says excitement, fun, entertainment, show biz." These are the kinds of feelings to which the Diner alludes, said Lewis: to a radio station, "those sensory feelings... equate to better ratings."

Liberty Broadcasting's Lapidus said the Diner will be used mainly for broadcasts for WHFS and WXTR-FM, but also for appearances (the Diner has already been scheduled for all the major events for both stations this year).

Lapidus noted that the Diner "has an advantage in a duopoly situation where you can use it for more than one radio station." He added that he has ordered a special electronic sign that will go on top of the Diner, which will allow the switching from one station logo to another and enable the insertion of client messages.

Fox 97's Beamer is excited about the prospects the RADIO-DINER can bring

to her station. Response from advertisers has been "tremendous," she said. The station has used the sample Diner, shown at the 1994 NAB Radio Show in Los Angeles, to promote the station in the local Egleston Children's Hospital Christmas Parade, held during the first weekend of December last year, where it got a great reception from parade watchers.

"I think it is going to be a home run," she said. "I think it'll be a great revenue stream for the radio station. I think it really will offer clients something that will be very helpful to them... And the exciting thing is its a win-win, because I think from a marketing standpoint it will be a home run for the radio station."

Lapidus sees a wide variety of promotional opportunities for the Diner for his

stations, including CD listening parties and artist interviews. The Diner, he said, "can get you down and inside of a crowd. Too frequently, remote broadcasts are done in locations where people can't see you." A promotional opportunity like the Diner, he offered, "creates a visual element."

The diner offers stations "some new and truly innovative ideas in attracting people to a remote," said Harris Allied's Burns. "The possibilities are limited only by the imagination of the creative and promotional staff at the radio station."

Clear Plan Essential

► continued from page 31

If the prospect is hot, you need to set an appointment for a custom-tailored proposal. Get out your calendar now. Do not allow the prospect to avoid setting another appointment at this meeting. Say, "we're both busy people. Let's get out our calendars and set a time to meet and discuss ways your business can make money with my radio station. If we do it now we don't have to waste time playing phone tag."

First-call closes

If the prospect is eager to start, has a deadline for a sale, or needs a holiday promotion, you might enjoy a first call close. Always bring materials in your media kit that can be used for a first call close. If it is right, do it.

Remember, clients closed on a first call pitch often have buyer's remorse. They've made an emotional decision while on the high that you have created. When you leave, you can expect them to have second thoughts. A great way to combat buyer's remorse before it sets in is to ask, "What is it about our station that made you decide to work with us?" That question helps your client find rational reasons for the decision. Later, he or she will have those reasons to embrace when doubt arises.

Congratulations. You have made a sale or an appointment. You did it systematically and efficiently. You kept your talking to a minimum, did not dwell on your station or downplay your competition. Your media kit was given at the end of the meeting so the prospect would continue to pay attention while you educated him about your station. Finally you avoided downgrading your new client's current ad campaign.

Now, if you haven't done so already, you can plan to close the sale.

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Don Surath is a former retailer who successfully used radio for many years to promote his businesses. He successfully transitioned to the sales side to become an award-winning salesperson, sales manager and sales trainer. He is available for sales training seminars at 415-824-2420.

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USA Radio Network Adds Programming

DALLAS Gary Nolan made his debut on the USA Radio Network late last year, as host of "USA Radio Daily." Live daily from 7:05 to 11 a.m., CST, the program offers listeners capsule stories of the day's news, hard-hitting sports, weather, top entertainment profiles and health developments, mixed in with lots of personality, good conversation and humor.

Gary Nolan joins USA Radio Network from powerhouse WHEN(AM) Syracuse, N.Y.

For information, contact Becky Henson at USA Radio Network at 800-829-8111; or circle Reader Service 22.

SJS Entertainment Launches Production Library

NEW YORK SJS Entertainment is offering "DECADE: The Ultimate '70's Production Library," a new service that provides morning DJs with a compilation of the hottest '70's clips of movie and television theme songs, comedians and news events of the decade. The material is distributed weekly and available nationwide on a market-exclusive basis.

Stations ordering "DECADE" will also receive the "Daily Plan-It," a daily '70's encyclopedia containing facts and trivia from the '70s that can be incorporated into the programming.

For information, contact Frank Guida at SJS Entertainment at 212-725-4500; or circle Reader Service 64.

Star Trek Generations Production Music

LOS ANGELES Emmy Award-winning composer Dennis McCarthy made his motion picture composing debut with the latest Star Trek installment, "Star Trek Generations." GNP Crescendo Records has released the "original motion picture soundtrack," including a 23 track production/sound effects library.

The album also contains 15 musical selections.

For information, contact Ray Costa or Rachele Cohen at 213-650-3588; or circle Reader Service 56.

Multimedia Music and Sound Effects

SEATTLE Energetic Music has released SUPER WAVE and MIDI No. 2, an MPC compatible CD-ROM. The release is second in a series of computer products to help end users avoid the sting of copyright infringement and legal red tape. More than 500 WAV files and more than 300 MIDI files combine to make this a useful and cost effective disc.

Included in the stereo WAV files are songs, musical cues, zips, zaps, sweeps, boings, bonks, clunks, drones, sci-fi, fantasy, chords, riffs, choirs, drums, guitars, percussion and much more.

The complete MIDI files are good for multimedia applications, presentations and sound card testing. Various lengths and tempos are included, and styles of

songs include country, jazz, rock, industrial, romantic, new age, reggae, polka, comedy, traditional, dance, Hip Hop, '50's style, funk, bluegrass, among others.

For information, contact Sandy Klem at 800-323-2872; or circle Reader Service 43.

PROMUSIC Inc. Introduces New Libraries

BOCA RATON, Fla. PROMUSIC recently introduced three new libraries to its present collection. "The DED Good Music Library," features four new British CDs for news, entertainment, hi-tech, industry, action and sports. Most compositions, maintaining an underscore quality, have long versions and alternate cut-downs.

"Logical Choice," from Australia, contains two CDs (with more scheduled) and offers an alternative sound, concentrating on uptempo, sport, action and indigenous music of the Asian-Pacific region.

"Justement" is a collection of 11 CDs produced in Paris, with a fresh and mainly acoustic sound for sports, news, travelogue, science, nature, action and drama in full length versions.

For information, contact Shana Bukovey at 407-995-0331; or circle Reader Service 75.

Art Laboe's Sunday Night Special

HOLLYWOOD, Calif. "The Art Laboe Sunday Night Special" radio show is broadcast live, via satellite on the Cable Radio Network and is carried by such stations as KGCI-FM Riverside and KRLA Los Angeles, KMEN San Bernardino, all California, among others.

The show is a multimix format consisting of Art Laboe's unique blend of time-tested oldies and selected contemporary hits that he sprinkles with audience interaction and from time to time, celebrity interviews with question and answer segments with the listeners.

For information, contact Frank Sosa at 818-559-7209; or circle Reader Service 156.

Honky Tonk in Digital Stereo

FEDERAL WAY, Wash. Country radio personality Ichabod Caine is hosting an all new syndicated radio program, "Honky Tonk Sundays," debuted on 41 stations in November 1994. Caine is KRPM(FM) K-106 morning personality as well as the host of "Country Club," radio program, currently airing on 200 stations across the U.S.

"Honky Tonk Sundays" features country music stars like Marty Stuart, Collin Raye, Charlie Daniels, Tracy Byrd and others. The stars share stories about their personal lives, faith and music. The program is available to stations on a barter basis, and is produced in digital stereo and delivered to affiliates each week on CD.

For information, contact Leslie Frank at GMI Media Group at 206-839-9414; or circle Reader Service 8.

Talking Business On the Radio

CLEARWATER, Fla. "Biz-Talk," a one-hour, five-night-a-week business radio talk show hosted by Jim Rosetti and produced by the Small Business Development Center at Florida Atlantic University has contracted with the Independent Broadcasters Network to be carried on its satellite network system.

"Biz-Talk" offers a unique new concept in talk radio as it hones in on the small business owner, or those in the exploratory stage of owning a business. The program offers real-world business information from a variety of experts.

For information, contact Jim Rosetti at

407-362-5641; or circle Reader Service 117.

Additional Terms Available From the Robert Thomas Group

FRESNO, Calif. All Robert Thomas Group programming, excluding "Night Breeze, The Greatest Love Songs of All Time," are now available to stations on a non-barter, cash basis. The non barter version of the programs will run two minutes versus the three-minute barter versions. Rates are determined by market size and local spot rates.

For information, contact Kevin Thomas at 209-221-7510; or circle Reader Service 89.

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PROMO POWER

Involve Morning Team in Promotions

by Mark Lapidus

WASHINGTON Are all disc jockeys created equal? Of course not. Some are more talented than others. Some are better known than others. And some are more creative than others. If your morning jock isn't the glue that keeps your radio station together, then it's time to reconsider the kind of glue you're using.

Captain, my captain

Every station needs a captain, a cheerleader and a ratings booster. An effective morning show produces all of these

results. So what does a morning personality have to do with promotions? Everything. Read on.

The promotion person's success is directly related to his or her relationships with all the department heads and the morning person/team. Promotion directors and morning DJs need frequent contact and a constant exchange of creative ideas. If this isn't already occurring at your station, begin by inviting your morning jock(s) to your weekly promotion meetings. Make the time as convenient as possible for them.

Promotion meetings should be scheduled

early in the week and fairly early in the morning as well, making it possible for salespeople to attend if necessary. A section of the weekly meeting should be devoted to discussing the promotional activities and needs of the morning show. When air talent can't make it, they should have their producer or a representative sit in for them, expressing points of view and carrying back information.

Promotion people should also have lunch or dinner with the morning people at least once a month.

Communication

Beyond promotion meetings, consider this: Program directors routinely meet with morning talent to go over the tapes, but promotion directors rarely meet with them individually to discuss promotions. This doesn't have to be formal. Just drop by the morning personality's office each day to touch base and talk about things that involve them. Unfortunately, most promotion people communicate with morning people by memo, and this is the least effective method.

If you cannot meet them in person, consider regular telephone talks. I used to talk frequently with one morning talent after his nap. Because there will be times you need to talk to talent in the afternoon, you should get familiar with their day-time snooze schedule.

Ideas: Do not let egos get in the way when it comes to generating your annual action plans. Most morning personalities are creative people. Many managers act as if they alone are capable of devising the game board. Morning talent should be involved in at least the conceptual part of this process. They will rightfully fight for getting more of the spotlight being shown on their show. They'll hit you with on-air contests, remote broadcasts and a larger operational staff. Let them advocate. They frequently will be correct. In this instance, having them battle for their piece of the pie can make the whole station a winner.

On-air promotion

How often do you talk about your morning show on your own station? Hopefully, you heavily promote all special activities. However, even when there's the usual happening, you can always focus on one promotable feature for the next day. An easy way to take care of this is to have the morning folks do a recorded promo that airs in each daypart. Increase the rotation based on the significance of the activity. If you've got a newsletter, interactive phone system or computer bulletin board, you can guess who I'm recommending be the star player.

Outside promotion: Your morning jocks should be your spokespersons whenever possible. If there is one person that hosts a parade, concert or television show, it should be the star of your team. There's one major exception: if they are terrific on the air, but awkward in person, be careful how they are exposed.

It may be tough for them to take, but

they may require coaching for personal appearances. Someone outside of radio—say a drama coach—can be a great deal of help. If your jock realizes you've hired a professional to help out, you're more likely to get a positive reaction.

Also, you may never want to use the morning team's real faces on television, print or outdoors. However, just because your morning show is not photogenic does not mean you cannot promote it. There are many ways to get around a "face for radio"—caricatures, names and voices without video, photos of them as kids, or even making a joke out of it by using models.

Press opps

Most stunts, crazy interviews and off-the-wall listener reactions occur during a morning show. It's vital that your morning person notify the promotion director as soon as something starts cooking. Decide on the spin together and then attack the media. Make the morning person available for comments and direct as much attention as possible to that person.

From time to time, invite somebody from the press to come by and join the morning show. It can be a win-win situation when you bring in television anchors, entertainment and sports reporters. It's interesting having them on

Do not let egos interfere with the generation of your radio station's annual action plans.

the air with you and it's terrific when they in turn plug your morning show.

Jealousy: Sometimes other DJs on a staff become upset when they realize that morning talent is more involved promotionally than they are. This can be overcome through realistic discussion. Each jock needs to understand the role of a morning show. If it is a role they desire, then they should make it personal goal to reach that level of success either at your station or elsewhere. If they're unable to overcome their insecurity in helping to promote your morning show properly, they are not really being part of your team.

Contracts: It may be too late for your current letter of agreement, but next time around think about what needs to be injected promotionally into the legal lines. Perhaps you need to include a certain number of appearances per week (free) and eliminate any problems regarding additional talent fees for outside media promoting your station.

Finally, do something nice for your morning team once in awhile. Spiff them with a free night out on the town or an overnight at a nice hotel. Remember, it's fun doing mornings, but nobody enjoys waking up at 3:30 a.m. Come to think of it, a few pounds of gourmet coffee would make a nice gift.

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Mark Lapidus is the director of marketing for Liberty Broadcasting. Liberty owns stations in Washington, D.C.; Baltimore, Richmond, Va.; Albany, N.Y.; Hartford, Conn.; and Providence, R.I. It also recently launched the Wolfman Jack Show on a national network.

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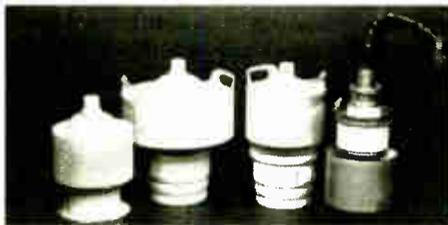
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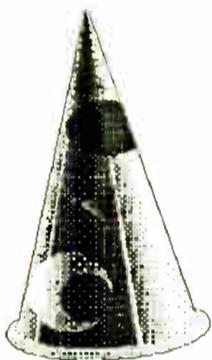
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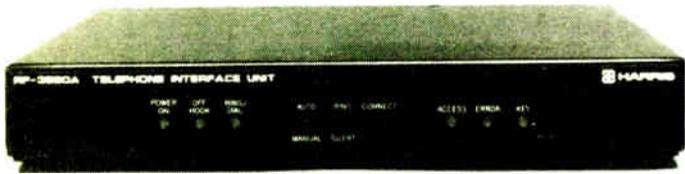
19 Harrison Road, Bridgton, ME 04009

207-647-3327 FAX 207-647-8273

READER SERVICE NO. 161

MARKETPLACE

Recently Introduced Products for the Radio Broadcast Professional



HF Telephone Systems

The RF-3560B telephone interface unit and the RF-3565 access unit comprise the new long-range HF telephone system

from Harris RF Communications. This system permits users to place and receive telephone calls from remote locations via HF, VHF or UHF radio.

The interface unit hooks into a standard two-wire telephone line, and the hand-held access unit connects to the mobile radio transceiver.

The RF-3560B is designed for unat-

tended operation. Incoming calls are automatically patched through a two-wire subscriber line into a PABX or other switched telephone network without operator intervention.

For information, contact John Cicotta in New York at 716-244-5830, ext. 3926; or circle **Reader Service 107**.

Adapter Kit

The new RFA-4027 SMA technician's adapter kit by RF Industries includes the

13 most popular SMA adapters. It contains both in-series and between-series adapters, enabling technicians to satisfy



most of their adapter requirements. The adapters are housed in a rugged leatherette case designed for portability and for storage on a shelf. All SMA parts are manufactured in a certified ISO 9002 facility. All adapter sections are constructed of nickel-plated machined brass with gold-plated contacts anchored in a Teflon dielectric.

For information, contact Les Perlman in California at 800-233-1728; fax: 619-549-6345; or circle **Reader Service 202**.

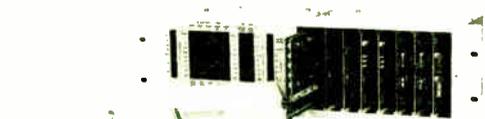
A cast of performers.

For more than 20 years, Inovonics has met the everyday needs of broadcasters the world over with sensible, top-quality broadcast products at down-to-earth prices.



222 Asymmetrical AM Low-pass Processor

Guarantees U.S. NRSC compliance, or is available in several versions for international shortwave service.



250 Programmable 5-band Stereo Processor

Gated AGC, 5-band Compression and EQ, split-spectrum Limiting—all with colorless PWM gain control. Manually pre-program 4 processing presets, or place entirely under computer/modem control via RS-232 bus.



255 "Spectral Loading" FM Processor

Triband-PWM Stereo Processor for contemporary music formats. Gated AGC, 3-band Compression and Limiting; unique "Spectral Loading" feature for a very aggressive sound.



260 Multifunction FM/TV Processor

Stereo AGC—Compressor—Limiter ideal for TV-aural and budget FM's. Split-spectrum dynamic control.

715 "DAVID" FM Processor / Stereo-Gen.

AGC—Compressor—Limiter, plus clean Digital Synthesis of the multiplex baseband signal. Internal RBDS/SCA combining; amazing performance at low cost!



705 & 706 Digital Synthesis Stereo Generators

Choice of a no-frills, basic Stereo-Gen., or a full-featured unit with metering and remote control. Both have patented overshoot compensation and a clean sound.



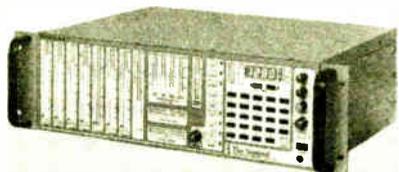
530 Off-Air FM Modulation Monitor

Tunable Mod-Monitor gives accurate measurement of total mod., pilot injection, stereo separation, etc. The peak flasher, metering and alarms may be removed.



550 The "Sentinel" Monitor Receiver

All-mode radio tunes AMAX-spec C-QUAM® Stereo, FM/FMX® Stereo and all analog and digital RBDS/SCA subcarriers. Comprehensive audio diagnostics permit off-air evaluation, comparison and analysis.



Coming soon: An easy-to-use RBDS Encoder, and a Monitor/Decoder for use with any FM Mod-Monitor.

Inovonics, Inc.

1305 Fair Ave., Santa Cruz, CA 95060 • TEL: (408)458-0552 • FAX: (408)458-0554



Circle (183) On Reader Service Card

World Radio History



Label-printing Software

Panduit Corp. has introduced a Windows version of its Pan-Mark label-printing software. Designed to create labels for identifying wires, cables and components in electrical and electronic applications, this software provides full Windows functions and uses all laser and dot matrix printers supported by Windows.

Pan-Mark for Windows provides alpha, numeric and combination serialization, octagonal and hexadecimal serialization, includes a bar code tool and supports all Windows fonts. The program, which requires Windows 3.1 or higher, is furnished on both 3.5-inch and 5.25-inch disks and is mouse- or keyboard-driven.

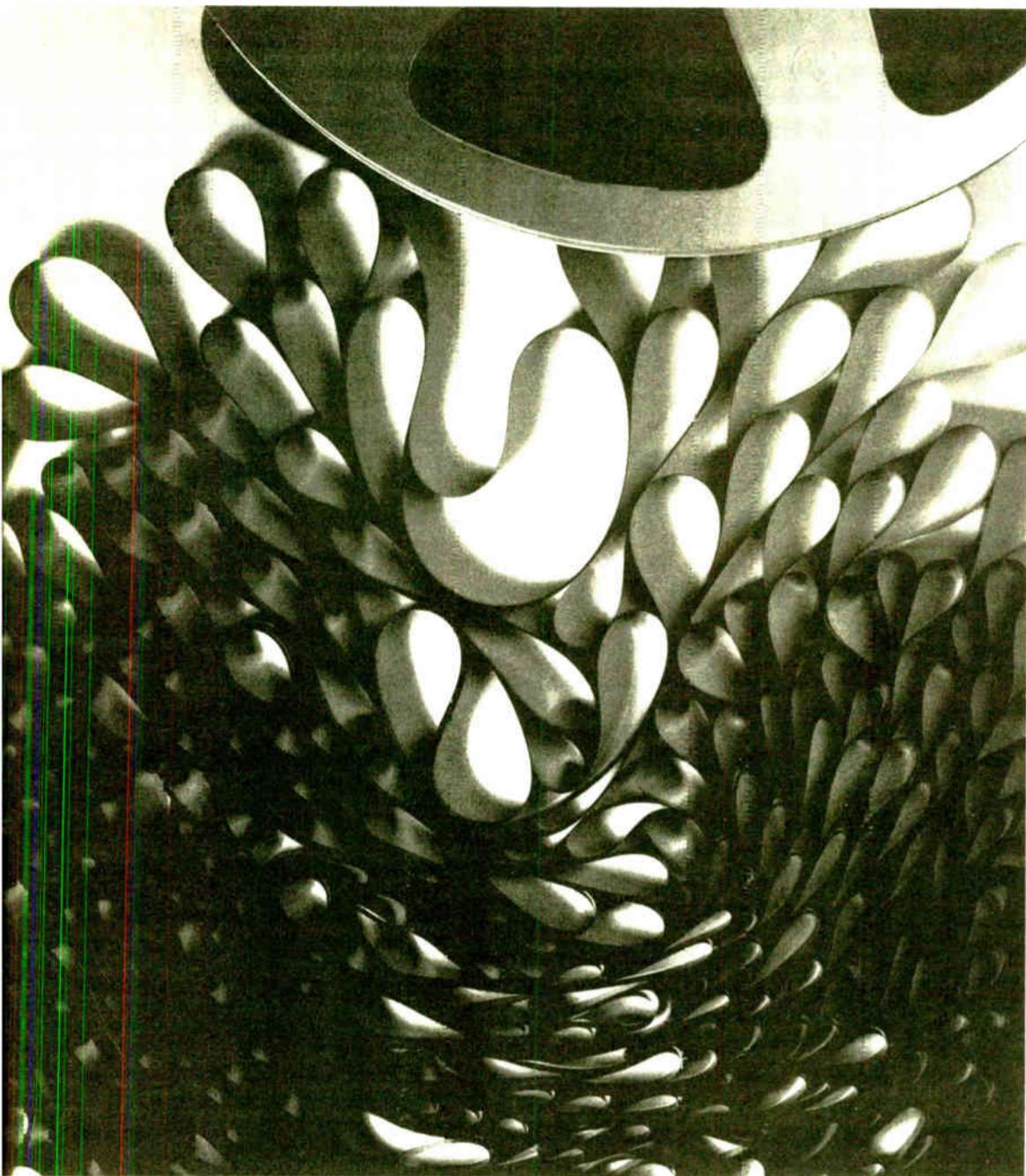
For information, contact Hans A. Lustig in Illinois at 708-990-0220; fax: 708-990-2556; or circle **Reader Service 77**.

Photoelectric Control Series

The PCR Photoelectric Control Series by SSAC Inc. is designed to withstand the rigorous requirements of outdoor lighting. The PCR Series is a combination of precision electronic circuitry and a reliable electromechanical output relay.

continued on page 40 ►

UNREEL



Have you ever thought about professional digital audio editing? Too slow? Too expensive? Difficult to understand? SADiE™ Disk Editors have changed all that. For a start SADiE™ runs on a PC, so you get much more computer for far less money. It has a fully functional Windows user interface, non-destructive sample accurate editing, real time cross fades with real time automated digital mixing, bounce down, overdub, EQ and dynamics control. And real time-saving.

SADiE™ Disk Editors have sold worldwide into broadcast, post-production, studios and mastering organisations. They have already been really put to the test out in the field and our existing customers will be pleased to see some of their suggestions in SADiE™ Version 2.2. The SADiE™ Disk Editor is just \$9,995* for a complete turnkey system, to include a 486/66DX PC, 2.0 Gbyte SCSI drive, 2 in: 4 out SADiE™ (digital/analog/SMPTE timecode support) and breakout box. Software updates are free for the lifetime of the product and there are *no hidden software extras*. It's all included in an honest straightforward price.

If it sounds unreal - why not pause for a couple of minutes today and phone or fax for some information.

Windows 3.1* on
486/66 host computer

Rapid graphical
editing

Clear user interface

Fully non-destructive,
sample accurate
editing

Creates edits while
recording

All crossfades
calculated in real-
time

Log and shuttle scrub
modes

Unique Trim Window
allowing real-time
adjustment of audio

Real-time automated
mixdown..

.. Bounce down

.. Dynamics control

.. EQ

.. Digital resampling

.. Time scrunch

.. Noise reduction

.. Overdub

.. Reverse playback

AES/EBU, SPDIF
and balanced
analog I/O

All standard sample
rates

Full SMPTE
timecode
support with chase
and trigger lock



Studio Audio Digital Equipment Inc
1808 West End Avenue
Suite 1119
Nashville, TN 37203
USA
TEL: 615 327 1140
FAX: 615 327 1699

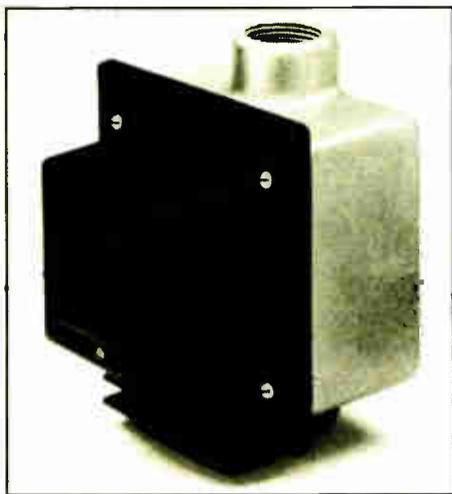
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Circle (149) On Reader Service Card

► continued from page 38



The total control is contained in a thermal, plastic-front housing which mounts to a standard 4" x 4" junction box. The

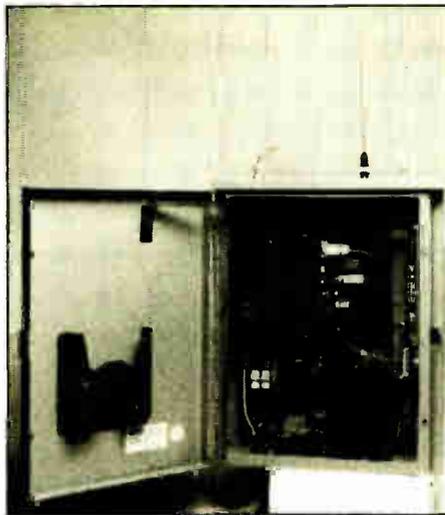
outputs are normally-open contacts rated at 20 amperes each. Input voltage is 120 V, AC 50/50 Hz.

For information, contact Dave Eastwood in New York at 315-638-1300; fax: 315-638-0333; or circle **Reader Service 39**.

Remote Control Unit

BMI's iRTU 300 low-point count remote terminal unit monitors and controls single devices within SCADA systems.

The low-cost iRTU 300 enables utilities to monitor and remotely control single devices along transmission and distribution lines in areas which were not included in SCADA systems before because of the expense of high-point



count RTUs.

A built-in Metricom radio interface links the unit to the master station.

allowing control of switched capacitor banks, line switches, pole switches, automatic reclosers and sectionalizers at remote sites not reachable by telephone lines.

For information, contact Jennifer McVeigh in California at 408-970-3700; fax: 408-970-3720; or circle **Reader Service 186**.



Planar Wave Piano Pick-up

Barcus-Berry's 4000N Planar Wave pick-up system for pianos is newly-designed with improved sensor and control unit. The sensor attaches to the piano sound board with easily removable transfer adhesive. The 4000N's low drain circuit design provides approximately 2,000 hours of battery life and is unaffected by voltage variations and line noise. Other features include high sound level without feedback, even response across the entire keyboard and virtually no bleed from other nearby instruments or ambient noise.

For information, contact Lynette Pullen in California at 714-897-6766; fax: 714-896-0736; or circle **Reader Service 25**.

Automated Backup Service

Harnack Engineering Inc. offers its clients automated backups for PC-compatible computers and networks. The company offers not only backups of traffic and billing data but also storage of sales, marketing and general accounting information. Harnack provides regular, scheduled removal of complete copies of data from a company's premises.

For information, contact Kirk Harnack in Tennessee at 800-366-7618; fax: 901-377-6676; or circle **Reader Service 141**.

Writeable CD Audio Systems

Accurate Sound's three new high-speed writable CD audio systems allow the user to insert audio DAT tape and burn, within minutes, a fully P-Q-encoded master CD ready for pressing.

Two of the models employ Eastman Kodak Co.'s high-speed writers using a Macintosh platform. The low-cost system includes a Kodak PCD 225 Writer, a 2X disc-at-once device. A second system uses the Kodak 6X PCD 600 Writer, which offers disc-at-once Red Book audio authoring.

The third system is the standalone Alea CD-maker, which features a Yamaha 4X burner, built-in DAT drive and a hard disk.

For information, contact Ron Newdoll
continued on next page ►

ADX Ensemble

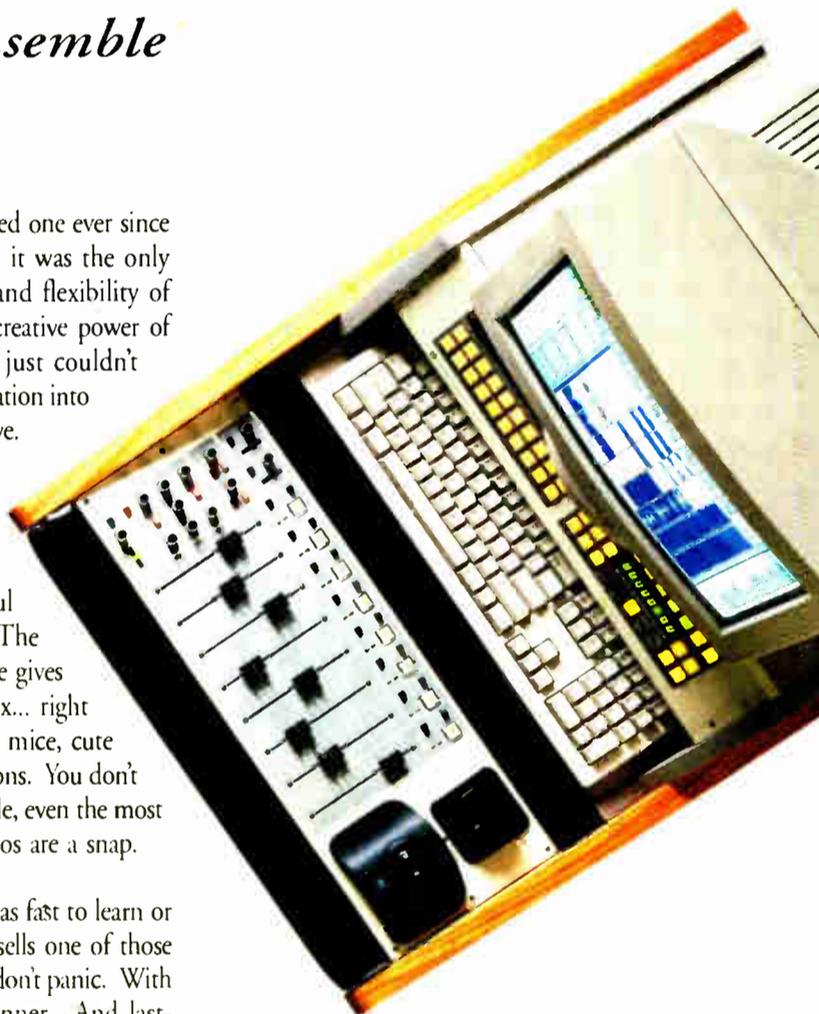
The ADX from PR&E. You've wanted one ever since you first laid eyes on it. You knew it was the only workstation to combine the speed and flexibility of moving fader automation with the creative power of digital editing. Problem was, you just couldn't squeeze a PR&E console and a workstation into the budget. Well here's the alternative.

Introducing the Ensemble. Like all members of the ADX family, Ensemble was created specifically to be the most effective and powerful workstation for radio production. The control surface of the ADX Ensemble gives you maximum control over your mix... right now. No more fooling around with mice, cute little screen faders and unlabeled buttons. You don't have time for that. With the Ensemble, even the most complex commercials, spots or promos are a snap.

No other full-featured workstation is as fast to learn or easy to use. The next time the AE sells one of those "simple" spots for immediate release, don't panic. With the ADX, you can be home for dinner. And last-minute changes are no problem, since ADX remembers everything you do. Everything. A spot produced last month or even last year can be fully recalled/reset and modified in minutes. ADX is a workstation guaranteed to reduce your stress level while extending your creative reach.

Best of all, the ADX Ensemble is backed by the same team of engineers and support staff that has made PR&E the first choice among the world's leading broadcasters. Call today for your full color brochure.

Pacific Recorders & Engineering Corporation
2070 Las Palmas Drive, Carlsbad, CA 92009
Tel: 619-438-3911 Fax: 619-438-9277
GSA Contract: GS-03F-4064B



► continued from previous page in California at 415-365-2843; fax: 415-365-3057; or circle Reader Service 172.

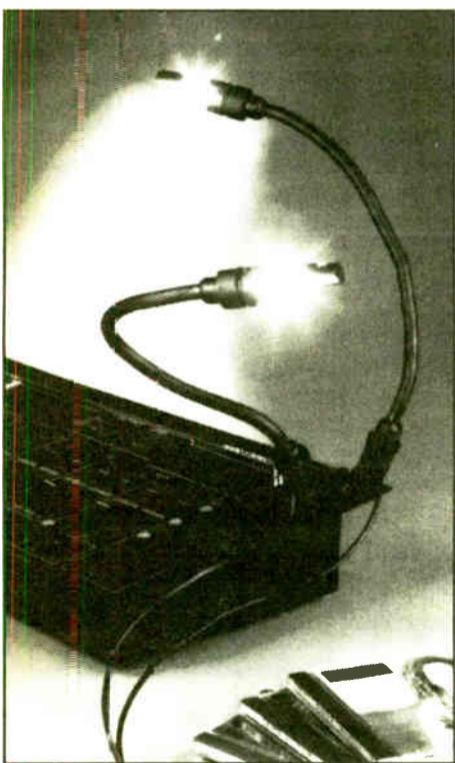


Insulated Tool Set

Jensen Tools Inc. offers a set of insulated tools that are engineered to protect the user against accidental electrical shock when working around live wires. These tools are recommended to test engineers and communications technicians for use when it is not possible or desirable to shut down a system to complete certain tasks.

The set contains 11 standard tools, including a seven-inch side cutter, eight-inch nose pliers and seven screwdrivers of various sizes. Each tool has been individually tested at 10,000 V and certified safe at 1,000 VAC/1,500 VDC.

For information, contact Karen Richardson in Arizona at 602-968-6231; fax: 602-438-1690; or circle Reader Service 5.



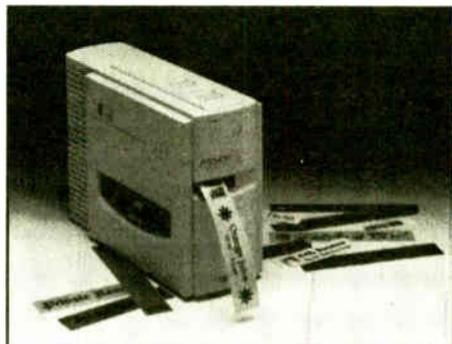
Clamp-on Light System

Ac-cetera Inc. has added the Lumin-eze (LE2) clamping system to its Lumin-eze clamp-on light system. The LE2 features dual extension lights and needs only one detachable power supply. The system easily clamps to horizontal or vertical structures. The arms and extensions swing and bend extensively to illuminate two areas simultaneously. Lamp shades adjust to direct light to desired areas.

For information, contact the company in Pennsylvania at 800-537-3491; fax: 412-344-0818; or circle Reader Service 212.

Electronic Labeling System

Brother has added the PT30 to its P-Touch line of electronic labeling systems. This new model allows the user to print up to five lines of type on a label. Tapes come in five sizes, ranging from 0.25 inches to 1 inch. The PT30 can be used to



label everything from floppy disks and file folders to name badges and video cassettes. It also provides a 2,000-character text memory so text can be stored and easily recalled. The PT30 includes 11 built-in bar codes, mirror printing and sequential numbering capabilities, as well as framing and underlining features.

For information, contact the company in New Jersey at 908-356-8880; fax: 908-356-4085; or circle Reader Service 111.

Digital Converter, Amp

Aardvark Computer Systems Inc. offers a range of digital equipment. The Aardverter A/D and D/A converter locks to external sync and offers digital peak metering and optimal jitter reduction. The converter also features RF filtering, AES/EBU and S/PDIF inputs and outputs. The Aardverter can be used for field recording, CD mastering and audio post production.

The AardDDA digital audio distribution amp features individually buffered and transformer-isolated outputs, a signal presence indicator, and AES/EBU and S/PDIF connectors.

For information, contact the company in Michigan at 313-665-8899; fax: 313-665-0694; or circle Reader Service 147.

FM STUDIES

- **SPACING/INTERFERENCE SEARCHES** to locate a channel
- **DETAILED INTERFERENCE STUDIES** optimizing site location and directional antenna designs (calculates allowed ERF on all 360 bearings)
- **TERRAIN ELEVATION RETRIEVAL** determines HAAT for 8 or more radials
- **DISTANCE TO CONTOURS** plots projected coverage
- **POPULATION COUNTING** to determine potential listening audience
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Circle (158) On Reader Service Card

Interface Card

Audio Precision has introduced a PCMCIA (Personal Computer Memory Card International Association) interface card for the System One audio test set. This miniature interface card fits in Type II PCMCIA card slots provided on notebook and sub-notebook computers, eliminating the need for an ISA bus slot on the host computer or the addition of a "docking station."

The PCMCIA interface allows for full control of all System One functions with a small, portable computer. A single System One unit may be moved to multiple locations within a plant, or transported for applications such as broadcast remote site maintenance and satellite or telecom field engineering.

For information, contact Tom Mintner

at 503-627-0832; fax: 503-641-8906; or circle Reader Service 36.

Software Program

JDJ Enterprises Inc. has introduced Computer Copy Service (CCS), a menu-driven software program designed to assist copywriters and sales people in developing material for commercials. CCS offers more than 200 original sample commercials in more than 150 categories, all of which can be edited to meet a client's specific needs. Plus, the user can write and save original copy, save and edit station promotions, store client information and print mailing labels. All material can be accessed instantly.

For information, contact Jim Grounds in Oklahoma at 800-207-1988, or circle Reader Service 218.

Quantum FM

Solid State

Solid Reliability

from **QEI**

- Proven reliability
- Maintenance-free FET technology
- Self-contained modules with own power supply regulator
- Compact size reduces shipping costs, allows affordable air shipment
- Power levels between 300 Watts and 6 kW
- Modular design offers buy-only-what-you-need affordability and convenience

For the same price you pay for a tube transmitter, you can now have a superior solid state FM transmitter with high-power, advanced technology exciter and cableless combiner. The modular design of QEI's QUANTUM-Series FM transmitters offers the advantage of buying only the amount of power you need...and means that you can upgrade to higher power levels whenever you're ready.

QUANTUM from QEI-the people who have been designing and building solid state transmitters longer than anyone else in the industry.

You need to know more! Call Jeff Detweiler today toll free (800) 334-9154.

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Williamstown, NJ 08094

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Fax (609) 629-1751

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Radio World

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Circle (18) On Reader Service Card

AMPLIFIERS

Want To Sell

Uher CV-140 stereo amplifier, as new, \$150 + shipping. J Morinelli, 901 Fairfax Rd, Drexel Hill PA 19026. 610-789-5472.

DBX 118 comp/exp. 124 NR; McIntoch C-28, MR-74, MC2105, SCR-2 w/walnut cabinets, manuals. D Fields, Legacy Prod, POB 194, Araca AR 72711. 501-451-8803.

Symetrix SX204 4 channel headphone amplifier, individual volume controls, \$100. Ken R, 1808 Madison Ave, Toledo OH 43624. 419-243-1000.

Want To Buy

200 - 500 W amps. B Lacy, KARX, 2025 N Hwy A1A, Indialantic FL 32903. 407-773-1962.

McIntosh MI-200 rackmount tube amp. 212-343-0265.

Record Cutting Equipment, records. 612-869-4963.

WANTED:

Pultec EQ's; Fairchild, Teletronix, dbx, UREI, Sontec Limiters. Neumann, Telefunken, AKG and RCA mics. MacIntosh or Marantz Gear; Lang, Neve and API gear. Misc old tubes and guitars.

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(415) 252-7102
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ANTENNAS/TOWERS/CABLES

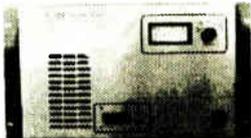
Want To Sell

300' AM (2), in WV, buyer responsible for removal, BO. Jack, 304-765-7373.

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B-500 BROADBAND FM AMPLIFIER



FEATURES:

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BT

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tel: 719-336-3902

ANTENNAS/TOWERS/CABLES

Want To Sell

Utility type 540 tower (200'), galvanized and painted, with guys and turnbuckles, already dismantled. G Peterson, KIQK, POB 1680, Rapid City SD 57709. 605-343-0888.

NEW ANDREW CABLE

Have tons of LDF 2-50, 3/8" @ only .75/ft.

Jim Mussell, 1421 Bay Ave.
Santa Maria, Ca. 93454
805-922-7775 fax 925-8663

Shively 3 bay CP, 1/2 wave spaced, \$2500. D Rose, KDOC, 29000 Radio Rd, Barstow CA 92312. 619-256-2121.

Windjammer AM, 185' tower, free to good home, needs paint, all hardware incl, take it down and it's yours, also have extra guy wires, johnny balls. B Dunkle, WTYS, 2725 Jefferson St, Marianna FL. 904-482-2131.

Shively 6813-6, 6 bay CP medium, on 96.3, excellent condition, \$2000 + shipping. M Martin, KATA/KFMI, Arcata CA 95521. 707-822-7223.

ERI 404 isolation transformer, used 2 years, \$2200. G Hofer, KJLT, POB 709, N Platte NE 69103. 308-532-5515.

Want To Buy

10 Amp f.s. thermocouple RF ammeter, new or used, in working cond. R Miller, KUAU, Box 575, Lahaina HI 96767. 808-572-5534.

FM on 104.3, 95.7 or 99.7; 340' of 3" coax. B Lacy, KARX, 2025 N Hwy A1A, Indialantic FL 32903. 407-773-1962.

Lepp 9860 insulator for self-supporting twr, will pay top dollar. D Mance, WATN, 199 Wealtha Ave, Watertown NY 13601. 315-782-1240.

Working 0-10 amp thermocouple RF ammeter. R Miller, KUAU, Box 575, Lahaina HI 96767-0575. 808-572-5534.

AUDIO PRODUCTION

Want To Sell

CRL prep processor, BO; AM stereo matrix proc, BO; C-Quam exciter, BO. J Kesler, Livingston KY 40445. 606-843-9999.

Owl Multi Filter mono to cut notch filter (3), \$100 + shipping. G Dunn, No Cal News, 5383 Willow Lake Ct, Byron CA 94514. 510-516-0299.

Shure FP-11 portable mic/line amp, \$125; Shure FP-12 portable headphone amp, \$125; AKG N66E 6 mic phantom power sply w/rack mount adapter, \$125. D Glassner, Airshow, 703-642-9035.

Mayer HFX 2 chnl, ambient NR unit, rk mt, \$775. E Toune, Audio Etc, 525 W Stratford Pl, Chicago IL 60657. 312-975-6598.

Shure SE-30 mixer, 3 chnl + aux, has non-std VU meter, clean, exc cond, \$75. W Haley, Rec Machine Service, Rt 2, Gordonsville VA 22942. Fax: 703-832-5247.

DBX 150 type I NR, 2 chnl, \$75. Ken R, 1808 Madison Ave, Toledo OH 43624. 419-243-1000.

Potomac FIM-21 field strength meter. A Sutton, WBCU, POB 70, Union SC 29379. 803-427-2999.

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or write to: J&I Audio/Video 20899 Kelvin Pl. Woodland Hills, CA 91367

Circle (41) On Reader Service Card

ADC 1/4" patchbays & cords, new, under half price; ADC TT patchbays \$149 up, new cords \$9.95. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

Bulk erasers for 1/2" \$79, Stewart direct boxes mono & 4 ch \$50 up, Cue command decoder \$125, ABC Network decoder \$125, Audiotechnica ATP-12T tone arms new in box (2) \$95 ea, Eventide H949 harmonizer \$495, new Tascam midlizer MTS1000 \$750, AB 200w pwr amp \$249, Dyna stereo 120 rk mt amp \$229, Gates tube Sta-Level pair, both \$400, Sherwood FM tuner, new tubes \$79, Altec 250 SU classic 10x2 tube rdg console, rebuilt \$2500, Ionics 7" reel copier 3 copies \$300 ea, Shure M67 rem mixers \$125, Crown & Furman elec crossovers \$95. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

Good used studio tape 1/2" \$15, 1" \$30, 2" \$55. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

Want To Buy

Esoteric Sound, re-equalizer. J Hawtt, Hawtt Audio, 2418 36th Ave W, Seattle WA 98199. 206-282-0720.

Advent MPR-100 line stage for music. A Levinson, Sprucehill Music, 1002 S 49th St, Philadelphia PA 19143. 215-729-0941.

Ampex tube mixers, recorders, especially MX10, MX35, 602-1 or 602-2. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

AUTOMATION EQUIPMENT

Want To Sell

Cetec 7000 comp sys with 48 tray Instacarts (2), and ITC R-R (4), \$5000. M Shafer, Jan-Di Broadcast, 315 Kennedy, Grand Jct CO 81501. 303-243-3699.

Harris System 90; IGM Go Cart 4216 48 tray (4); IGM Insta Cart 12, 12 tray; SMC Carousel 250. T Wortmann, WJAG, 304 Bruasch, Norfolk NE 68701. 402-371-0780.

IGM Go-Cart and Go-Cart 2, both 78 trays, gd cond, \$300/ea; spare IGM Basic A parts. R O'Kelly, KLOO, 1221 SW 25th St, Corvallis OR 97339. 503-753-4493.

SMC DP2, 20A switcher, 352 Carousels (2), 452 Carousel, time cart, stereo cart, spare parts, Audicord cart recorder, \$2000. D Rose, KDOC, 29000 Radio Rd, Barstow CA 92312. 619-256-2121.

SMC MSP-1 10 source automation sys w/4 stereo 352 Carousels, incl 2 racks, batt back-up and spare parts, BO/Trade. P Johnson, KCRV, POB 909, Caruthersville MO 63830. 314-888-0107.

Sonomag TAC-1 and 700 dual tape play, IGM time anncr, \$200. B Kuiper, WFUR, 399 Garfield, Grand Rapids MI 49504. 616-451-9387.

Harris 992-5118-001 encoder. T Wortmann, WJAG, 304 Bruasch, Norfolk NE 68701. 402-371-0780.

ITC 750 series automated PB R-R, \$50. Ken R, 1808 Madison Ave, Toledo OH 43624. 419-243-1000.

Wegener 1630 for CNN news, \$450. P Bridges, KGKO, 202 East Cross, Benton AR 72015. 501-778-8257.

Sentry FS-12C, gd/excel cond, \$2450; TS-1 also avail. Call 806-372-5130.

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Otari MX-5050 Mark III-2 1/2 Track Stereo Reel	REBUILT	\$ 2,195
LPB Signature II S-15A 8 Pot Mono Console -	REBUILT	\$ 1,595
Revox B-77 Reel 7 1/2 & 15 IPS -	REBUILT	\$ 895
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CART MACHINES

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Fidelipac CTR11, \$950; AudiCord A11, E11, A21, \$950/ea; Radio Systems RS700 PRO DAT (4), \$1995; Otari MX5050 (2), \$2000; ARS1000 (5), \$600; Tascam 122MKII, \$400. C Ba-inowski, Good News Network, 3213 Huxley Dr, Augusta GA 30909. 706-733-8201.

Harris Criterion compact (2), mono 3 tone cue, 1 machine for parts, \$150/both. B Eddy, WRRR, Box 374, St Marys WV 26170. 304-684-3400.

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ITC SP (2) mono PB, some new parts, \$250/ea. A Switzer, 60 Second Prods, RR2 Box M430, Monroe NY 10950. 914-496-5371.

Tascam MSR-16 16 track analog w/ acdbx, less than 25 hrs, \$3000; Teac A-3440, nds work, gd for ps, \$150. T Dupuy, Holbrook Media Prods, 108 Exchange Pl, Lafayette LA 70503. 318-234-3768.

BE 5300C tripledeck, stereo, PB, mint less than 50 hours, BO. R Kaufman, Pams Prods, POB 462247, Garland TX 75046. 214-271-7625, after 3PM CDT.

ITC Series 1 record/playback, like new, very low hours, \$1250/BO; ITC Series 1 playback only, like new, very low hours, \$1250/BO. Paul Driggs, 708-228-5656.

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Ampex 440 2 trk, 1/4", rk mt, \$100 + shpg. G Dunn, No Cal News, 5383 Willow Lake Ct, Byron CA 94514. 510-516-0299.

Ampex AG-440 (2), R-R, R/P, old but works, \$100/ea. Gary, Morningstar Sound, 28 Norse Dr, Howell NJ 07731. 908-938-4217.

RCA M1-12875 RCA cart wire rec, w/2 carts + manual, mint cond, \$250/trade; Tandberg 10x0 open reel, 10" reel capacity, mint cond; \$250 + shpg; Uher Universal 5000, 5" reel cap, \$40 + shpg; Ampex AL-500, 7" cap in port case, mint, \$250 + shpg; Ampro 730, vintage 1949, very clean w/manual, \$25 + shipping. J Morinelli, 901 Fairfax Rd, Drexel Hill PA 19026. 610-789-5472.

Scully 270 R-R; Ampex 4020293-01 R-R. T Wortmann, WJAG, 304 Bruasch, Norfolk NE 68701. 402-371-0780.

Scully 280 R/P R-R, \$300. M Martin, KATA/KFMI, Arcata CA 95521. 707-822-7223.

Tascam 40-4, 4 track, 1/4" with dbx NR, rack mt, and remote, low hrs, \$550. R Bragg, Producers Video, 3700 Malden Ave, Baltimore MD 21211. 410-523-7520.

Revox A-77 (3), poor cond, w/rack mounting kits, \$150/ea; Revox PR-99 (4), good cond, play only, automation decks with tone sensors, \$400/ea. R O'Kelly, KLOO, 1221 SW 25th St, Corvallis OR 97339. 503-753-4493.

Tele 300 hi spd duplicator, cass or R-R master, 3 slave cass, good cond, \$300/BO. Gary, Morningstar Sound, 28 Norse Dr, Howell NJ 07731. 908-938-4217.

Otari MX5050 MK-III, 8 track, R-R, exc cond, \$1600 + shipping, cash, firm. S St John, St John Prod, POB 641448, Kenner LA 70064. 504-464-8881.

Otari MTR 12 1/4" 2 trk w/time code board, \$2000; Otari MX5050 MKIII, 1/2" 8 trk, \$1500. D Gaydos, WNYU, 721 Bdway, NY NY 10003. 212-998-1663.

Ampex AG 350, mono r-r with solid state electronics, rack mount, \$500; Ampex 350 (2), mono r-r with Inovonics electronics, solid state, \$300. A Baker, Bct Prod of America, 804 E 38th St, Indianapolis IN 46205. 317-925-7371.

Otari SX70 8 track, 1" r-r, new remote control with 25 ft cable interface, 6 1/2" tape reels and maintenance tape, all books and specs, BO. B Giordano, WODS, Boston MA, 617-728-1957.

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Sony MDS-101 mini disc R/P, in orig box, \$450. R Dewese, WJYM, 8761 Fremont Pike, Perrysburg OH 43551. 419-748-8430.

Ampex ATR 100 (2) 4 trk \$3500 ea, 2 trk 1/2" \$4000, (2) 2 trk 1/4" \$2500 ea. 212-343-0265.

Otari Mark II-IV 1/2" 4-track, multi-track, mint, less than 50 hrs, BO. R Kaufman, Pams Prods, POB 462247, Garland TX 75046. 214-271-7625, after 3PM CDT.

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Ampex ATR800 mono, Tascam 25-2, Tascam 7300, Ampex ATR700, \$695 ea, Scully 16 track 2" \$3450, Tascam 52 top of line, \$1150, Ampex AG350 electronics \$75, 3M M56 16 track \$5500, M79-24 fully rebuilt \$11500, Tascam locator for 85-16 \$495. Sony TCD-5 & Marantz stereo 3 head portable cassettes both \$475, Fostex E22 1/2" center track time-code deck \$1800, Fostex A80 8 track & 450 mixer \$1950, Tascam 80-8 & M5 \$1950, Nagra 10" reel adaptor \$1400, Nagra 4.2 sync mono, Haliburton case, Tole, AC ps \$2500, Tascam 38 8 track with dbx \$1650. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

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Gates Stereo Yard 8 pot, all solid state, \$300 + shipping. G Dunn, No Cal News, 5383 Willow Lake Ct, Byron CA 94514. 510-516-0299.

Kustom brand 6 rotary pot mono, nds minor work, \$300/BO. R O'Kelly, KLOO, 1221 SW 25th St, Corvallis OR 97339. 503-753-4493.

LPB Signature II, S-15A, 8 pot, 24 input, mono, excellent condition, \$1500. J Wilsbach, WMSS, 214 Race St, Middleton PA 17057. 717-948-9136.

McMartin B-500, 5 chnl stereo, gd cond, \$600/BO. G Fullhart, WVKS, 4665 W Bancroft, Toledo OH 43615. 419-531-1681.

Ramko 12 chnl stereo w/2 inputs, BO/trade. P Johnson, KCRV, POB 909, Caruthersville MO 63830. 314-888-0107.

Shure FP51 compressed mixer, 4 chnl, \$450. Lake, Deep South Sports, 408 S. Leflore Ave, Cleveland MS 38732 601-843-2587.

Spotmaster 5 input mono, 2 chnl out, \$200. M Martin, KATA/KFMI, Arcata CA 95521. 707-822-7223.

Arrakis 6 pot, 12 input mono, \$500 or trade for Cart recorder. A Switzer, 60 Second Productions, RR2 Box M430, Monroe NY 10950. 914-496-5371.

MCI 528 was \$82,000 new, exc cond \$16500, Quantum 32x16x24 as used by LA Philharmonic \$4950, Audionics 501 \$3500. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

Gatley 16 x 8 with EQ 4 effects buss quad monitoring cannon connectors for line & mic inputs and common connectors for outputs, \$850. A Baker, Broadcast Production of America, 604 E 38th St, Indianapolis IN 46205. 317-925-7371.

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AKAI X700 sound effects sampling keyboard w/new roll-around stand, \$700. B Giordano, WODS, Boston MA, 617-728-1957.

Clubman Stereo soundmixer 1-5, \$100; Realistic stereo, sound mixer, \$100. P Bridges, KGKO, 202 East Cross, Benton AR 72015. 501-778-8257.

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CBS Audimax 4450A solid state FM stereo, \$300. B Kuiper, WFUR, 399 Garfield, Grand Rapids MI 49504. 616-451-9387.

Panaxis Micro-mod stereo audio compressor, \$50 + shipping. G Dunn, No Cal News, 5383 Willow Lake Ct, Byron CA 94514. 510-516-0299.

Inovonics MAP-II multiband audio proc; Inovonics 222 NRSC AM pre emphasis/low pass audio proc, \$300/both. M Martin, KATA/KFMI, Arcata CA 95521. 707-822-7223.

Processing Plus IMP III processor designed for AM stations or mono FM, \$500. J Wilsbach, WMSS, 214 Race St, Middleton PA 17057. 717-948-9136.

CBS Volumax 4000A AM limiter, \$75. A Switzer, 60 Second Prods, RR2 Box M430, Monroe NY 10950. 914-496-5371.

Orban Optimod 8100, also XT2 chassis, Texas Audio Prisms and Texarc card for 8100. P Statton, WBTG, POB 518, Sheffield AL 35660. 205-381-6800.

Orban Optimod 8000A, 8100 and 9100 w/compost clipper, \$1200+. Steve, CBP, Box 411, Alexandria KY 41076. 312-509-8523.

Sony C-74 condenser shotgun, battery or phantom power, excellent condition, short shotgun, \$600. E Toune, Audio Etc, 525 W Stratford Pl, Chicago IL 60657. 312-975-6598.

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Beyer DT-108 headset mic, excellent condition, \$100/Best Offer. A Wudel, 9A Estherville IA 51334. 712-362-4119.

Electro Voice RE 27 N/D, as new, \$300. P Russell, Bowdoin College, Brunswick ME 04011. 207-725-3066.

NBC Chimes orig promo piece from 40's, mint cond; Little Wonder Mic, mint cond, \$25; J Morinelli, 901 Fairfax Rd, Drexel Hill PA 19026. 610-789-5472.

Sennheiser HMD 224X (2) sportscaster headset wires with connectors, \$150/ea or \$250/both. Lake, Deep South Sports, 408 S Leflore Ave, Cleveland MS 38732. 601-843-2587.

Telex FMR100 diversity wireless mic systems, body pack w/spare XLR cable, \$450. Lake, Deep South Sports, 408 S Leflore Ave, Cleveland MS 38732. 601-843-2587.

Vega 77/67 wireless, diversity port lavalier system, w/Tram 50 mic, 3 types antenna, power supply, \$750. R Bragg, Producers Video, 3700 Malden Ave, Baltimore MD 21211. 410-523-7520.

Neve 1066 preamp, 3 band eq, lo pass filter, recapped, \$1500; Summit Audio TPA-200B dual channel tube mic preamp, still in box, \$1700. Bob, Clockwork, 606 Mamaroneck NY 10543. 914-381-0661.

Sennheiser MKH-40 cardioid; Sennheiser MKH-30 Figure 8; M/S mounting clip; shock mount cradle, exc cond, \$1600. D Glassner, Airshow, 703-642-9035.

Symetrix SX202 2 channel mic pre-amp, \$100. P Russell, Bowdoin College, Brunswick ME 04011. 207-725-3066.

Sony ECM377 large dia condition mics (2) \$495 ea, RCA 77DX \$950, 44BX matched set of 3 \$3950, Shure SM5 \$325, SM7 \$295, AKG D12 \$195, Crown GLM200 lavalier like new \$125. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

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RCA 77DXs/44BXs ribbon, chrome/TV grey, good condition. BO. R Kaufman, Pams Prods, POB 462247, Garland TX 75046. 214-271-7625, after 3PM CDT.

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Altec input xfrm modules, pkg of 5 pieces, \$20. J Morinelli, 901 Fairfax Rd, Drexel Hill PA 19026. 610-789-5472.

Realistic 42-2115 stereo tape control ctr (2), \$10/ea, Archer A/V selector, \$10. G Dunn, No Cal News, 5383 Willow Lake Ct, Byron CA 94514. 510-516-0299.

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Paradyne 4951-03 equip rack, \$175; Soundolier equip rack, \$120 + shgp. B Lord, Lord Bldg, 3824 SW Myrtle St, Seattle WA 98126. 206-932-4839.

Tascam 1/2" alignment tape 250 nw/m IEC eq; also rack mt for Tascam 38, BO. P Cibley, Studio C, POB 767, NY NY 10156. 212-532-2980.

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Henry Engineering Telecart II or BE PC-1 or other telephone to cart deck interface. A Slaugh, Ski Areas of NY, 2144 Currie Rd, Tully NY 13159. 315-696-6550.

Acrosound TO-350 or Peerless S-268-Q. B Leslie, Pro Rcdng, 13709 Mapleleaf Dr, Cleveland OH 44125. 216-662-1435.

B + O Ribbon, mono or stereo. A Levinson, Sprucehill Music, 1002 S 49th St, Philadelphia PA 19143. 215-729-0941.

Pacific Recorders SDA-8 DA w/XLR connectors. J Miller, KABC, 3321 S La Cienega Blvd, Los Angeles CA 90016. 310-840-4946.

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Collins 20V-1, good condition, Best Offer. E Pendergast, KAOK, POB 19090, Lake Charles LA 70615. 318-436-7541.

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ADVERTISER INDEX

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Page No.	Advertiser	Reader Service No.	Page No.	Advertiser	Reader Service No.
20	AMP Services	23	38	Inovonics	183
24,25	Arrakis	179	31	International Datacasting Corp.	191
6	ATI	16	14	ITC	135
30	ATI	79	42	J&I Audio/Video	41
26	Audio Broadcast Group	152	20	J Squared Technical Service	184
37	Audio Broadcast Group	148	45	Marathon Products	49
14	Audio Precision	50	29	Martin Leasing	99
44	Audisar	26	19	Modulation Sciences	144
47	Auditronics	1	30	Modulation Sciences	38
30	Autogram	61	27	Murphy Studio Furniture	80
44	BBH Software	87	19	Myat	20
21	Belar	104	36	NAB	—
20	Benchmark Media Systems	201	34	National Public Radio	131
22	Bext	140	7	Pacific Recorders	126
30	Broadcast Devices Inc.	217	40	Pacific Recorders	138
16	BSW	97	22	Penta Labs	83
4	Burk Technology	35	30	Phasetek	15
28	CCA Electronics	167	21	Potomac Instruments	92
30	Circuit Werkes	130	37	Price Wheeler Corp.	213
3	Comrex	160	37	Prophet Systems	33
12	Conex Electro Systems	118	41	OEI	113
13	Continental Electronics Corp.	59	20	S.C.M.S.	6
30	Crown Broadcast	194	8	Satellite Systems	101
15	Cutting Edge	210	44	Sescom	3
8	Dataworld	63	37	Shively Labs	161
41	Dataworld	158	18	Shure Brothers	164
10	Dolby	215	12	Sine Systems	11
37	Econco	102	30	Stephens Communications	171
46	Econco	21	39	Studio Audio & Video Ltd.	149
46	Energy-Onyx	95	20	Svetlana Electron Devices	190
20	Excalibur	46	46	Svetlana Electron Devices	72
23	Fidelipac	54	11	Tascam/Teac	115
35	Ghostwriters	69	9	Telos Systems	204
20	Gorman Redlich	84	33	TFT	206
28	Group W Satellite	150	37	The Management	10
42	Hall Electronics	110	46	Transcom Corp.	187
29	Halland Broadcast Service	52	42	USAfoam	18
20	Hallikainen & Friends	98	45	Varian	155
1	Harris Allied	31	2	Wheatstone	73
32	Harris Allied	29	48	Wheatstone	199
35	H&H Productions	146	37	Zercom	125

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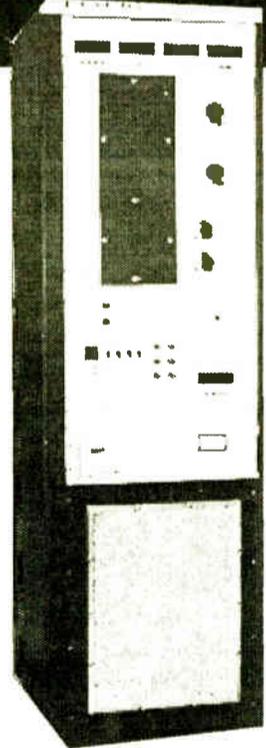
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