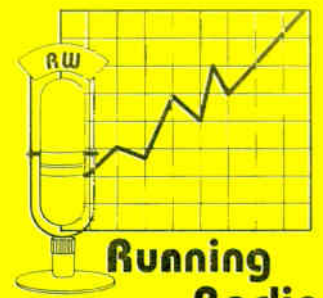


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Radio World



Running Radio
See pp. 17-33

Vol 19, No 17

Radio's Best Read Newspaper

August 23, 1995

Radio Mega-Deals Heat Up Summer Market

by Lynn Meadows

NEW YORK It was a week that will go down in radio history.

First, the Walt Disney Co. announced it was buying Capital Cities/ABC Inc. for \$19 billion. The next day Westinghouse Electric Corp. said it would acquire CBS Inc. for \$5.4 billion.

And, after less than two days of discussion, the U.S. House of Representatives passed the telecommunications bill of 1995 and voted to remove all limits on radio ownership.

For Disney, the acquisition of ABC Radio is a venture into a previously unexplored industry. Bill Steding, managing director of Star Media Group, said Disney will probably just hold on to a good thing. "Michael Eisner's philosophy has typically been 'if it ain't broke don't fix it.' They (ABC) are really making a lot of money."

In market after market, however, the combination of Group W and CBS brings two long-time competitors together on the same team.

Strategic plan

Steding, whose Star Media Group was instrumental in previous Group W acquisitions and who continues to advise the organization, said the purchase of CBS was part of Westinghouse's strategic plan for the radio division "to have the best four facilities in the top 10 markets, allowed under current law. It takes them that way."

Steding suggested the genesis of the final transaction had its beginning in September 1993 when initial discussions started on Group W acquiring CBS Radio. The company's last major broadcasting purchase was in 1989 when it bought Legacy and Metropolitan Broadcasting radio stations for \$360 million.

All of the 21 CBS radio stations being acquired by Group W are in the top 20 markets. The purchase brings the group its first stations in St. Louis, Minneapolis, and Dallas. It is a good start. WCCO(AM) in Minneapolis and KMOX(AM) in St. Louis are both historical 50,000 W clear channels that brought

CBS \$20 million and \$19 million respectively in 1994, according to Broadcast Investment Analysts (BIA).

Bottom line

In New York City, BIA figures show WINS(AM) billed \$30 million in 1994

continued on page 6 ▶

Hundt: Radio Is Strong

EDITOR'S NOTE: Reed E. Hundt was named chairman of the Federal Communications Commission by President Clinton on Nov. 19, 1993. His term will expire June 30, 1998.

Hundt agreed to talk with *Radio World* Editor in Chief Lucia Cobo and Staff Writer Lynn Meadows about issues facing radio and the future of the medium.

Before assuming his current post, Hundt was a partner in the Washington law offices of Latham & Watkins, where his work included legal and regulatory issues in emerging technologies such as cellular telephones, wireless cable, direct broadcast satellite and interactive television.

Hundt graduated Magna Cum Laude from Yale College and graduated from Yale Law School.

RW: The radio industry would like to know a bit better, who you are and what your ideas are regarding certain areas of concern — digital audio radio satellite, digital audio broadcast terrestrial and from a regulatory standpoint also.

H: I think we have essentially two jobs here at the FCC. First, it ought to be our job to write fair rules on competition in all markets, and second, it ought to be our job to advocate the public interest.

Public interest is whatever the country needs for communications that markets are going to give it. The normal workings of the market are going to give you many benefits, economic growth, job growth, diversity of programming, lots of different

entertainment, a certain amount of news, but markets are not perfect — they leave things out.

Public interest is whatever the markets do not give us but which as a society we deserve.

continued on page 14 ▶

WORLD MEDIA EXPO '95

Radio and TV professionals will converge on New Orleans to see the latest products and hear the latest news in the business at World Media Expo. See preview, pp. 51-76

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NEWSWATCH

Eureka-147 to Test In San Francisco

WASHINGTON Eureka-147 may still be tested in San Francisco in the digital audio radio (DAR) field tests this fall.

Sources at the Department of Commerce say the National Telecommunications Information Administration (NTIA) is working with the Electronic Industries Association (EIA) and the telemetry industry to develop an acceptable test plan for Eureka-147.

In order for field tests to be consistent with the recently completed lab tests, the Eureka system must be tested on the L-Band. In the United States, that space is reserved for aeronautical telemetry.

The NTIA has resisted granting temporary use of the L-Band for testing because the L-Band has little chance of ever being

continued on page 2 ▶

NEWSWATCH

► continued from page 1

used for digital radio in the United States.

Those who support testing Eureka-147 in the field say that U.S. manufacturers need to see how Eureka performs in order to be competitive. If a plan is agreed upon, proponents of both in-band, on-channel (IBOC) systems and Eureka-147 will each have a chance to prove once and for all that their sound is superior.

Disney Buys Cap Cities/ABC Inc. for \$19 Billion

BURBANK, Calif. Walt Disney Company will be spending approximately \$19 billion to purchase Capital

Cities/ABC Inc. In addition to radio, Capital Cities/ABC also owns 80 percent of ESPN, 50 percent of Lifetime Television, 37.5 percent of A&E, a large publishing group, and a multimedia group which develops and manages business opportunities in new and emerging media technologies.

Capital Cities/ABC owns 21 radio stations and the ABC Radio Networks that serve more than 3,400 stations. While the industry speculated whether Disney will hold onto the radio assets, Bob Callahan, President of ABC Radio Networks, said in a statement, "This appears to be a terrific deal for both sides with complementary assets that can yield creative and

powerful programming for the radio industry. ABC Radio Networks has worked closely with the Disney folks for years developing holiday specials, theme park promotions and remotes."

Chancellor Buys Shamrock

DALLAS Chancellor Broadcasting Co. signed an agreement early this month to acquire 19 radio stations owned by Shamrock Broadcasting for \$395 million. The transaction will bring the number of stations owned by Chancellor to 21 FM stations and 12 AMs.

After the expected completion of the deal in early 1996, Chancellor will have market duopolies in San Francisco, Minneapolis, Denver, Cincinnati, and

continued on next page ►

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Is Talk Radio too Prurient for America?

Broadcasters Balk at Government Regulation

by Lynn Meadows

WASHINGTON "I don't ever want to see us in this country in a position where radio's audience finds radio content to be repugnant," Federal Communications Commission Chairman Reed Hundt said in an interview with **RW**. While no sane broadcaster would disagree with Hundt's statement, the talk segment of the industry may be wary of the regulator's intentions.

If the president approves the telecommunications legislation, television manufacturers will have to install a V-Chip in

every television over 13 inches. An undetermined rating system will help TV owners screen out up to four levels of violent programming using the chip. Legislation mandating the chip flew through the Senate and passed the House on August 4th.

In a speech before the National Press Club at the end of July, Hundt called for broadcasters to develop a "contract for kids and community." He has spoken in favor of the V-Chip to help parents "select from the avalanche of programs pouring uninvited over the air into their homes."

The H-Chip

Although Hundt seems primarily concerned with television shows, in a recent **RW** interview, he said "I don't think radio should let this dialogue go on to the point that people have to start talking about an 'H-Chip' that cuts off hearing of certain kinds of shows."

At present, the primary restriction on radio content is the safe harbor which limits indecent material to late night hours between 10 p.m. and 6 a.m. This time period was upheld by the D.C. Circuit Court of Appeals in June.

After that decision Hundt said "parents and the public are the winners" in the lower court's decision, while the National Association of Broadcasters (NAB) announced it was "deeply disappointed" in the court's ruling. The NAB in coalition with the American Civil Liberties Union, National Public Radio and others has requested the Supreme Court review the case.

The coalition wants the Supreme Court to decide on the constitutionality of a "safe harbor" and review the indecency definition which they believe to be vague.

In its Notice of Apparent Liability to Infinity Broadcasting in May 1994, the commission said it had "defined indecency as language or material that, in context, depicts or describes, in terms patently offensive as measured by contemporary community standards for the broadcast medium, sexual or excretory activities or organs."

Infinity holds the dubious honor of having the biggest bill for indecency. For the most part, the company has been fined because of discussions on "The Howard Stern Show." A Buffalo listener reported Stern to the FCC last year for separate discussions of masturbation and oral sex. The FCC used its definition to fine four stations broadcasting the show \$50,000 apiece.

To date, Infinity has refused to pay those and other fines and broadcasters seem to support that decision. Mel Karmazin, CEO of Infinity, was not available for comment.

Even those who find Stern's show distasteful support him professionally. "I see a lot of criticism of Howard Stern personally in the industry," said Mike Harrison, editor and publisher of *Talkers* magazine. But Harrison adds, professionally there is "tremendous resistance to government regulation of programming."

Alan Colmes, host of "The Alan Colmes Show," said, "I don't feel government should be involved with regulating content. Period."

He says the free marketplace should

decide how much is too much.

Before going national, Colmes hosted a show on WMCA(AM) in New York where the guests ranged from congressmen to a woman "who had been lactating for 19 years." He said had he been a "shock jock," he would not have been able to get the range of guests he did. Colmes also pointed out advertisers stay away from some shows that are too harsh.

Levels of concern

Analyst Harrison said there are no easy answers. "There has always been that level of concern for tastefulness just for self-preservation," he said. At the same time, he added talk radio is supposed to provide an outlet for the disenfranchised and the creative. He says too much restriction could render the medium "impotent."

"It is not a question of porn or perish," said Barry Farber, who hosts "The Barry Farber Show." Farber said he has everything against government censorship, but nothing against listeners saying what they want. He thinks the religious right is part of "a gathering storm" and will eventually become a force of influence for shows it wants to hear.

Tom Leykis, who broadcasts "The Tom Leykis Show," agrees that government should not regulate content. "Shows that are good have an audience," he said.



Tom Leykis

Leykis pointed out how conservatives are opposed to big government until it comes to content. As in the case of Howard Stern's comment on the Latino singer, Selena, Leykis says the audience will indicate when a program goes too far. ☺

NEWSWATCH

► continued from previous page

Sacramento. It will also gain regional duopolies in New York and Los Angeles.

Chancellor was formed in 1993 by Hicks, Muse, Tate & Furst Inc. of Dallas, a private investment firm. Thomas Hicks, chairman, said, "our goal was to build Chancellor from the ground up into a major radio company. With this acquisition, we have accomplished that objective."

Advertising Increases Soften

NEW YORK The Radio industry posted its 34th consecutive month of revenue growth in June. According to the Radio Advertising Bureau (RAB), June brought a 6 percent increase over June of 1994 in local and national spot advertising revenue.

Although national spot revenue by itself only showed a 1 percent increase in June, local revenue gained 7 percent over the previous year. While the increase was less than increases in earlier months of this year, RAB President and CEO Gary Fries said, "it still appears that we have a strong third and fourth quarter developing."

Changes at EIA

ARLINGTON, Va. The Electronic Industries Association (EIA) is expanding its show line-up and its management team. Jonathan Thompson was named Consumer Electronics Shows (CES) staff vice president. Wayne Crawford became the new group show director. Daniel Cole joined as the director of sales and Karen Chupka was promoted to staff director of marketing for CES.

With the changes, CES is ready to add new shows in addition to its International Winter Consumer Electronics Show and Mobile Electronics Show. The EIA predicts national sales of consumer electronic products in 1995 will reach \$61 billion. That is an increase of 8.8 percent over last year. ☺

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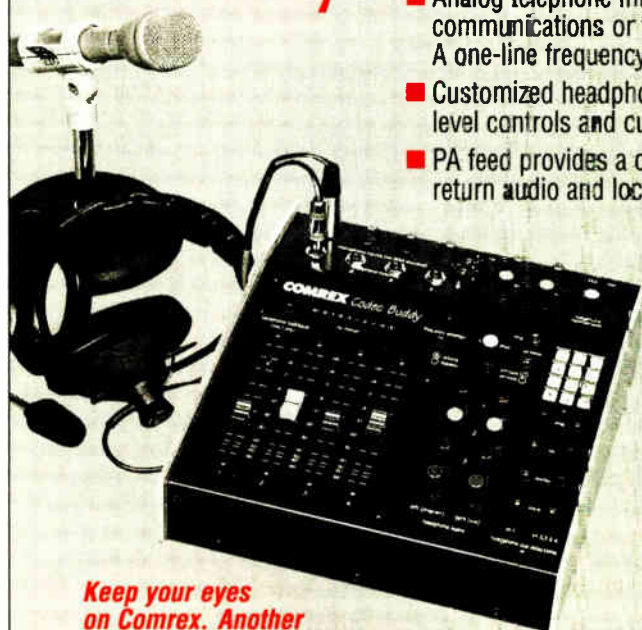
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Debating Pros, Cons of Laissez-faire Radio

WASHINGTON Aah ... It is World Media Expo time again. And once again, your hard-working gang at IMAS Publishing will publish the World Media Expo News. I can't wait. New Orleans, the Marconi Awards, good food — we will have booth on the exhibit floor, so please come by and say hello. We'll be looking for you.

As our lead story suggests, the real news this fall and for the foreseeable future is the relaxation of the ownership rules governing all facets of telecommunications.

I must confess that all this merger madness and congressional *legerdemain* has raised more questions in my mind than I have answers. I'll throw them out at you and if you would like to weigh in with an

opinion, write me letter.

scenarios — some more benign than others. The top radio news facilities in the top markets, once earnest rivals that pushed each other to the edge, will now be owned and sold by the same company. Will their programming be as good as before without the ever-present threat of losing a ratings battle to the cross-town competition? Selling them in concert will make the parent company more money — but will the market be as well-served? And what if one of each of those two news outlets per market (the weaker one) is changed to a different format leaving only one news voice? How would the market be served then?

In any case, CBS and Group W are both groups that date back from the inception of radio in this country. Recently I wrote about how neat it was that they were two of the leading-edge companies in the business with their involvement in the development of IBOC digital radio. Now two-thirds of the USA Digital Radio project will be owned by one entity.

Another scenario that bothers me a bit is the idea that the top markets, where the bulk of the money is spent in radio, will be the ones divvied up by the few mega-groups that will be created — thus leaving the small markets, where the bulk of the stations are, out of the loop, as it were, in the political and economic arena.

I believe that National Association of Broadcasters, the Federal Communications Commission and just about any national advertiser that deals with radio will have to make a super-human effort to service these latter stations, which may number in the majority, but which will lack the clout to control the industry. And let's face it — how realistic is that expectation? Who is prepared to speak for them?

I would urge every broadcaster out there to make his or her feelings known on the

subject. Think about what the long-term consequences could be of a total deregulation of radio — up to and including allowing unlimited foreign ownership of U.S. spectrum. If you think this is good for the business, then by all means support Congress. If, however, you want

sweeping changes. Get in on the discussion. Now.

★ ★ ★

Roger Thanouser of Fidelipac had some sad news to report. Everyone here at **RW** offers condolences to the family and friends of Bob McNeill. After a long and painful

struggle with cancer, Bob died on Sunday, July 23.

In a letter to company dealers, Roger wrote: "With deep sadness and regret, we announce that Bob McNeill passed away ... As most of you know, Bob endured a long and painful struggle with cancer over the past year or more. Throughout it all he consistently displayed remarkable courage, humility and humor. We all will miss Bob."

"Bob is survived by his wife Joan and two grown children. We will forward your expressions of sympathy to Joan at her home."

You can write to Fidelipac at P.O. Box 808, Moorestown, N.J. 08057.

Bob had spent the last six months or so training Dave Strode to succeed him as sales manager of the company. Dave has been with Fidelipac for more than 10 years, serving at various times as a technician and manufacturing supervisor.

★ ★ ★

Word has it that AT&T will be setting up an experimental station in New Orleans for some public demos of its system. No word yet on whether it will use the IBAC or the IBOC system. More info on that in the next issue of **RW**.



Helping Kids with KKRW-FM



HOUSTON Arrow 93.7's morning team welcomed World Champion Houston Rocket, Robert Horry to the radio station on Thursday, July 28. Arrow invited listeners to drop off can goods for Kid Care Inc. in exchange for Robert Horry's autograph.

Pictured left to right: Morning Drive News and Public Service Director, Jacket Robbins, World Champion Houston Rocket, Robert Horry, and Morning Show DJ, Johnathan Doll.

radio to be treated like the finite resource that it is, perhaps you should urge the president to veto this sweeping deregulation.

I don't know what the answer is. I do know that I feel that not enough discussion has happened to merit such

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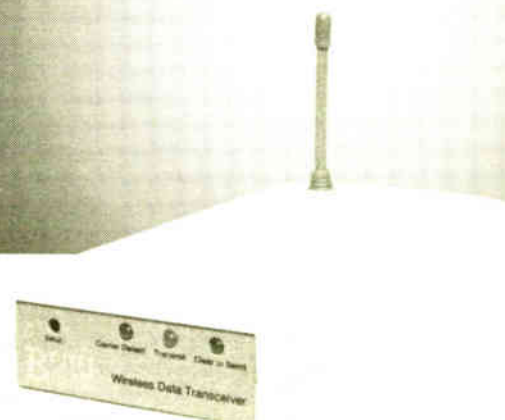
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IBOC questions

Dear RW,

I was one of the many broadcasters who took the (USA Digital Radio) DAB bus tour at the show and was impressed by the demonstration. However, I did some "off bus" listening to the signal on a portable receiver and heard noticeable "multipath-like" noise on the regular FM signal. And on both the AM and FM, the signals were being splattered two channels on either side of the broadcast signals.

I ask my consulting engineer's opinion and he thought the FM "multipath-like" noise was the AM component of the digital modulation. And he thought that the splatter was due to large bandwidth of the digital modulation.

I cannot think of a single FM that would add DAB if it caused the current signal to sound noisy, scratchy or inferior. And channel splatter of the magnitude that was present at the show would cause chaos in those markets where there are a lot of stations.

I hoped USA Digital is also aware of these problems and has some plans to address them.

Mark F. McNeil, president
Guardian Communications Inc.,
Cincinnati

Dear RW,

I read with interest and some amusement the headline article regarding the IBOC demonstrations in Las Vegas this past NAB. A new phenomena was discussed regarding the selective reception characteristics of the AM version of the IBOC system.

This so called "new" phenomena is something that has been known since the 1920s. It is called selective fading. Double sideband AM waves are prone to distortion due to this phenomena due to improper phase alignment of the sideband energy and carrier. The sidebands

and carrier do not arrive at the receiver at the same time. Well, in a digital world all the data does not get there at the proper time. Same problem different manifestation.

I find it difficult to understand that we as an industry seem to be charging off down the digital path without having a fundamental understanding of the problems we are trying to solve. Selective fading and multipath reception are two fundamental problems inherent in any wideband communications system.

Much more research needs to be done on the physics of wave propagation and reception characteristics before a selection is made for a modulation and detection technique. Another statement made in the article was that no effort was going to be made to study the effects of distant skywave reception for the AM system. Did I miss something? Are we planning to make the AM service daytime only?

Bandwidth and modulation technique of the signal play an important role in reception difficulties when multipath is encountered. A narrow vs. wideband FM system, for instance, have different reception characteristics when subjected to multipath reception. A wideband FM system suffers worse distortion than does a narrowband signal under identical time delay characteristics.

When AM and narrowband FM are subjected to the same multipath characteristics AM comes out the clear winner because of a simpler sideband component. A simple analysis of one modulation scheme vs. another such as the AM/FM example just described points up the possibility that one may be better than the other under certain circumstances.

I have read much material that has been prepared on the mechanics of multipath reception. Unfortunately, not a lot of it has dealt with what effects multipath reception have on various types of modulation and detection.

I would suggest that before we figure out how much digital compression we can stand that we take a look at propagation and reception characteristics of many different forms of modulation. We will also have to come to grips with whether analog AM and FM can really coexist with this additional RF signal. At the risk of ridicule I will pull a concept from the ashes that will truly drive the point home. The marketplace will ultimately decide.

If in band, on channel, digital broadcasting impairs its analog counterpart enough, no broadcaster in his or her right mind will destroy his or her existing business in the hope that digital will catch on. Remember, in the beginning 99.999 percent of the public will still be listening to conventional AM and FM receivers. I speak from first hand experience in this regard.

In early experiments with CBS's FMX system it turned out that it produced more multi-path distortion on conventional receivers! Sadly, the system worked great as long as you had an FMX equipped radio. The trouble was nobody did.

From history, Major Armstrong developed wideband frequency modulation in an attempt to solve the static problem that still hampers AM reception. It was touted

Take Care of Business

If the meek will indeed inherit the earth, then the bulk of radio broadcasters have nothing to worry about from the three recently announced media mega-mergers.

Conversations around the water coolers at the New Orleans Convention Center during the upcoming World Media Expo will be buzzing with details of the Disney purchase of ABC/Cap Cities, the union of Group W and CBS, and

Chancellor's acquisition of Shamrock — all within a few days.

Rather than suggest a dark, monopolistic future for radio, important deals by these huge corporations actually reinforce the truth: radio remains a strong, robust industry capable of healthy returns on investment.

Radio has not merely survived; it has thrived for 75 years, shaking off challenges from television, cable and digital satellite TV... even MTV's threat that video would "Kill the Radio Star." Radio has consistently ridden the waves of change and today enjoys the lion's share of media consumption; this kind of long-term success naturally attracts those looking for a piece of the action.

Does this mean your fortune will come from giant broadcast corporations looking to acquire your station? Most likely not. Radio's greatest success stories have been written by entrepreneurs; those who take the risks, stay on the edge of the business, brace for coming changes and make adjustments to profit from those changes.

It is for this reason the World Media Expo, including the NAB Radio Show and the SBE Engineering Conference should be on your itinerary. Broadcasters that accept and embrace new technologies see the opportunities they present and are better prepared for those changes. Those who scorn digital audio technology, satellite DAB delivery, duopoly issues and the Internet are the ones who will be left behind.

Go to the show. Participate in workshops. Ask the questions, test out the products and put your two cents in with the groups gathered around the water coolers. The more prepared you are for the future, the more successful and profitable your operation will be.

After all, earning a living doing radio entails making some money while super-serving your community. And whether or not you are a small broadcaster or a media giant, that remains the first order of business.

—RW

as a great idea and a brilliant breakthrough. Because mobile radios were not really a factor in early FM development Armstrong was not able to fully comprehend the problems with multipath reception that would later plague FM.

Remember, the problems with FM multipath are a modulation related. During the 1940s RCA did quite a bit of research into the multipath reception characteristic of FM and they addressed the modulation issue. While this was largely an effort to discredit Armstrong it did come to some damning conclusions about multipath and how it affected wideband FM reception. Unfortunately, much of this work was ignored for decades long after FM became a commercial success in spite of its problems.

So that I am not misunderstood let me say that I have always had a tremendous amount of respect for Major Armstrong and his contributions to modern communications; virtually all of which are still in widespread use. He was among a handful of true geniuses of the 20th century.

One final point. I object strongly to the USA Digital system being described as having CD quality. Compact disc quality is based on a 16 bit linear transformation of analog to digital conversion. No compression is used in the production of commercial compact discs. Distortion does occur when data is compressed. This has been amply demonstrated. While I admit that many of the compression systems work well and sound very good, they should not be described as "CD quality."

In science, an iterative approach to problem solving is generally the path to a truly elegant solution. Digital broadcasting appears to so far be an effort to throw out the baby with the bath water. Let's try

and understand more fully why what we have does not work before we wipe the slate clean and start over. If we do not, perhaps the same laws of physics will plague a digital system as well. Trading one set of problems for another may not prove to be beneficial.

Robert C. Tarsio, chief engineer
WLTW-FM, New York

Kudos to all

Dear RW,

In response to Tom McCarthy's letter concerning music on the AM band, I say "kudos upon kudos." Having worked many years in the AM market prior to switching to TV, I have been disappointed to watch the AMers tuck their tails between their legs and bend over to the FM market as far as music is concerned.

Granted, the frequency response and readily available stereo signal makes it ideal for music. However, as I listen to the radio now as a consumer, I quickly become bored with, not to mention insulted by, the "liner radio" on the FM band. It is especially boring as I travel and listen to it in my office. I am well aware of the easy numbers to be pulled by talk radio and the cost advantages of not staffing.

But all talk is equally as boring as "48 hits in a row" is. I find myself quite frequently cruising the AM band in search of some balance. Fortunately, some stations still broadcast variety. A good talk show, mixed with some good tunes, local and national news will keep me tuned in all day. AM is best with live formatted programming. It always was. FM is not. To those who dare, I say thanks!

Mike Seaver, chief engineer
KHQA-TV, Quincy, IL

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Radio World
September 6, 1995**

Radio Deals of Summer

► continued from page 1

while WCBS(AM) billed \$23 million. In Chicago, CBS news station WBBM(AM), another one of the original clear channels, billed \$16 million in 1994. A primary competitor of WBBM(AM) is WMAQ(AM) that Group W purchased in 1988 and turned into a news/sports format. WMAQ(AM) billed \$18.5 million last year. After the acquisition, Group W will own both.

Andrew Schwartzman, executive director of Media Access Project, said it does not make sense to him to merge the CBS and Group W all-news operations. He used the soon-to-be sister stations in New York City as an example. WINS(AM)

and WCBS(AM) have been competitors with all-news formats.

Schwartzman said from a business point of view, it makes sense to sell the CBS chain to someone else and be competitive. Although Group W might save a little money if it merges the news operations, Schwartzman said he does not believe it will significantly increase market share. He added that from the public's point of view, having two thriving stations to choose from is also preferable.

As for what's ahead for CBS Radio under Group W, Steding said there will be a "substantially improved" profit margin and the focus will be on individual markets rather than the group as a whole. "They (CBS) thought like a network group," Steding said. "Now, they're going to have to think like a local marketing company."

Rather than repeating a format just because it is successful in one market as CBS Radio has done, Steding said, the Group W philosophy is to evaluate each market individually.

A look at BIA Publications' figures for the Los Angeles market reveals that the Group W philosophy is successful. In that city, Group W's 5 kW news station KFVB(AM) billed \$25 million last year. The clear channel CBS news station KNX(AM) brought in \$3.6 million less.

Ownership limit

After acquiring CBS, Westinghouse will own 39 radio stations (see chart). If the legislation lifting the ownership caps had not passed, Westinghouse would have been over the 20 AM/20 FM limit by only one extra FM station.

Even if Congress had not passed the legislation, the possibility of an FCC waiver allowing Westinghouse/CBS to exceed the limits was likely. Given the deregulatory climate, Schwartzman said "the FCC is not going to be confrontational even if Congress does not pass this legislation."

For the radio industry as a whole, Steding maintained the new group creates

a new definition for large group owner that will be hard — if not impossible — to match.

"It creates the first real mega radio group in the world," he said. The only way to counter such magnitude, Steding speculated, would be a three-way merger of such groups as Evergreen, Viacom, Infinity or ABC. With ABC having just been acquired by Disney, that would leave only three groups with the potential to do battle as one with the new Group W.

Future of radio

The CBS and ABC deals could represent what will happen when ownership deregulation becomes law, which still hinges on Congress overriding the president's expected veto. As the industry is consolidated into fewer and fewer hands, opinions of deregulation run hot and cold.

The formation of such a super group was inevitable in the radio industry, Steding said, for economies of scale and to give local terrestrial radio the power to compete in local markets with new competition from satellite and cable digital radio services.

Jim Wesley, CEO of the new Patterson Broadcasting whose company has purchased 16 stations this year said, "I don't think that this consolidation that is taking place will change the basic nature of the radio business. It is a very local business." He added that there will always be a market for good local programming.

Others see the tradition of the one-station radio owner going the way of the dinosaurs. Schwartzman said "the tradition of 'small' family-owned radio groups" is an era that "is rapidly coming to an end."

Pluria Marshall with the National Association of Black Owned Broadcasters (NABOB) said deregulation and the trend toward consolidation "is going to shut out approximately 60 percent of broadcast owners of the future."

□ □ □

Radio World International Editor Alan Carter contributed to this report.

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Radio's First Mega Group at a Glance: Group W plus CBS Radio holdings

Data Courtesy of BIA Publications

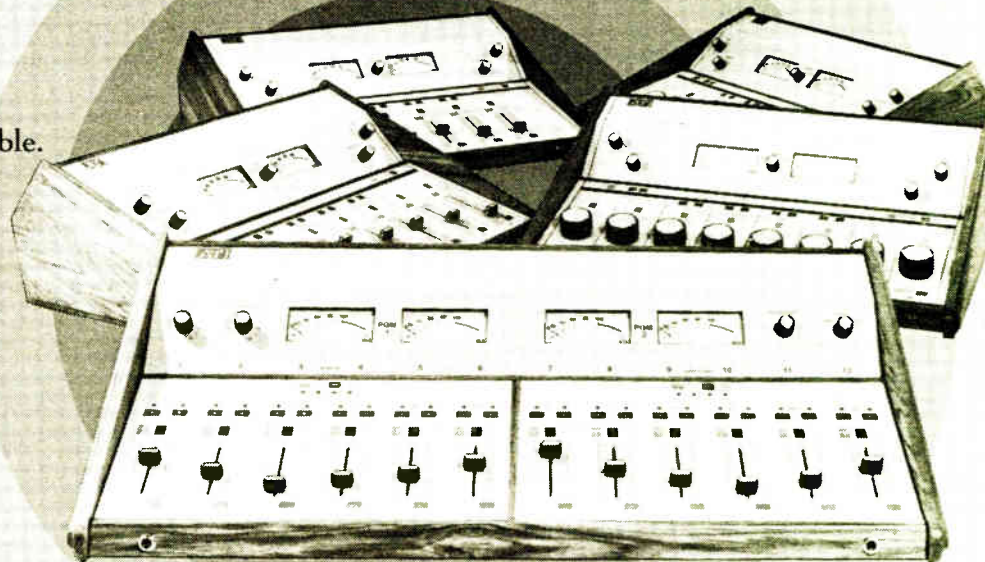
Call sign	Date Purchased	Format	1994 Revenue (\$000)	Power
New York:				
WCBS(AM)	1924	News	\$23,000	50 kW-U
WINS(AM)	1962	News	\$30,000	50 kW-U
WCBS-FM	1941	Oldies	\$27,000	6.8 kW
WNEW-FM	1989	Alternative	\$16,500	6 kW
Los Angeles:				
KFVB(AM)	1966	News	\$25,000	5 kW-U
KNX(AM)	1936	News	\$21,400	50 kW-U
KCBS-FM	1948	70s Oldies	\$19,000	28.5 kW
KTWV-FM	1989	New Age	\$12,200	58 kW
Chicago:				
WBBM(AM)	1931	News	\$16,000	50 kW-U
WMAQ(AM)	1988	News/Sports	\$18,500	50 kW-U
WSCR(AM)	1995	Sports/Talk	\$3,500	5 kW-D, 1.2 kW-N
WBBM-FM	1941	CHR/Dance	\$12,000	4.2 kW
WXRT(FM)	1995	Progressive	\$11,000	6.7 kW
San Francisco:				
KCBS(AM)	1949	News	\$17,000	50 kW-U
KPIX(AM)	1994	News/Info	\$600	10 kW-U
KPIX-FM	1994	News/Info	\$1,000	6.9 kW
KRQR(FM)	1948	Classic Rock	\$6,500	82 kW
Philadelphia:				
KYW(AM)	1921	News	\$22,500	50 kW-U
WGMP(AM)	1958	Sports	\$2,500	50 kW-U
WMMR(FM)	1989	AOR	\$14,500	18 kW
WOGL(FM)	1944	Oldies	\$12,000	12.5 kW
Detroit:				
WWJ(AM)	1989	News	\$12,200	5 kW-U
WLLZ(FM)	1989	AOR	\$4,500	50 kW
WYST(FM)	1989	70s Oldies	\$5,500	15 kW
Dallas-Fort Worth:				
KRRW(FM)	1993	70s Oldies	\$4,000	100 kW
KTXQ(FM)	1985	AOR	\$6,700	100 kW
Washington:				
WARW(FM)	1985	Classic Rock	\$5,000	20.5 kW
Houston:				
KIKK(AM)	1993	Country	\$1,000	650 W-D, 250 W-N
KILT(AM)	1989	Sports	\$1,000	5 kW-U
KIKK-FM	1993	Country	\$11,000	100 kW
KILT-FM	1989	Country	\$16,800	100 kW
KKRW(FM)	1985	70s Oldies	\$8,500	100 kW
Boston:				
WBZ(AM)	1921	News/Talk	\$16,800	50 kW-U
WODS(FM)	1948	Oldies	\$11,000	16 kW
Minneapolis:				
WCCO(AM)	1992	Full Service	\$20,000	50 kW-U
WLTE(FM)	1992	Soft AC	\$7,500	100 kW
Pittsburgh:				
KDKA(AM)	1920	News/Talk	\$11,000	50 kW-U
St. Louis:				
KMOX(AM)	1932	News/Talk	\$19,000	50 kW
KLOU(FM)	1962	Oldies	\$3,000	100 kW

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Radio Responds Slowly to DARS

NAB Poised to Battle DARS, Stations Across the Nation Not Really Ready to Comment, FCC Looking for Input

by Angela Novack

WASHINGTON The National Association of Broadcasters continues to lead the radio industry in opposition to satellite digital broadcasting.

Meanwhile, individual broadcasters and groups remain quiet in responding to an FCC Notice of Proposed Rule Making (NPRM) for satellite digital audio radio services (DARS).

The FCC issued the NPRM on digital satellite radio in June stating that opponents bear the responsibility to prove that digital audio radio is not in the public interest.

The commission is asking for comments, due Sept. 15, on public interest issues as well as licensing procedures and overall regulation. Reply comments then will be accepted until Oct. 13.

The main concern of the NAB is the impact DARS will have on local radio.

"Radio is truly a local medium and has served the community well," said Lynn McReynolds, NAB spokesperson.

Harm in potentially destroying the local radio industry outweighs the potential good in providing a few more national channels.

—Lynn McReynolds

"Harm in potentially destroying the local radio industry outweighs the potential good in providing a few more national channels."

The NAB is asking local broadcasters to send letters to the FCC in response to the NPRM, she said.

Response from individual broadcasters was less forthcoming in an informal survey of major and mid-market groups.

While some seem uncertain of their plans for filing comments, others voiced their confidence in the ability of the NAB to represent the industry.

"That's their role," said Paul Fiddick, president of the radio group at Heritage Media Corp in Dallas. "We are supportive of the NAB position."

One representative of a major group was unsure of his compa-

ny's position and suggested it may not respond to the notice.

NAB President Edward O. Fritts indicated in a written statement that the NAB opposes DARS but is "pleased" by the range of issues addressed in the notice.

"We look forward to responding to these questions and intend

to provide the commission with compelling evidence of the devastating impact such a service would have on local radio stations and listeners across America," Fritts stated.

In separate statements, Commissioner James H. Quello and Commissioner Susan Ness expressed their particular sensi-


tivity to the potential impact of DARS on local broadcasting. Industry comments will be a valuable resource to the commission as it hammers out the rules governing DARS, they noted.

Specific issues raised in the NPRM include: the number of licenses to be granted, the amount of spectrum per license, selection of licenses when mutually exclusive applications are

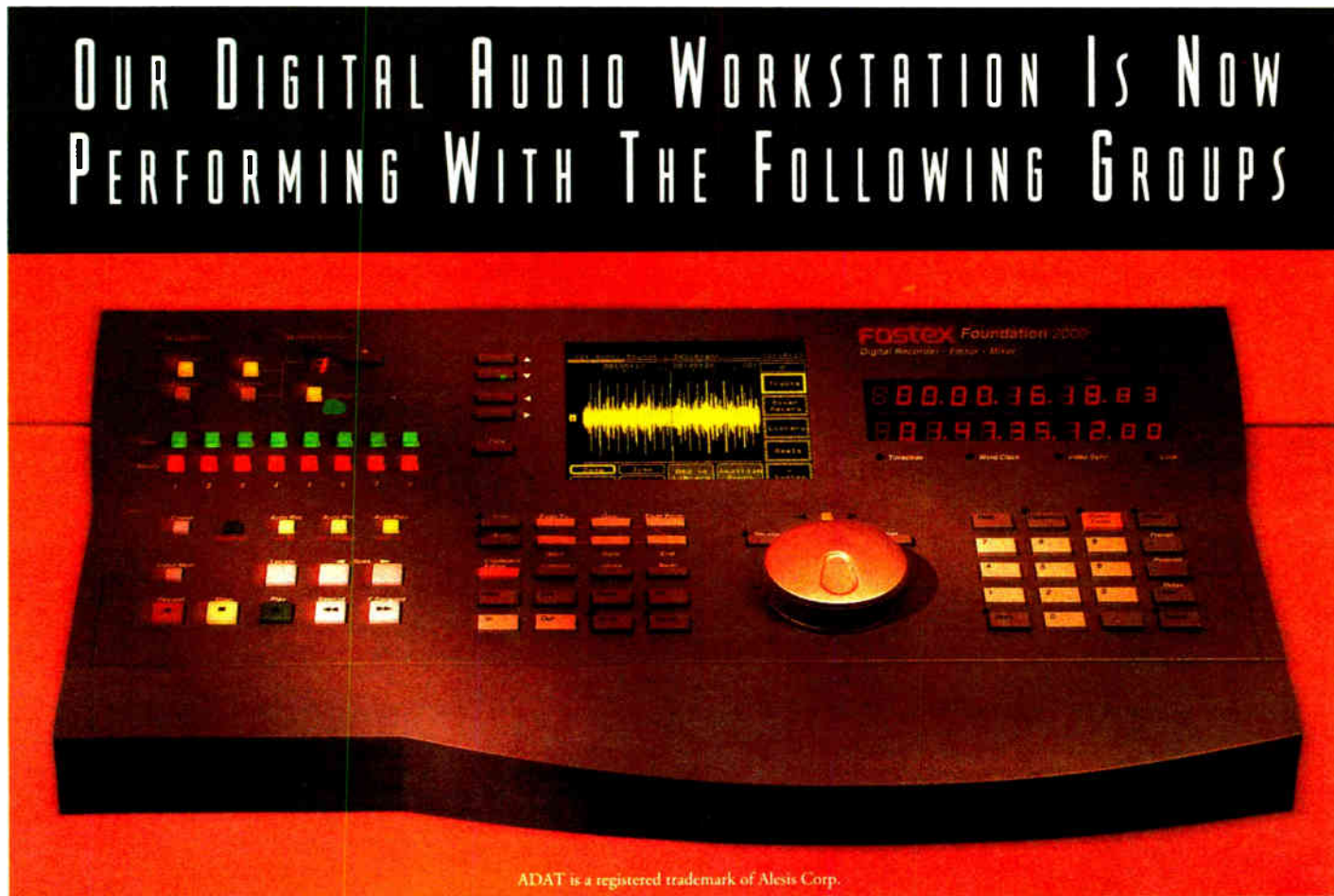
filed and the classification of licenses.

Discussion concerning the potential impact on local broadcasting centers on the reaction of consumers and advertisers.

The commission is asking for comments regarding the possible change in audience listening patterns, forced changes in programming and the impact on advertising revenues.

Four applications have been filed at the commission for permission to launch digital satellite radio services, but action is pending on the NPRM. 

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World Radio History

RAB Sets Up Web Site For Radio Members

by Alan Haber

DALLAS RAB on the WWW? It is fast becoming a three-letter world out there on the information superhighway (broadcast-wise, that is). First the Federal Communications Commission (FCC) and National Association of Broadcasters (NAB) hit the Web, and now the Radio Advertising Bureau, on behalf of its more than 3,700 members, is about to lay claim to some cyberspace real estate.

The move to the Internet's World Wide Web, which includes the RAB's entire on-line marketing system and database, is expected to take place by Sept. 1 (although the site is not operational at the present time, its address will be <http://www.rab.com>).

On-line access

Why the move? "The RAB has had on-line access to a variety of the data that we provide our member stations for about 10 years," said Mike Mahone, executive vice president for services. Until now, he said, this data "was provided for our members through a bulletin

board service (Sales Plus)."

The new service is seen by the RAB as providing "a greatly enhanced version of the valuable sales and marketing information currently available on Sales Plus, including access to RAB's extensive co-op database, Instant Backgrounds, promotion and copywriting files, and local and national success stories."

Forging role

Gary Fries, RAB president and chief executive officer, said that "By relocating Sales Plus and other information systems onto the Internet, RAB continues to forge a leadership role as the radio industry moves into the 21st century.

"With this new on-line system, RAB not only will offer a valuable service to member radio stations in the United States, but also will help to define today the parameters of how the Internet will be used in the future."

The RAB has more in mind for the Web than simply providing access to data. Beginning around September 1, the bureau will be offering Web sites to its member radio stations (see *Haber Space*,

elsewhere in this issue). The RAB will demonstrate its Web site program at its booth at the NAB Radio Show in New Orleans.

Mahone pointed to some key reasons for the RAB setting up shop on the Web. "We wanted to be able to make our information available to our stations on a more cost-efficient basis," he said, adding that RAB members will be able to access the data on the site for around \$25 a month.

The world's largest cooperative advertising database is in the RAB system, said Mahone, along with information on new business development and non-traditional revenues. Graphic images, proprietary client information, and industry-wide e-mail will also be accessible.

In other words, the RAB site will contain a host of information "to help our stations get up to speed with all the various business categories they are trying to deal with on a day-to-day basis," said Mahone.

Being on the Web will allow a graphical presentation of the data now available to RAB members in a text-only format on Sales Plus.

Growth on the horizon

But wait — there is growth on the horizon. After about 60 days of operation, the site will offer access to the RAB's database of around 7,000 radio commercials, collected from all over the country. Members will be able to go into the database and search for particular types of spots, and for spots produced for certain size markets.

There are more benefits to the RAB's move to the Internet-Mahone noted that one is making it easier for the bureau's international members to access data.

Fries's vision is fixed squarely on the future. "With over 10,000 radio stations on the air in the United States alone," he said, "this new service will provide the critical sales and marketing information that will help radio move swiftly and certainly into the passing lane on the information superhighway." ☺

Radio Most Listened To in Workplace

by Alan R. Peterson

BALTIMORE More people listen to the radio in their cars than any other location of listening, but more of the listening occurs at the workplace.

These are the findings of Baltimore-based Research Director Inc., using raw Arbitron data from among the most successful stations in America. More than 500 individual station reports and 183,000 diaries were included in the analysis.

Using data from Winter 1992 through Winter 1995, Research Director Inc. determined nearly 73 percent of a radio station's total weekly audience listens to that station in the car.

According to Marc Greenspan, a partner with Research Director, "This estimate varies by format, by market and by station." The survey includes highly successful stations in markets ranked one through 253.

In-car listening accounts for only 30 percent of a typical station's total quarter hours of listening. Workplace listening took a narrow lead with 35.5 percent of total quarter hours.

The study indicates occasions of listening may have a more important role than previously thought in improving time spent listening (TSL). These occasions, along with the average duration of listening, are the two components of TSL.

Findings from the study also reflect the importance of the first preference listener to the ratings success of the station. According to partner Rhody Bosley, "It is the first preference listeners that contribute most of the listening to the station."

A first preference listener is one that spends more of his or her radio listening time with that one station than any other. Research shows 36 percent of diaries to a typical station included in the analysis contributed 72 percent of the quarter hours.

Research Director partner Julie Heath states "The first preference listener spends two-thirds of his or her radio listening time with his first preference station, compared to the second preference listener who typically spends just 22 percent of his or her time listening to his second preference station."

Research Director Inc., was formed in January 1993. It conducts diary reviews and produces media buying guides and custom sales presentations for client stations. ☺

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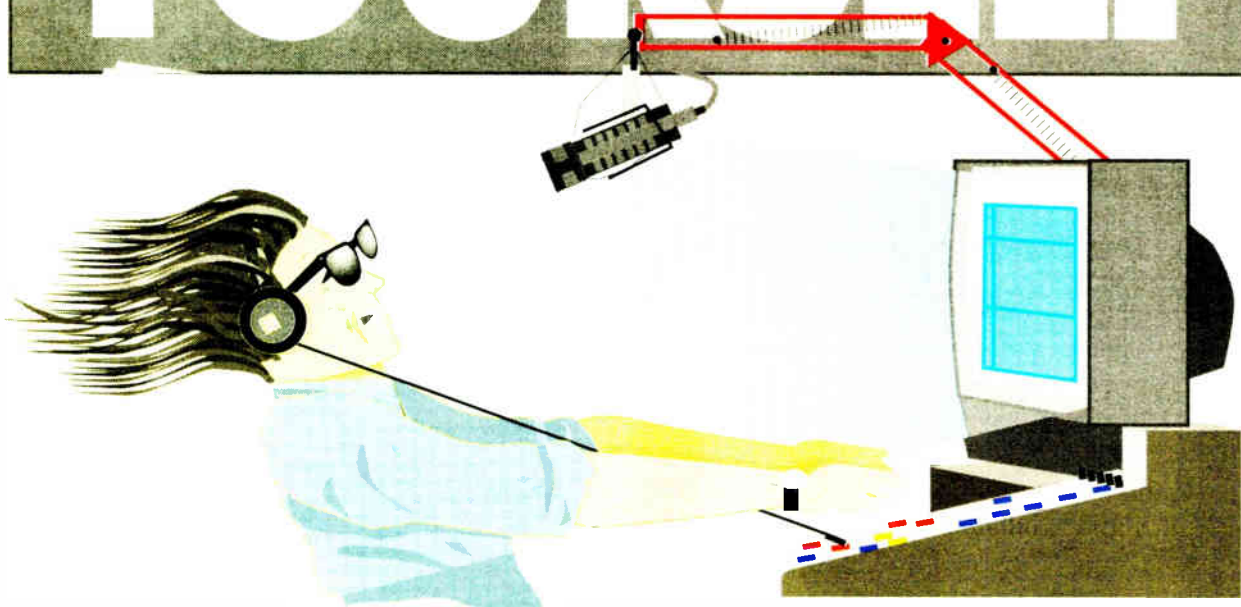
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INTERNATIONAL UPDATE

Ancillary Services Key To DAB's Future Growth

MONTREUX, Switzerland As multimedia becomes less a "buzzword" and more a reality, the line between the audio domain and the video domain becomes more blurred.

Nowhere is this more in evidence than with DAB.

Many of those involved in DAB, such as Sveriges Radio and Swedish Teracom, believe that the extra multimedia broadcast services DAB can provide will be the force that drives the success of DAB.

Ancillary services

Teracom announced a year ago its desire to explore ancillary DAB services, and now, this goal became a reality with a public demonstration in Montreux, Switzerland.

Swedish Teracom is currently working on three DAB and FM multimedia services: Image Radio, Portable Information Terminal, and Data Radio Channel (DARC).

The features these services will eventually contain, according to Pierre Karlsson at Teracom, are limited only by invention and creative ability, not by technology. Both the Image Radio and Portable Information Terminal will make use of DAB receivers.

Karlsson said they envision the DAB receiver of the future as including a radio receiver, a graphic screen, a loudspeaker, processor, large memory and, of course, a very user friendly interface.

Most of the services being discussed for multimedia transmission include traffic and travel services, as well as advertisements. Teracom wants the thinking on this to be broadened considerably.

The Teracom idea is a portable information point acting as an information channel for the general public. Information on the channel could come from various sources and would be updated continuously via a DAB channel.

Publicly available information could include: news, weather, sports scores, gambling information, hotel information, timetables and stock market information, as well as, film, music, theatre and museum offerings.

Official unveiling

Teracom officially unveiled its ideas for this transmission service at the 1995 Montreux Television symposium. The first pilot system, according to Karlsson, will be ready by autumn, allowing the focus to then turn to developing the services.

Teracom wants to then test various sound, image, text and data services under real-world conditions.

Teracom plans for the system make it possible for information to be encrypted or left open, with the system permitting synchronism information to be returned during the transmission. Control signals also can be transmitted, telling the receiver how to process information sent and how timely the

information is.

The greatest potential, Karlsson said, lies in the interactive abilities of the system, which will allow the "listener" to exercise greater control over the information.

"Interactivity is achieved either by transmitting large amounts of information and storing it where the user can select what to see or hear, or by incorporating return channels that are used to call up information on-line," Karlsson said.

With mobile multimedia, Karlsson believes, people will be able "to read the morning paper in electronic form on receivers whether they are riding a bus, sailing a boat or lying in a hammock. They can receive up-to-the-minute share pricings or the latest news from text displays. While watching a hockey game, they can press a button for instant replay of a cunningly scored goal."

FM network project

Although working on several DAB projects, Teracom has not abandoned work on projects with FM networks. The DARC system is a digital subcarrier system used for transmitting data services via FM networks. The system has been in place since 1986, but until recently the services were geared towards the visually impaired.

Teracom now wants to expand the system to include newspapers. Via the DARC system, radio "newspapers" will be transmitted complete with full text, images and graphics. The subscriber then can decide how much of the stored information to use.

In addition to expanding the audience for DARC, it would increase the benefits for the core audience of the visually impaired by giving them more choice in how to receive the information.

Visually impaired people could chose synthetic speech, view an enlarged text presentation on a VDU screen, or print out the information. It will also be possible for DARC to transmit still images and sequences of still images.

This channel will be opened next year. Teracom hopes that because DARC has a fairly high transmission capacity, other services can be transmitted via the FM network simultaneously, including stereo sound, mono sound and an RDS system. The DARC system was based on system development carried out by Nippon Hoso Kyokai (NHK), the Japanese national broadcaster.

For the Montreux display, Teracom showed a model DAB receiver designed by students; however, Teracom is planning to get into the receiver business.

Said Karlsson, Teracom is in the same position as other broadcasters involved with DAB, the receivers are what is delaying their plans. As soon as receivers are available, then it is "full steam ahead."

ABC Networks Offer MPEG

by T. Carter Ross

WASHINGTON By year's end, ABC Radio Networks affiliates will use new technologies to receive programming from the syndicator's satellites.

MPEG I Layer II-based audio compression technology, which is widely used in program delivery via ISDN and as an audio storage medium, is being incorporated into Scientific-Atlanta digital audio receiver systems. ABC Radio Networks uses Scientific-Atlanta products to distribute programming to its affiliates.

Currently, ABC Radio uses Scientific-Atlanta SEDAT compression to distribute its music- and speech-based programs, as well as news programming.

According to Bob Donnelly, vice president of engineering for ABC Radio Networks, the new receivers are being beta tested this month, and by year-end 1,000 stations will be outfitted with the new combination MPEG/SEDAT receivers.

Three hundred stations that received new SEDAT-only receivers prior to the beta test will be retrofitted once the other affiliates receive the new MPEG/SEDAT units.

"It brings greater flexibility," Donnelly said of the new receivers. "The significance for affiliates is that (incorporating MPEG compression) enables our receiver to work with storage and automation technologies that use MPEG technology."

Therefore a station that uses, for example,

an MPEG-based automation system or an MPEG-based digital studio-to-transmitter link (STL) can incorporate MPEG-encoded ABC Radio programming without having to pass the audio through multiple compression algorithms.

ABC Radio Networks also sees value in MPEG compression for its future plans.

"We are undertaking a store-and-forward project that would enable us to download audio as files into affiliate servers (from which) affiliates access information," Donnelly said.

Once affiliate stations downlink these files, they could be easily integrated into a station automation system.

According to Donnelly, ABC Radio Networks will decide which algorithm is used on a case-by-case basis. "This does not preclude us from using other algorithms such as SEDAT or Dolby," he said.

Currently, ABC Radio plans to distribute its music-format programs, which originate from Dallas, using the MPEG Layer II compression format, while SEDAT will be used with speech-based programs and news.

"Over time that may change," Donnelly said.

Scientific-Atlanta licensed the MPEG technology from the Vancouver, British Columbia-based MPR Teltech, which incorporates MPEG Layer II in its ISDN products.

For Scientific-Atlanta, the move expands the versatility of its product line.

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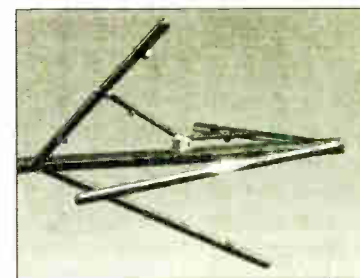
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 World Radio History

NPR Funding to Continue, for Now

by Lynn Meadows

WASHINGTON Funding for National Public Radio will continue at least through 1998 — but the coming budget pinch was a recurring theme at the board of directors meeting in late July and a possible catalyst behind reorganization plans announced earlier this month.



In their meeting, board members agreed that moving the Public Radio Conference from San Diego to Washington during the height of the Congressional budget discussions helped save the organization's federal funding.



As of mid-July, NPR had raised \$6.775 million towards the base budget goal of \$7.8 million. The Development Committee announced the donation of two large grants. The Ford Foundation gave \$500,000 and Archer Daniels Midland Corporation gave \$650,000.



The lightning rod issue during the board meeting came when the Membership Committee recommended giving Alaskan stations a 65 percent discount on Full Service Membership. NPR President Delano Lewis said not giving the stations a discount will put the Alaskan stations "in jeopardy." Without the new policy, the membership committee expected several Alaskan stations to be forced to drop

NPR membership.

Several members grudgingly agreed to vote for the Alaskan discount, but added they would only do so for one year. Board member Patricia Wente said that Alaska needs to "look within" to find a solution. Although the measure granting a discount for one year passed, both the chairman of the board and the chairman of the Finance Committee voted no to send a message to the state to plan ahead better.

More discussion ensued when members grappled with increasing fees to cover the budget for the Distribution/Interconnection (D/I) committee.

Last year, the board lowered the D/I fee by \$500 to \$5,700. The D/I budget has been stretched as NPR prepares for the switch to its new satellite in January and the conversion to digital by spring 1996.

Members agreed to increase the D/I fee to \$6,000 per station. Given the future funding challenges, they preferred to keep the committee's \$8 million dollar working capital fund untouched for later use. With the fund in place, the board also escapes fees for insurance.

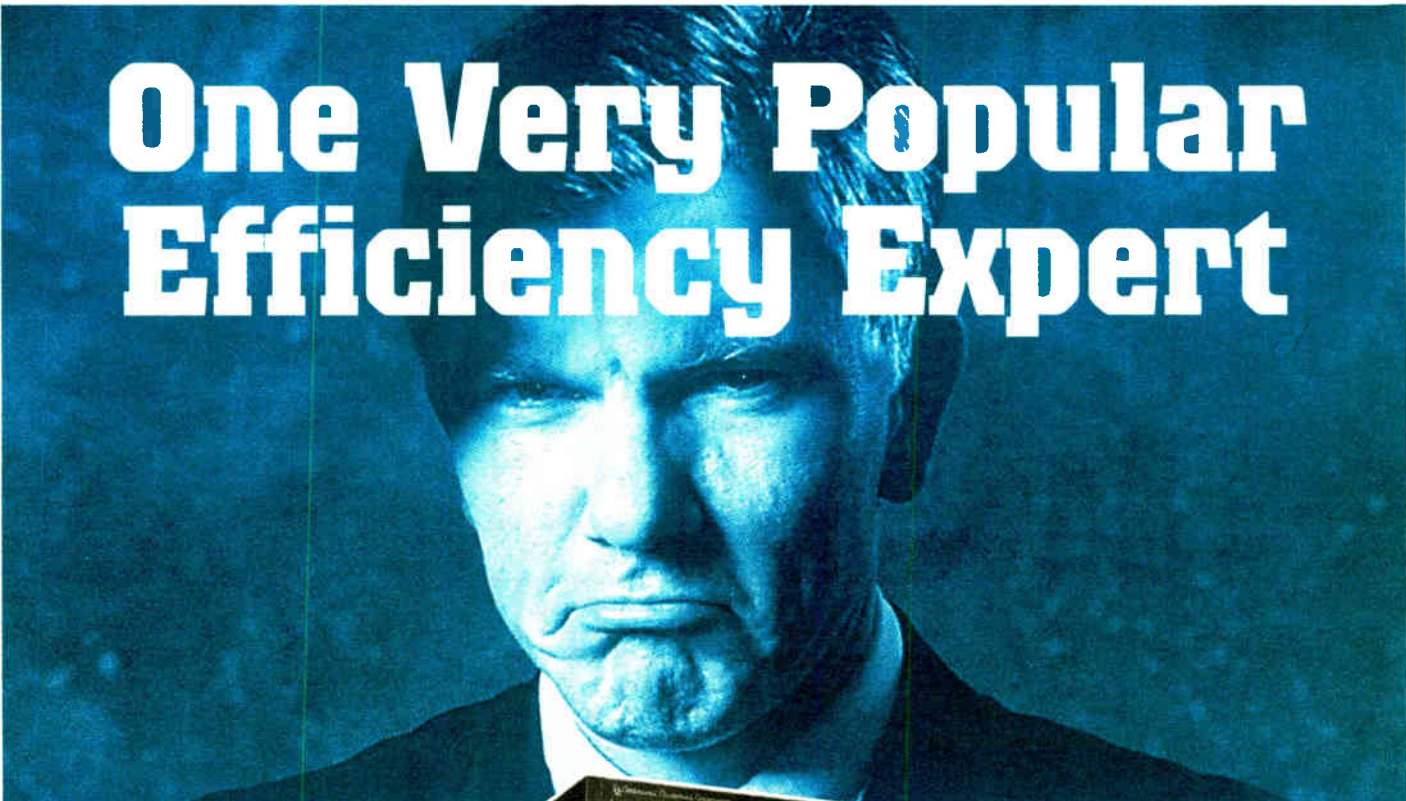
In a final measure, the board passed a resolution expressing its "opposition to any action which would authorize public

radio stations to accept advertising." Members agreed that accepting advertisers would result in a net revenue loss caused by corporate underwriters backing away and taking their grants with them.

In early August, NPR announced restructuring plans that will save \$2.2 million. The plan will eliminate 40 positions and create 20 new ones by October 1. The organization plans to create a centralized operations and administration desk.

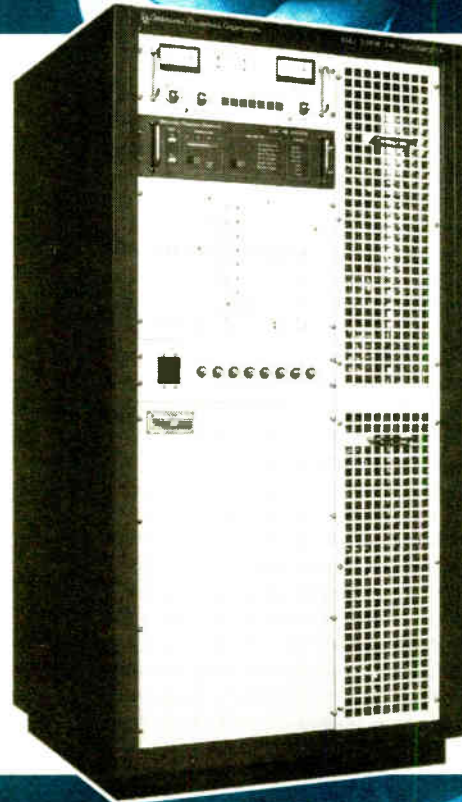
The Member Services division for the 538 member stations will also be reorganized. Designated customer service representatives will provide program marketing, fundraising support and promotion services tailored to individual NPR member stations' needs.

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Technology Marketplace Must Thrive

► continued from page 1

When it comes to radio, we need to figure out what are the fair rules of competition in the changing world and also what is the public interest stake in radio land.

RW: *The biggest fear in radio right now is that the advent of so much new technology could mean radio gets left behind. You are in the middle of a comment period right now for digital audio radio satellite. Is there anything you would encourage radio broadcasters to do in preparation for DARS?*

H: Yes. I think right now radio is a very strong industry, doing very well economically. Radio operators are holding a lot of high cards in the high stakes game of the communications revolution, but there is a lot to worry about.

But, we also can try to be sensitive to the competitive impact of this new technology. I personally think there is a very good chance that a national satellite radio service will intensify the inherent advantages of local markets that radio stations have. I hope that is true. We need to talk about that candidly with radio operators and that is one of the things I want to do at the World Media Expo.

RW: *And what about the progress of digital audio broadcasting? If, when all is said and done, all the data gathered and collected, you find that none of the in-band systems are that good, quite frankly, are you prepared to start again, look elsewhere, push for out-of-band?*

H: Well, we certainly could do that, but I have heard only positive things about the technological progress. People are giving me constantly optimistic reports and the commission has, quite intentionally, tried to structure the introduction of DARS with progress of

in-band digital because it makes sense for those two events to be unfolding at more or less the same time.

RW: *Recently, news reports suggest that some of our*



FCC Chairman Reed Hundt

Congressmen have been talking about doing away with the FCC or restructuring it. What you think the FCC's role is in our world today and in the future?

H: If the FCC did not exist, the public would want to invent it right away because someone has to advocate the public interest in the communications revolution. Someone needs to figure out how to get every classroom in the country connected to communications net-

works. Someone has to figure out how to get children's educational TV delivered free over the air so that even the one-quarter of our children who live in poverty could have access to it.

And someone has to figure out how to preserve competition in the local radio markets. I think it is silly to say 'Let the Department of Justice handle it' because that means, first let the competition be killed, and then let somebody who is the president of a dead business hire a lawyer to file a lawsuit in order to collect damages. How about if we just have a blueprint for competition so that it never gets extinguished?

That is the kind of job that the FCC should be doing — making sure that there is a blueprint that keeps competition alive even as technologies are constantly evolving and the businesses are constantly changing.

That is why our main concern right now with respect to radio competition is not only the satellite, but — very immediately — is Congressmen who go too far in precluding sensible rules with respect to radio ownership. I hope not, because

everybody in the radio business would suffer if the vigorous competition of today is replaced by over-concentration and domination by a few.

There are not many people who will deny that radio is a robustly competitive business right now. This is in part because of our rules. Our rules, like rules of a football game, let the players play, and they know what the rules are, they follow them and it is a fair fight.

It is not a fair fight if you drop all regulation, and you let the person who happens to have the most money on that day buy out all the systems and go too far and stop the competition, and replace it with a monopoly.

RW: *And what is the FCC able to do?*

H: We are still the watchdog with respect to national ownership caps and with respect to local competition. We will have to wait and see what Congress comes up with on both of these subjects.

But on a whole different topic, one that I think radio ought to be talking about among itself and expressing its own views about is this: How can radio deal with the degrading of our political discourse system?

There is an incredible volume of misinformation that is spread across this country. People in this country who are decent intelligent people are possessed of all kinds of utterly false fantastical concepts, and they are hearing this stuff in large part from the mass media. Now what can radio, which is a tremendous distributor of news, do about this?

And, how can radio reconcile this kind of responsibility to a certain public interest with such scenes as giving an

award to Gordon Liddy? How can you, if you are in the radio industry, deal with your own obvious desire to serve the public interest and your industry's truly bizarre commendation of this particular individual for statements that if your teenager were to make you would reprimand?

RW: *Are you talking about reinstating the Fairness Doctrine?*

H: No. I am saying, when is somebody from radio going to talk publicly about this? When is somebody from radio going to come in and tell me that they are a little sorry that this state of affairs is occurring and they have some ideas for dealing with it? And am I going to hear at this convention that there are people in the radio business who have some awareness of the disconnect between their capability to inform the country accurately and fairly, and the country's wild, fictitious, fantastical, conspiratorial suspicions that are promoted in significant part by radio?

I am not in the mode of saying it is my job to be the national nanny. I am in the mode of coming in as a supplicant saying: Do you all have any ideas?

RW: *OK. It is a very interesting parallel to the V-Chip and what they are doing on TV...*

H: It is a very accurate parallel, but I do not think that radio should let this dialogue go on to the point that people have to start talking about a H-chip that cuts off hearing of radio.

What we need is to hear from radio some evidence of self-awareness about this particular problem. Now, to give you an example, (Commissioner) Jim Quello has talked about editorial boards and ombudsman and self-correction techniques.

Does the radio industry have a basis for saying that it does those kinds of things? Does the radio industry have any thought about creating self-generated codes of ethics or accuracy in the media? I do not know the answers to these questions but I am saying to you that I am interested in hearing whether there are answers, or whether there are people seriously raising the questions.

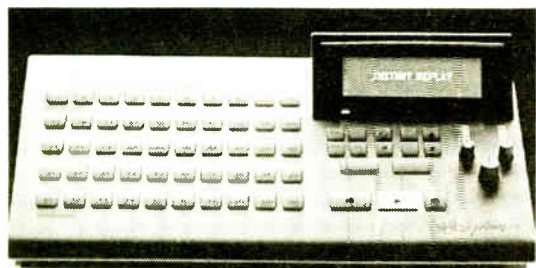
RW: *It is an interesting question. Back in the earlier days of radio it seemed that there was more self-policing, like when a Westinghouse would deliberately walk away from cigarette advertising long before you could not advertise cigarettes on the air. Maybe you will get some e-mail on it.*

H: That would be great! You know, I am a confirmed fan of radio. I remember putting it under the blankets and listening to it late at night so my parents did not realize that I was still awake; having it on in the car for the last 30 years and listening to pretty much every kind of station there is.

What is also true is that radio is a tremendous source of energy and it is a hugely important source of information, more now than ever before, except that a lot of this information is disinformation. I do not ever want to see us in this country be in a position where radio's audience finds radio content to be repugnant; where radio's audience feels that radio has become a fringe media because it is not expressing mainstream

continued on page 16 ►

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► continued from page 14

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We have plenty of channels — there is chance for every kind of mode of expression. There are plenty of chances for people to exercise free speech — that is not the issue.

The issue is: Is there going to be enough responsibility to exercise the right of free speech alone, but also to fulfill the duty of accurate free speech? What is radio doing about that? I have got to tell you, when radio is giving awards to G. Gordon Liddy for expressing advice about how to kill law enforcement officers this is not what I consider to be

responsive to this issue.

RW: *You have mentioned a couple times the information infrastructure. Let's talk about what is the role of broadcasters or what part will they play in that information infrastructure?*

H: When it comes to helping us teach our kids and raise our kids, broadcasters can have all the rule they want. We all have a problem in raising kids in this incredibly complex and challenging society.

It is a lot more difficult for kids now than when I was growing up in every conceivable respect. The world is more violent, the schools are in worse shape.

society's more complex, they have to learn more, this complete economy is more competitive, everything is frankly a lot more challenging, and we need every tool we can as a country to help our kids cope with this, and the tools of the electronic media are supple, flexible and wonderful to use if they are used right.

This is a great opportunity for TV and radio to help us all raise our children. Educational radio shows are particularly acceptable. Talk shows specifically designed for kids where they have a chance to express themselves are perfectly acceptable. PSAs on radio and on TV that help give kids some ideas of how to cope with this society are perfectly acceptable.

These are just some of the tools that broadcast TV and radio can give all of us

as parents and adults, and none of that needs to be dependent on the FCC becoming the Federal Criticism Commission. It is the type of activity that, if nothing else, ensures that those media continue to have their hold on the imaginations of the country.

We are in a situation right now in this country in which the activity of playing video games is now consuming as much or more of kids' time than their listening to radio or watching TV, with the exception of just one of the TV networks, that broadcasts a lot directed at children, and that's Fox. Video games are in effect like a network in terms of captivating kids' intelligence and interest.

That is really not something to be indifferent about if you are in the radio or TV business because it means you are losing the audience of tomorrow.

It also means that you are not necessarily losing it to a media that parents particularly love. This particular media of kids' video games is one in which sales for Mortal Kombat in this country annually are greater than all the sales of education software alone. I do not regard this as a positive fact for radio and TV as a business or a positive fact for the country as a parent.

It should be regarded as a challenge for radio and TV, let's get those kids back. Let's figure out how to deliver a product that interests them and at the same time provides benefits to their families.

RW: *I know that you are very proud of the fact that you sort of brought the FCC into the modern era. What can you tell us about that?*

H: The computerization and the networking of the commission is at least one of our tangible signs of progress. We are up to 14,000 Internet hits per day.

RW: *Are you getting the response that you hoped to?*

H: It is actually beyond what anyone had predicted. We did not realize just how wonderful it would be for all of us to be open to communication through these new tools, and we get all kinds of information that helps us shape our opinions.

It is just great to feel that we are more open to the public. Last night and tonight I was on-line for open conversations with anybody in the country.

RW: *You have a few more of those coming up, don't you?*

H: After tonight, the next thing we are going to do is have non-real-time conversations where we post a question on a bulletin board one day and then collect conversation.

That way I can come in on a regular Tuesday morning or Thursday night and participate in a discussion. I think that is another good technique (forum).

There is one downside that I should confess. This has completely eliminated all of my arguments at home against getting an ISDN Internet connection and new computers for the kids. So now I have to scrape up the money.

RW: *What is your favorite Washington radio station?*

H: I never like to pick favorites because it seems unfair and also because they change every week. I will just have to settle for telling you that I am an eclectic listener.

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page 29

Radio Greats Reunited On WCBS-FM Show

by Alan Haber

NEW YORK All the elements are nearly in place on this partly sunny morning: street vendors are getting ready to set up shop on their respective corners, where they will be hawking pretzels, jewelry, and cannot-live-without souvenirs of the Big Apple.

Still-sleepy mid-towners are pulling exercise pants and baggy sweatshirts over their pajamas and yawning as they make their way to their local newsstands for a copy of the Sunday New York Times; the heat and humidity are beginning to rise from the uneven sidewalks and asphalt and hover over the city streets.

It is another Sunday morning in New York. All the elements, and every one is equally important. Everything is basically the same as it ever was, except, perhaps, the faint feeling that something is somehow different.

If you were in New York City that 11th day of June, that ever-so-yet-not-so-typical Sunday morning, you might have angled your head a bit to just the right position and been able to pick up the feeling that, above the still-sleepy city

Something wonderful was transporting people back to their youth.

streets, something wonderful was happening, was transporting people back to their youth-confirming, quite possibly, that their youth was still with them.

Listen up, part one

Ed Baer, one of the original WMCA (AM) Good Guys, they of the coveted, yellow Good Guy sweatshirts, is sending out good vibes for two glorious hours of warm and fuzzy radio.

As the Buckingham's "Don't You Care," a top-10 hit in 1967, fades, Baer comes in fast and furious: "Here at CBS-FM, the Radio Greats Weekend, the Big Bad Baer, keeping you company till Triple D, Dandy Dan time at 10 o'clock this morning. Hey, I got some nice phone calls in." Who called? "Anthony in Flushing says great to hear me on the air," said Baer, with typical Good Guy warmth.

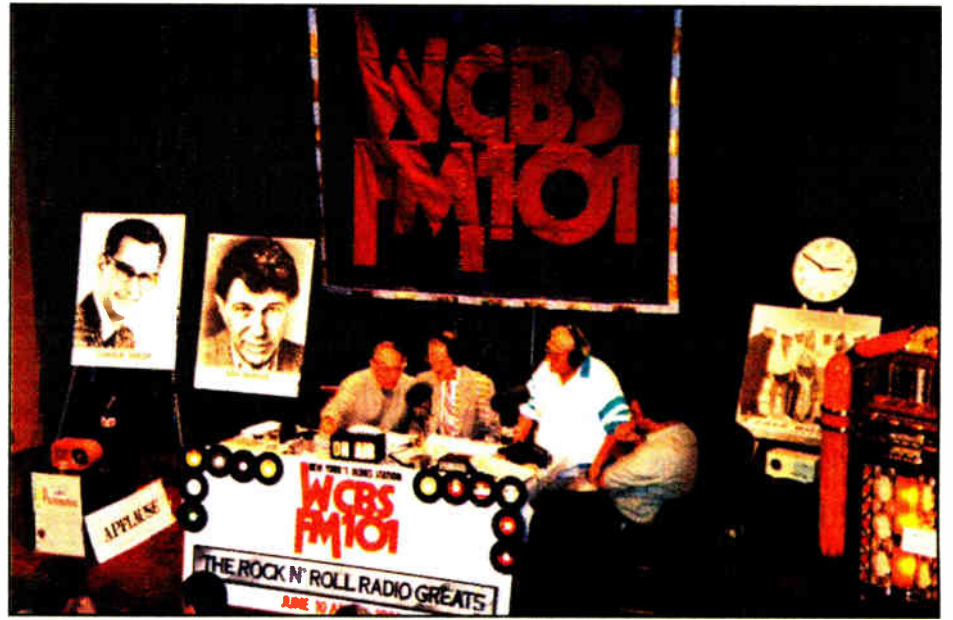
A couple of those custom positioners that rock groups used to cut for radio stations in the '60s — priceless remembrances from not so long ago — find their way into Baer's on-air mix.

"We're the Beach Boys," the group chanted in unison, "and we love the WMCA Good Guys." The Boys segued

right into an a capella take on their song, "When I Grow Up to Be a Man": "When I grow up with WMCA," they sing, in perfect harmony.

"The Ed Baer Affair," the Big Bad Baer proudly proclaims (these days, he is heard on WHUD-FM Peekskill, N.Y., where he is the King of the Hudson Valley), "Keeping you company on this Sunday morning, uptown, or, as we used to say in the Good Guy days, 'Don't put uptown down.'" It was like that in the '60s, when WMCA and crosstown rival WABC (AM) were in fierce competition for listeners.

continued on page 25 ►



WCBS-FM Program Director Joe McCoy (left) talks on-air with former WABC personalities Charlie Greer (center) and Herb Oscar Anderson (second from right).

INTERNATIONAL UPDATE

Combative Radio from 'Down Under'

by Max Thrower

BELLINGEN, Australia Australian talk radio has many forms but there is only one type that feels unique.

The sort where the temperament of the host swings unpredictably between barking mad and smoothly seductive.

The kind where a huge audience, whose average age is more than 45, is swept along on a wave of crude nationalism.

The type that often relies on heaping blame on welfare recipients for a morning ripe with entertainment.

The radio programs where you are not worth your salt unless you hold your opinions like a zealot.

"Nice" talk radio

Forget about nice Sandy McCutcheon broadcasting talk at ABC Radio National: "Thanks for those comments Geoff," Sandy might say after Geoff expresses some thoughts about the worthiness of corporal punishment.

Forget about Ian "Macca" Macnamara with Australia All Over, taking calls from Maree of Mount Hopeless: "It is a glorious morning here, Macca, and a flock of hook-billed parakeets just flew over," Maree might say. "Tell me were they red-tipped or spangled hook-billed parakeets?" Macca may ask in reply.

And do not even contemplate those earnest clergymen who respond to whatever dilemma a caller poses with an opener like "It is a problem, a very real problem. ..."

The true flavor of Australian talk is combative, provocative and emotional.

It is hosted by the type of middle-aged men that university undergraduates love to hate.

Ron Casey, who got into a fist fight on television with Normie Rowe, a Vietnam

veteran and publicly admired star of stage musicals.

John Tingle, who has taken a seat in the upper house of a state parliament as sole representative of the Shooters Party, an organization devoted to ensuring the right of every individual to do as much shooting, fishing and four wheel driving as is physically possible.

The "king"

The most famous of all Australian talk hosts, however, is John Laws, who is often called "king of Australian talk radio." His morning program is broadcast across the country, and

Laws' show always seemed to be the same: get rid of trade unions, less social security, eliminate blubberers who leech off society, the righteousness of hard work and money—all interlaced with Willie Nelson singing "America the Beautiful"—and a deeply romantic stance on male-female relations.

One day I asked a co-worker what she got out of Laws' program. "I just like the way he puts shit on people," she replied.

She did not care about his mellifluous voice or his volumes of love poetry; she liked the rude side, the verbal attacks on callers holding a different opinion, hanging up on people, the goading of the audience to obtain a response.



Semblance of reason

But modern times seem to be wearing down Laws and his ilk. The mood swings do not seem so radical, a semblance of reason can take over the programs for an hour or two at a time. It is almost as if they have all begun to shuffle on the edges of the middle ground.

Maybe the time has come when the crown will be passed to a new generation of talk hosts. A generation with opinions forged into the furnace of 1980s economic rationalism. A generation with enough unreconstructed testosterone to pass the weekend playing war games, armed with paintguns, in the freezing mud of the Snowy Mountains.

Why should the tawdry baton of talk radio not be passed on? After all without feral talk hosts to love and hate, people might take to discussing politics with their neighbors and loving and hating them instead. And that would mean social chaos.

□ □ □

Max Thrower is a creative and technical writer based in Bellingen, New South Wales, Australia. He can be contacted at fax: 61-6-655-2436.

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World Radio History

INTERNATIONAL UPDATE

Niche Players Thrive in Canada

by James Careless

OTTAWA Tune to CJVB(AM) in Vancouver, British Columbia, any morning, and chances are you will hear just another radio station playing the hits ... except, of course, that at CJVB the hits are in Cantonese.

There is a good reason for this: There are approximately a quarter-million Chinese living in the Vancouver region, many of whom are new immigrants that want to hear radio in their native language.

More importantly, their community is prosperous, said CJVB Vice President and General Manager Ed Ylanen. "Chinese programming has always been the engine that has driven the programming and marketing of the station," he said.

CJVB is what Canadians call an "ethnic radio station," one broadcasting in one or

more languages that are not either English or French.

It is one of 14 such stations in Canada, serving the large immigrant populations centered in Toronto, Montréal and Vancouver. In Canada, immigrants traditionally move to the big cities when they arrive, to integrate into existing ethnic communities. Toronto, for instance, has half a million Italians alone, making it the largest "Italian city" in the world outside of Italy.

Assigned frequency

Seven of these stations — including CJVB — broadcast like any other radio station, using an assigned frequency to reach their listeners.

The other half are what the government calls "Secondary Communications Multiplex Operations" (SCMO). They piggyback their signal onto a subcarrier of an

existing FM station. These signals can only be received using radios that are adapted to decode the subchannel. Such radios are often sold or leased by the SCMO stations themselves or via cable television.

As might be expected, the traditional-style broadcasters are much larger than the SCMOs. For instance, CHIN Radio, which operates both AM and FM stations in Toronto, employs 125 people. SCMO station CHCR Toronto, which broadcasts on the subchannel of CKFM, employs only 14.

Targeting the market

Although the languages may differ from station to station, the strategies employed by ethnic broadcasters are basically the same: identify the largest and most prosperous ethnic markets in the community and schedule news, information, talk and music in their native tongues at the best possible times.

Then set aside the less-popular airtimes, such as evenings and weekends, for smaller ethnic groups that have lesser potential to deliver audience levels that do attract advertisers.

Some small mom-and-pop SCMOs are an exception to this rule, choosing to focus on a single language. Larger ethnic broadcasters, however, tend to try to capture as much of the multilingual market as possible, boosting their advertising revenues to the maximum.

Programming on the stations depends on what the community wants to hear. CJVB, for instance, targets an upbeat

contemporary sound in order to win over sophisticated Chinese immigrants who have recently moved to Vancouver from Hong Kong.

CFMB 1410 in Montréal, however, relies on a more traditional middle-of-the-road (MOR) sound to serve its primary Italian audience, many of whom are older immigrants who have been in Canada for some time.

How stations like CHIN Radio produce their programming again depends on



Large promotions help stations like CHIN in Toronto draw audiences and advertisers.

audience size, said CHIN President and CEO Johnny Lombardi.

"We hire the people to do the regular programming that is on everyday. But anything that is weekend-only we work a deal with the producer," he said.

"We handpick these producers," Lombardi added. "We do not take just anyone off the streets. We check the communities and find out who is considered a personality and who can really bring the community together."

The result is that, when it comes to managing airtime, ethnic stations "do a bit of everything," as CFMB Programming Director Walter Centa said.

When it comes to selling advertising, Canadian ethnic radio stations face a significant handicap: They cannot rely on

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BOOK REVIEW

The Art of Broadcasting Sports Told by New Book

by Harry Heath

STILLWATER, Okla. Here is a book every wannabe sportscaster in the country will find both exciting and useful. And more than a few long-timers will nod in approval as well.

Its author, a high-energy broadcaster-turned-professor, has made a significant contribution to the literature of radio and television journalism. Professor John R. Catsis, the man who put it all together, teaches what he has written to a popular class in the School of Journalism and Broadcasting at Oklahoma State University.

"Sports Broadcasting," published by Nelson-Hall Inc., 111 N. Canal St., Chicago 60606, is just off the press. It will sell for about \$25, the publisher said, and one of its first appearances was at the annual meeting of the Association for Education in Journalism and Mass Communication, Aug. 7-12 in Washington.

My credentials for being the book's first reviewer? I co-authored its counterpart for print journalists years ago and I can tell you this is a more-than-worthy companion volume on any library shelf.

So much for background. Let's get on with the game.

I like what Catsis has done for several reasons. First, for the book's readable style. But equally important is the quality of the research in Chapters 1-3 and 5-8. It is original research. This is especially true of the first two chapters and Chapter 7. Information in these, to this reviewer's knowledge, will not be found between book covers anywhere else.

Marketing demands and logic as well call for the author to present thorough treatment of both radio and television in this first-of-a-kind book. He achieves this balance admirably.

The book's guts are its excellent chapters on sportscasting, play-by-play and color, but these are strengthened by well-rounded content covering the historical, business, technological and production aspects of the field.

Those who buy and read "Sports Broadcasting" will be delighted, too, by Curt Gowdy's introduction. To any but Johnny-come-latelies, Gowdy represents the best in

the business. He recounts highlights from the days when he covered six-man football in Wyoming to his work with Mel Allen for the New York Yankees and his later success broadcasting pro football.

But there are many other features that will attract sports buffs. In its 261-plus pages index, Sports Broadcasting includes numerous intriguing sidelights. They come in 46 different "Time Outs" ranging from anecdotes about Graham McNamee and Ted Husing to such topics as program notes, expressions made famous by sports announcers and clichés.

Special attention also should be called to the 42 well-selected photos and illustrations that brighten the volume, plus its many

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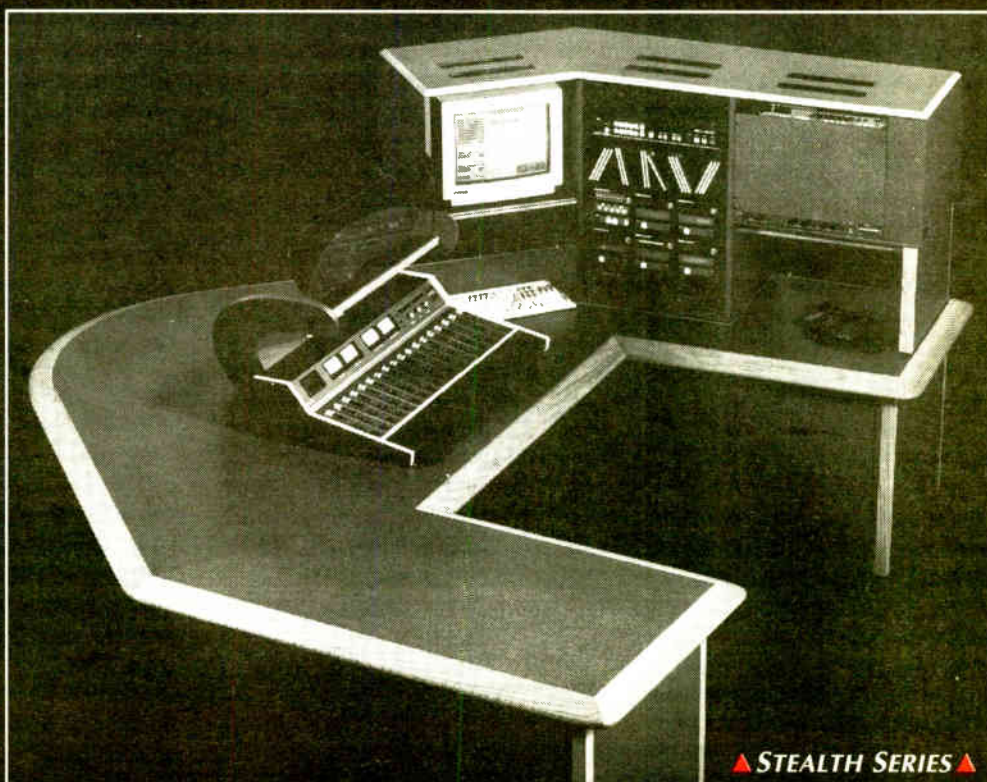
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Niche Programming Plays Well

► continued from page 19

Bureau of Broadcast Measurement (BBM) audience ratings, which often place them dead last in the market.

"Our one drawback that we are not measured by BBM," Lombardi said. "They cannot measure us properly because we have so many languages."

"At this point in time, BBM cannot measure an ethnic audience," said Ylanen. He said the problem stems from the fact that "their ballots are in English or French, and if BBM is going to approach an ethnic household, they have to get the ballot into the language of that household," something which is "very complex and very expensive."

Of course, it is one thing for ethnic broadcasters to denounce the BBMs, and claim their audiences are much larger than measured; it is quite another to convince sponsors to buy airtime on the basis of this argument.

So how do ethnic stations manage to sell advertising?

"What happens with our sales team is that we become preachers," said CJVB Sales Manager Niko Notaris. "We try to preach the ethnic word."

In Notaris' market, this means pointing out to advertisers that two out of every five people in the Vancouver suburb of Richmond are of Asian origin. It also means spending the station money on BBM-style surveys of the Chinese community. Notaris also holds up "examples of people who have advertised with us in the past, and it has worked for them," he said.

Big promotions

Meanwhile, CHIN Radio relies on big promotions like the annual CHIN International Picnic—a three-day event that Lombardi claims attracted more than 350,000 people this year—to demonstrate the station's presence in the city.

"We live on our promotional events," Lombardi said. "We use these events to promote our stations and satisfy a lot of sponsors who keep coming back to us."

The fact that CHIN itself has managed to stay in business for almost 30 years proves that Lombardi attracts advertisers to his station.

Still, most of the ads on ethnic radio tend to be for local business. That is because mainstream ad agencies in Canada

are just beginning to grasp the potential of the growing ethnic market, said Robin Glenny, vice president of new business development at the Radio Marketing Bureau.

Noting the change that is finally taking place, Glenny said, "I think they are now starting to develop some creative advertising programs that will look at specific segments of the market."

Market notice growing

Still, for Canadian ethnic radio stations, national advertisers remain a small part of their advertising revenues. "One of the biggest challenges we have had is to get the mainstream advertising community to understand that if a station has been around as long as we have (since 1972 in the case of CJVB)," Ylanen said, "we must be doing something right for the advertisers."

There is general consensus among those interviewed that, as a whole, the outlook for the ethnic radio market here is bullish.

"I think the market is growing tremendously," Glenny said. "As pockets like Vancouver continue to develop, it is going to become more and more important. (As well), I think we have evidence in Toronto, on the north side of the city with the explosion of the Chinese community here and the great concentration of ethnic groups in certain areas that they will play a greater role in retail and national business."

However, this growth poses a threat to ethnic stations that do not closely watch the demographics of their audience. That is because, while immigration remains strong, the ethnic groups coming here continue to change.

"Seven years ago we had one hour (of Chinese programming) a day," Lombardi said. "Now we have five hours a day. That gives you an indication how the demographics have changed in this area."

"We follow the market," he added with the wisdom of an ethnic broadcaster who has worked 29 years in the business. "As you see a slowdown in one (group), you pick up the slack by picking up Chinese or East Indian or others that are growing."

□ □ □

James Careless, an audio producer, covers the industry in Canada for Radio World. Contact him via e-mail at aa938@freenet.carleton.ca.

Art of Sports

► continued from page 19

tables, charts and graphs that strengthen points made in the text.

The author uses a creative approach in giving thanks to various experts who read the manuscript, answered questions and offered suggestions. He calls these people Most Valuable Players and lists them at the end of various chapters. Among these MVPs are Anne K. Elliott of Nielsen Media Research; Joe Commare, widely known for his technical work for ABC-TV and ESPN; Bill Teegins, sports director for KWTU Oklahoma City, and Dave Garrett, voice of the Dallas Cowboys.

As would be expected, many well-known sportscasters appear in the book, names such as Red Barber, Chris Berman, Harry Carey, Howard Cosell, Ernie Harwell, John Madden, Don Meredith, Dan Patrick and Dick Vitale.

The author writes from a solid foundation. He holds two degrees from the Medill School of Journalism, Northwestern University, followed by 30 years in a wide variety of broadcasting roles. Early in his career he handled football and basketball play-by-play involving several major universities, then continued his sports experience with KYW(AM) Philadelphia before moving to KPRC-AM-TV, the NBC affiliate in Houston. Also in Houston, he was with both KTRH-AM and KHOU-TV.

Catsis has served as executive producer for WMTW-TV Portland, Maine, and has been president and general manager of KIVA-TV (now KOBF) in Farmington, N.M., and KYKN-FM in Grants, N.M. In Santa Fe-Albuquerque, he was a stockholder and president of KIVA-FM. In each of these he was actively involved in the creation and production of sports broadcasts.

This wide background is reflected in the author's ability to make potentially confusing technical concepts understandable.

How to sum it up? Gowdy does it best with his opening statement in the introduction: "I wish I had this book when I was starting out in the business."

□ □ □

Harry Heath is professor emeritus of the University of Oklahoma.

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MANAGER'S NOTEBOOK

Start New Employees Off on Proper Footing

Making New Hires Feel at Home Is Only Part of the Process; Proper Training, Introductions Also Help

by Sue Jones

ROCKVILLE, Md. Let's say you have just spent two months searching for a new sales representative, engineer, or business manager and have finally found the perfect person with the right qualifications for your needs and with a desired salary within your range.

Finding this person took a lot of time and effort that left piles of work waiting on your desk. After completing all of the necessary tax forms and other reporting documents, your first response is probably relief that you have the job done and are ready to catch up on your regular work.

Actually, the job of recruiting and starting a new employee is only half done. To get it right, you have a few more things to do.

Introduction

Prepare a memorandum to be distributed to all staff members on the new employee's first day. Post it on a bulletin board for any absent or part time staff members. The memo should indicate the position the new employee will hold. You may want to indicate the employee's former organization prior to joining your team. List some

Prepare a memorandum to be distributed to all staff on the new employee's first day.

of the accomplishments or background information of the new person. Be sure to give a copy of the memo to the new staff member so they are aware of what the other staff members know about him/her.

As the general manager, personally tour the office and introduce each staff member to the new recruit. With this type of introduction, you can give the new team member some basic information about each staff member, such as their position and duties as they relate to the new person's job.

These types of introductions serve many purposes. They equally inform all staff members at the same time that there is a new team member and what that member will be doing. This eliminates speculation and gives your current staff some basic information about the new person to speed his/her assimilation into the station culture.

It introduces the new staff member with positive statements about why he/she is now with your station. It keeps the receptionist from telling callers the requested person does not work at your station. The caller may dial other local stations looking for the sales representative who called earlier about a special advertising package.

Your new employee will most likely be pleased that you took the time to write a memo on their behalf and/or personally introduce them to each staff

member. It will get your new employee off to a positive start with your station and the position.

Get work space ready

Showing the new staff member to the predecessor's work area is not adequate. If the work area had been previously occupied, remove any personal items that may have been left behind. Clean and organize the space. Your

new recruit will not be enthralled with a dusty desk punctuated with coffee rings, leftover mugs and stray papers.

Even if you explain that you have been too busy to get the area ready, it will send a clear message to the new recruit: "If I am not important enough to this organization to get a decent work area, why should I go to extraordinary lengths for this station?"

Check all of the office equipment in the work area to make sure that it is functioning properly including the telephone, stapler, calculator and computer. Replace or repair anything that needs

it, including the chair, before the new employee's first day.

Ideally, a job description should be given to employees on their first day. A well written job description will help define the position and give the new person direction. It should also identify the type of work that is required of the position. If you do not have formal position descriptions written, prepare a list of duties and responsibilities. This will reduce misunderstandings of your expectations of the position.

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Start New Hires On Right Track

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There are several benefits to providing a written job description on the employee's first day. It clearly identifies the duties that are expected, and the basis for evaluating performance. If no job description or list of duties and responsibilities are given, the employee could justifiably claim to have been unaware that specific duties were his/her responsibility.

Employee Handbook

Give the new employee a copy of the employee handbook. This would contain the personnel policies and procedures. A written employee handbook will save you

the time of explaining details about station benefits, business and travel expense policies, leave and personnel policies. It also provides complete and consistent information to all staff members about such matters.

In your haste to get your new employee started, you may forget to explain some very important information about holidays and pay policies that can cause confusion and frustration at a later date. Give the new staff member an office tele-

phone extension list of the station's personnel. This will be an important tool for the new employee to keep in fast touch with other staff members without having to walk to their work area. It will also help the new

A well written job description will help define the position and give the new person direction.

person to remember the co-workers' names. The new member should also receive an operating procedures manual, consisting of information on how to do specific jobs and tasks at the station. They have the written procedures on how to complete the standard tasks and staff interaction at the station.

Whether your station has an electronic security system or standard keys, be sure to give the new employee the necessary keys and passwords for security systems and devices.

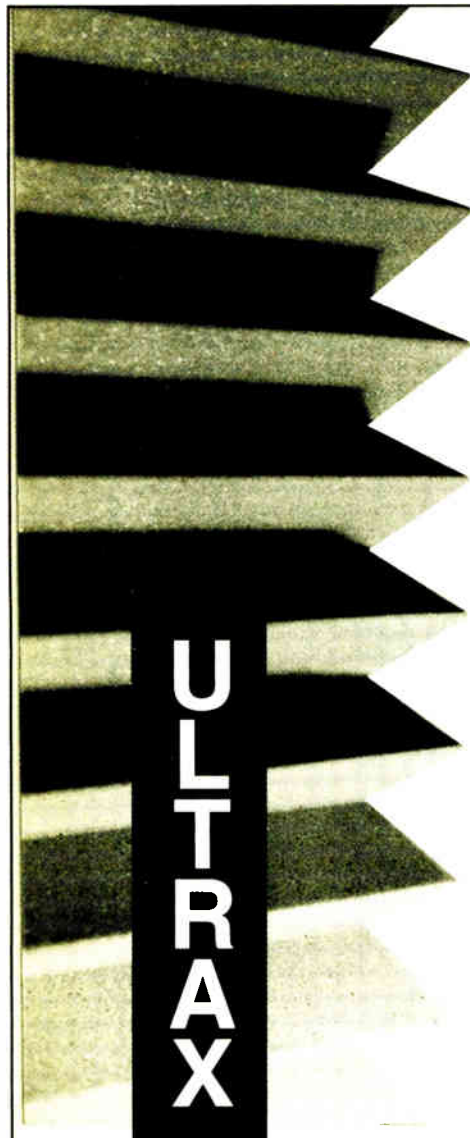
Make sure the new recruit knows where to find standard forms used in the station. The same is true for office supplies and equipment.

Finally, there is a new arrival checklist for yourself. Make up a standard checklist of items to be completed for each new employee. This is a repeatable process that should be completed consistently for each new person. The checklist will prevent overlooking an important item and help assure consistency.

As you can see, the more written material you have ready to give a new employee, the less time you will be required to orient the new person one-on-one which is a costly process. A little preparation the day before the new person arrives will help assure that all documents and information are provided in the most efficient way.

(Editor's Note: Job descriptions for the 10 most common jobs are available on disk from Performance Management at 703-323-0491.)

□ □ □
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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Web Site Slithers in Reptile Style

by Alan Haber

ALEXANDRIA, Va. What? You have not been acquainted with "reptile style"? You have not had the pleasure of decking yourself out in the latest lizard duds and swinging your tail through town as your adoring fans follow your every step?

That is one sorry L7, or square situation, dudes. Fortunately, Dr. Haberspace has the cure for your reptilian ills, in the form of KMKF(FM), Manhattan, Kan.'s "Rock 101.5" Web site <http://codrus.mmedia.com/KROCK/html/klineup.html>.

The 50,000 watt powerhouse, which hits listeners in northeast Kansas with a unique blend of "The Cutting Edge and The Classics that Count" is taking no prisoners with its wacky Web home.

You'll find all manner of wild stuff here, particularly if — while on the home page — you click on music director Raubin Pierce's name. You'll find yourself quickly transported to a black screen with the curious message "got to be quick to swim in these waters" emblazoned on top.

Truer words have never been spoken. Just beneath the message you'll find the word



"Hang." If you wait too long to click on the "Drop me a line" link, the words "on," "my" and "friend" appear next to "Hang," one at a time. You'll then find yourself in "Raubin's Oasis on the World Wide Web" (you'd actually wind up here anyway, but this is one heckuva clever way to get there.) Here, you'll find a list of cool links, and a page called "Mr. Mojo Risin's Other Lives," about Jim Morrison and the Doors.

Factor in regional concert listings and you've got a most promising site, which looks like it is currently under construction by KMKF.

So, forgive the mess while the K-Rockers come up with some other cool pages for Web surfers. And, put your hands together for this month's Neat Site.

If you're looking for a new business opportunity to tack on to your already busy, busy, busy broadcast-oriented day, look no further than the creation of Web sites for radio stations.

The Radio Advertising Bureau (RAB) and RadioSite recently threw their hats into the Cyberspace ring, offering Web homes to stations that want them. As noted recently here in *RW*, the RAB is doing the Web thing by offering turnkey sites to radio stations, group operators, networks and other organizations, all of whom must be RAB members.

RAB offers members as few as three and as many as 20 pages for their sites, which will reside on the bureau's server. A variety of packages will be offered to members, who

are charged a creative fee for the building of their sites, and a monthly fee for having the RAB maintain them (if they choose to go this route.)

Construction of the first RAB sites is slated for around Sept. 1. Call the RAB at 214-753-6700 for more information.

RadioSite is a new company that was in development with several radio station Web sites as this was being written. An attractive notice on the Web, at <http://www.radiosite.com>, lets potential station clients know about the opportunities that await them.

In developing their plans, RadioSite focused on two things, according to Bob Lion, vice president of marketing: providing

pages that are marketing-driven, in terms of their ability to reach listeners, and marketing-oriented, as they relate to creating revenue for stations.

Lion said that radio station Web sites that really meet the needs of their listeners are the sites that will be successful and get repeat business, in terms of repeat surfing.

RadioSite's service is structured toward the average computer user and listener. To do anything other than that, Lion said, "is to be saying to your audience, 'Unless you're really a Nethead, this page is not for you.' I think that any station that excludes its listeners in any way, shape or form can actually hurt itself more than help itself."

Information that listeners are interested in

will be on the Web sites created by RadioSite — news links for news stations, for example. Playlists and the latest on upcoming promotions are examples of station information that could appear — in other words, information that would be relevant to the "life of the radio station as it interacts with its listeners," said Lion.

There will be graphics on RadioSite's Web sites, but none of the heavy-duty variety: "Any graphic over 20,000 bytes won't be there," said Lion. This means download times will be quicker for Web surfers.

Revenue-minded stations might find opportunity with RadioSite's Web sites. Sign-in pages, for example, will be offered. "The database information from that alone is going to be valuable for all kinds of marketing things," said Lion.

And then there's advertising. The Interep
continued on page 29 ▶

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PROMO POWER

Brainstorm Your Way to Better Promos

by Mark Lapidus

WASHINGTON "Would you describe yourself as a person with an open mind?" I guess I answered "yes" too quickly because my interviewer removed his glasses, rubbed his eyes and asked the question with more emphasis: "Do you have a really open mind ... I mean ... suppose I told you that many of the things you think you know about radio programming and promotion are probably wrong ... and that assumptions you may make about audiences are off the mark ... how would you feel about that?"

"Wow," I thought, "this guy is one

intense general manager. If I get this job as promotion director, it is going to be a challenge." I must have muddled my way through the correct answer, because I was hired.

Greater understanding

It was several years later that I came back to this question with a far greater understanding of what he meant. His first point was that to be successful in promotion and programming, an open mind is the greatest tool. His second point about my perspective was also insightful.

As an industry, we do a terrible job training people for their positions. The

worst part is that if someone stays in a job long enough, he or she may begin to believe he knows exactly what he is doing even though he or she may have not learned it correctly in the first place. Before tackling the educational process, let's see if we can pry open our brains a bit.

Are people in radio promotion and programming more defensive, egotistical and territorial than in other industries? Probably. Otherwise, we would all be insurance agents! If every day at work is like a battle zone, consider that you could be at least a small part of the problem.

When you do something wrong, 'fess up. If you have started to work on a project that is not beneficial, be honest about it.

Anyone who is an ace at brainstorming sessions will tell you that in the process it is best to consider every idea a good idea. In this manner, you are likely to generate more ideas. Eliminating the bad ones is the easy part and is done after all the ideas are on the table.

Consider all ideas

If this concept is so successful with brainstorming, why not apply it to the analysis of other ideas that are thrown at you every day? Do not be so quick to toss out that little nibble of a promotion that was proposed by a sales assistant or an intern. Tell him or her you will think about it for awhile—and then actually do think about it.

It is not necessary that you be the person to dream up every concept your department executes. Do not be the person known as the "if he/she didn't think of it, we'll never do it" person. Instead, be proud of taking a concept generated by somebody else and molding it in the best possible manner. There are many ways to put your stamp on other people's concepts. Ironically, there are a lot of radio promotions and programs that we think are original, but have actually been done before.

Educational process

Now to the educational process. Sure, there are many in radio who have formal bachelor and masters and even doctoral degrees, but a vast majority of people still come up through the ranks. We begin with entry level jobs in an area of interest, like sales. The lucky among us are partnered with good mentors.

Those not so lucky either stumble along learning from their own mistakes, develop bad habits or get out of the business due to frustration. There is even a possibility that someone can remain in a position for so many years that he or she actually begins to believe that he knows everything there is to know about his or her position, but in fact, never learned the basics very well from the start.

Further complications

To further complicate matters: even with a good mentor, it is possible to learn everything well about your area of interest, but nothing about another aspect of the business. For example, many great programming people know nothing about sales and vice versa.

As station staffs combine with duopolies and decrease in size with automation and satellite delivery, this narrow approach to knowledge hurts each station and the radio industry at large. This lack of delivery ultimately creates misunderstandings about motive, development of station goals and can even make enemies of department heads.

How do we improve these conditions? Much of the solution lies with personal responsibility. If there are areas in your radio station you do not understand, gradually learn them. Pick departments one at a time and move forward. If you do not know how your salespeople sell time, go on a few calls; have them teach you how they use ratings; what cold calling and prospecting is like; how agency presentations differ from direct; and how commissions and collections work.

Conversely, salespeople should spend an
continued on page 33 ►



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Greats Gather at Oldies WCBS-FM

► continued from page 17

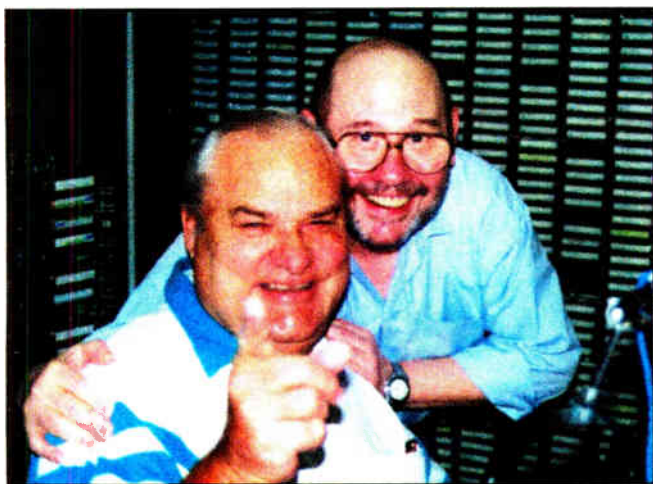
High atop the city streets, on the 17th floor of Black Rock, the home of CBS, the fifth Rock and Roll Radio Greats Weekend is in high gear, complete with custom positioners and jingles (It is the Rock and Roll Radio Greats Weekend!).

The music spans the A to Z of rock and roll radio, from doo-wop to punk and everything in between. Airchecks from the "good old days" at WABC and WMCA play throughout the two-day celebration.

Other radio stations around the country have done reunions, but WCBS-FM's are the marks by which the others are measured.

Reaction great

The reaction to the first reunion in August of 1984 was nothing short of extraordinary. Joe McCoy, WCBS-FM's



Former WABC personality Herb Oscar Anderson remembers the good old days with Ron Lundy (right).

program director and a "radio great" himself, said it "stopped New York cold." The phones did not stop ringing for days. "People called us up," he remembered.

"They laughed, they cried. We had people up all night taping. We had people who paid people to tape." Imagine: thousands of amateur pop culture archivists, all over the New York Metropolitan area, preserving rock and roll radio history.

"We had taxi drivers and people calling up saying they were not going to work that weekend," said McCoy. "I had a guy who called me on a Sunday. He just got back from England, and he said he made the taxi driver pull over to the side of the

High atop the city streets the Radio Greats Weekend is in gear.

road so he could find a phone booth. He said, 'How long have you been doing this?' I said, 'We started six o'clock Saturday morning.' And he said, 'God, if I knew this, I wouldn't have gone to England.'"

McCoy remembered that first reunion as if it were happening this wonderful weekend. "It was incredible," he said. "It was very emotional. These guys had not seen each other in years. And, you know, the ABC camp was in one room, the MCA camp was in another, just like the old days." Echoes of crosstown rivalries.

Remember the wild tales, the pranks pulled on program directors, the wacky DJ stunts? They evoke a time when New

York radio was as much as part of the area's residents' lives as their morning coffee and homework. Not that it isn't today, of course, but, somehow, it was different. Somehow.

"That is the fun part of the whole weekend, you know," said McCoy. "The stories are as much a part of the weekend as the music is."

Officially proclaimed

WCBS-FM's fifth Rock and Roll Radio Greats Weekend, commemorated with an official proclamation from New York City Mayor Rudolph W. Giuliani (Mayor Rudy, as Cousin Bruce calls him), has pulled together all the New York radio greats, thanks to the efforts of the station's first-class, devoted staff.

Some may, and have, called these weekends reunions, but, somehow, it is

weird to do that. Bruce "Cousin Bruce" Morrow, who is still sending warm feelings out to his fans in the tri-state area from behind his coveted New York microphone Wednesday and Saturday nights at WCBS-FM, doesn't think the word "reunion" is the way to describe the weekend.

"I just think it should be called the Radio Greats Salute," he said. "I've never cared for the word reunion, 'cause it is really not a

reunion. It is a salute to some of the radio greats. And it is really done for the audience. It is a fun thing."

Thinking of the audience

Ah, the audience. Finally, perhaps as it should always have been, WCBS-FM took its show on the road this time around, in addition to holding court in its own studios. The traveling was easy—just a couple of feet down the street to 25 West 52nd Street, to the Museum of Television and Radio's main theater. There, above the stage, hung a seemingly larger-than-life WCBS-FM banner. And some of the great radio personalities — Cousin Bruce, Big Dan Ingram, Herb Oscar Anderson (once the Morning Mayor of New York when he was on WABC), Charlie Greer, Chuck Leonard, Ron Lundy, Ed Baer, Dean Anthony, and, yes, Wolfman Jack, in one of his last personal appear-

ances — entertained New York area radio fans, in the flesh.

Throughout the weekend, other rock 'n' roll Radio Greats manned the microphones at WCBS-FM's studios, like Ted Brown from WNEW(AM), and Harry Harrison (these days, WCBS-FM's morning mayor, and a former WABC personality). Tributes to some of rock 'n' roll Radio's true pioneers, like the late Alan Freed, Murray the K, and former WMCA Good Guy Jack Spector, were also heard, evoking fond, treasured memories.

Dan Daniel, one of the original WMCA Good Guys, is celebrating his 35th year in New York radio; these days, he is at

country station WYNY-FM, where he makes the afternoons a happy place for New Yorkers.

"What a thrill it was to be on WCBS-FM doing my own show," he said.

The weekend was a real reunion for Daniel: "We get involved in our own lives, and we get involved in our own jobs," he said. "And to see each other in



Charlie Greer (left) and Ron Lundy (right) share a funny moment with Chuck Leonard.

this context is very special, because it actually does bring back the time when we were really together."

There was real competition back in the days of WMCA and WABC, and the WCBS-FM Weekend harkened back, in some small way, perhaps, to that time. And, sometimes, the competition was of the inner variety.

"When I came to New York, I saw that I was going to be on opposite a guy who is probably, arguably, the greatest top 40 disc jockey in the history of radio, Dan Ingram," said Daniel.

The powers that be at WMCA asked Daniel to call himself Dandy Dan, which he did. And Triple D. And This is Danny, and This is Dan, This is Dan Daniel, and This is Big Skinny, and The Tall Thin Texan—anything that would help (listeners) remember Dan Daniel, *vis a vis* Dan Ingram, said Daniel.

Is that so different from today? Perhaps not. But still, the times were different, and names maybe meant something more than they do today.

Making it

New York is very special. Just ask anybody. Or, just ask HOA, Herb Oscar Anderson.

"New York, New York, If I can make it there, I can make it anywhere," he sang. "What can I tell you? It is New York." HOA's daily rendition of "Hello Again" as morning mayor of New York on WABC. How could New York have had so many mayors? "Hello again, here's my best to you, are your skies all grey? I hope they're blue" — was like a slice of heaven, delivered via the airwaves to New Yorkers and everyone else within earshot who could hear the giant WABC bellowing out of their radios.

Simply stepping out of the elevator on the 17th floor of Black Rock (WCBS-FM's home) puts you squarely into the

thick of the Rock and Roll Radio Greats Weekend. A banner hangs above the elevator bank, heralding the event. Blow up cards, remembrances of previous reunions, signed by the personalities who made them so memorable and successful, hang in the lobby.

And, this morning, the halls are thick with the famous voices that made New York special. Charlie Greer, who made Dennison Clothiers famous with clever commercials read during his all-night show on WABC ("Money talks, nobody



A quartet of WABC veterans reminisce (left to right): Charlie Greer, Ron Lundy, Les Marshak, and Cousin Bruce Morrow.

walks"), is there. HOA is, too. And so is Joe O'Brien, one of the original WMCA Good Guys.

Ron Lundy, mid-morning man at WCBS-FM since 1984, with time well spent at WIL in St. Louis and at WABC is on the air in the WCBS-FM studios, 39 years after he began his career in radio (and 30 after coming to New York). He's reminiscing with Joe McCoy, and HOA. He is arguably the happiest man on the air in the radio universe, a man who looks like he is having more fun than anyone could ever possibly have. His trademark greeting, "Hello Luv, this is Ron Lundy in the greatest city in the world!" sends shivers up your spine every single time you hear it.

Walking down the steps leading to the



A quartet of WABC veterans reminisce (left to right): Charlie Greer, Ron Lundy, Les Marshak, and Cousin Bruce Morrow.

stage in the Museum of Television and Radio's main theater, Chuck Leonard, one of New York rock and roll radio's great voices, is greeted by thunderous applause.

"Dan Ingram probably explained it to me best of all," said Leonard. "When I had first joined (the WABC) staff back in the mid-'60s, Dan explained to me that disc jockies in New York come and go for two or three years. You don't become a New York disc jockey until you've been here between four and seven years, before you really qualify, before they

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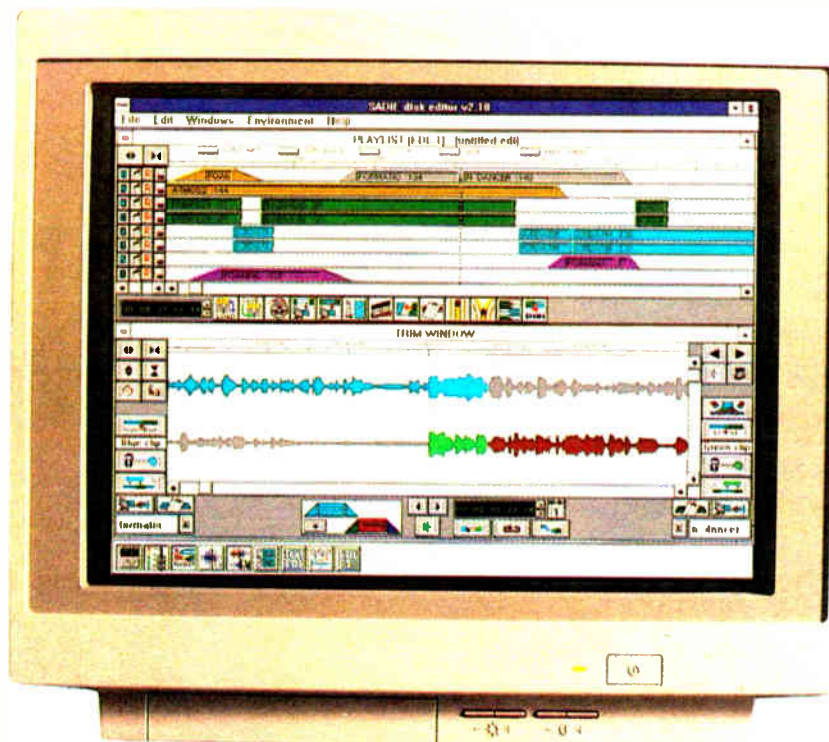
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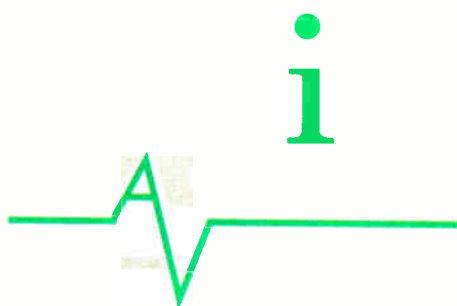
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See Us At WME Booth 255
World Radio History

Radio Greats Gather

► continued from page 25
really tag onto you.

"Once you become a New York disc jockey, you'll be a New York disc jockey forever."

Ingram told him, he said, that New York disc jockies are treated "something like the statues in the Guggenheim (museum). They move them around from place to place, but they never throw one out. So, consequently, once you get in, if you want to stay, you can find a way."

The curtain closes, 11 years after the first WCBS-FM Rock and Roll Radio Greats Weekend, and all that is left are the memories. The audience at the Museum of Television and Radio made this one special, said Cousin Brucie.

"The heart and soul of radio is the audience, not Cousin Brucie, not the transmitters, not the program directors. It is the audience. The audience is the heart and soul. And the idea of allowing them to come and participate, that is what made this one different. That is why this one will stand out in my mind," he said.

"Eight minutes before seven here on this Sunday morning with you, and our Radio Greats Weekend continues on

CBS-FM, 101," said the fondly remembered Ted Brown.

"Theodore David Brown, that is my name" said the familiar voice. "and if you're wondering what happened to me, well, you know, we were on WNEW, and then 'NEW was sold"

The former home of the great singers, from Sinatra to Streisand, is now a business station. "Ella Fitzgerald gives the stock market reports, and she's good at it, too, because she sings them," he joked.

Brown relates that he is now living in Jupiter, Fla., and that he misses New York.

"You miss the seasons and you miss the action, and you miss a lot of things," he

said before he imparted a piece of sage advice to his listeners, perhaps letting loose with the inevitable moral of the

Radio Greats Weekend:
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Brainstorm Promo Ideas

► continued from page 24

hour or two in a control room watching air talent work; learn how a music director spits out a daily playlist; how production is assigned; and the logic behind promotions, advertising and contesting.

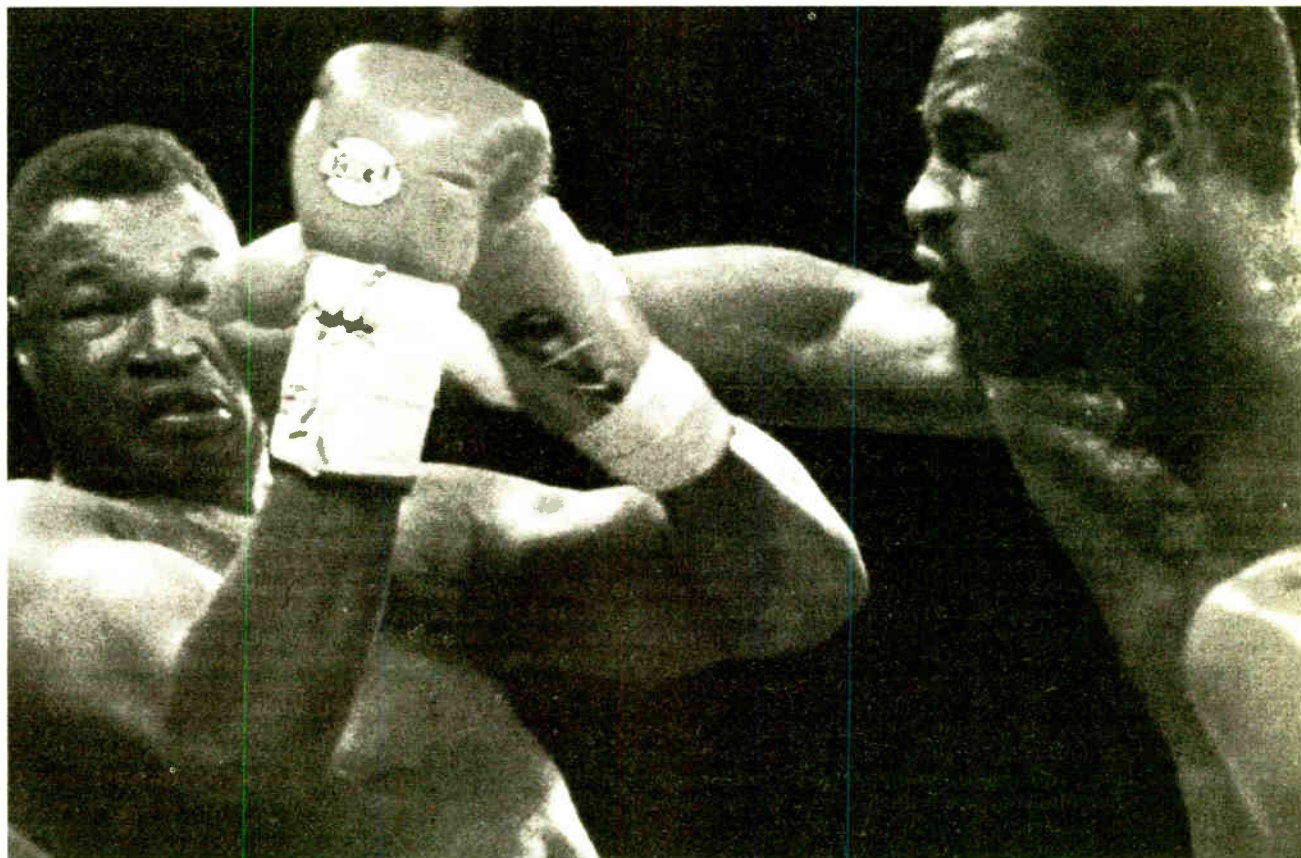
Have you ever watched an engineer set the processing for your station's sound? Do you know what processing is? Gradually move from department to department until you have worked your way around the station. Many people will say "who's got the time for this?" The truth is that only those who are well organized and motivated will attempt this exercise.

People who are truly well-rounded will be those with the greatest odds of success moving into the 21st century. Let's also make a point of seeing that when interns and entry-level people join us, they receive a well-rounded view of an operation.

I have more questions than answers about development on the job and the educational process. It is a heavy long-term subject and we mostly deal with the short-term in our business. The easiest solution is only to hire the best trained and open minded people. Will you be among those who fit the description 10 years from now?

□ □ □

Mark Lapidus is director of marketing for Liberty Broadcasting. Liberty owns stations in Washington, Baltimore, Richmond, Va., Long Island and Albany, N.Y., Hartford, Conn. and Providence, R.I.



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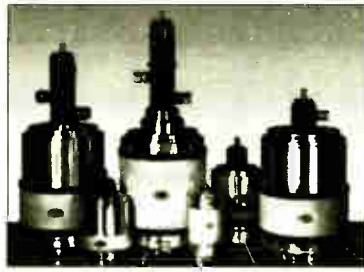
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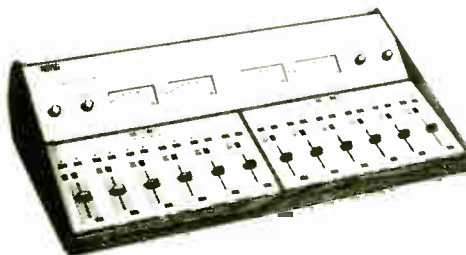
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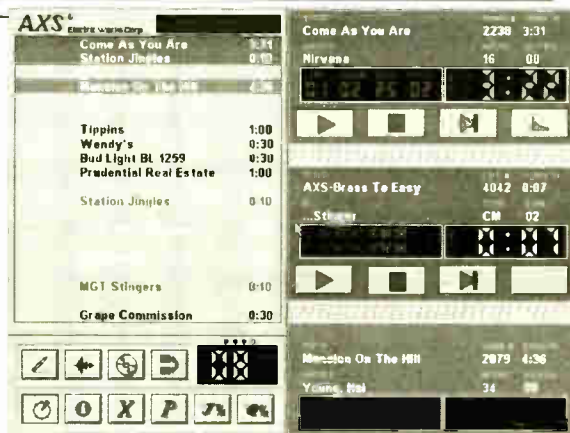
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READER SERVICE NO. 21

Spot Creation Deserves Attention

Part I

by Ty Ford

BALTIMORE At NAB '95, I was commissioned by NAB to present a paper titled "Better Profit and Ratings from Better Copy and Production." The paper was based on the concept that better management of the most dangerous part of a station's air sound — spot breaks — will result in reduced active and passive tune-out.

By reducing tune-out, the station gains quarter-hours and come. With better ratings, the station can charge more for its spots and thereby increase revenues.

I am happy to say that response to the paper was very good. It opened a lot of eyes and ears. It brought peoples' attention to one of the biggest problems facing commercial radio. A problem to which many in the industry have allowed themselves to become deaf.

Barely alive

About a year ago, I read an article in a media magazine titled, "Is Advertising Dead?" It sent chills up my spine

Slither in Cyber Space

► continued from page 23

Radio Store is RadioSite's exclusive marketing representative, and will be selling national advertising for placement on the sites. Interep will have its own home page on RadioSite's Web site, which will feature radio research, scripts and audio of Mercury Award winners and information on Interep's format networks. Stations will be able to sell their own local advertising on their sites.

"We don't want people to find [the ads] intrusive," said Lion. "The things that people don't like about advertising, let's say, in movie theaters, is that the ads don't necessarily relate to the experience."

So if you're on a music page, and you see something about Michael Jackson, it is considered relevant and is not thought of as an interruption.

A small, monthly maintenance fee will be charged to stations who sign up for a Web site with RadioSite. Stations can keep their site on RadioSite's server, their own server or parts in both locations, depending on their needs. Call Lion at 212-309-9090 if your station is interested getting on the Web.

Thanks to everybody who has been sending me e-mail about how much they like Haberspace; in particular, I'd like to recognize Joe Benson, a longtime RW reader who sent me a four pager-plus full of pointers to great sites and interesting ideas. I've been checking out some of the sites these e-mailers have been pointing me to. I'll run down a few of them next month.

Until then, Benson makes a great point: "There's a lot out there in Cyberspace," he wrote. "Radio needs to catch a ride on this big, big wave. It's the ultimate way to hang ten."

Right on, surfer dude!

because I had similar thoughts, although not as severe. It is true, many of the communications concepts, words, use of language, performance and production used in spot production have been inbred and discounted for so many decades that they have become, at the very least, less effective.

It is this way because of the "We've always done it this way" response. As a result, many radio spots have become parodies of themselves.

The production directors, creative directors and spot writers who are turning out this stuff are not doing their jobs. Too many are trying to hide the crap that's being written with ear candy. The solution to the problem is not a new sound effects package, or violating copyright laws by stealing sound bytes from TV show and movie soundtracks, those are just band-aids. The real solution, and it will be deemed as "too much hard work" by the stupid and lazy, will be to come to new terms with the language and its use.

I know you did not want to think about this, but you have to. While you are processing the denial phase, let's take a gentle historical look at the circumstances that have created the predicament in which we now find ourselves.

Beginning of the end

Throughout the '80s, Docket 80-90 gave most radio markets just the increased competition they had been craving, more stations in each metro area. At the same time, the unprecedented upward spiraling of station prices, fed by investors playing "hot potato" with radio properties, pushed debt services to unexpected heights.

As increasing debt services ate away at profit margins, broadcasters found that radio was no longer a "license to print money."

At the same time, other consumer diversions such as cable TV, DirecTV, digital cable radio, video games, on-line computer services and the Internet also were luring listeners away.

The largest and most profitable demographic of American humanity, the aging baby boomers—no longer as fascinated by music radio—was also facing recession and failed expectations as a result of the fact that too much of the business that happened in the 1980s was paper shuffling instead of real commerce.

Some said it was just a re-balancing of an out-of-control economy. Others claimed that there are just too many companies, products and services on the market, and because of that, advertising wasn't as effective as it used to be. At the bottom line, there were fewer consumers with fewer dollars, more places than ever vying for those dollars and more and more places for advertisers to spend their ad dollars.

Made harder

All of these things have made it more difficult for radio advertising to perform as well as it had in the past. Except for the top four or five stations in a larger or medium market, (ones with the biggest coverage areas), it

became a buyer's market, with ad agencies and direct clients looking for value-added reasons to make a buy.

What have the sales departments done? They've cut deals, circumvented the traditional client/ad agency/station chain by going directly to the client. The radio station sales department drags the promotions director and program director into meetings to try to come up with ways to keep the customer happy, without destroying the programming.

RADIO spots

This works until one day you happen to be in the car listening to your own station and you realize that it sounds like Irv's Discount Auto Parts owns your station, and the programming is starting to get in the way.

In an effort to stop the erosion, program directors resorted to negatively spotlight commercials by actively promoting how few of them would be heard. In effect, they were (and are) telling their listeners and clients that commercials are bad ... you wish you did not have to air them ... and you will do whatever you think makes your

listener believe that they're hearing fewer of them so your station will be perceived as having fewer of them cluttering up the air.

Crazy old uncle

Applying the classic sales strategy of eliminating the objections, and because they were not prepared to deal with the real and more complicated issues, radio began hiding its commercial inventory away like it was a crazy old uncle—a disgrace to the family, but what are you going to do?

Once on that slippery slope, the usual direction is down, which is where we are now. And when DAB becomes a reality, there will be even more choices for radio listeners. By the time we start seeing little stinger antennas on the new Lexus and Acuras for DAB reception, it will be too late.

However, the pendulum is starting to swing back. Competition for business among ad agencies has been as lethal to that industry as the increasing competition has been to the broadcasters. Like their radio counterparts, some agency creative types have also been hoeing the same row a little too long.

Tune in next time to discover why some stations are headed over a cliff, and how to make sure that station isn't YOOoooouuuu.

□□□

Ty Ford has an attractively priced three-cassette box-set of the almost two-hour long session from NAB '95. He may be reached at 410-889-6201 or Tford1010@aol.com.

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ROOTS OF RADIO

Big Band Remotes Defined Broadcasting Era

Radio Remotes During Big Band Era Helped Music, Artists and Stations Achieve Greater Popularity

by Richard W. O'Donnell

PORT RICHEY, Fla. Without radio remotes to popularize the Big Band sound, the Big Band Era probably wouldn't have been an era at all.

The remotes came from all over the country: from the Totem Pole, Frank Dailey's Meadowbrook, the Palomar, the

ular programs had gone to bed. They permeated the airwaves from 11 p.m. until the wee hours of the morning, and Goodman, Miller, Dorsey and all the other great names were featured, playing their very best stuff.

You would hug your pillow, while sprawled in bed, and, in the darkness, listen to the finest music modern America had to offer back then.

Music critic Stamford Young described the Big Band Era as "the glory days of popular music," and remarked that it would never be matched, despite technical advances in musical instruments and sound reproduction.

"In a way," he said, "I feel sorry for the young people of today. Sure, they've got their share of modern day musical heroes, and some of them are great. But the kids of today missed out on the Big Band vocalists... they missed the Dorsey Brothers, Woody Herman, Kay

Kyser and all the others when they were in their prime."

Critic Young said the big bands of yesteryear owe a lot to radio remotes. "There were live broadcasts from dance halls everywhere," he said, "and the young people stayed up late at night to hear them. Most bands lost money playing these remotes. They might have been on tour picking up more dough,

but the remotes were an opportunity to publicize their band names, and make themselves known."

That way, Young explained, "they could demand higher prices when they went on a tour of one-nighters. Radio remotes helped the bands to become famous. There isn't any doubt about that."

The King of Swing

It all started with the great Benny Goodman. His band launched a decade of swing, the Big Apple, jitterbugging, canaries, crooners, songs with wild titles, tender ballads and marvelous arrangements.

The Goodman band arrived on the scene in 1936 and took the nation by storm. Goodman was crowned the King of Swing, and he proved to be a mighty monarch. His clarinet became known to the nation as "The Licorice Stick," and it was featured on many late night radio remotes.

"Goodman was great," recalled critic Young, "but the nation would not have been able to hear his music if it weren't for the remotes. A band playing in a dance hall, or a big hotel, doesn't make much noise nationally, all by itself. The remotes made it possible for Goodman to be heard."

Another Big Band legend, Gene Krupa, was the drummer in the Goodman group. And Helen Ward, a vocalist for the group, was once rated one of the top singers of her day, although her name has since been lost in the musical shuffle.

Once it was launched by the radio remotes, the Big Band Era became a part of the nation's way of life. The bands hit their high notes during the Second World War, when departing servicemen would hold their girls close, during a final dance, before heading overseas. It was that way in all the Big Band films they made back then. It was that way in real life, too.

But we are getting ahead of ourselves. It was back in the '30s, thanks to remotes, that the big bands caught on.

After Benny Goodman came a magnificent array of musical talent. There was Glenn Miller, Artie Shaw, Woody Herman and the Dorsey Brothers. And Les Brown, Charles Barnet, Count Basie, Xavier Cugat, Duchin, Bob Crosby, Larry Clinton, Frankie Carle, Cab Calloway, Hampton, Heidt, James, Red Nichols, Ozzie Nelson, Sammy Kaye, Gene Krupa, Kay Kyser, Freddy Martin, Charles Spivak, Buddy Rich, Ray Noble and Ted Weems.

Then there were those two

great female orchestra leaders, Ina Ray Hutton and Dolly Dawn. Dolly Dawn led an orchestra called Dolly Dawn and Her Dawn Patrol.

The list seems endless.

Do you remember the songs they played? Do you remember "Cherokee" by the Barnet band? And Basie's "One O'Clock Jump"? And don't forget Tommy Dorsey's "Boogie Woogie." Or brother Jimmy's hit version of "Tangerine."

Or "Muskkrat Ramble" (Crosby); "Sunrise Serenade" (Carle),

introduced the great hits of the day. The thing that bothered me was the long ride home late at night. That was the rough part.

"Another thing: I used to wonder if what I was saying was making it out over the airwaves. Radio was young in those days, and I often wondered if all the wires were in the right plugs when I did those remotes. Still, all things considered, they were fun. I didn't think so when I was doing them, but, looking back, I had a chance to meet some of the really great names of the



Woody Herman

Glen Island Casino, the Palladium, Elitch's Garden and countless other dancing palaces across the nation, including a splendid array of the best hotels.

Usually they were hosted by popular radio announcers of the '30s, such as Martin Bloch, Jimmy Wallington, Harlow Wilcox, Don Wilson and sportscaster Ted Hussing. The shows were on late at night, after the reg-



Artie Shaw, shown with Lana Turner

"Smoke Rings" (Glen Gray), "Sentimental Journey" (Les Brown), "Minnie the Moocher" (Calloway), "Dipsy Doodle" (Larry Clinton), "Let's Dance" (Goodman), "Flying Home" (Hampton), and "Woodchoppers' Ball" (Woody Herman). And who will ever forget Glenn Miller's chugging version of "Chattanooga Choo-Choo"?

All of the hit songs of the Big Band Era bring back beautiful memories. Remember Doris Day singing "Sentimental Journey" with the Les Brown band? And Artie Shaw's "Begin the Beguine"? Don't forget Ted Weems' "Heartaches." Or Harry James' "Carnival of Venice" and "The Flight of the Bumblebee." What music!

Remote reflections

Most people remember Fred Foy as the narrator of the long-running radio series, "The Lone Ranger." But Foy also did his share of radio remotes along the way.

"If you were a staff announcer — and I was — you ended up doing your share of remotes," he once told an interviewer. "They were a fact of life. Late at night, you'd end up at some dance hall in the middle of nowhere, standing in front of a mic, attempting to sound wide awake as you

musical world. I was lucky to have done them."

Tom Hussey, who used to broadcast the Red Sox games, also did remotes for Boston stations during his early years on radio. "I remember a dance hall they had out on Huntington Avenue," he recalled during an interview years ago. "It was near Boston's distinguished Symphony Hall, only a stone's throw away. And it was near the radio station where I worked."

"Those Big Band remotes were a joy to do. It was at that dance hall on Huntington Avenue that Artie Shaw first made a name for himself. Until he did remotes there, nobody had heard his music to any great degree," Hussey said.

Crooners and canaries

Do you remember some of the great singers with the big bands? Who was Tommy Dorsey's male vocalist? That's right! His name was Sinatra. He also sang with Harry James for a while. Of course, Vaughan Monroe and Billy Eckstine had bands of their own. So did Art Lund. And Bob Crosby, too.

Merv Griffin was a vocalist with the Freddy Martin Orchestra. Perry Como was with

continued on page 32 ►

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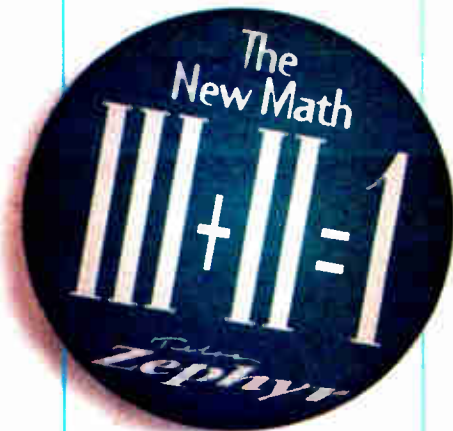
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Remotes Defined Radio

► continued from page 30

Ted Weems. Count Basie had Joe Williams and Kay Kyser helped Mike Douglas launch his career. Glenn Miller had a chap named Johnny Desmond singing with his band for a while, and Don Cornell started out with Sammy Kaye.

The Haymes brothers, Dick and Bob, established themselves during the Big Band days. So did Bob and Ray Eberly. Also Eddy Howard, Jack Leonard, Jimmy Rushing and Harry Babbitt. Don't forget Gordon MacRae; he arrived with the Big Bands too. And come to think of it, Bing Crosby even got his basic training with Paul Whiteman's Orchestra.

Then there were the "canaries," the female vocalists who made beautiful sounds. Doris Day is probably the most

famous canary of all. She sang with the Les Brown crew.

Another illustrious canary was Ella Fitzgerald, who was featured with Chic Webb's band, and is generally regarded as the greatest chirper of them all. Another great one was Peggy Lee, who served a hitch with Goodman.

Rosemary Clooney started with the Tony Pastor outfit, and Jo Stafford was a featured vocalist with Tommy Dorsey. Other popular female vocalists were Ginny Powell, Amy Arnell, Bea Wain, Helen O'Connell, Betty Hutton, Edythe Wright, Kay Starr, Mildred Bailey, Gloria DeHaven, Marilyn Maxwell, Sarah Vaughan, Anita O'Day, June Christie, Connie Haines, Dinah Washington, Billie Holiday and Lena Horne.

All of the really big bands had radio shows during the '40s. The most popular was Kay Kyser and his Kollege of Musical Knowledge. Remember that one? Remember the Fitch Bandwagon? And Horace Heidt's Pot of Gold? Hal Kemp, Miller, James, the Dorseys, Shaw, Herman, Goodman, Frankie Carle and Larry Clinton all had their own shows. These were not remotes, it should be emphasized. These were sponsored shows featuring the big names.

Back to the remotes

But let's not forget those radio remotes. A lot of big names got their start on them as announcers. They included Steve Allen, Paul Douglas, Den Seymour, Harry Von Zell, Durwood Kirby and a chap named William Saunders who did hundreds of them.

Saunders, who worked the New York area, opened his remotes by inviting

listeners to be "serenaded by the sweet strains of Guy Lombardo and his Royal Canadians coming to you from the beautiful Roosevelt Grille in magnificent downtown New York." His flowery openings were adopted by countless announcers on other stations.

The big bands could be heard regularly on CBS, NBC—when it had both the Blue and Red Networks—and especially the Mutual Network, which, at the time, had more stations than anybody else.



Tommy Dorsey

Local stations also had their own remotes.

When did they fade from popularity? Probably in 1941, when the networks were involved in a dispute with ASCAP, the American Society of Authors, Composers and Publishers. ASCAP wanted more money for allowing its music to be played on the airwaves, and the organization had all the big-name composers as members.

The networks refused to budge. Yes, there were still Big Band remotes, but old songs such as "Yankee Doodle," "My Old Kentucky Home," "London Bridge" and other vintage favorites had to be played. In most cases, the bands could not even play their theme songs on the air.

Lost in the battle

As a result, the remotes lost their audiences. And they were soon dropped from station schedules. A year later, when the dispute was settled, the nation had other matters on its mind. We were at war, and most of the Big Bands were in Hollywood making films.

In time, the Big Bands faded away, primarily because the big names in the industry either retired or passed on. But you can still hear the Glenn Miller Band, or The Dorsey Band or some other group in concert. Most are led by musicians who appeared with the bands or have some name value.

Sadly, most of the musicians pumping out the old songs were not even born when the music was first played.

For the most part, the Big Bands are gone. The glory days are over. They are a fond memory.

And so are the Big Band radio remotes.

□□□

Richard O'Donnell is a semi-retired writer living in Florida, who formerly wrote an "off-beat" news column for the Boston Globe. Reach him care of RW.



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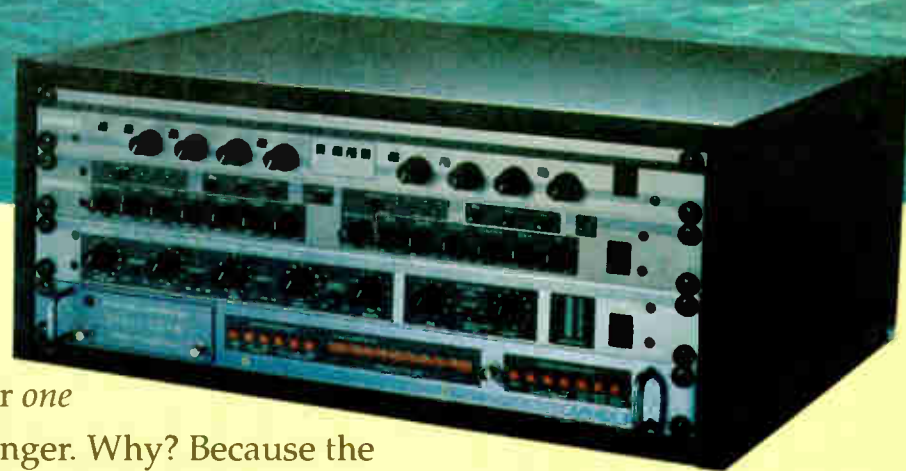
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COLE'S LAW

Supreme Court Calls for 'Strict Scrutiny'

Recent Supreme Court Decision May Have Effect On Commission's Existing Employment Rules

by Harry Cole

WASHINGTON Big legal news of late came from the Supreme Court, with the overruling of Metro Broadcasting Inc. vs. Federal Communications Commission (FCC).

Students of this kind of thing will recall that, in its 1990 decision in Metro, the Court upheld the FCC's minority ownership policies against the claim that those policies were unconstitutional reverse discrimination. Now, a scant five years later, in a case called Adarand Constructors Inc. vs. Peña, the Court has effectively thrown that earlier decision out. This could have far-reaching effects for broadcasters.

Deferential to FCC

In the Metro case, the Court held that the FCC's minority ownership policies concerning comparative preferences, distress sales and tax certificates were constitutional. In doing so, the Court applied a standard of judicial review that was extremely deferential to the FCC (and Congress, which had effectively endorsed the FCC's programs). The Court concluded that, even if the policies at issue discriminated on the basis of race, those policies could survive if, 1) they were directed to some important goal, and 2) they were motivated by some "benign" purpose. The Court characterized the FCC's stated interest in promoting diversity of programming as an "important" goal, and concluded that the purpose of the policies—to increase minority ownership of broadcast stations—was appropriately "benign."

The Court's adoption of a very deferential standard of review was novel. Historically, when confronted by a governmental policy which, on its face, runs directly contrary to specific constitutional direction, the Court has applied a tough standard of review, known as "strict scrutiny." That standard is based on the notion that, when the Constitution says that the government cannot do something and the government tries to do it anyway, the presumption is that the government really cannot do it. That presumption is rebuttable by the government, but it is definitely an uphill battle. The apparent abandonment of the strict scrutiny approach was by far the most noteworthy aspect of the Metro decision.

Overruled

Now that aspect has been overruled. In Adarand—a case involving federal set-asides in the highway construction business—the Supreme Court specifically admitted that it had been wrong in its choice of standard of review in Metro. Henceforth, race-based government programs, both state and federal, will be subject to strict scrutiny analysis, according to the Court.

"So what?" you may ask. After all, the FCC's minority tax certificate policy has already been killed by Congress, the minority comparative preferences are all on hold while the commission tries to come up with a substitute for its former

"integration" criterion, and it has been years since the FCC designated any incumbent licensee for noncomparative hearing, a *sine qua non* for invocation of the minority distress sale policy. So what difference will the new standard of review make?

Well, sure, the minority ownership policies may already be effectively dead. But what about the commission's EEO

The Court's adoption of a very deferential standard of review was novel.

rules? Those appear to be race-based policies. One would think that they, too, should be subject to the same strict scrutiny analysis.

This does not mean, of course, that the EEO rules are automatically unconstitutional. As indicated, even if they are challenged in court and subject to strict scrutiny analysis, they may still be successfully defended if they are designed to achieve a "compelling" governmental interest and if they are the most "narrowly tailored" means available of achieving that interest (i.e., if no non-race-based alternative exists which would achieve the same goal). But, in the case of the FCC's EEO rules, that would be a hard test to satisfy.

Collectively innocent

First, the courts have found that race-based rules or policies are alright if they are designed to correct specific situations where discrimination has been found to have occurred. In other words, the remedying of a past discrimination is an appropriately "compelling" governmental interest. But that does not help the FCC's EEO rules, because there has never been any finding that the broadcast industry as a whole has been guilty of discrimination. Perhaps an individual broadcaster here or there may have discriminated, but that does not support a nationwide, industry-wide indictment of broadcasters.

In this context, it is also important to note that the courts have specifically rejected the facile suggestion offered by some that the mere "under-representation" of minorities reflects some historical, societal discrimination that can be remedied. The courts will not assume that affirmative, unlawful discrimination is the reason that employment statistics may not happen to match up with population statistics.

Because, as far as we know, neither the FCC nor any other agency or court has found that the broadcast industry as a whole has been guilty of discrimination, it would appear that the commission will not be able to claim that its EEO rules are aimed at the "compelling" goal of remedying discrimination.

Of course, the FCC could claim that the compelling goal of increasing program diversity somehow supports its

EEO program. Even if we were to assume that program diversity is a "compelling" governmental interest, this claim would still run afoul of the second element of the strict scrutiny test.

Recall that element requires that race-based policies be "narrowly tailored" to achieve the desired goal. But it is difficult to see how EEO policies could be said to be narrowly tailored to advance the notion of "program diversity." This is especially so when the FCC has historically assumed that program diversity

are the most "narrowly tailored" means of supposedly achieving the same result.

Another component of the "narrow tailoring" factor assesses how long the race-based policy will have to be in place. Race-based policies that need be in effect only a short time are obviously preferable to longer standing ones, and even more preferable to open-ended ones. Here the FCC's EEO policies again fall seriously short. As matters now stand, those policies could be on the books forever: the FCC appears never to have even considered under what circumstances the EEO rules might become unnecessary.

Final analysis

The bottomline is that, if the FCC's EEO rules were subject to judicial challenge under the "strict scrutiny" analysis which the Supreme Court has held applicable in such cases, a reasonable argument could be made that those rules should not survive. Whether anyone will try to make that case in court remains to be seen.

If you have any questions about this development, you should be sure to contact your communications counsel.

□ □ □

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

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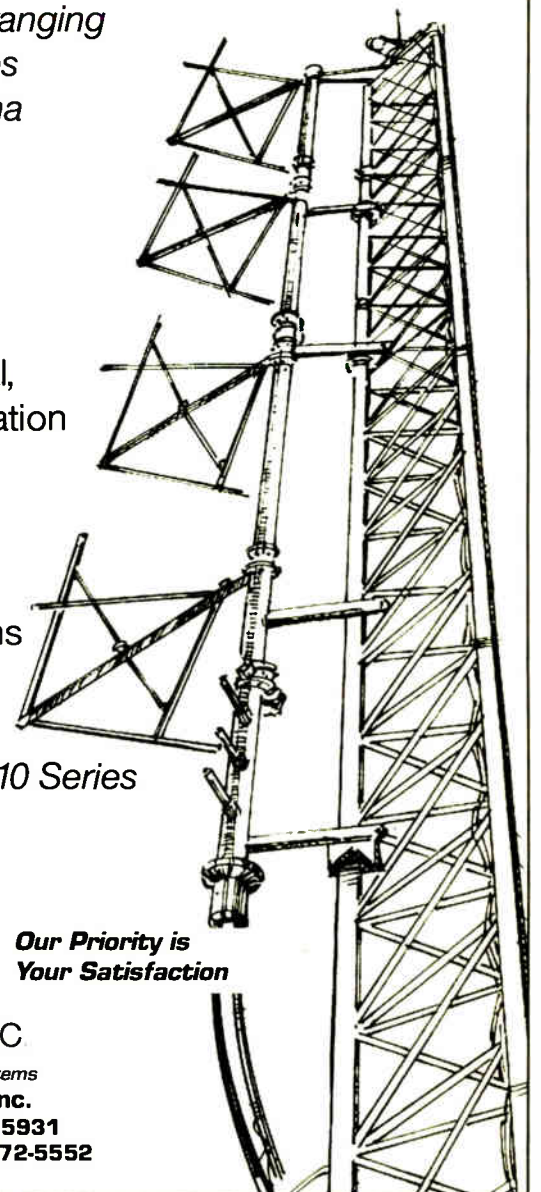
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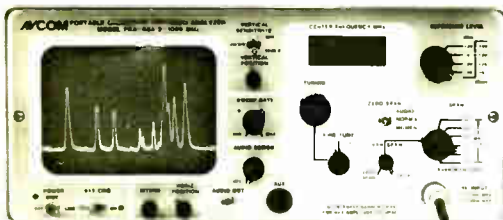
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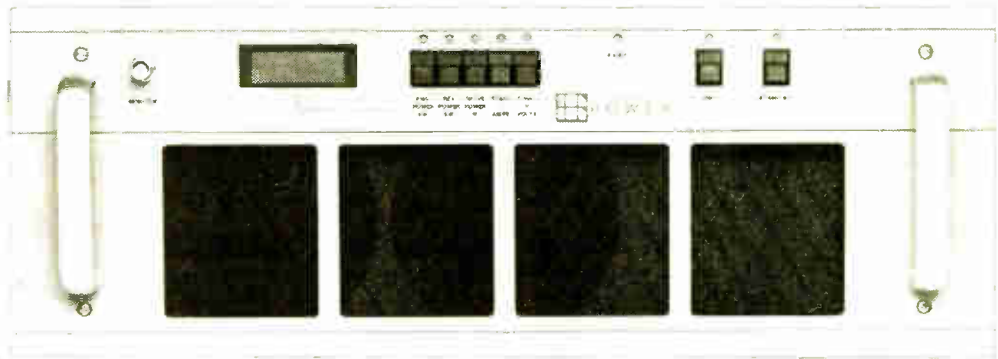


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RETRO RADIO

Early Modulation Experiments Used Carbon

by Ron Pesha

QUEENSBURY, N.Y. Like telegraphy, early radio transmitted only dots and dashes. Turn the transmitter on and off with a key and you have code. But the public required voice and music before broadcasting could develop.

Lacking amplification, early experimenters devised modulation systems interesting for their basic design by our standards.

Lets look at some of those schemes as detailed in the book "Radio Telephony," by Professor Alfred Goldsmith, published by the Wireless Press of New York City in 1918.

Pioneers first transmitted voice by simply wiring a carbon mouthpiece in series between the transmitter and the antenna. The mouthpiece resistance must equal the antennas combined radiation and ohmic resistance for maximum modulation. But the common telephone mouthpiece dissipates only about 2 watts safely.

Increase the RF, and the carbon granules heat and pack. Tap the microphone to free them. Lee de Forest and others devised mechanical tappers. But much higher power required microphones of vastly enhanced heat dissipation. One system involved large numbers of individual carbon microphone elements fed via tubes from a horn into which the announcer spoke. The engineers connected the individual microphones in series-parallel to maintain a matching resistance.

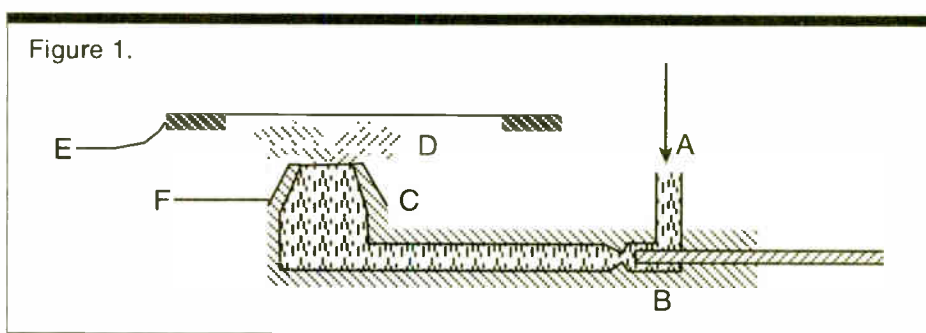
Then they tried cooling the microphone with oil that circulated between the carbon granules and a finned radiator, first

by a larger or smaller capacity (which capacity is, in effect, parallel with the antenna capacity). This effect may be considerable if the antenna capacity is small.

Fessenden had invented frequency modulation two decades before Edwin Armstrong!

Actually it is not FM but PM, phase modulation, because percentage of modulation rose 6 db per octave. The book makes no mention of this rising characteristic, for surely the ability to transmit sound at all negated any concern about the flatness of frequency response.

Perhaps readers with legal knowledge can let us know if Armstrong infringed on the earlier work, for Fessenden frequently



was involved in patent litigation.

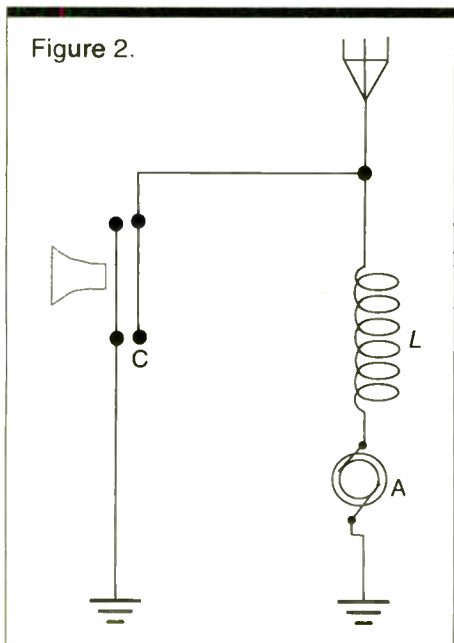
Ronald Pesha was a chief engineer in commercial broadcasting for 17 years and

is now associate professor of broadcasting at Adirondack Community College in Queensbury, NY 12804-1498. He can be reached at 518-743-2200, ext. 567.

Call the Pioneers!



Courtesy, Colorado Historical Society F20.275



passively, and then actively pumped. This led to the liquid microphone in Figure 1.

A pump directed a jet of conductive liquid onto the microphone diaphragm, the liquid substituting for the carbon particles. The vibration of the diaphragm varied the length of the jet, and hence its resistance, at an audio rate. The liquids constant replenishment carried the heat away. Such a microphone could modulate 400 watts and more by 1910.

Physicist Reginald Fessenden made the first audio broadcast ever (and played a violin solo himself!) on Dec. 24, 1906. Fessenden, holding patents in greater number than anyone except Edison, also invented a condenser transmitter shown in Figure 2.

The microphone will, according to the book, detune the antenna by shunting the coil L and the radio frequency alternator A

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BOTTOMLINE BROADCASTER

Measure Transmission Line with Resonance

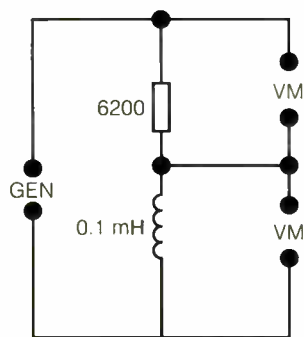
by James R. Murphy

MORGANTOWN, W.Va. If you are a broadcast engineer, sooner or later you will need to measure the length of a transmission line or the value of an RF component. Perhaps you suspect water in a feedline, or maybe a capacitor value needs to be checked. Having some simple equipment prepared may speed up your work in finding the problem.

The tools and equipment for these tasks vary widely. For instance, if a transmission line rests on top of the ground, you will need only a tape measure. If the line is buried in a shallow trench, all that is required are some out-of-work pyramid builders to dig it up. For this, in addition to the tape measure, you may need a case of beer, or maybe some silver coins to pitch to the exhausted crew.

For lines deeply buried or otherwise totally inaccessible, you will need to revert to more sophisticated measurements. One popular scheme requires your brother-in-law to wet his fingers and grab one end of the line. Then, place a voltage at the other end and measure the time before he jumps and makes nasty gestures at you. Applying the speed of light,

Figure 1.



reflex time, and the velocity of sound can yield a fair approximation of the line length.

Better ways

But believe it or not, there are other ways to determine an unknown line length or component value. If you eliminate buying or renting a time domain reflectometer (TDR) at about \$800, your options are limited. But you can still fig-

The tools and equipment for these tasks vary widely.

ure out these values with reasonable accuracy.

Method number one is the quick and dirty way. The accuracy suffers a bit, but it can yield a ballpark figure as well as teach the user something about resonant circuits.

Refer to Figure 1. If you connect a reactance and resistance in series, and drive the loop with an AC signal, the voltage distribution can help determine the reactance of the circuit. Using the values shown with a 1 MHz signal, the 1 mH coil has a reactance of about 200 ohms. If the resistor is 6,200 ohms, the signal voltage will divide equally across the two components.

Turning this around, if you replace the fixed resistance with an adjustable type, and set it for a voltage equal to that dropped across the unknown reactance, you then know the value of that reactance by measuring the resultant resistance.

Because you are working with small signals at high frequencies, the most practical measurement device for this is the oscilloscope. The scope's high impedance will not load the circuit, and even the most economical unit should

have enough response and sensitivity to read the results with reasonable accuracy.

Figure 2 suggests a circuit to accommodate a range of reactances. Before determining the branch resistances, you should have a rough idea of the readings to be dealt with. As an example, a 1 mH coil has a reactance of 1,600 ohms at 1 MHz, but a .001 μF capacitor has a reactance of only 160 ohms. This means if you are reasonably sure you are measuring capacitance, you should lower the frequency to perhaps 0.1 MHz to place the values in a more workable range. If the values indicate so, you can even use audio

frequencies, or 60 Hz.

In operation, you should adjust your generator's frequency as accurately as possible, then switch and adjust your controls for a reading of equal amplitude.

Then, measure the resistance, and you will have your unknown reactance. From there, you need only plug in the formula values to determine capacitance or inductance values. As a reminder:

$$C = \frac{1}{2\pi f X_c} \quad \text{and} \quad L = \frac{X_L}{2\pi f}$$

Resistor values

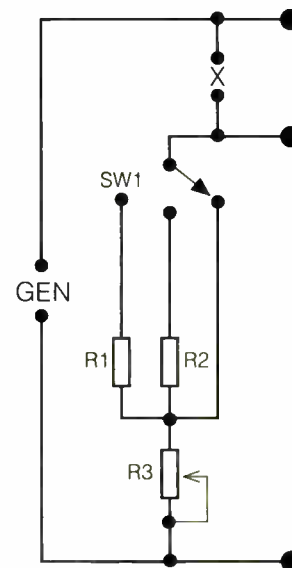
R1, R2 and R3 can vary widely.

Inductive reactances can be upward to 5,000 or 6,000 ohms at 1 MHz, and even when lowering the measurement frequency, capacitive reactance can be very large.

A handy range of values would be 1,000 ohms for R1, 500 ohms for R2 and a 500 ohms potentiometer for R3. You could then measure up to 500 ohms with R3 only, up to 1,000 ohms with R2 switched in and up to 1,500 ohms with R1 in the circuit. You could, of course, add more resistors to give you greater range. Just keep in mind that the pot needs to have a range to cover the incremental steps. If you build this, keep in mind you are dealing with RF frequencies, so you should keep all leads short and make the project as small as you can. Also, to read across the unknown reactance, you will need to isolate your scope otherwise you will short out the resistance section. To keep your readings as stable as possible, keep your hands away except when making adjustments.

RF transmission line lengths can be measured using the same principles. It is only necessary to point out some line characteristics. Remember that a quarter-wave segment displays opposite impedances at each end: if you short one end, the other end appears open at RF frequencies. If you open one end, the other end displays a short. In a half-wave transmission line segment, opposite ends are identical. A short at one end results in a short at the other. By opening one end, a high impedance should be detected at the other. These basic characteristics can help us determine the distance to an open or short,

Figure 2.



thereby determining line length.

Before attempting the measurement, make sure your transmission line is completely open at the far end. Also ensure that nothing is connected at the near end other than your test equipment. If the transmission line is good, we should see a short at the near end at a frequency which calculates as the quarter-wave length.

Figure 3.

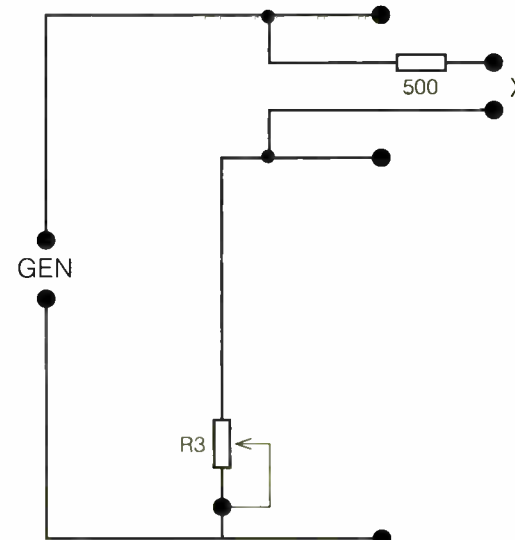


Figure 3 shows the components needed to make a measurement. By placing a build-out resistor and setting our standard (R3) for the same value, we can then adjust the generator's frequency until both have equal voltage drops. At higher frequencies, we will have inductive reactance in series with the build-out, and below we will see capacitive reactance. Only at the quarter wave or half wave frequency will we see a zero resistance at the point where the transmission line connects.

Once this frequency is found, we can calculate the distance to the open, which is either a quarter-wavelength away, or a short one-half-wave distant. Of course, there are multiples of these lengths which will yield the same results. However, we would not expect to see a three- or five-quarter wavelength in a normal antenna field, since their lengths would be many

continued on page 44 ▶

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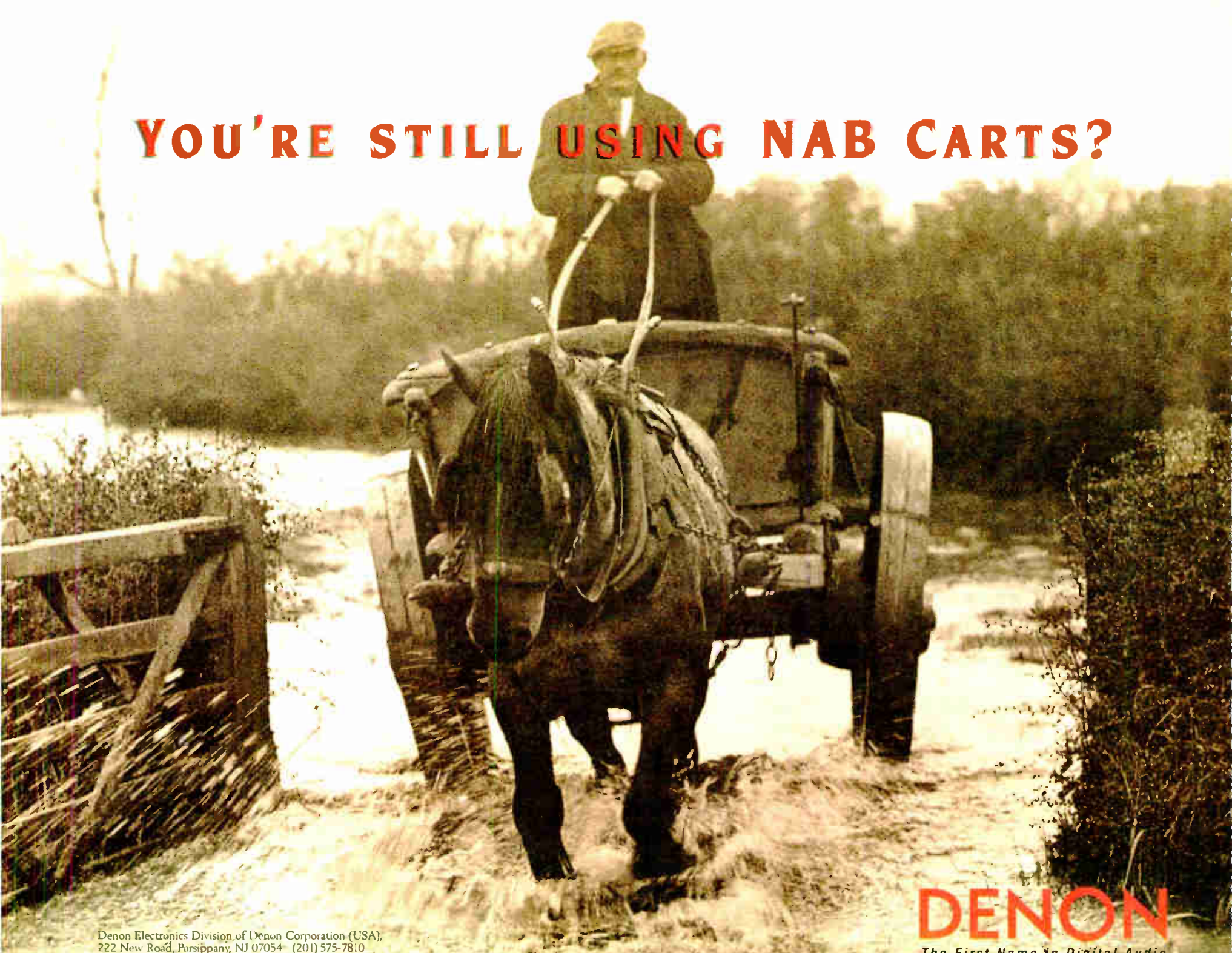


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DN 990R MD Cart™ Recorder (shown) and the DN 980R/ DN 995R machines

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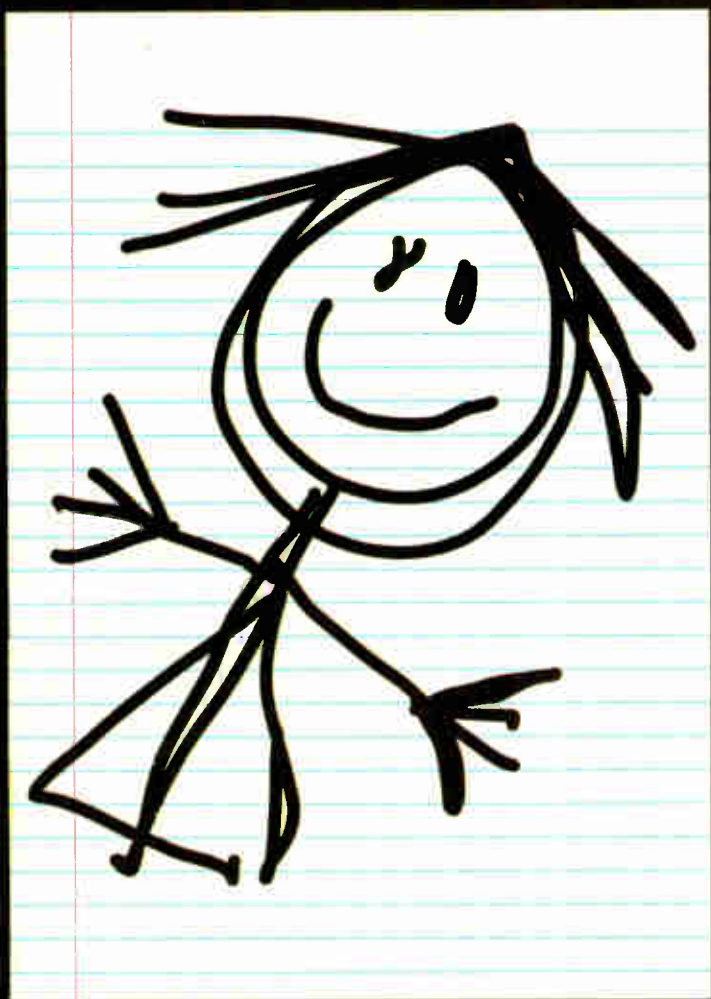


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STATION SKETCHES

Pulling All-nighters the Right Way

by Tom Vernon

HARRISBURG, Pa. It takes a lot of organization and planning to run a good engineering department, be it a solo operation or one with a large staff.

One task that requires a lot of foresight is preparing for overnight transmitter maintenance, especially in small markets where there may not be a backup transmitter. The time when the transmitter can be off the air is a valuable resource. If properly utilized, major repairs can be completed, and equipment peaked to perfection.

Squandered, it is a period when equipment is torn up and barely put back together in time for 5:30 a.m. sign-on.

This month's *Station Sketches* looks at the psychological and organizational preparation and skills necessary for a productive overnight maintenance session. I will discuss some ways to make those five-and-a-half hours after midnight as productive as possible.

Plan ahead

It is best to begin planning a few days in advance. Start with a written list of everything you want to accomplish, and then prioritize it. Replacing weak finals or damaged ATU components is probably more important than tweaking the STL. Assign a high priority to investigating changes in transmitter readings.

Now is the time to catch small problems before they turn into major crises.

Do not plan on doing too much in one overnight. Experience will tell how many projects you can safely fit in this time frame. The main criteria for a project being on your checklist is that it can be done at no other time.

Use your final project list to produce a materials checklist. Include everything you will need to complete projects: tools, test equipment, parts, air filters, manuals, and even dymo label tape. Do not leave anything out. Gather everything at the transmitter site at least a day before the overnight. Check off items as they are in place.

If you are working with an assistant, be sure he or she is familiar with your ideas. Discuss ways you can divide up responsibility to make the best use of your time.

If you have ordered parts, open the boxes and verify that these indeed are the parts you ordered. There is little worse than opening boxes at 3 a.m. and finding that what is inside does not match the packing slip, or that the most critical parts were back ordered.

Do your homework

Take equipment manuals home and review any adjustments or alignment procedures you will need to make. It might help to write down some of the more difficult procedures in your own words.

Some complex ideas and procedures may best be visualized using bubble or flow charts. This is especially true when other people need to understand your ideas. Many computer programs are available to help you quickly produce neat and easily modifiable documents.

With a priorities list, parts list, and other documentation in place, it is time to talk about psychological planning. Being mentally prepared and in the right frame

of mind for an overnight is critical to your success. During quiet periods, pre-visualize what you are going to do. Try and see every step in your mind's eye. By doing this you may discover something that got left off your list. Also, this mental dress rehearsal will allow you to work more efficiently, because you will have "been there" before. Such mental preparation will allow you to approach the overnight with a sense of calm and self-confidence.

Try and get a few hours of sleep before working. Even with rest, your sleep cycle will be disrupted, and you may not have the edge that you are used to. This rest period may also be a good time to do your pre-visualizing.

Safety is foremost

Safety is an important consideration when planning overnights. Working alone in a high voltage environment without enough sleep can be dangerous. Try and have someone with you, preferably a person who knows CPR. If this is not possible, have someone call and check up on you occasionally. That caller should be able to give directions to the transmitter site if EMTs need to be dispatched.

It is also wise to check the weather forecast and bring a weather radio with you. This is especially critical during lightning season. Be ready to duck out in a hurry if

a thunderstorm appears. If you are working alone at a remote transmitter site, be sure your car is secured, and lock the fence and transmitter build-

ing behind you. This should prevent any unwanted encounters with the local night life.

Now a few thoughts about what the well-dressed engineer wears to the overnight, and what he or she does not wear. Wear clothing that allows unlimited freedom of movement which you can get completely filthy in. Do not wear watches and rings. It is amazing how fast a gold ring can get red hot with a little current flowing through it, not to mention the damage it can do to a circuit. The same is true for metallic watch bands. The accuracy of older analog watches is not enhanced by exposure to strong electromagnetic fields.

Full readings

Before beginning any transmitter work, take a full set of meter readings, and note the positions of all tuning controls. This will give you a "normal" reference for later use.

Do major work on the transmitter or associated equipment right after sign-off, while you are the most alert and your energy level is highest. Keep a written record of your work. After each project or major step is completed, put all the covers back on and make sure the transmitter still operates. This may seem annoying and time-consuming, but it sure beats trying to troubleshoot a transmitter that will not operate after you have made several major changes, and you do not know which one is causing the problem.

It is a medically proven fact that an engineer's brain cells turn into steel wool around 4 a.m., resulting in diminished concentration and irrational thought.

Time for a break. Have someone make a pizza run for you, or pack a thermos and sandwiches. Food and caffeine are important at this hour of the morning. Now is a good time to jot down notes on what has been accomplished so far, while details are fresh in your memory.

With your energy level and alertness waning, work on some of the minor projects. Clean the inside of the transmitter, change air filters, take the blowers apart and clean them, or check continuity of the interlock switches.

Allow time to put everything back together and cleaned up before sign on. Have the studio operator turn the trans-

mitter on and take readings. This will verify that remote metering and control are still intact.

Stay around for about a half hour after sign on. If anything major is going to go wrong with the transmitter, it will probably happen now.

If everything has been planned and organized properly, you can look back over your list, congratulate yourself on how much was accomplished, and head off for some well-deserved rest. If not, you may find the clock creeping towards 5:30 with a transmitter that will not go back on, wishing that you were any place but the radio station.

□ □ □

When he is not pounding the keys for *RW*, Tom Vernon writes multimedia reviews for a variety of computer publications. Call Tom at 717-367-5595.

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Tiny, BASIC Black Box Delivers

by Alan R. Peterson

ROCKLIN, Calif. Black boxes are both livelihood and hobby for station engineers. Besides fulfilling certain technical needs not addressed by manufacturers, there is a special challenge in cramming lots of circuitry into as small a box as possible.

That is why the Parallax BASIC Stamp computer module will, by virtue of its versatility, fast become a favorite of black box tinkerers. This is a BASIC-programmed computer that is quite literally the size of a Vienna sausage.

Remember BASIC? All those IFs, LETs, FORs, and GOSUBs you struggled with in 1983, trying to program that Sinclair computer? Parallax Inc. has created the BS2-IC; a tiny computer that holds 600 instructions, handles 16 I/O lines, interfaces serially with PCs for easy programming, plays tones, reads potentiometer positions and performs timing cycles. Best of all, it can be easily programmed in good old BASIC.

And tiny is as tiny does: imagine a computer small enough to be rubber-banded to the 9 V battery powering it!

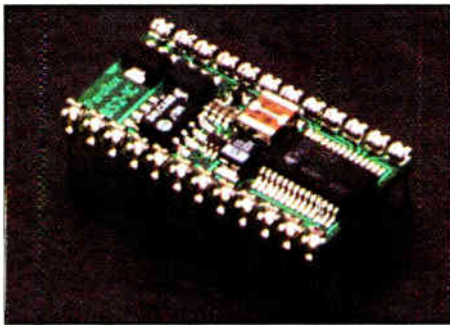
So what?

What can this pint-sized processor do? It can be a machine controller to assure cart tightness. Program the BASIC Stamp with Pause and Output High commands, connect to the start logic lines of your cart deck, workstation and/or reel. Press one button and the Stamp will dub your cart with a predictable, programmable delay.

Rudimentary session recall devices can be realized using the Stamp's capability to digitize console pot positions. Further, its Input, PWM and Pulse Out instructions could control stepper motors (can-

puts/outputs, it can be used as the brain of a semi-intelligent audio router. Several I/O lines could control 4066 quad switches, 4051 analog multiplexers, relay drivers or FETs to direct audio around the station. The Stamp's timing function can assure make-before-break or break-before-make connections to keep switching noise to a minimum.

Tie those I/O lines to heavier relay drivers and the Stamp becomes a smart power-up



... and big brother BS2-IC

box. Some external SCSI devices need to be "first-on-first-off" (such as the external drives for the Roland DM-80 workstation). Configure the Stamp to activate AC outlets for the SCSIs first, followed by the PC.

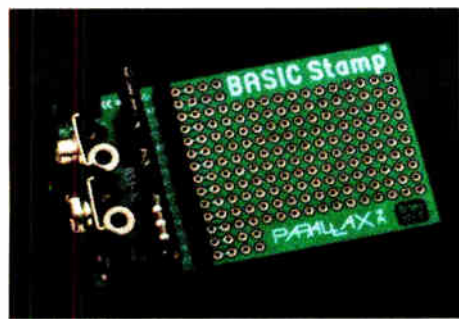
On a grander scale, the Stamp can control antenna switching for AM arrays. With one button the Stamp can dump the transmitter, switch in the night pattern, wait for

feedback that the array is ready, return the transmitter to the air and signal the operator the sequence is complete, and perhaps even execute the next audio event. Programming can include decision branches to assure the transmitter will not come back on into a no-load condition.

"Basically", there is a lot going on here for about \$50. At last it is possible to put a computer inside that ubiquitous black box and the possibilities it offers are limited only by imagination. Get the paperwork on the BASIC Stamp—models BS1-IC and BS2-IC—and design something terrific for your station.

□□□

Parallax has catalogs and application notes available by calling 916-624-8333, fax on demand at 916-624-1869, or e-mail at info@parallaxinc.com.



The Parallax BS1-IC ...

nibalized from dead printers), mechanically linked to the backs of console pots.

Taken to a preposterous extreme, a Stamp wired in this manner can convert a prehistoric Yard or Gatesway 80 console to moving fader automation!

The Stamp's ability to read and scale variable resistance—a thermistor, for example—makes it a versatile temperature alarm. Fans come on when the rack gets too warm, a bell goes off for station "how hot is it?" temperature contests, and klaxon horns let you know your microwave popcorn is on fire in the lunchroom.

Sequential control

Stations not ready to fully automate during overnight satellite time could read network tones with a dual tone multifrequency (DTMF) decoder circuit and interface the outputs with a Stamp computer. The BASIC Stamp can then operate cart decks programmed in a specific sequence.

Because the Stamp is capable of 16 in-

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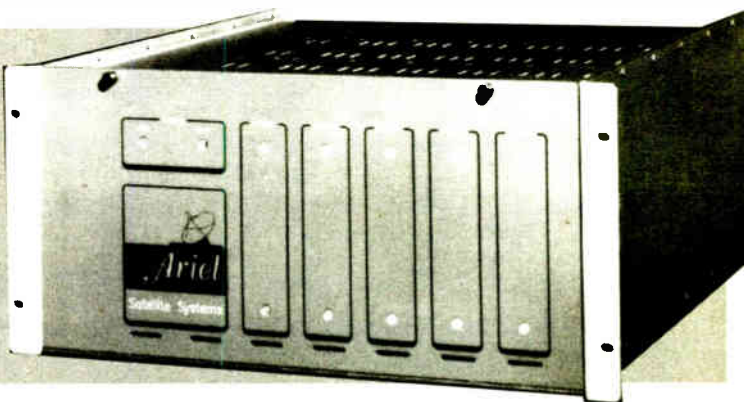
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Techniques for Measuring Transmission Line

► continued from page 38

times the distance between (or to) the towers.

Suppose a certain transmission line is shorted or open somewhere between the transmitter and tower #1. First measure the physical distance by pacing it off or using a tape. Assume the station is on 950 kHz, and the distance is 200 feet. Go to the tower, pull the blade, and get ready for measurement.

At the transmitter end, disconnect everything from the line and connect our "box." Adjust the oscillator to allow frequency and beginning checking for equal waveforms across the build-out

resistor and the standard. Continue to adjust the frequency until the two are equal. At that point, it's time for some math.

First, calculate the quarter-wave distance using the station's frequency:

$$\frac{984}{0.950} = 1,036 \text{ feet (full wavelength)}$$

$$\frac{1036}{4} = 259 \text{ feet (quarter wavelength)}$$

Since radio waves are slowed down in transmission lines, the actual distance must be multiplied by a velocity factor. This is usually about .9 for coaxial cable, so:

$$259 \times 0.9 = 233 \text{ feet.}$$

Using this data, we know that any frequency above 950 kHz will indicate a quarter-wave distance less than 233 feet, so if the oscillator setting is, say, 1,240 kHz, we know that an open exists somewhere close to 178.5 feet, or a short exists at 357 feet. If our tower is 200 feet away, it would be safe to assume we have an open somewhere near the tower.

The next step would be to "shoot" the measurement from the tower end. In order to confirm a short from the other end, assume the transmission line is open

about 20 or 25 feet away. In order to "see" this as a quarter-wave short, the oscillator would need to be about 9 mHz, as determined by:

$$25 \times 4 = 100 \text{ feet (Whole wavelength)} / 0.9 \text{ (velocity)} = 111 \text{ ft.}$$

$$\text{so, } \frac{984}{111} = 8.86 \text{ MHz.}$$

We may not have access to these frequencies, so we need only sweep up to 2 mHz or so to confirm that we do indeed have an open at this point. If we assume that we have a short at the half-wavelength point at 25 feet, then we calculate:

$$25 \times 2 = 50 \text{ feet. } 50/0.9 = 55.5 \text{ feet}$$

$$\text{so, } \frac{984}{55.5} = 17.7 \text{ MHz}$$

Which is again out of the range of our equipment.

Bridge method

If the station has a directional antenna system, you probably have access to an operating impedance bridge (OIB). If so, and with a stable generator or synthesizer, you can make surprisingly accurate

These basic characteristics can help us determine the distance to an open or short, thereby determining line length.

measurements of components and line-lengths. Simply drive the OIB with the generator and clip the output across the line or component. It helps, too, to have a field strength meter or receiver to act as a null detector. Adjust the generator's frequency while measuring the impedance on the bridge. If you are measuring a capacitor, set the resistance to zero and tune the C reactance. Do the same on the inductance side for coils. On transmission lines, once a zero reactance is obtained, you are at the quarter/half-wave point. From there, the math and analysis are identical.

Having this information and procedure handy may help you find out that unknown capacitor value or locate that transmission line short, and most certainly will improve relations with your brother-in-law.

Oh, and you won't need the pyramid builders, either.

□ □ □

James Murphy is director of engineering at West Virginia Radio Corp. He can be reached at 304-296-0029.

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Live Assist Screen
Pictured

The screenshot shows the SALSA software interface. At the top, there is a timer displaying '02:29:32' and 'ON' with a green dot, and another timer displaying '22:09'. Below the timer is a level indicator with 'L' and 'R' channels and a 'SALSA' logo. To the right, there are control buttons for 'ON AIR' (with a green dot), 'PAUSE', and 'ERROR'. A central playlist table is visible, and to the right is a control panel with buttons for 'ON AIR', 'PAUSE', 'STEP', 'MENU', 'CLOCK', 'TIME EVENT', 'SEARCH', 'TEXT', 'TITLE', 'NEWS', 'ARTIST', 'SPORTS', 'ALBUM', 'WETHR', 'TEMPO', 'STOCKS', 'THEME', 'LOCAL REPORT', 'TIME', and 'FARM REPORT'. A callout box points to the 'SEARCH' and 'TEXT' buttons with the text 'User Programmable Database Search and Store Parameters'.

00:	ALABAMA	BORN COUNTRY	03:07
03:	HIGHWAY 101	WHO'S LONELY NOW	03:09
06:	ALAN JACKSON	CHASIN THAT NEON R	02:58
09:	THE JUDDS	LOVE CAN BUILD A	04:04
13:	THE BROWN ADOBE	SALSA SPECIALS	00:30
14:	WVBU LEGAL ID	SPRING MARATHON ID	01:00
14:	LEWISBURG PHOTO	SPRING FEVER SALE	00:30
15:	CARLENE CARTER	COME ON BACK	02:46

SPORTS NEWS (updated at 3pm)
The Philadelphia Phillies, fresh off a losing streak on the road, rallied to beat the San Diego Padres 15-12 in a home-run slug fest at the Vet.
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Directional Antennas Made Easy

Part II

by Jack Layton

MCMURRAY, Pa. After the Part I refresher course on the "whys" of directional antenna systems, it is now time to tackle the "how to's."

While the array is working, long before any sign of trouble, take some time to write down all of the loop current ratios and phases as indicated on the antenna monitor. Calibrate the monitor as per the manufacturer's instructions before setting out on this project. Again, while the array is working, long before any sign of trouble, take some time to write down all of the settings of the crank controls on the phasor.

Reliable method

Figure 1 shows a reliable method of recording the exact setting of each read-out. With this method, there is no guess work as to where the control was set. Just make sure the counter or shaft couplers are not slipping. The piece of paper containing all this information will save a lot of grief and aggravation should a "do gooder" or disgruntled employee decide to make some adjustments for you.

These tasks may seem elementary,

However, because it is no longer required to log operating parameters on a regular basis, you would be surprised how many people have no idea what phases and loop currents were before the lightning struck.

On a regular basis, immediately after sign off, visually inspect the inside of the phasor cabinet. Check each clip on every coil for signs of heating. Make sure all clips are tight. Check the roller contact on adjustable inductors.

Check mica capacitors for excessive heat. Do the same at each "dog house." Look for burn marks. They can be the first signs of lightning damage that can later cause a catastrophic failure. Ball and horn lightning spark gaps should be inspected for damage. Make sure all ground connections are intact. Loose intermittent metallic connections in high RF fields can generate enough heat to cause a fire if they are in close contact with combustible material.

Sampling system

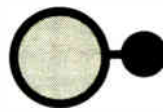
Suspect the antenna sampling system or antenna monitor if there is an abrupt change in phase while the loop and base current ratios remain intact. An actual change in one operating parameter is almost always accompanied by a change in others. If this is not the case first take

a careful look at the entire antenna monitoring system. If the monitor is at fault you will usually not be able to zero- or 180-degree calibrate.

the pickup transformer or at the bottom end of the isolation coil. Connect the reference line to the reference tower input on the antenna monitor. Connect the installed sample line to one of the other inputs.

The loop currents indicated on the monitor will probably be different due

Power #1



0
4
7 8

Power #2



4
8
8 9

Phase #2



2
9
1

FIGURE #1 Write down the control crank positions exactly as they appear on the phasor cabinet. This is good insurance against unauthorized tampering. It's also a good idea to write down this information before you start any adjustments. You can always come back to ground zero.

As a further check use a coaxial tee and a short length of coax to feed the reference RF sample to another input on the monitor. The loop current indications on the reference and second input should be the same although different than when only one cable is connected. When both are connected the sampling device has a double termination. If the coax jumper is short (a foot or two in length) the phase difference should read very close to zero.

Lightning has been known to damage toroidal current transformers. They may show no outward damage. When the loop current ratio changes without a corresponding change in base current ratio suspect the transformer. An abrupt change in phase on one tower in a multi-tower array not accompanied by a change in other operating parameters is also cause to suspect the current transformer. Keep the feed wire in the center of the pass hole.

When the feed wire lays on one side of the pass hole insulation there has more chance of a lightning arc to the grounded transformer case. It is a good idea to keep a spare pickup transformer in stock for trouble shooting and/or repairs.

Non-insulated loops

Towers that are considerably taller than 90 degrees utilize non-insulated pickup loops mounted a quarter wavelength down from the top of the tower. The sampling line is brought down the tower on non-insulated hangers. An isolation coil wound out of 3/8-inch or 1/2-inch phase stabilized coax brings the RF sample across the base insulator. The shield of the coil must make a good electrical connection to the tower on the RF hot end and to the ground system on the cold end. A poor intermittent connection on either end will cause erratic changes in the operating parameters of the array.

Equal length sampling lines can be checked using another piece of coax as a comparison. A piece of plain old RG-8 or RG-58 can serve as a reference standard. It must be long enough to reach from the antenna monitor to the base of the farthest tower. Parallel the sample line and the reference cable with a coaxial tee at

to the higher losses in the RG-8 or RG-58. The phase you read is the difference in delay between the sample line and the reference line. It should be noted. Go through the same procedure for the other towers in the system. Each should yield the same phase indication. A bad sample line will show up like a sore thumb.

Check monitor points

Never, ever, never, make any adjustments in an attempt to correct changed operating parameters without first taking a look at the monitor points. If they have not changed, the problem is in the sampling system. When the array is in adjustment, you will only compound the problem if you try to correct by more adjustment. Heed the age old axiom: Don't try to fix something that ain't broken! Sampling system problems causing indicated phase or loop currents to be in error, or base current ratio discrepancies attributable to damaged RF ammeters, must be corrected by repair or replacement, not adjustment.

All directional antenna design is based on inverse field. The radiation pattern shown in the application for a construction permit is a graph of the calculated inverse field intensity at various azimuths produced by the array. Proof-of-performance measurements relate measured field intensity to inverse field intensity.

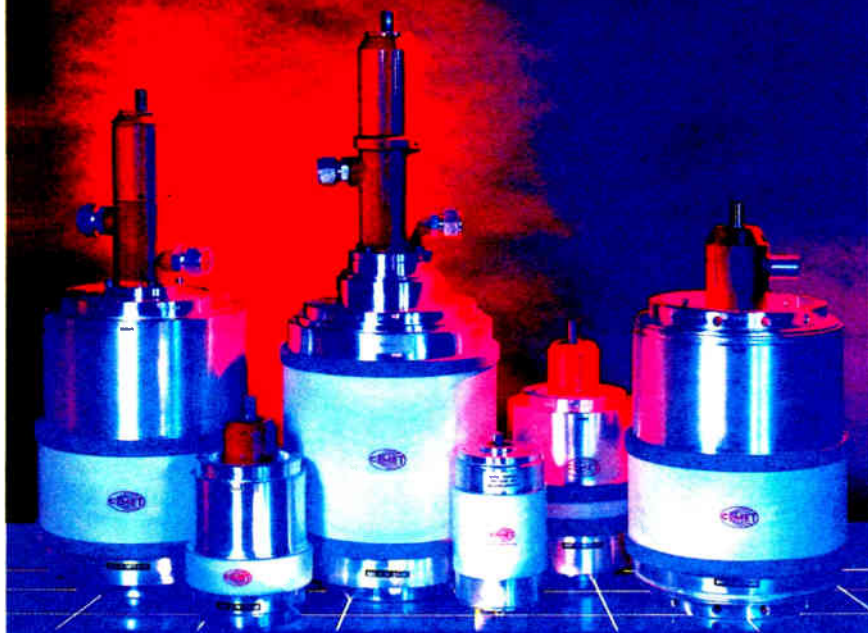
In the free-space imaginary world, there are no losses or disturbances encountered by the radiated signal other than those caused by distance. If we make a field intensity measurement one mile from the antenna system and then move out to two miles the second measurement will be exactly half the value of the first. When we move out to four miles this measurement will be one-fourth the first; at eight miles one-eighth the first; and so on. By doubling the distance the field intensity will drop to half its previous value. This is known as the inverse distance law.

Real world

Meanwhile, back in the real world, when we take our field intensity meter and attempt to duplicate what seems to

continued on page 78 ►

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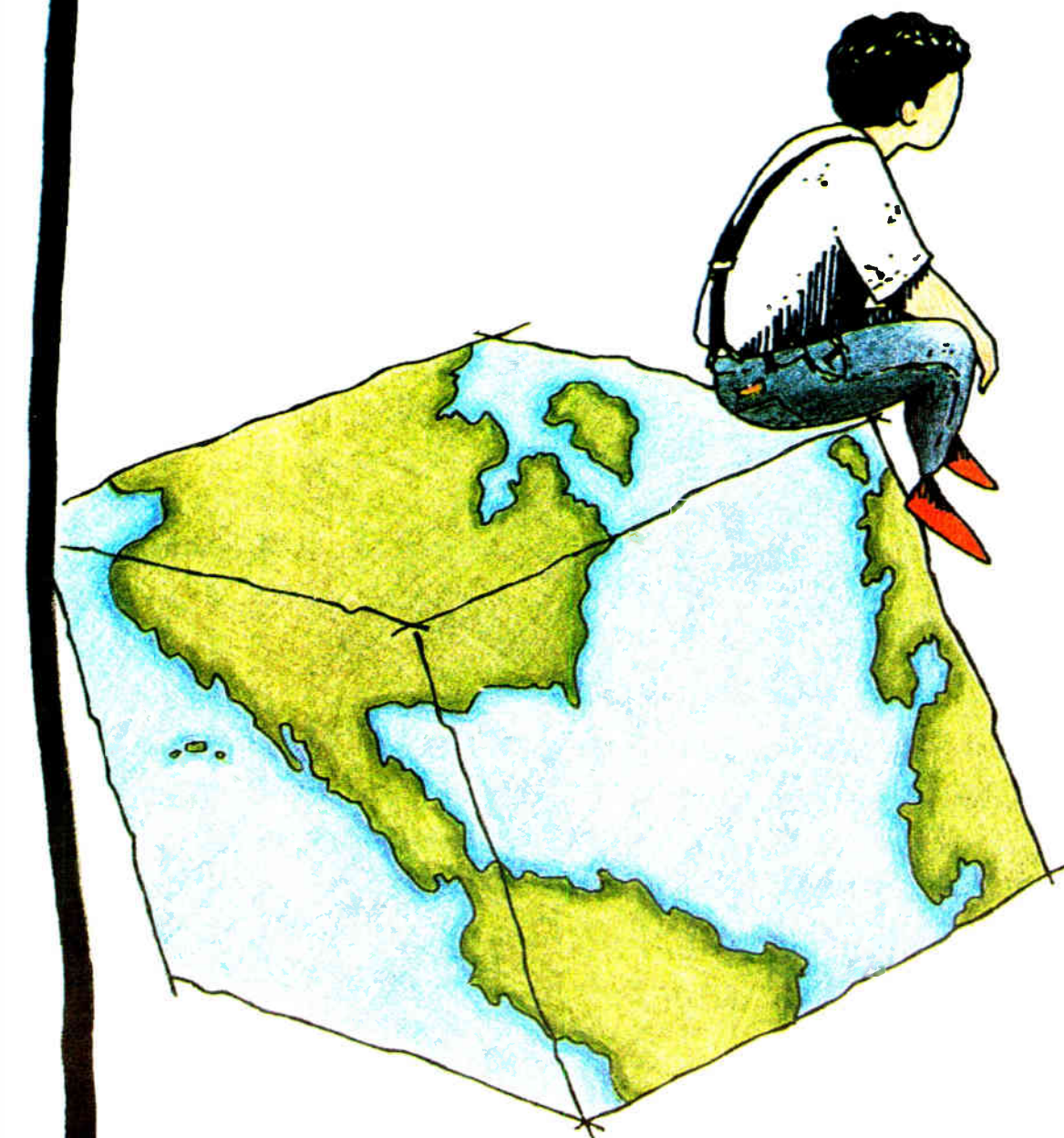


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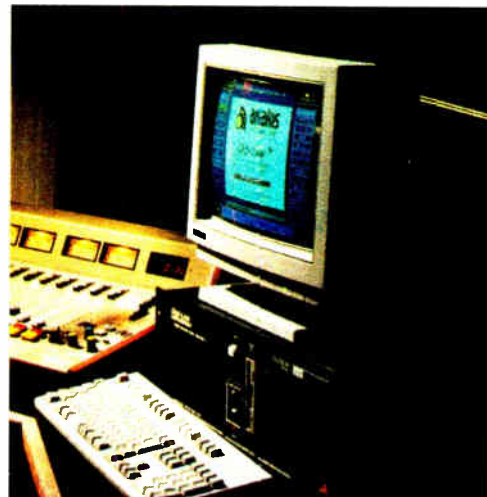
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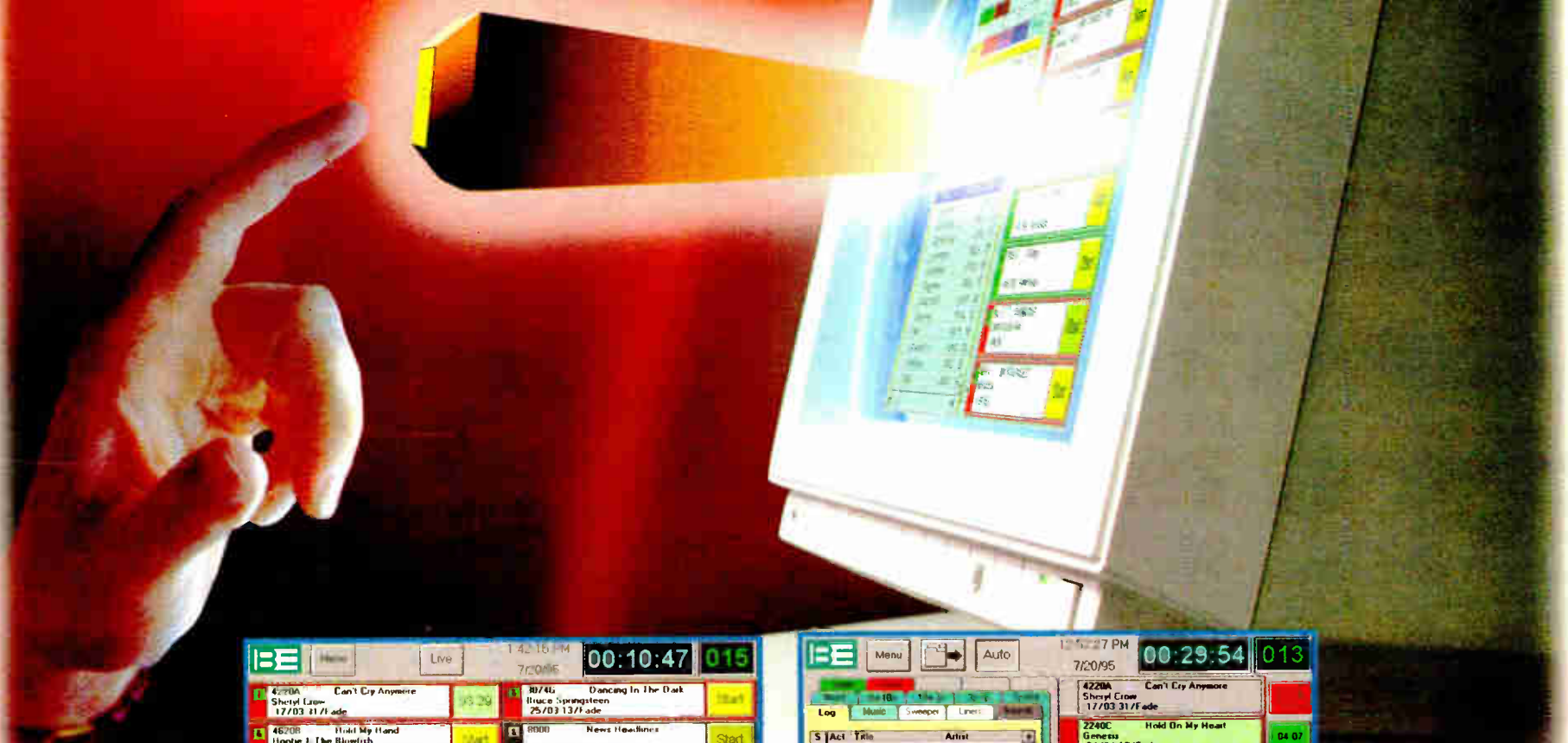
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PREVIEW

New Orleans Convention Center • September 6-9, 1995

'Big Easy' Hosts NAB Radio Show

by Alan R. Peterson

NEW ORLEANS The NAB Radio Show — celebrating 75 years of radio — is slated for Sept. 6-9, at the New Orleans Convention Center, as part of the second annual World Media Expo (WME). This year, emphasis will be on DAB, interactive technologies, the Internet, digital audio and the needs of small market broadcasters. Because the NAB show is being held as part of WME, attendees will have crossover access to a number of additional bonus sessions as part of the RTNDA, SBE and SMPTE conferences.

Getting around to workshops and exhibits will be easier for the fall show with major areas color-coded by category, and special "locators" to help attendees find specific seminars, manufacturers and exhibits.

Sharing the convention center with the other organizations involved in the World Media Expo means lots of hands-on examination of the newest and most innovative products available to broadcasters.

Digital chain

Harris Allied will again provide its Harris (Zaxcom) digital console, married to the DDS digital system for a total digital audio chain. This configuration has already attracted the attention of Jacor Communications and Gannett Broadcasting and should be of great interest. Other products returning to the NAB show include the veteran Orban DSE-7000 workstation, the vox Pro telephone recorder, the Oktava 219 microphone and consoles by Audionics.

BSW's display area will be well

represented by the Fostex Foundation digital audio workstation, consoles from AudioArts, the 360 Systems Instant Replay random access cart replacement system and the Phone-Byte telephone recorder for caller playback.

Broadcast Electronics brings back its humorous "jungle" motif; complete with Audiovault workstations in the mouths of tiki gods. Also displayed will be the CORE automation controller, the AVAir Windows-based live controller for the Audiovault and the new FM4C 4 kW FM transmitter.

Although the opening reception will not be until 6 p.m., there are plenty of reasons to arrive early in New Orleans.

Wednesday

Get started at 8:30 AM on Wednesday, September 6 for a guided tour of New Orleans radio stations. Discuss station operations and view the facilities of several studios in New Orleans. Station tours are always a highlight of NAB radio shows and early registration gets you in. There is a fee for the tour.

If you are not sure which workshops to attend, start with "Sneak Preview—Getting the Most Out of the NAB Radio Show" at 1:15 p.m. This will help you set your agenda for the four day show.

The opening ceremony takes place at 2

p.m. with the keynote address delivered by Mario Cuomo: former three term governor of New York and host of "The Mario Cuomo Show" (distributed by SW Networks).

Management and sales workshops begin promptly at 3:30 p.m. in the areas of station acquisitions (LMAs and duopolies), management of non-sales staff, revenue forecasting and perceptions of Hispanic and Urban formats.

"Exploring and Exploding Radio's Myths" will examine formative rules as they have been practiced in the past and discuss their relevance today, including: sweeping quarter hours, give-aways beginning on Thursdays and similar music styles played back to back.

In a bonus session, NAB Vice President of Operations Dr. John D. Abel will host "Profiting From Technology in the '90s." This crossover workshop will feature demonstrations of the Internet and World Wide Web, the digital radio studio of the '90s (featuring a digital studio provided by Harris Allied) and data broadcasting.

Wednesday concludes with the opening reception at the Hilton Riverside Hotel from 6 to 8 p.m.

Thursday

Today, general managers, sales managers, program directors and engineers all have their own workshops to attend separately.

At 9 a.m., program directors may wish to attend "Needles In a Haystack"; a

SBE Offers Engineers Timely Agenda

NEW ORLEANS The Society of Broadcast Engineers (SBE) will feature five workshops and nine technical sessions at its SBE Engineering Conference, Sept. 6-9, held here in conjunction with the World Media Expo. More than 40 workshop leaders and speakers will cover a broad range of topics of interest to both radio and television engineers and those in related fields.

The theme of the SBE's 10th annual conference is "Face to Face with Change," and promises to offer an exciting array of programs that deal with both current and emerging technology.

All participants will receive admission to World Media Expo, the combined exhibition of SBE, the NAB Radio Show, SMPTE and RTNDA. The exhibition will be open Thursday and Friday, 9 a.m. to 6 p.m. and Saturday, 9 a.m. to 4 p.m.

The conference begins on Wednesday, Sept. 6, with optional Ennes Workshops. Participants will be able to choose from three concurrent workshops in the morning and two in the afternoon. Participants in the Ennes Workshops must be registered for the full SBE Conference, Thursday - Saturday, Sept. 7-9.

The Workshops are followed by three packed days of technical sessions. Thursday begins with a general session on the new Emergency Alert System and Unattended Operation. Beverly Baker, Chief of the FCC's Compliance and Information Bureau and the FCC's Acting Chief of EAS, Frank Lucia, will be joined by Gary Timm, of the Wisconsin Emergency Communications Committee, Harold Hallikainen of Hallikainen & Friends and William Ramsey of the Nebraska ETV Network.

Also expected is a representative from the National Weather Service.

The general session will continue in the afternoon with a panel discussion on broadcast issues that involve both the FCC and the Federal Aviation Administration. Panelists will

continued on page 54 ▶



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World Radio History

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NEUTRIK

CONNECTING THE WORLD

'Big Easy' Hosts NAB

► continued from page 51

workshop to enhance chances of finding and keeping quality employees, or "Finding Your Voice"; differentiating yesterday's announcing technique from contemporary methods.

General managers and sales managers will want to attend "State of Radio Sales," "20 Great Promotions to Build Your Bottom Line" and "Branding vs. Benchmarking," while engineers will find lots to do in an all-day digital seminar and the satellite DAB forum.

As a special feature, Mel Karmazin of Infinity Broadcasting and Lowry Mays of Clear Channel Communications will par-

ticipate in "Radio: Today's Trends, Tomorrow's Opportunities" at 10:30 a.m..

Workshops abound throughout Thursday. Station managers should attend the FCC Regulatory Update with Commissioner Susan Ness, the "Discrimination Playhouse" and Dan O'Day's "Total Quality Service Radio Station." Sales managers will have their hands full choosing between the "Real World Streetfighters" workshop, the seminars on small market duopoly sales, strategies and small market salespeople training.

Engineers may wish to visit "The

Digital Radio Station: Everything Else is History" for a primer in digital technology, or "internet@radioshow.nab" for a look at stations now on the Web.

Program directors have choices in format roundtables in Rock, Urban, Country and Hispanic, and the "Database and Event Marketing" workshop to build ratings and profit.

Friday

Start the morning off with the FCC Chairman's Breakfast, with Chairman Reed Hundt offering his insights on policy developments.

You're going to need a good breakfast, as Friday will be a busy day.

Beginning at 9 a.m., meet publishers and editors of leading trade publications in "Meet The Press." Management will

want to attend workshops on "Station Improvements Under FCC Rules" and "FCC Rule Enforcement." "Sports Packaging: Big Bucks Ballgame," "The Bleeding Edge," which tells how to avoid problems in employing new technology and "Every Last Cent" which discusses non-traditional ways of generating revenue.

And all this before lunch, which means the NAB Radio Luncheon at noon. Ben Cohen and Jerry Greenfield of Ben and Jerry's Ice Cream will share their business insights with broadcasters, explaining how two "real guys" combined ice cream with an unusual flair for marketing to create an amazing overnight success story. The luncheon continues with the National Radio Award, being given this year to CBS Radio President Nancy Widmann.

The workshops resume at 2 p.m., beginning with "Radio and the 104th Congress"; the inside story on where radio and its issues are heading.

Owners and managers will want to attend "Under One Roof: How to Save Money in a Duopoly Situation" and "Station Cost Savings Tips," while sales managers should attend either "State and Future of Radio Sales" or "Time Management for Managers."

Westwood One Radio's Tom Leykis will moderate "Spanking or Time Out: How to Manage Talent," a workshop instructing programmers what to look for when making hiring decisions, and avoiding unmanageable talent.

On a related subject, managers and job-seekers can meet and talk at "Opportunity '95: The Complete Radio Career Fair" from 9 a.m. to 2 p.m. Saturday.

Throughout Friday afternoon, the NAB legal department will moderate a seminar on lottery and contest ads; recent law changes have offered new revenue sources and greater latitude in station contests and promotions, but FCC fines can be steep for violating the laws that remain. "Making Money and Keeping Out of Trouble with Lottery, Contest and Casino Gambling Ads" will keep your station legal.

Send your production director to "Creative Production for the '90s" and your sales manager to "Making Money in Non-Traditional Ways" and finish the day at the Friday Night Party at the New Orleans Hilton Riverside.

Saturday

The NAB Radio Show begins to wind down with Opportunity '95 (see above) and the Internet Boot Camp. Sales-related sessions include geodemographic marketing, job sharing and new technologies to improve sales. Management workshops concentrate on license renewal, station research and the venerable small market "swap shop" concept. Program directors can meet some of radio's best p.m. drive performers in "Personality Radio Outside Morning Drive," for ideas on creative elements in other dayparts.

Big finish

And to end the week on a festive note, the NAB Marconi Award ceremony takes place Saturday night, hosted by Gary Owens. The awards dinner and reception is a black-tie affair and is admissible by ticket only.

See the accompanying article on the Marconi Awards for a summary of categories and finalists.

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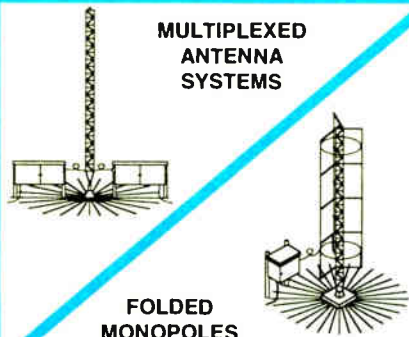
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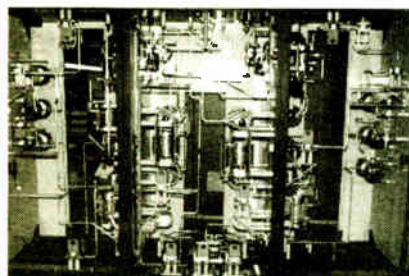
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WORLD MEDIA EXPO

SBE's Timely Agenda

▶ continued from page 51 include Richard Smith, head of the FCC Office of Engineering Technology, Robert Greenberg of the FCC's FM Branch, Robert Denny, Jr., PE, of Denny & Associates, Dr. Rudy Kalafus of Trimbal Navigation and a representative from the FAA.

All day Friday and Saturday morning are devoted to separate radio and television sessions dealing with RF and digital technology. Saturday afternoon, participants will again gather in general session for a series of papers dealing with safety and liability issues. A complete run down of the program follows.

Wednesday, September 6

Ennes Workshops

- 9 a.m.**
1. Digital Video and Computer Systems
Bob Paulson, Omnimedia Communication
 2. Solid State Power Amplifier Troubleshooting & Repair
Karl Black, Harris Corporation Broadcast Division
 3. QEI Digital Exciter
Instructor TBA

- 12:30 p.m.**
4. EAS
Leonard Charles, WISC-TV and Chairman, SBE EAS Committee
 5. Broadcast Engineering Management
David Carr, KHOU-TV and Troy Pennington, WZZK Radio

Thursday, September 7

EAS and Unattended Operation
Session Moderator: Bill Ruck, KFOG/KNBR

- 9 a.m.**
- Introduction
Beverly Baker, Chief CIB, FCC

EBS to EAS: Roundup of New EAS Rules
Frank Lucia, EAS, FCC

- 9:30 a.m.**
- Weather Service and EAS
Speaker TBA

- 10 a.m.**
- EAS and the State Committees
Gary Timm, Wisconsin State Emergency Communication Committee

- 10:30 a.m.**
- The Hardware You'll Need
Harold Hallikainen, Hallikainen & Friends

- 11 a.m.**
- Remote Control of Multiple Transmitters
William R. Ramsay, Nebraska ETV Network

11:30 a.m. Questions from the floor

- 1 p.m.**
- FCC/FAA
Session Moderator: Dane Erickson, PE, Hammett & Edison, Inc.
Panelists: Robert Greenberg, FM Branch, FCC; Robert Denny, Jr., PE, Denny & Associates; Richard Smith, Office of Engineering Technology, FCC; Dr. Rudy Kalafus, Trimble Navigation, Inc. FAA Representative

2:15 p.m. SBE Annual Membership Meeting

Friday, September 8

Digital Technology for Radio, Part I
Session Moderator: John Battison, PE, Consulting Communications Engineer

- 9 a.m.**
- Surviving Your Digital Future
Skip Pizzi, Broadcast Engineering Magazine

- 9:30 a.m.**
- Digital Storage Options
James Hauptstuek, Harris/Allied

- 10 a.m.**
- The Pitfalls of Digital Audio
Glynn Walden, Group W Radio

- 10:30 a.m.**
- Principles of Echo Cancellation for Talk Shows and Teleconferencing
Elaine Jones, Gentner Communications Corp.

- 11 a.m.**
- Quality Control in a Digital Plant
Speaker TBA, Tektronix

- 11:30 a.m.**
- NPR's Experience With Digital Technology
Mike Starling, CPBE, National Public Radio

Digital Technology for Television, Part I
Session Moderator: Marvin Born, CPBE, WBNS TV

- 9 a.m.**
- The Digital Era: A Tutorial on Digital Video
Trevor Vaz, LSI Logic

- 9:30 a.m.**
- Design and Evaluation of User Interfaces for Video Applications
Steve Smedberg, Abekas Video Systems

- 10 a.m.**
- Next Generation Newsroom Systems
Richard Pierceall, Avid Technology

- 10:30 a.m.**
- Changing the Shape of Post Production
Bob Pank, Quantel, Ltd.

- 11 a.m.**
- Design Requirements for Newsrooms and Technical Operations in the Digital Future
Frank Rees, Rees Associates

- 11:30 a.m.**
- Video Disk Server Configurations for Automated Broadcast Applications
Seth Olitzky, Louth Automation

RF For Radio
Session Moderator: Bill Ruck, KFOG/KNBR

- 1 p.m.**
- RF Phase Response Versus Sound Quality in AM Broadcasting
Timothy C. Cutforth, PE, Vir James Engineers

- 1:30 p.m.**
- Post Processing Yields Improved Design Parameters for AM Directional Antennas
J.L. Smith, P.E.

- 2 p.m.**
- Practical Aspects of Broadcast Antenna Maintenance and Operation
Thomas Gary Osenkowsky,

RF for TV
Session Moderator: Doug Garlinger, CPBE, LeSEA Broadcasting

- 1 p.m.**
- The Effect of Supporting Structures on UHF Slotted Patterns for NTSC and HDTV Applications
Rex Niecamp, CPBE, Harris/Allied

- 1:30 p.m.**
- (PS)- More Than Just a Crowbarless Solution to IOT Protection
Nat Ostroff, Comark Communications

- 2 p.m.**
- New Approach to Crowbar Protection
Allen E. Ripingill, Larcant/TTC

- 2:30 p.m.**
- A Single Tube 60kw IF Dplexed UHF Transmitter
Dr. Timothy P. Hulick, Aerodyne

Saturday, September 9

Digital for Radio II
Session Moderator: Milford Smith, Greater Media, Inc.

- 9 a.m.**
- Fiber Optic Telecommunications
Bill Cordell, CPBE, Spectrum Engineering Co.

- 9:30 a.m.**
- On-Carrier FM Digital Audio, The Technology is Available Now
David P. Maxson, CBRE, WCRB

- 10 a.m.**
- Real World Experiences with ISDN and the New Breed of Codescs
Larry Paulausky, CE, WPEN/WMGK

- 10:30 a.m.**
- 18 GHz Digital Microwave: A Path to Radio's Future
Kevin McNamara, CE, WWRC/WGAY

- 11 a.m.**
- DAB Lab Tests - What the Data Reveals
Tom Keller, Consultant

- 11:30 a.m.**
- DAB Field Tests - Where the Bits Hit the Road
Bert Goldman, Shamrock Broadcasting & Robert Culver, Lohnes & Culver

Digital Technology for Television, Part II

continued on page 59 ▶

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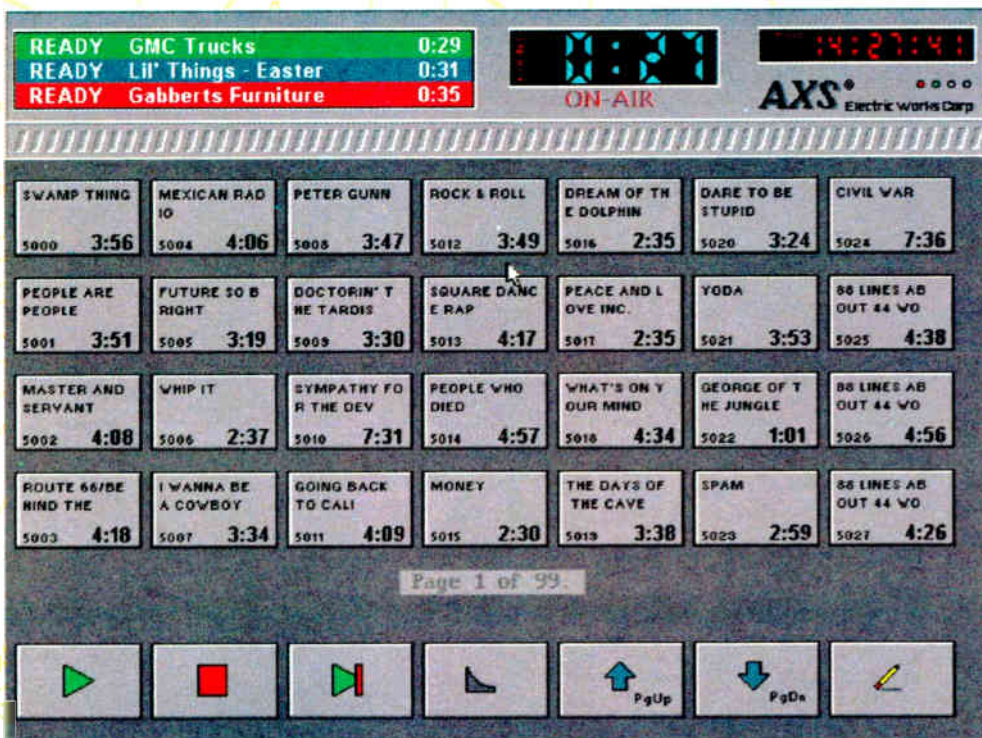
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SWP

15:18:00	Time Announce Jock-0	0:95
	Futures So Bright	3:19
	++Assorted Jingles++	0:10
	Hold On	4:05
15:23:00	Time Announce Jock-0	0:05
15:24:00	2:00 Spot Break	2:00
	Cub Cadet	0:30
	AXS Copy (LIVE)	0:30
	Arizona Ice Tea	0:30
	Oaklawn Jockey Club	0:30
	++Assorted Jingles++	0:10
	The Days Of The Cave	3:38
15:30:00	Time Announce Jock-0	0:05
	People Are People	3:51

Future So Bright CUT # 5005 LENGTH 3:20
OUTQ/INIT TIMBUK 3 TYPE HD EOM 05.0

Friend...Good Words CUT # 2221 LENGTH 0:02
OUTQ/INIT LI EOM 00.0

Hold On SONG # 0133 LENGTH 4:05
ARTIST Wilson Phillips INTRO 14 OUTRO 07.0

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CUT LENGTH 03:56:26
CUT POSITION 00:05:01

START 00:03:30
END 00:05:01
MARKED 00:01:36

Cut Number: 5000
File name: D:\AXS\550\5000.SND
Description: Swamp Thing Grid, The
Cut Type: 22.05kHz EOM: 00:05:00
Intro: 0 Tertiary: 00:10:00

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Radio Honors Its Best Stations

Broadcasters Nominate, Evaluate and Select the Brightest Stars in the Medium by Market and Format

by Alan R. Peterson

WASHINGTON As the concluding event of the National Association of Broadcasters Radio Show, the nation's top talents, stations and formats will be recognized at the 1995 Marconi Awards Dinner and Show in the La Nouvelle Orleans Ballroom of the New Orleans Convention Center.

More than 100 radio stations and personalities representing the best and the brightest in the industry are finalists in their categories for the Marconi Award.

Winners in 22 categories will be announced Saturday night, Sept. 9, in a black-tie ceremony to be hosted by Broadcasting Hall of Fame inductee Gary Owens.

The number of nominees for this year's honors were higher than in previous years, according to NAB President and CEO Edward O. Fritts. "We're delighted that we received a record number of nominations for this year's competition," said Fritts.

The categories include "Legendary Station of the Year" and "Network/

Syndicated Personality of the Year," in addition to station and personality awards based on market size and formats.

Voting process

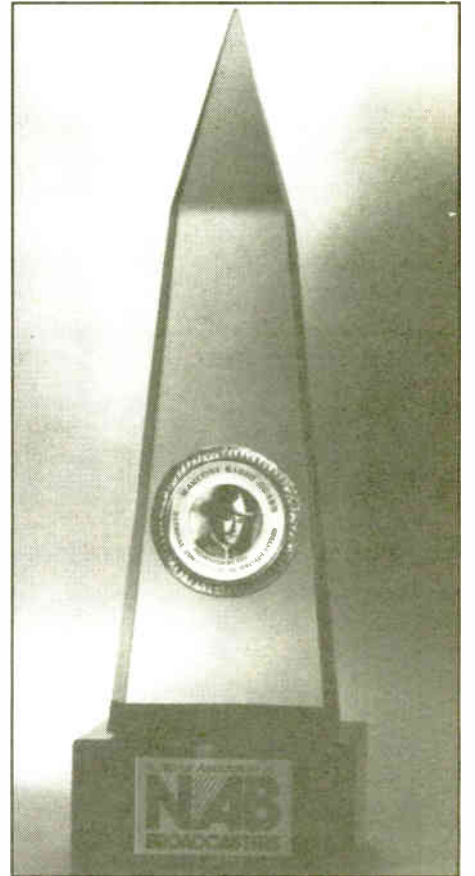
Nominees were announced in late May, based on open submissions received from NAB member stations, and reviewed by a task force of broadcasters who narrowed the choices down to five in each category. During July, ballots were sent to NAB member radio stations, where program directors and general managers each indicated their choices.

Voting was closed on Friday, Aug. 4, for tabulation by KPMG Peat Marwick in

Washington. The winners will be announced at the Marconi Awards ceremony.

Your host

Gary Owens has been honored by both the NAB and the Museum of Broadcast Communications' Radio Hall of Fame for a career that spans five of radio's biggest decades. Well-known for his tenure at many of Los Angeles' top radio stations, Gary Owens is most recognizable in cartoon and commercial voice-work, and as the man who made the phrase "beautiful downtown Burbank" a



household catch-phrase from TV's "Rowan and Martin's Laugh-In." Today, Owens still hosts his own show on KJQI(AM) Los Angeles.

The nominees

Among the honors of the evening, awards will be given to the Legendary Station of the Year. The nominees include: KGO(AM) San Francisco, KSL(AM) Salt Lake City, WBZ(AM) Boston, WOR(AM) New York and WSB(AM) Atlanta.

EFM's Rush Limbaugh is nominated for network/syndicated personality of the year, while the ABC Radio Network counts four of its own as nominees: The Fabulous Sports Babe, former "Fly Jock" Tom Joyner, oldies host Dick Bartley and Rick Dees for his "Weekly Top 40 Countdown."

Major market personality of the year nominees include WLUP-FM Chicago's Jonathon Brandmeier, Bob Collins of WGN(AM) Chicago, Mark and Brian of KLOS(FM) Los Angeles, Mike Roberts of WVEE(FM) Atlanta and Neil Rogers of WIOD(AM) Miami.

Marconi Awards will also be handed out to the station of the year by format. This category encompasses all market sizes and includes adult contemporary/easy listening, Big Band/nostalgia, CHR, classical, country, jazz, oldies, news/talk/sports, religious/Gospel, Spanish, rock and urban/R&B.

Admission to the Marconi Radio Awards dinner and show is by separate ticket. For information on the event, call the NAB's fax-on-demand service at 301-216-1847.

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SBE Acknowledges Best in New Orleans

NEW ORLEANS The Society of Broadcast Engineers (SBE) released its list of recipients for the society's 1994 Individual and Chapter Awards. The awards will be presented during the SBE's annual Engineering Conference and World Media Expo, Sept. 6-9, in New Orleans, La.

Life Time Achievement Awards will be presented to James C. Wulliman of Green Valley, Ariz., and Benjamin Wolfe, of Baltimore. Both men are Charter and Fellow members of SBE and were instrumental in founding SBE's successful certification program for broadcast engineers in the early 1970s. Wulliman is retired from WTMJ in Milwaukee but continues to serve SBE as certification director and is a former president of the SBE. Wolfe is retired from a broadcast engineering career that stretches back to the 1930s and served on the SBE board of directors.

Receiving the SBE's Broadcast Engineer of the Year award is Donald Wilkinson, vice president/director of engineering of Fisher Broadcasting in Seattle. Wilkinson has been an SBE member for more than 14 years and has been heavily involved in the Seattle and Portland communities in the area of RFR regulation.

Douglas Garlinger will receive the SBE's Educator of the Year award.

Garlinger is a member of the SBE Certification Committee and is co-author of the SBE Television Operator's Course. He is director of engineering for the LeSEA Broadcasting Corporation.

The following award recipients will also be presented in New Orleans on Sept. 9:

- Best SBE Regional Convention or Conference: 1994 22nd Annual Regional Convention; Syracuse, New York; Sept. 30, 1994; Sponsoring Chapter 22.
- Most Interactive SBE Chapter: Chapter 48, Denver: Interacting Organizations-SCTE, SMPTE, CBA, CCA, DBS, etc.
- Best Technical Article or Program by a SBE Member: "Fiber Optic OSP" by Neal McLain; Chapter 24 Newsletter, seven parts.
- Best Article, Paper or Program by an SBE Student Member: "Madison Marathon" by James W. Stellpflug; Chapter 24 Newsletter, July 1994.

- Most SBE Certified Chapter: Chapter 99, Bryan, Texas, 82 percent.
- Highest Member Attendance at SBE Chapter Meetings: Chapter 85, Central Western Oklahoma, 85 percent.
- SBE Chapter with Greatest Growth in New Members: Chapter 56, Tulsa, Okla., 31 percent.

SBE represents the interests of broadcast engineers. Its 5,000 members are found in all areas of the United States and 30 other countries. SBE Certification is recognized as the leading indicator of broadcast engineering experience and ability.

Agenda

▶ continued from page 54
 Session Moderator: Jerry Butler, WETA-TV
9 a.m.
 Networks & Servers for Post-Production Digital Integration
 Brian Cashman, Avid Technology

9:30 a.m.
 Detailed Time and Spectral Characteristics of the Grand Alliance 8-VSB HDTV Signal Under Non-linear Power Amplification
 Robert C. Davis, Harris/Allied Systems

10 a.m.
 A/V Disk Drives
 Reza Rassool, Micropolis Corporation

10:30 a.m.
 Interactivity In A Distance Learning Application
 Dennis Vearrier, CBTE,
 Locke Martin Information Group

11 a.m.
 "Like Being Behind A Camera":
 Remote Camera Automation
 Matthew Straeb, VTSM, Vinten TSM

11:30 a.m.
 Error Detection & Handling using EDH Monitor/Analyzer Software For Windows 3.1
 Michele Preau, Leitch Incorporated

General Session:
 Safety & Liability
 Session Moderator: Dane Ericksen, PE, Hammett & Edison, Inc.

1 p.m.
 FCC Tower Registration Update
 Bob Greenberg, FCC FM Branch

1:30 p.m.
 Towers & Safety
 Mark Bell, Contributing Writer
 Television Broadcast Magazine

2 p.m.
 Environmental Protection of UHF Slotted Antennas
 Rex Niekamp, CPBE, Harris/Allied

2:30 p.m.
 UL Listing and Other Studio Transmitter Safety Issues
 Terry Baum, CPBE, Criterion Broadcast Services

Full conference registrants will receive a free ticket to attend one session from each of the other three conferences which, along with SBE, make up World Media Expo. They include the NAB Radio Show, the 137th SMPTE Technical Conference and the RTNDA International Conference.

SBE will close the conference with an awards dinner in the Grand Ballroom of the Fairmont Hotel. Two Lifetime Achievement awards will be presented along with a number of other awards.

Special guest speaker for the evening will be John W. Reiser, Senior Broadcast Engineer with the International Bureau of the FCC.

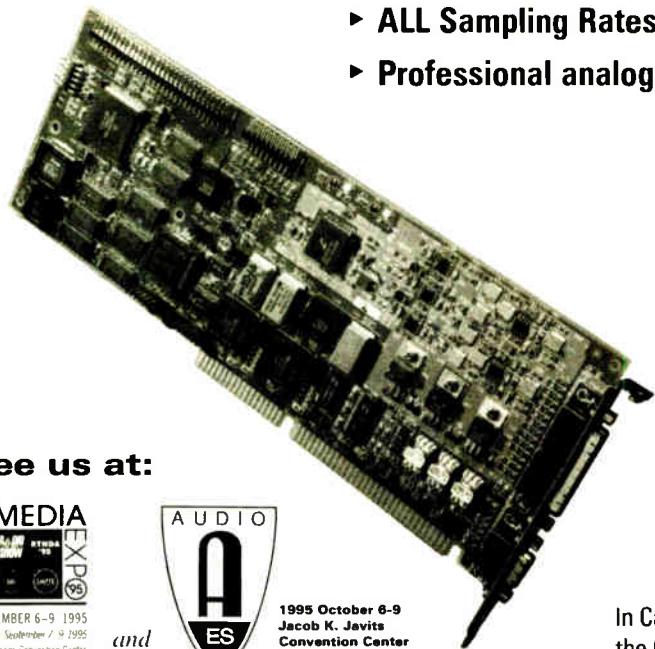
To register for the SBE Engineering Conference and World Media Expo, call the SBE National Office at 317-253-0122. Registration forms and updated information can also be obtained through the SBE Conference fax-on-demand line. Call 301-216-1853 from the handset on your fax machine and follow the instructions.

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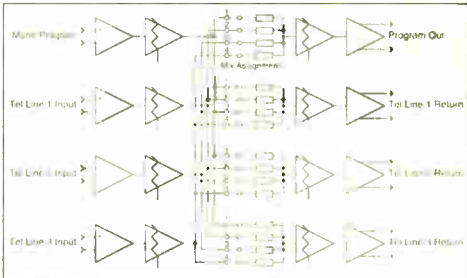
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The IFA-10 4x4 mixer is the perfect device for creating any simple mix-minus. Use it as a mono input to your console or down stream and get a mix-minus for three telco lines, or use it down stream from a stereo console and conference two lines. Need more lines? Combine two or more units. At \$300, power supply included, it's priced right. Now you can get that talkshow on the air without having to buy a high priced, fancy-dancy console. Call Rory Rall today for details.



BENCHMARK MEDIA SYSTEMS, INC.
Phone 800-262-4675, FAX 315-437-8119

READER SERVICE NO. 185

AUTOMATED FM ANTENNA PATTERN MEASUREMENTS



Using the Dept. of Defense Global Positioning System (GPS), and our hi-tech airplane, let us show you the signal your station is really transmitting. We measure each and every degree of both the horizontal and vertical patterns. Your signal is your most important asset! Don't guess. Be sure you're getting the maximum possible coverage. Call us today for a brochure or confidential consultation.

STEPHENS COMMUNICATIONS INC.
Little Rock, AR. • (501) 821-5756

READER SERVICE NO. 86

REMEMBER THE CORTANA FOLDED UNIPOLE ANTENNA? WE STILL MAKE IT WITH THE SAME HIGH QUALITY MATERIALS AND WORKMANSHIP. IT FEATURES...

- BROAD BANDWIDTH
- GROUNDED ANTENNA
- ELIMINATES ISOCOUPERS
- BEST ANTENNA FOR DIRECTIONAL ARRAYS.

ALSO

nott ltd.
1001 La Plante Hwy
Lanham, MD 21751
Phone 410-427-5200, Fax 410-427-1117

READER SERVICE NO. 166

Shape Up!

Coverage. Saturation. DBk contours. In FM broadcasting, the "bottom line" is always based on your pattern.

More than any other manufacturer, Shively has the experience and reputation for providing crucial pattern solutions for critical propagation problems. On any tower. At any power level. Remember, *it pays to be heard.*

A good pattern. The shape you need. Talk to your consultant. And contact us.

Shively Labs

A Division of Howell Laboratories, Inc.
19 Harrison Road, Bridgton, ME 04009
207-647-3327 FAX 207-647-8273

SEE US AT WME BOOTH # 464

READER SERVICE NO. 63

Call MYAT For Rigid Line & Components




Facing a "right now" emergency? Planning a new installation? Upgrading your facility? Whatever the need, MYAT is the solution. MYAT products are quality-built for maximum performance and long life. And we take delivery commitments seriously.

Call your favorite RF distributor or MYAT direct at 201-767-5380, or fax 201-767-4147 for our complete catalog and reference guide.

MYAT INC.
380 Chestnut St
P.O. Box 425
Norwood, NJ
07648

READER SERVICE NO. 143



A-7550... 10 kHz to 1 GHz PORTABLE SPECTRUM ANALYZER

Synthesized tuning and phase locked frequency stabilization enable accurate swept frequency measurements over calibrated span widths from as wide as 100 MHz/div to as narrow as 1 kHz/div. A standard 300 Hz resolution bandwidth filter and peak hold mode provide NRSC measurement capability. Other A-7550 features include:

- +30 to -120 dBm measurement range
- DC operation from 12 to 30 volts (Built-in battery optional)
- Optional built-in tracking generator
- Optional built-in AM/FM SSB receiver
- Optional IEEE-488 or RS-232 interfaces

For more information or a demonstration of the A-7550 contact:

IFR SYSTEMS, INC.
10200 West York St., Wichita, Kansas 67215
Phone (316) 522-4981 Ext. 207, FAX (316) 524-2623
DIRECT FACTORY RENTAL PLAN AVAILABLE

READER SERVICE NO. 97

Exhibitor Directory

The following is a partial preview of the products that companies will exhibit at The World Media Expo in New Orleans. For a complete listing see the official exhibition guide.

A-Ware Software Inc. 945

On Display: Music Master, a music scheduling system for radio stations, networks and consultants; makes library management efficient, schedules logs quickly, allows final changes to be made easily and interfaces with most automation and live-assist music storage systems. Also available is Read Time, the paperless studio.

Accu-Weather Inc. 1163, 1953

Intro: UltraGraphix-32 Weather System, delivers totally custom 32-bit graphics, new VirtualWeather flythroughs and animation. FirstWarn, weather warning crawl generation system; AccuNet on-line services; Meteorology School and the exclusive Ray-Ban UV Index.

Also: The Exclusive Accu-Weather Forecast Service, which is very accurate, highly promotable and used by top-rated stations in the United States and worldwide, including WABC-TV, KNBC-TV and WPVI-TV.

Acoustical Solutions Inc. 1265

Intro: AlphaSorb wall panels, rigid sound absorbers covered in Guilford fabric with NRC .80; available in standard and custom sizes up to 4 x 10 feet, Class 1 fire-rated. Sonex Valueline and Sonex Classic acoustical foams, new Class 1 fire-rated and fiber-free sound-absorbing foams available in natural white as well as painted charcoal, blue, brown and beige.

Also: Alpha Wedge and Pyramid acoustic foam; Soundtex fabric wall covering; Audioseal sound barrier, a dense, high-temperature fused vinyl sound blocker with STC 27; Sonex ceiling tiles and modular recording/broadcast booth.

AEQ-AMERICA INC. 827

On Display: AEQ Digital Audio Codec ADC-3000, a multiformat audio codec that offers an array of user-selectable options, a full duplex encoder/decoder with different bandwidth selections up to 10.5 kHz, and two compression algorithms, ISO MPEG Layer II and CCITT G.722. Telephone Line Extender TLE-02, a portable mixer and digital telephone hybrid with frequency extender capability that works with regular phone lines and cellular phones. Digital Telephone Hybrid TH-02 EX, a rack-mountable unit capable of more than 60 dB hybrid rejection; can host up to two phone lines with frequency extender offering multiconference capability. Portable Mixer MP-10, which has five inputs (mic/line) and a built-in telephone; internal battery provides four hours of autonomy; ideal for remote event transmissions. Audio Monitor System AM-03, which has three selectable input, phase display and high audio quality. The MAR System (Management of Audio Resources) for recording and playback offers a superb user interface and automatic news recording capability. On-air consoles, featuring the BC-500 and BC-2000 Series.

Contact: Gerardo Vargas, Dir.
 2211 48th St. S, Ste. II
 Tempe, AZ 85282
 602-431-0334
 FAX: 602-431-0497

American Medical Association 1462

American Speech-Language-Hearing Association 912

Ametron/American Electronic Supply Inc. n/a

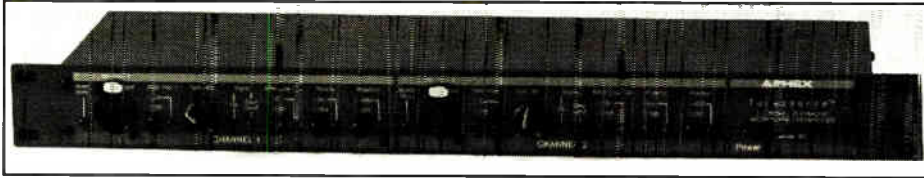
On Display: Audio, video, A/V equipment and endless amounts of cables, connectors and accessories for such equipment. We also rent and repair this equipment.

Andrew Corp. 2327

On Display: Microwave transmission antennas and systems, including UHF/VHF-TV, ESA, STL, Heliac coaxial cables, MAXCLINE and HRLINE rigid transmission lines.

APHEX SYSTEMS LTD. 435

On Display: Aphex Air Chain—Compeller



Aphex "Tubessence" Mic Preamp Model 107

Model 320A, Aural Exciter Type III Model 250, Dominator II Model 720/722 and Digicoder Model 400. Model 622 Gate and Model 107 Dual-Channel Tube Mic Preamp. Contact: Brad Lunde, Dir. of Sales/Mktg.

11068 Randall St.
 Sun Valley, CA 91352
 818-767-2929
 FAX: 818-767-2641

The Arbitron Co. 419

Intro: Retail Profiling, a powerful marketing technique that teaches how to increase local market sales.

Also: MaximiSer and Scarborough.

ARRAKIS SYSTEMS INC. 645

Intro: New line of high-power digital workstations, focusing on live on-air, multitrack editing and satellite delivery; Digilink III and Trak*Star III. Digital console/workstation.

Also: Digi-Link digital automation and cart replacement system; Trak*Star, the affordable eight-track editor for radio; Gemini, live on-air workstation and push-button control; three audio consoles—1,200/12,000/22,000; Desk*Star studio furniture; and Modulink prewired system packages.

Contact: Jon Young
 2619 Midpoint Dr.
 Fort Collins, CO 80525
 970-224-2248
 FAX: 970-493-1076

Associated Press 1519

On Display: The Associated Press, the world's largest newsgathering organization, providing the following services to 15,000 media outlets worldwide: Video—APTV, international video news service covering the world's top stories. Software—AP NewsCenter and AP NewsDesk/AP NewsDesk LAN for managing news and information resources. Radio networks—AP ALL News Radio, AP Network News, Texas AP Network; flexible programming that fits any format. News wires—State, regional, national and international news, business, sports, entertainment and weather. Graphics—AP GraphicsBank, an on-line database of 70,000 images available 24 hours a day. Data delivery—AP Express, a shared data network for words, sound and photos.

ATCi 1765

Intro: PC Demod. a PC-based demodulator that receives data at 384 kbps.

Also: Simulcast multibeam antenna, sees 35 satellites at the same time. Vanguard instruments spectrum analyzer/satellite receiver/monitor.

AUDIO PRECISION INC. 1252, 1254

Intro: System Two, a true dual-domain audio analyzer. APWIN Windows-based software for System One and System Two audio analyzers.

Also: System One audio analyzers and Portable One Plus Audio Test Set for field and studio use.

Contact: Tom Mintner
 P.O. Box 2209
 Beaverton, OR 97005
 503-627-0832
 FAX: 503-641-8906

AUDIO TECHNOLOGIES INC./ATI 910

Intro: NANOAMP Series Dual (BGD200) and Quad (BGD400) Bargraph Meters that display up to 12 critical audio lines in only

a single rack space; quiet, external 24 VDC wall-mount power modules can drive several NANOAMPs. ENCORE Series Dual (DA206) and Quad (DA412) Audio Distribution Amplifiers (XLR-type input and output connectors); two or four inputs; RF protected. DA200 and MDA200, two new dual-channel audio distribution amplifier

six-source line selector, module extenders, gold contact switches, Penny & Giles faders, Sifam meters, better than 16-bit digital audio performance and simple phone module.

Also: R-16 on-air console for newsroom, digital workstations and other applications where only a few inputs are needed. MR-40 multitrack audio production console with four mono mic/line input modules and eight stereo line modules.

Contact: Rick Strage, Sales Mgr.
 7305 Performance Dr.
 Syracuse, NY 13212
 315-452-5000
 FAX: 315-452-0160

AUDION LABORATORIES 1109

Intro: VoxPro 2.0 Phone Editor, including ballistic, audible, fast forward/reverse; backwards and forwards real-time scrubbing; file transfer via network and removable media; automatic two-channel gain control; no-compression six-hour stereo capability; one-screen operation; optional color-coded control panel.

Contact: Sue Rogers
 12903 Manzanita Rd. NE
 Bainbridge Island, WA 98110
 206-713-8680

AUDITRONICS INC. 139, 141

Intro: The 2500 series audio console system, a newly introduced, smaller footprint audio console for radio on-air and production with music or talk formats. System features program, audition and two mix-minus busses. Three frame sizes and options are available.

Also: The 210 series audio console system, an industry standard drop-in audio

modules in the MICROAMP System 10,000 series of interchangeable distribution, microphone and line amplifier modules in one rack frame.

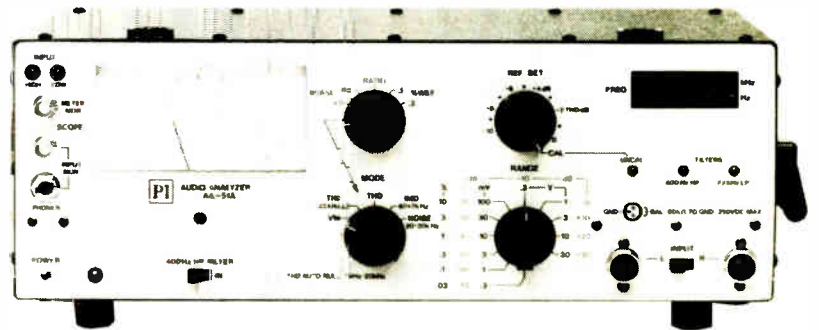
Also: NANOAMP Series mixers, battery packs, mobile DC converters, IHF to PRO interfaces. ENCORE Series audio distribution amplifiers, precision phono preamplifiers. MICROAMP Series microphone, line buffer, distribution, power and phono amplifiers; headphone drivers; studio metering systems, System 10,000 Modular Rack System. VANGUARD Series broadcast on-air consoles; six-, eight- and 12-mixer, dual-channel stereo.

Contact: Sam Wenzel, Pres.
 328 W. Maple Ave.
 Horsham, PA 19044
 215-443-0330
 FAX: 215-443-0394

AUDIOARTS ENGINEERING 727

Intro: R-60 on-air audio console features

AA-51A AUDIO ANALYZER NEW \$3770; UPGRADE \$1560



MEASURES:

- ✓ HARMONIC DISTORTION
- ✓ VOLTS
- ✓ dB; dBm (600 ohms)
- ✓ FREQUENCY
- ✓ WOW & FLUTTER
- ✓ STEREO PHASING
- ✓ SIGNAL + NOISE NOISE
- ✓ INTERMODULATION DISTORTION
- ✓ DIFFERENTIAL GAIN OF STEREO CHANNELS

FEATURES:

- ✓ AUTO-NULL THD+N
- ✓ SHIELDED & BALANCED STEREO INPUTS
- ✓ COMPATIBLE WITH NAB TEST DISKS
- ✓ FREQUENCY READOUT
- ✓ SWITCHABLE HIGH-PASS AND LOW-PASS FILTERS
- ✓ VERNIER SET-LEVEL CONTROL
- ✓ HEADPHONE INPUT MONITOR PORT

PLEASE CONTACT US FOR COMPLETE DETAILS



Potomac Instruments, inc.

932 Philadelphia Ave., Silver Spring, MD 20910
 Phone 1-301-589-2662 • Fax 1-301-589-2665

console with 12-, 18- and 24-input mainframes; loads of options. The 801 series audio console system, an on-air and production audio console with 12-, 18- and 24-input position mainframes. The 1900 mix-minus system, a unique modular rack-mounted mix-minus/IFB audio system; unlimited input, output and IFB configurations; especially suited for talk formats with remote guests/hosts; producer IFB panels available.

Contact: Bob Greenwald, Sales Engr.
3750 Old Getwell Rd.
Memphis, TN 37116
901-362-1350
FAX: 901-365-8629

AUTOGRAM CORP. 1048

Intro: New line of modular signal routing and control products. CYA-3 prioritized emergency audio switcher.

Also: Pacemaker and Mini-Mix line of audio consoles available in 6 to 16 channels.

Contact: John Hutson, Mktg. Mgr.
1500 Capital Ave.
Plano, TX 75074
800-327-6901
FAX: 214-423-6334

BAF COMMUNICATIONS CORP. 1 819

Intro: SNV-MS200e, 7-rack Production Satellite News Vehicle; ENG-18b Van with Crow's Nest Camera.

Also: Satellite Space Segment for Satellite News Gathering.

Contact: Bob King, V.P. Sales & Mktg.
314 Northstar Ct.
Sanford, FL 32771
800-633-8223; 407-324-8250
FAX: 407-324-7860

Baron Services Inc. 1701

Belar Electronics Laboratory Inc. 338

Intro: TVM-250 SAP/PRO Monitor. RDS-1 RDS monitor/analyzer.

Also: Complete line of AM, FM and TV modulation monitors.

Belden Wire and Cable Co. 2245, 2247

Intro: Plenum RGB cables available in 3, 4 and 5 coaxial cable versions; high flex RG-59/U and RG-11/U triaxial camera cables available in several jacket colors; super flex high-performance snake cables; super flex low-loss RG-8 cables.

Also: AES/EBU digital audio cables; mic and musical instrument cables; line level audio cables; precision video coax, triax cables;

camera cables; fiber optics, 50 ohm transmission cables and power cords.

BEXT INC. 549

Intro: Front-panel programmable television exciter and translators. New Lex 25/716, FM 25 W exciter with built-in stereo generator and audio processor.

Also: SF (FM) Series amplifiers with new automatic power foldback instead of shutdown due to excess reflected power (150 W to 5 kW). HPT Series translators, boosters, transmitters (for FM use). Lex 25 (25 W exciter) FM. T Series single-tube amplifiers for FM broadcast. Tex 30 exciter. SF 1000 1 kW MOSFET amplifier.

Contact: Michelle DeFazio, Sales Mgr.
1045 Tenth Ave.
San Diego, CA 92101
619-239-8462
FAX: 619-239-8474

**BIA PUBLICATIONS/
BIA CONSULTING INC. 948**

On Display: Radio and television market and station data in a database software program called MasterAccess. Radio and television investment guides, "Investing in Radio" and "Investing in Television," as well as up-to-date station directories, BIA's "Radio Yearbook" and "Television Yearbook." Financial consulting services including business valuations, asset appraisals, business planning, market research, litigation support and investment banking.

Contact: Debbie Metcalf, Asst. V.P., Mktg.
14595 Avion Pkwy., Ste. 500
Chantilly, VA 22021
703-818-2425
FAX: 703-803-3299

Bittree Inc. 1764

On Display: The 1/4-inch patchbay and the T1 audio patchbay, both with the original 3-pin rear interface; RS 422 data patchbays, patchcord and accessories, as well as serial digital video patchbays.

Bloomberg Financial Markets 1061

British Information Services 142

On Display: Radio—"Newsbreaks from Britain," a free daily news feature audio actuality service filed by digital ISDN circuit from London to stations/networks in both English and Spanish.

Television—A wide range of monthly news magazine programs about British lifestyle and society. All programs are free of charge

to stations and are produced, in addition to English, in several other language versions, including Spanish and Arabic. TV Facilities Unit—Provides assistance to television stations covering stories on location in the United Kingdom.

BROADCAST ELECTRONICS INC. 319

Intro: FM-4C, 4 kW solid-state FM transmitter.

Also: AudioVAULT digital studio systems; CORE digital automation system; Sentry automation system; Disc Trak, digital cart machines; Air Trak consoles; FM-30b, 30 kW FM transmitter; FM-3C, 3 kW solid-state FM transmitter; FM-1C1, 1 kW solid-state AM transmitter; as well as Marti Electronics STLs, RPU's and exciters.

Contact: Kim Winking, Mktg. Services Admin.
4100 N. 24th St.
Quincy, IL 62301
217-224-9600
FAX: 217-224-9607

BROADCAST PROGRAMMING 361

Intro: Three new music formats: Digital New AC, AC 45+ and AC Variety Gold. Offering BP barter option to clients.

Also: Provider of expert music formats, libraries and consulting services to locally programmed radio stations. Chartbreakers Weekly Hit CDs and monthly recurrent services. BP Consulting Group provides full-service research and consulting services to music stations. With its parent company, Broadcast Electronics, BP assembles complete digital programming systems for live, live-assist or fully automated stations. BP and BE can provide a turnkey digital music programming solution at an affordable price, backed by 24-hour support.

Contact: Alison Link, Mktg. Admin.
2211 5th Ave.
Seattle, WA 98121
800-426-9082
FAX: 206-441-6582

mitter problems instantly; audible alarms and front-panel indicators alert the operator to out-of-tolerance conditions. ARC-16SA, a standalone transmitter control system that can be called from anywhere; Model ESI, Enhanced Speech Interface, accepts either voice or data calls and allows you to take immediate control. LX-1, a six-input stereo selector.

Contact: Dan Rau, Sales Mgr.
7 Beaver Brook Rd.
Littleton, MA 01460
508-486-0086
FAX: 508-486-0081

CCA ELECTRONICS 635

Intro: FM100GS, 100 W high-performance FM exciter.

Also: G-Line 2.5 to 45 kW tube FM transmitters; GS-Line 2.5 to 12 kW single-tube FM transmitters.

Contact: Darrin Tebbe, Sales Eng.
P.O. Box 426
Fairburn, GA 30213
404-964-3530
FAX: 404-964-2222

CELLCAST INC. 239

On Display: RBS-400, a remote broadcast studio, frequency extender, mixer and cellular transceiver all in one.

Contact: Rhonda Moore, V.P.
2002 Ford Ave.
Springdale, AR 72764
501-750-0277
FAX: 501-751-3761

Chemical Manufacturers Association 1601

**The Church of Jesus Christ
of Latter Day Saints 1072**

CIRCUIT RESEARCH LABS INC. 827

Intro: DP-100 DSP FM Stereo Processing System and Stereo Generator, using the latest 32-bit floating point processing; analog, AES/EBU and TOSLINK fiber inputs and outputs. SC-100 RBDS/RDS Generator with enhanced automation and paging ter-



CRL's DP100 Digital Processor

**BROADCAST SUPPLY
WORLDWIDE/BSW 1509**

On Display: The 360 Systems Instant Replay, Arrakis Digilink, Audioarts consoles and The Blue Group's PhoneByte.

Contact: Tim Schwieger, V.P. Mktg.
7012 27th St. W
Tacoma, WA 98466
800-426-8434
FAX: 800-231-7055

Broadcasters General Store Inc. 461

Intro: ISDN/SW56 Codecs. SRC-8A remote relay control from Broadcast Tools. CCS FieldFone.

Also: DNF universal VTR remote controls. 360 Systems DigiCart and Instant Replay. Products from Gentner, Comrex and CCS.

BURK TECHNOLOGY 122

Intro: BDT-115 RF Data Link, which provides error-free communications between ARC-16 remote control units; operates in the 902-928 band and eliminates telco charges for data lines and SCA requirements for remote control links. Antennas for the BDT-115 permit line-of-sight operation at up to 20 miles. The BTU-4, Burk Temperature Unit, supports up to four independent temperature sensors, and also provides AC line voltage monitoring. The BTO Outdoor Sensor is intended for general-purpose monitoring of equipment or ambient temperatures. The BTI Indoor Sensor is tailored for monitoring ambient temperatures within a room. The BTS Stack Probe is specially designed for sensing heat within the air ducting of your equipment.

Also: ARC-16, a two-unit transmitter control system that allows you to rectify trans-

missional functions; includes 300-pager terminal program and LED sign control program.

Also: A complete line of audio processing products for AM, FM and television. FM stereo, SCA and television stereo generators; DAA Series AES/EBU analyzer.

Contact: William L. Ammons, Nat'l Sales Mgr.
2522 W. Geneva Dr.
Tempe, AZ 85282
800-535-7648
FAX: 602-438-8227

Clark Wire & Cable 2319, 2321

Intro: Audio/video rack panels with 0.068-inch black anodized aluminum, 0.500-inch flanges for added strength and white silk-screened numbering; custom layouts available. 800 Series AES/EBU digital audio cable. RG6SD serial digital coax. SM Series service-multiple audio/video cables.

Also: RCC Series remote composite cable; 700 Series audio snake; industry standard audio and video cables; super-low-loss video snakes; microphone cables; remote composite cables; Hannay cable reels; Neutrik, Switchcraft, Amphenol, Alcatel connectors; Clark Ergonomic Crimp Tool and Coastel Automatic Strip Tool.

Columbine JDS Systems Inc. 1035

On Display: Provider of media software and services, with service and support from offices in Denver, Memphis, New York, London and Sydney to more than 1,600 radio, television and cable installations in 28 countries, offers Traffic Systems for various common technology platforms. These systems are enhanced by Log Plus, which makes it easy to prepare your schedules; Skim Plus, which

The Wizard™ has gone STEREO!

The new **DIGITAL** FMSA-1 gives The Wizard System unmatched stereo monitoring capabilities. . .



Superlative stereo performance. Linear-phase filters that reveal the true performance of your audio processing. The stability of digital stereo demodulation. The sophisticated graphical presentation of The Wizard. And—with the RS-232 port—operation on site or off.

Contact Belar today for more details on what should be your next modulation monitor

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(610) 687-5550 • FAX (610) 687-2686
Call, write or FAX for more information on Belar AM, FM, Stereo, SCA, and TV monitors.



LOG FOR LESS

Everyone loves Eventide digital audio-loggers. They've thoroughly obsoleted old-fashioned reel-to-reel logging recorders. But for some stations, our 24-channel model VR240 is more than the budget can handle. And many stations will never need to record up to 24 channels.

500 hours, half the price

The Eventide VR204 4-channel digital logger is the perfect answer. It costs less than half the price of a fully optioned Eventide VR240! The high density DDS2 drive of the VR204 can actually record more than 500 hours, divided among up to 4-channels, on a single DAT tape. That's twice the record time of our original models.

Built-in hard disk

The VR204 is a single drive machine, yet it can play and record simultaneously. That's because it features an ingenious built-in hard disk memory module that keeps recording even if the tape is playing back an

earlier segment (or if the tape runs out). When the tape resumes recording, the content of the hard disk is transferred to tape, maintaining the completeness of the taped log.

Two-way compatibility

There's also a play-only model, the VP204, which is ideal for the GM's or PD's desk or for the group's main office. And both the VR204 and VP204 can playback any of the 24 channels recorded on an Eventide VR240.

Keep an accurate audio record of everything that goes out on your air. Keep track of the competition as well. Contact your broadcast dealer or Eventide for the full story on the economical VR204. Because without an Eventide digital logger, you really don't know what you're missing.



**Now record
500+ hours on
one tiny DAT tape**



Circle (15) On Reader Service Card
See Us At WME Booth 1362

World Radio History

Eventide
the next step

One Alsan Way, Little Ferry, NJ 07643
Tel 201-641-1200 Fax 201-641-1640

gives immediate access to station inventory information in a user-friendly Windows environment; Sales Management System (SMS), a PC-based system that lets you quickly project expected revenue, monitor budgets and establish sales quotas.

Communication

Graphics Inc. 845, 847
On Display: Manufacturer of screen-printed decals and bumper stickers. Creative designs and logos available from experts in broadcast design.

COMPUTER CONCEPTS

CORP. 327
Intro: Maestro, a Windows-based interface allowing all traditional DCS functionality with enhanced features, such as integration to music database and display of news and information text. CartRack, which provides instant access to songs, sound effects and all tools of the fast-paced drive-time shows. StudioFrame, a Windows-based 8/24-track digital audio workstation.

NewsRoom, which provides for complete control over all news operations. ISO MPEG Layer II, the plug-in option that gives DCS users world-standard audio compression. VoiceTracker, which lets announcers time their voiceovers with precision and preview audio. LogMerge, merges the commercial and music scheduling logs into one complete log for DCS.

Also: Digital Commercial System (DCS) hard disk audio storage system. With its list of new features, DCS becomes that hub of all station operations; from the graphics control of Maestro through the instant audio access of CartRack through the convenience of VoiceTracker.

Contact: Della Northcutt, V.P.
8375 Melrose Dr.
Lenexa, KS 66214
913-541-0900
FAX: 913-541-0169

COMREX CORP.

735

Intro: NEXUS ISDN Audio Codec, incorporates a user-friendly BONDING terminal adapter with Comrex's new upgraded G.722 digital audio codec; the NEXUS is capable of 15 kHz bidirectional audio on a full ISDN line and is also compatible with standard 7.5 kHz G.722 codecs. Codec Buddy, a multi-function remote console designed for ISDN/SW56 remote broadcasts; it works with any digital audio codec, providing audio mixes for program feeds, communications, headphones and public address systems; the Buddy condenses the various mixers, amplifiers and complex cabling required for these remotes into one small box.

Also: A full range of digital audio codecs for ISDN and SW56 use: DX200 MusicLine ISO/MPEG Layer II, DX100 apt-X, DXR.1 and DXP/1 G.722. Frequency extenders to provide up to 8 kHz audio on standard analog telephone lines: LXT/R one-line system, 2XP/2XR two-line system, and 3XP/3XR three-line system. Also, wireless cue system and telephone couplers.

Contact: Marsha Shamel
65 Nonset Path
Acton, MA 01720
508-263-1800
FAX: 508-635-0401

COMSTREAM CORP.

119

Intro: New products for transmitting audio and video by satellite such as a high-speed DVB-compliant system for transmitting digital MPEG 2 video or high-volume data

broadcast. New advances in digital audio encoders for Comrex digital audio networks, which transmit CD-quality MPEG 2 audio for a variety of applications.

Also: The ComStream line of professional digital audio products. The digital audio network, featuring the ABR200 receiver. All network sites are addressable over the air. The Audio Network Management System provides a graphical interface to your network from a central location to access and control ComStream networks.

CONTINENTAL

ELECTRONICS CORP.

1145

On Display: Complete line of AM and FM transmission products. Transmitters from 50 W to

70 kW. Shortwave and higher power levels are also available.

Contact: Steve A. Claterbaugh,
Adv. & Promo's
P.O. Box 270879
Dallas, TX 75227
214-381-7161
FAX: 214-381-4949

Corporate Computer

Systems (CCS)
(see MUSICAM USA)

CROWN BROADCAST

1180, 1182

Intro: FM translators; FM receiver module; FM250 250 W transmitter; FSK module.

Also: FM transmitters; Crown AirForce hard drive storage system.

Contact: Mark Potterbaum

1718 W. Mishawaka Rd.

Elkhart, IN 46517

219-294-8050

FAX: 219-294-8302

Custom Business

Systems/CBSI

335

CUTTING EDGE

TECHNOLOGIES

839

On Display: The Unity 2000i FM and the Unity AM broadcast processors, offering processing settings appropriate for all formats. The Unity processors include Version 4.X hardware and software, and Unity Remote software for processor control from anywhere by modem. Also on display: Dividend Composite Filter, which provides full-spectral

protection, including RBDS and other SCA signals.

Contact: Neil Glassman, Mktg. Dir.

2101 Superior Ave.

Cleveland, OH 44114

216-241-3343

FAX: 216-241-4103

DALET DIGITAL MEDIA

SYSTEMS

1144, 1146, 1148

Intro: Finalized four- and eight-track editors, designed especially for radio stations. Call&Record application for reporters out in the field to record their stories over the phone, as Dalet's improved ISDN Transfer application for transferring audio to distant locations.

Also: Dalet's many applications

\$6295*
Powerful.
100 layers per track.
Bar/Beat Editing.
Time compression.
Pitch Correction.
Full Automation.
Interface for DA-88/ADAT/RS-422.
Trigger Mode.
Portability.
No computer needed.
SMPTE/MMC/MTC/SPP Sync.
Video Output.
Scrub Preview.
Backup to SCSI/Audio DAT.
Non Destructive Editing.
Punch In/Out.
Reliability.
Portable/Stand Alone.
"No Crash" performance.
Fast.
Easy to learn.
Confidence.

DM-800
Digital Audio
Workstation!

*MSRP 4-1-95. Price subject to change.

WorldRadioHistory

for radio stations include: satellite automation, live-assist, music automation and news. Dalet software relies on Windows graphics and on a centralized network architecture allowing a large number of users. Operations can be performed by simple drag-and-drop with the mouse, through fader starts or remote control keyboards. All audio is instantaneously accessible to all users. Contact: Steve Kelley, Opns. Mgr. 122 42nd St. E, Ste. 4906 New York, NY 10168 212-370-0665 FAX: 212-370-9610

Datacount Inc. 465, 467
Intro: A new music scheduling system that is available in a buyout

license with a low support fee. The new release of the DARTS 7 system, which makes doing traffic easier and more efficient by doing multistation combined traffic for up to eight stations. Automation interfacing is more flexible by offering automatic log reconciliation to most major digital automation systems. DARTS 7 is fully compatible with Novell and Lantastic networks and may be purchased in multistation and multiterminal versions.

Also: DARTS (Data Accounts Receivable and Traffic Scheduling) software for broadcasters; a PC-based system available in single- and multi-user versions that encompasses all aspects of logging, traffic, co-op billing, accounts receivable, as well as sales and

management reporting. DARTS also offers a multistation version. Automation interfaces to major automation/digital suppliers are available, as well as exports to popular spreadsheet applications. A downsized version of DARTS, called DARTS EL (Entry Level), is also available for smaller market stations.

DATAWORLD INC. 944

Intro: Detailed ethnic and demographic reporting via tabular and graphical (map) formats. Large on-line database provides instant access. Internet communications capability. New ethnic/demographic shading overlays for any base map.

Also: Allocation map books;

coverage analysis; terrain digitizing; AM, FM, TV, LPTV and wireless cable databases; interference studies and directories; 24-hour remote access. Contact: John Neff or Bob Richards, Sales 4827 Rugby Ave., Ste. 200 Bethesda, MD 20814 800-368-5754; 301-652-8822 FAX: 301-656-5341

dbm Systems Inc. 1069

Intro: Instant Access option for CartWorks digital audio storage and automation system. Forty-eight push-buttons allow rapid access to user-defined audio cuts stored on CartWorks.

Also: CartWorks, a Windows-based digital audio system for broadcasters.

It replaces traditional audio cart machines with digital audio from the hard drive while keeping the operation almost identical. Manual, live-assist and automation modes are supported. Requires minimal staff retraining.

DATA CENTER MANAGEMENT (DCM) 1711

Contact: Rick Summers 841 Baxter St., Ste. 108 Charlotte, NC 28202 704-377-1496 FAX: 704-377-6336

Denon Electronics 144, 146

Intro: DN 981F, MiniDisc cart player with Hot Start gives you the ability to play back any track instantaneously; up to 10 tracks can be loaded at a time for immediate playback. DN1400F, 200-CD jukebox with two transports. DN80R, portable MD recorder.

Also: A complete line of CD players, cassette decks and MD cart recorders for broadcast and post production.

Contact: John Casey, Mktg. Mgr. 222 New Rd. Parsippany, NJ 07054 201-882-7460 FAX: 201-808-1608

DG Systems 1127

On Display: Multimedia transaction networking services for the broadcast radio advertising industry; accurate and timely delivery of CD-quality audio commercials and associated traffic instructions from advertising agencies and production studios to radio stations.

DI-TECH INC. 2348

Intro: Models 5886/5887, 64 x 64 A/V routing switcher assemblies requiring six rack units of space; Models 5881/5882, 128 x 160 A/V routing switcher assemblies requiring 20 rack units of space. The four include redundant power supplies.

Also: Model 9002 multilevel control system, audio/video DAs, video equalizers, audio mono and stereo monitor amplifiers.

Contact: Tony Bolletino 48 Jefryn Blvd. Deer Park, NY 11729 516-667-6300 FAX: 516-595-1012

DIELECTRIC COMMUNICATIONS 1361

Intro: HDTV planning packet for antenna system design and analysis. DCR-L low-power FM antenna.

Also: VHF, UHF and FM products including horizontal and circularly polarized antennas; transmission line and waveguides; RF systems, switches and loads.

Contact: Constance L. Eldridge, Mktg. Coord. P.O. Box 949 Raymond, ME 04071 207-655-4555 FAX: 207-655-7120

DIGITAL COURIER INTERNATIONAL INC. 955

On Display: Two-way digital PC-net moves CD-quality audio and text cross-country to radio stations, studios and distributors in as little as one hour.

Contact: Sandra Acham, Mktg. Ass't 8618 Commerce Ct. Burnaby, Canada USA 4N6 604-293-6047 FAX: 604-473-5835

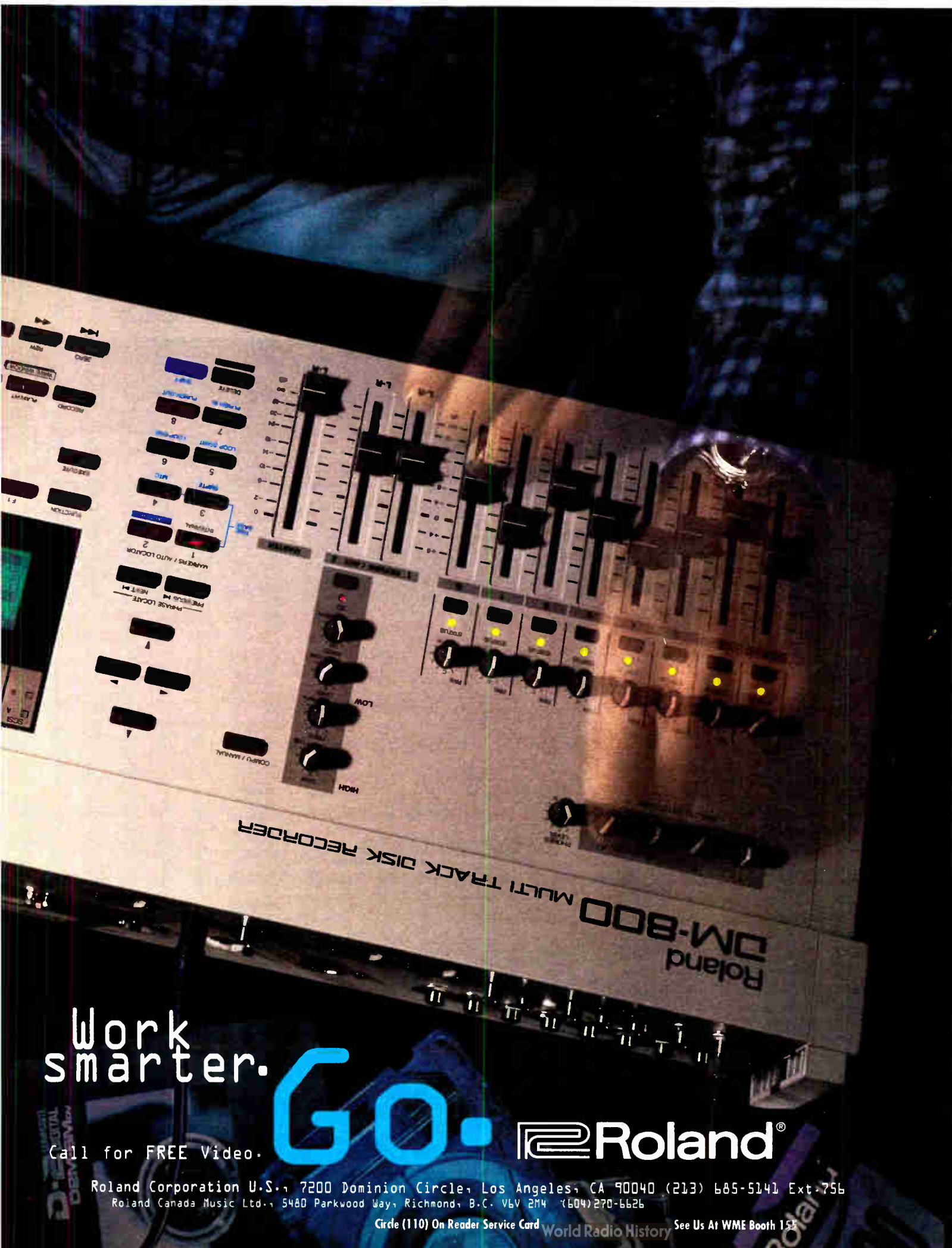
Digital D.J. Inc. 1153, 1155

Digital Link Inc. 158

Intro: ADAS, a Windows-based automation system. Also: DAP, a PC-based MS-DOS automation system.

DOLBY LABORATORIES INC. 1219, 1231

On Display: The Dolby Fax system for high-quality audio trans-



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Roland Canada Music Ltd., 5480 Parkwood Way, Richmond, B.C. V6V 2M4 (604) 270-6626

Circle (110) On Reader Service Card World Radio History See Us At WME Booth 153

Guts & Glory.



Command the absolute highest audio performance. Radio Systems' RS Series consoles deliver with less than .02% distortion, super-low noise, and excellent crosstalk specifications.

RS Series consoles are low cost, not cheap. They are ruggedly constructed to endure the battles of everyday use.

There are a lot of mid-priced consoles out there that look good and offer similar features on the outside. But only RS Series consoles have the guts it takes to perform on the inside.

Here's the drill:

- Total access to all parts, connectors, and controls is assured with one simple lift of the front panel.
- All assemblies, including faders, switches, and circuit boards are fully connectorized for fast, solderless replacement.
- Total DC control allows no audio on front panel switches or faders, assuring long-term audio integrity and reduced maintenance costs.
- Quick-connect barrier strips are used for all audio and remote control wiring.

- Complete input agility lets any channel mix mic, through consumer, through line level signals on either input. All logic is fully programmable for each input.
- Wiring diagrams are permanently adhered inside the console.

RS Series consoles install quickly, repair easily and last so long they've earned their stripes. Now that's real guts and glory. The first mid-priced, fully featured console still wins the price-value war.

1-800-622-0022

FAX 317-966-0623

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ALLIED**

mission via ISDN, the DP series of encoders and decoders incorporating Dolby AC-2 and Dolby AC-3 digital audio coding, the Model 740 Spectral Processor and other applications for Dolby AC-3 multichannel audio technologies.
Contact: Eileen Tuuri, Mktg. Services Mgr.
 100 Potrero Ave.
 San Francisco, CA 94103
 415-558-0200
 FAX: 415-863-1373

Dow Jones & Co. Inc. 2326, 2328

Dr. Red Duke's Health Report 1223
 On Display: Dr. "Red" Duke's Health Report now available for radio. Dr. Duke has been a source of health information for TV viewers for more than a decade; now radio listeners are enjoying his reports on health, fitness and nutrition.

E-Z UP International Inc. 660, 664
 Intro: The E-Z UP Instant Shelter Eclipse was developed from the original Series 9000 model and sets up in less than 60 seconds. New features include a powder-coated white frame, the high-strength steel oval trusses for increased stress resistance, a taller peak for a tighter fit, and larger, stronger outer legs. The Eclipse is available in a variety of colored fabric tops and sizes ranging from 8 x 8 to 10 x 20 feet. Optional sidewalls, rail skirts and bug screens Velcro in place for extra protection from wind and sun.

Also: E-Z UP Instant Shelter Encore Model, developed from the original E-Z UP Instant Shelter. Used to keep cool on remote locations and grab attention with highly visible silk-screened call letters. New features include a higher peak, additional sizes and a lighter, stronger frame. The Encore sets up in seconds, requires no assembly, no ropes and is fully self-contained. Folds up to size of golf bag. Sizes range from 5 x 5 to 10 x 20 feet in 23 colors and accessories are available.

ECONCO BROADCAST SERVICE 1173
 On Display: Medium- to high-power quality rebuilt power tubes and klystrons for radio and TV transmitters.
Contact: Debbie Baker, Sales
 1318 Commerce Ave.
 Woodland, CA 95776
 800-532-6626
 FAX: 916-666-7760

ELECTRIC WORKS CORP./ THE MANAGEMENT 1119
 Intro: The Digital Longform Recorder (DLR), which can record up to four simultaneous events onto a digital hard disk. Simultaneous replay of events is also possible. DLR replaces existing tape or cassette recorders and single-track digital recorders.
 Also: The expanded AXS digital hard disk system with touchscreen and program pad. For live, live-assist, CD or hard disk music and satellite operations.
Contact: Adrian Charlton, G.M.
 P.O. Box 1-36457
 Fort Worth, TX 76136
 817-625-9761
 FAX: 817-624-9741

ENCO SYSTEMS INC. 945
 On Display: DAD486x digital audio delivery system.
Contact: Larry Lamoray, V.P. Sales & Mktg.
 24403 Halsted Rd.
 Farmington Hills, MI 48335
 810-476-5711
 FAX: 810-476-5712

Energetic Music 148
 Intro: Romantic #2 CD, Travel and Leisure #2 CD and Light Jazz #1 CD.
 Also: 23 CDs and cassettes for radio, TV and videos.

ENERGY-ONIX 260
 Intro: Several new broadcast transmitter products.
 Also: Digitally controlled composite STL1 and STL2. FM products include the ECO and MK series of grounded grid triode transmitters. Solid-state transmitters include the Legend series of high-power and SST series of low-power FM transmitters.
Contact: Ernie Belanger, V.P. Mktg.
 752 Warren St.
 Hudson, NY 12534

518-828-1690
 FAX: 518-828-8476

ERI—ELECTRONICS RESEARCH INC. 906
 Intro: S.K.I.P., antenna site surveillance monitor and reporter. RFSS, energy isolation device addressing OSHA's lock-out/tag-out regulations. Lightning spur, low-cost, high-efficiency lightning dissipation system.
 Also: Transmitting towers and antennas; Lambda mounting system; towers and monopoles.
Contact: David Davies
 7777 Gardner Rd.
 Chandler, IN 47610
 812-925-6000
 FAX: 812-925-4030

EVENTIDE INC. 1360, 1362
 Intro: BD1020 digital video delay.
 Also: DSP 4000B Broadcast Production Ultra Harmonizer with Digital Time Squeeze; BD980 digital radio obscenity delay.

Contact: Gil Griffith, V.P. Sales (Audio)
 1 Alsan Way
 Little Ferry, NJ 07643
 201-641-1200
 FAX: 201-641-1640

Fidelipac Corp. 365
 Intro: DCR1000 MO, DCR1000 with 230MB magneto-optical disk drive; each diskette stores two hours of stereo audio with 15 kHz bandwidth or almost six hours of mono with 10 kHz bandwidth. MXE console, three new optional modules: five-band mic EQ with pan, talk-back/studio monitor and telephone interface.
 Also: DCR1000 Digital Cartridge Machine; analog cart machines, broadcast audio console; NAB cartridges.

Film House Inc. 835

FirstCom Music 1068
 Intro: The Production Edge, an exclusive 60-CD collection.
 Also: All the best production music in the industry or your money back. The Custom

Production Library (the original pick-and-choose library) offers well-produced, high-quality music. The 25 percent Exchange Privilege allows you to keep your music selection fresh and up-to-date. View the demonstration of MusiQuick software, the quick and easy way to search for just the right track.

Focal Press 2239
 On Display: Focal Press is a leading publisher of professional, educational and reference materials on broadcast and other electronic media, including the following: Communication Technology Update, Fourth Edition; Winning the Global Television News Game; Global Broadcasting Systems; International Dictionary of Broadcasting and Film; Television News; and Projection for the Performing Arts. Our product line of more than 150 books includes many texts on technology, management and production. Stop by our booth and take advantage of a special 10 percent show discount on all titles.

Why would anybody put 50 compact discs into something like this?

So broadcasters would never have to so much as touch a CD again. No matter what.

No matter what size their CD library, 100 or 1000. No matter what they want to program for when. No matter what kind of computer equipment they have. No matter what goes wrong with a CD, a player, the changer.

No matter what.

High capacity CD players are all but a must these days, no question of that. How high a capacity, that's a question. Which one's the easiest to load, that's another good question. And what brand is the most reliable, that's probably the best question.

Introducing the 100-CD "Instant Library Change" CD Player/Changer from NSM of Germany.

It's the answer to all those questions. And a lot more.

Put simply, our Model 3101 is the most efficient, totally flexible, all-but-infallibly reliable CD Player/Changer ever made for broadcasters.

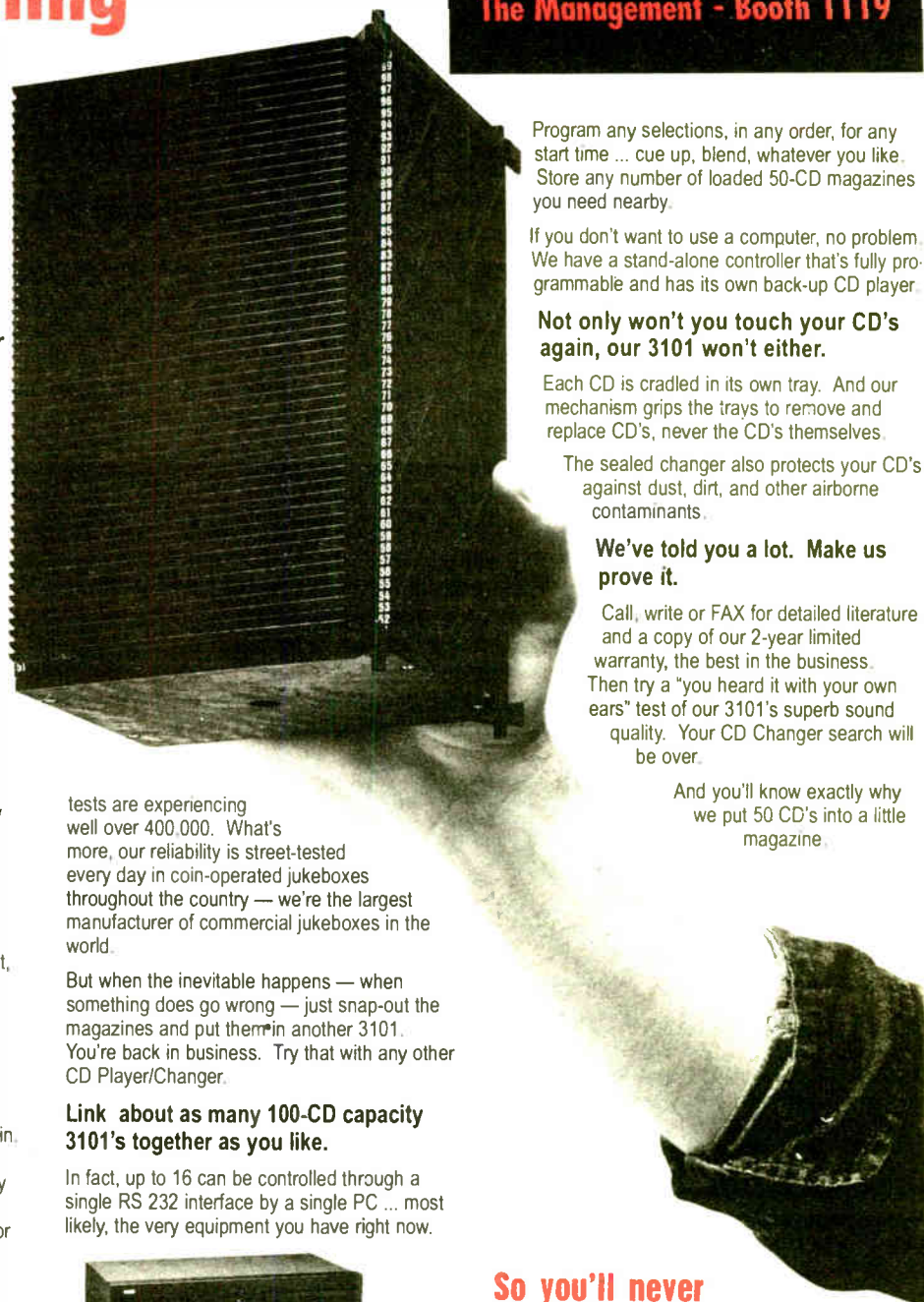
The snap-in/snap-out 50-CD magazines are the key.

Once CD's are loaded in the magazine's numbered slots, you never have to touch them again. You simply snap-in two magazines, 100 CD's worth, into our 3101 Player/Changer. Then any of its 100 CD's are all but instantly accessible. It takes an average of less than five seconds for our 3101 to find and begin playing any one of them.

You can change the entire library in just about the same time ... just by snapping out the two magazines, snapping in another pre-loaded set.

What happens if our 3101 breaks down?

We won't say it could never happen. We will say that it'll be rare. Our 3101 has the highest reliability rating in the industry, way above all the others. Its MSBF (Mean Swaps Between Failures) is over 200,000 and our current units in laboratory



See the NSM 3101 at the World Media Expo
Broadcast Electronics - Booth 319
The Management - Booth 1119

Program any selections, in any order, for any start time ... cue up, blend, whatever you like. Store any number of loaded 50-CD magazines you need nearby.

If you don't want to use a computer, no problem. We have a stand-alone controller that's fully programmable and has its own back-up CD player.

Not only won't you touch your CD's again, our 3101 won't either.

Each CD is cradled in its own tray. And our mechanism grips the trays to remove and replace CD's, never the CD's themselves.

The sealed changer also protects your CD's against dust, dirt, and other airborne contaminants.

We've told you a lot. Make us prove it.

Call, write or FAX for detailed literature and a copy of our 2-year limited warranty, the best in the business. Then try a "you heard it with your own ears" test of our 3101's superb sound quality. Your CD Changer search will be over.

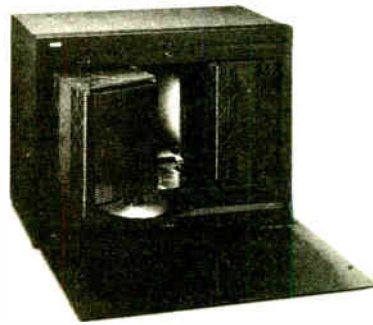
And you'll know exactly why we put 50 CD's into a little magazine.

tests are experiencing well over 400,000. What's more, our reliability is street-tested every day in coin-operated jukeboxes throughout the country — we're the largest manufacturer of commercial jukeboxes in the world.

But when the inevitable happens — when something does go wrong — just snap-out the magazines and put them in another 3101. You're back in business. Try that with any other CD Player/Changer.

Link about as many 100-CD capacity 3101's together as you like.

In fact, up to 16 can be controlled through a single RS 232 interface by a single PC ... most likely, the very equipment you have right now.



So you'll never have to do it again.

NSM M.U.S.I.C.

1-800-423-1122

FAX: (516) 273-4240

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Circle (205) On Reader Service Card

FOSTEX CORP. OF AMERICA 1083, 1085

Intro: PD-4 portable timecode DAT recorder, featuring off-tape confidence monitoring via four-head design, built-in three-channel mixer and two-hour recording. FSC-1 full-featured sample rate converter.

Also: Foundation 2000RE non-linear recorder/editor with 16-channel, eight-input/output design, plus ADAT. Models D-10, D-25 and D-30 timecode DAT recorders. Contact: Eric Richardson, Mktg. Dir. 15431 Blackburn Ave. Norwalk, CA 90650 310-921-1112 FAX: 310-802-1964

FREELAND CORP. 1083

Contact: Harry Freeland
75412 Highway 25
Covington, LA 70433
504-893-1243
FAX: 504-892-7323

GENTNER COMMUNICATIONS CORP. 555

Intro: TS612, multiline on-air phone system with network interface and screening software. TeleHybrid, turns virtually any business phone into a non-air system; works with most analog or digital, single- or multiline phones. AVT 7000 Series Audio for Video Teleconferencers, provide natural-sound 7 kHz response in a low-cost acoustic echo canceller for videoconferencing.

Also: DH1A and DH11, digital hybrids for on-air and production. G3200 Super Hybrid, for bringing telephone calls into talk shows with live studio audiences or guests without headphones. VRC2000 Transmitter Remote Control offers transmitter control from virtually anywhere via modem and computer. GT300 and GT700 Group Teleconferencers for phone line and four-wire video codecs. Contact: Rich Finlinson, Mktg. Dir. 1825 Research Way Salt Lake City, UT 84119 801-975-6200 FAX: 801-974-3676

GEPCO INTERNATIONAL INC. 1461, 1463

Intro: The VSD2001, an extended distance low-loss serial digital video cable. This RG-6 type coax provides lower attenuation than traditional precision video cables at serial digital frequencies. The VA-1/3, a composite cable constructed of one video and three audio cables



International E-Z Up's tent

under a round flexible jacket.

Also: Video cable including serial digital, precision video, coaxial, triaxial, CATV, HDTV and RGB/sync/composite. Audio cables include single-pair, multi-pair, multiconductor, microphone, guitar/instrument, speaker and digital audio. Custom products, including cable assemblies, breakout boxes, audio and video snakes, panels and custom-wired patch bays.

Contact: Greg Hansen, Nat'l Sales Mgr. 2225 Hubbard St. W Chicago, IL 60612-1613

800-966-0069; 312-733-9555
FAX: 312-733-6416

Graham-Patten Systems 1227

Intro: Vamp AES digital STL on T1.
Also: D/ESAM 820 and D/ESAM 400 digital edit suite audio mixers.

HARRIS ALLIED 1109

Intro: 8-VSB digital ATV exciter, designed for station upgrades during the transition to digital terrestrial television transmission; DRC1000 digital audio console, an on-air mixing console for radio. The 10-channel unit is manufactured by Zaxcom Audio, and is capable of routing, audio processing, digital delay and mix minus. CD FM transmitters (PT CD and HT CD). Audion VoxPro digital sound editing system. Audio-Metrics studio furniture and Audio-Metrics CD-10E. Oktava microphones. Radio Systems' Digital Delivery System (DDS).

Also: DSE 1400/DSR 1400 digital satellite exciter. M-1ENG mobile electronic news-gathering system. Sigma Series HD 30C1 UHF television transmitter. Platinum III VHF solid-state modules. Digit digital FM exciter. Harris Quest 1 FM transmitter. Harris DX 50, 50 kW digital solid-state MW transmitters. Harris Gates 5 MW transmitter. NTI EQ3 high-definition sound enhancement system. Register Data Systems (RDS) Phantom; Gentner TS612 DCT multiline telephone system.

Contact: Martha Rapp, P.R. Mgr. Broadcast Division 3200 Wismann Ln. Quincy, IL 62305 217-222-7577 FAX: 217-222-0581

HOLADAY INDUSTRIES INC. 1365

Intro: The HI-4000 RF hazard measurement system and model HI-3702 RF-induced current meter.

Also: A full line of instrumentation for electromagnetic field measurements, from DC to microwave.

Contact: Michael Leighton, Sales/Mktg. 14825 Martin Dr. Eden Prairie, MN 55344 612-934-4920 FAX: 612-934-3604

Hughes Communications Inc. 1835

On Display: HCI, a unit of Hughes Electronics, is a commercial satellite operator, with 16 spacecraft owned or operated on behalf of U.S. and international customers. HCI provides video, voice and data communications services, and is a pioneer in the fields of satellite television distribution, high-power direct-to-home satellite broadcasting, mobile communications and high data rate transmission.

IMAS PUBLISHING 1168

Publisher of *Radio World*, *TV Technology* and *Computer Video*.

INOVONICS INC. 561

Intro: Model 630, a frequency-agile, single-channel FM receiver for FM translator applications. Features high sensitivity, two IF bandwidths, composite and left/right audio outputs.

Also: Complete line of audio processors for AM, FM and TV; FM stereo generators; DAVID-II FM processor/generator and other processor/generator combo units; FM modulation monitor; Sentinel all-mode diagnostic receiver; the TVU, an on-screen audio level display keyer for teleproduction; RDS/RBDS encoding and decoding equipment.

Contact: Jim Wood, Pres./Chief Eng. 1305 Fair Ave. Santa Cruz, CA 95060 408-458-0552 FAX: 408-458-0554

INTERNATIONAL DATACASTING 1039

Intro: EchoCom, a Microsoft Windows-based package of software for implementing a multimedia data broadcasting system, using International Datacasting's satellite systems. EchoCom can be used to transmit e-mail, program schedules, news wires, photo services, graphics or video presentations. The package consists of a filing cabinet with up to 256 file folders, a JPEG window, text window and an audio/video player. Users are registered for security and an addressable network management system controls which folders are available to each user.

Also: Satellite equipment for point-to-multipoint information distribution, including the FlexRoute and MPEG PRO digital audio and the DataNet data broadcasting systems with corresponding network management systems and addressable receivers.

Contact: Virginia Lee Williams, Dir., Sales & Mktg.

3850 Holcomb Bridge Rd., Ste. 420 Norcross, GA 30092 770-446-9684 FAX: 770-448-6396

INTERNATIONAL TAPETRONICS CORP. 619

Intro: DigiCenter Software Release 2.0, a comprehensive software advancement for the DigiCenter hardware platform; includes expanded networking management, audio database management tool box, third-party editor interfaces, and automated file conversion and transfers. Integrated Partnership, program providing fully integrated digital radio solutions, integrated traffic and music programs, alliance/distributor with Compaq Computer Corp., multiple third-party editor choices and CD management systems. NEWSsystem Software Release 2.50 with multiple wire auto-capture, multiple wire text-capture and multiple servers.

Also: DigiCenter, a digital audio management system that includes DigiCenter 33, a central audio library management system capable of networking up to 255 workstations; DigiCenter NEWS, a newsgathering and editing system with both text and audio capabilities serving multiple workstations; DigiCenter CD control systems; DigiCenter Virtual Console; DigiCenter PD MATE, a music and traffic schedule merging system. DPR-612, a solid-state digital program repeater with 16-bit, 16 kHz capability. ITC's Audio Routing Switcher.

Contact: Charlie Bates 2425 Main St. S, P.O. Box 241 Bloomington, IL 61702-0241 309-828-1381 FAX: 309-828-1386

JAM Creative Productions Inc. 126

Intro: Latest jingles and station ID packages created for stations of all formats, including A/C, CHR, News/Talk, Oldies and Country. JAM's 20th anniversary commemorative CD is also available.

Also: JAM offers a wide selection of syndicated ID packages, and demos are available for every format. Two production libraries: The Answer for the '90s and QFX.

JAMPRO ANTENNAS INC. 819

Intro: A complete line of rigid coaxial transmission lines and all related components, along with waveguide transmission line and accessories, LPTV filters and combiners, and FM bandpass filters and combiners; coaxial hybrid couplers and harmonic filters for FM, VHF and UHF applications.

Also: The Penetrator series of FM side-mount antennas, low-power translator antenna, and the FM panel antenna; the JA/LS low-power UHF slot antenna, a favorite of LPTV broadcasters for its performance and

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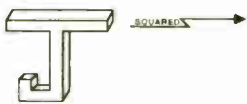
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We can help get you back on the air with our STL Loaner Program. We have STL's available that will be set to your frequency prior to shipping. We also provide over-the-phone technical assistance.



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(503) 471-2262

READER SERVICE NO. 120

Excalibur Electronics CD-1 Interface Amp



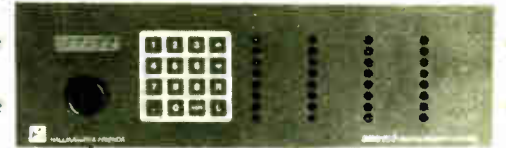
The industry's favorite unidirectional interface amplifier is designed to match IHF output standards (10kΩ unbalanced, -10dBV) to broadcast input standards (+4dBm, balanced). DC coupling, <0.006% THD & IMD, and >90dB S/N make the CD-1 appropriate for use with the highest quality CD players, as well as with monitor tuners, cassette and tape playback, DAT playback, and ENG equipment. Table-top mounting or, using the included angle brackets, may be attached to a rack panel, your cabinetry, or anywhere convenient. A dual version, the CD-2, is also available.

EXCALIBUR ELECTRONICS, INC., CHANTILLY, VIRGINIA
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READER SERVICE NO. 218

EXPAND • ABILITY

Expandable Digital Remote Control.

As your station metering requirements grow to additional sites and channels, the DRC 190 from Hallikainen & Friends grows with you. By its inherent, modular-expansion design, the DRC 190 can accommodate a single transmitter or grow to manage up to 100. Reliable firmware includes a multiple access, anti-contention data packet system allowing any site to communicate with any other site over wire-line, sub-carrier or half-duplex UHF radio. The same firmware allows expanding the system by adding additional sites or channels at any time. For a system to grow with, not out of, expand with the DRC 190.



PROGRAMMABLE EXPANDABLE AFFORDABLE DRC 190

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805-541-0200

READER SERVICE NO. 28

MATCHBOX II IS BEST FOR DIGITAL

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Only MATCHBOX II has *programmable gain* that's optimized for digital editor sound cards.

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READER SERVICE NO. 74

- ◆ HI-GAIN mode for digital editors
- ◆ All four outputs adjustable
- ◆ Pro-grade gold-plated RCA jacks
- ◆ Over 110 dB dynamic range
- ◆ Self-contained power supply

* Power-Mac is a trademark of Apple Computer

Quality* Power Tubes

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3CX15,000A3	4CX1500A	4CX250BT
3CX10,000H3	4CX800A	4CX250BC/8957
3CX10,000A7	4CX400A	4CX250B/7203
3CX3000F7/8162	4CX350AC	4X150A
3CX3000A7	4X350A/8321	5CX1500B
3CX2500H3		5CX1500A
3CX2500F3/8251		YC130/9019
3CX2500A3/8161		8560AS
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4CX3500A		



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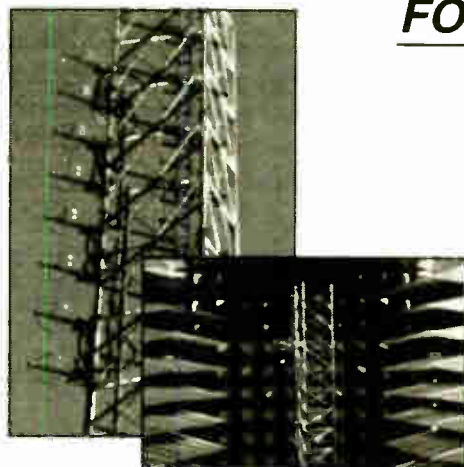
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Sacramento, CA 95828
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FAX: 916-383-1182

KD Kanopy Inc. 118, 120

KILLER TRACKS 1272, 1274

Intro: TuneBuilder, a music self-editing software package, now available with Killer Tracks production libraries.

Also: Full-service package of 78 CDs plus updates. BMG Scoring Library, featuring longer cues, 33 CDs plus updates. NJJ, a 25-CD promo/beat-oriented library with updates. Chronic Music, a 3-CD buyout with hip hop, deep house and acid jazz.

Contact: Diane Craig Lantz, Dir./Broadcast Mktg.
6534 Sunset Blvd.
Hollywood, CA 90028
800-877-0078
FAX: 800-787-2257

Larcen-TTC Inc. 1248

Intro: RMS500, a 500 W solid-state UHF transmitter.

Also: FMS500, a 500 W solid-state FM transmitter.

LORAL MICROWAVE—NARDA 1278

435 Moreland Rd.
Hauppauge, NY 11788
516-231-1700
FAX: 516-231-1711

MANAGEMENT, THE 1119

Intro: Digital Longform Recorder (DLR) multiplayback system, allowing multisegment record and playback simultaneously; Advanced Feature Package (AFP) combines three software options: Jock Specific Time announce with up to 36 jocks, PowerFill provides accurate joins to specific events, and Telco software control.

Also: AXS hard disk audio storage and retrieval system; Super Log traffic and billing system; Music Log Playlist Generation software for live and automated stations.

Contact: Adrian Charlton, G.M.
P.O. Box 136457
Ft. Worth, TX 76136
817-625-9761
FAX: 817-625-9741

MARTI ELECTRONICS 267

Intro: ME-40 40 W FM exciter; SR-10 frequency-agile RPU receiver; Marti digital

STL.

Also: Complete product line of remote pickup transmitters and receivers; analog and digital composite studio to transmitter links; subcarrier modulators and demodulators.

Contact: Jim Godfrey, Dir. Sales & Mktg.
P.O. Box 661, 1501 N. Main
Cleburne, TX 76833
817-645-9163
FAX: 817-641-3869

McCurdy Radio Industries Ltd. 162

On Display: DCS3000 serial digital and Microcompact digital intercoms; M/2000 automation system; McCart digital audio storage, multichannel playback; UMD-32 three-color 32-character tally display; ATS-100 audio test set; AT2656 stereo audio monitor; UIO-80



Nagra ARES-C Recorder

serial/parallel machine control interface; accessories.

Metro Networks/Metro Traffic Control 661

On Display: Metro Traffic Control, Metro Networks Weather, Metro Networks News, Metro Networks Sports and Radio Watch America.

Moody Broadcasting Network 265

On Display: ACCUWatch, a duty control point and national Emergency Alert System to enable radio stations to legally operate unattended locally. Duty control point monitoring requires use of a dial-up/dial-out automatic transmitter service controller device, such as the BE VMC-16, Burk ARC-16, Gentner VRC-2000 and Sine Systems RFC-1/B. Equipment offered by MBN includes

these products and Zephyrus Electronics Ltd. satellite stereo audio and data channel receiving systems.

MOSELEY ASSOCIATES 1262, 1264

Intro: Starlink 9000 in TI and RF configurations, digital.

Also: MRC-1620 and MRC-2 Remote Control; DSP 6000 Digital STL System; PCL 6000 Analog STL System; RPL 4000 Remote Pickup System.

Contact: David Chancey
111 Castilian Dr.
Goleta, CA 93117
805-968-9621
FAX: 805-685-9638

MPR TELTECH 949

Intro: Capella Live, a real-time, PC-based

MPEG audio codec; encodes and decodes MPEG audio, records and plays back audio in real time; with its new daughterboard, enables real-time audio transmission up to 384 kbps; offers all sampling rates, CD-quality analog and digital interfaces, a V.35/X.21 interface for connection to a terminal adapter and implementation of ISO/MPEG standard.

Also: LII Blue ISO/MPEG Layer II audio codec for professional broadcast and

production applications; features four-channel multiplexer, up to four RS-530 interfaces, ancillary data transfer, sample rate converters and PC remote control software.

Contact: Lori Davis, Mktg. Spec.
8999 Nelson Way
Burnaby, B.C. V51 4B5
604-293-6076
FAX: 604-293-5787

MUSICAM USA (FORMERLY CCS) 927

Intro: MUSICAM Express, MUSICAM Starguide satellite receiver, MUSICAM audio products: Prima ISDN codec, FieldFone codec and WinDax.

Also: Full line of MUSICAM digital audio products.

Contact: Judith Gross
670 N. Beers St., Bldg. #4
Holmdel, NJ 07733
908-739-5600
FAX: 908-739-1818

Nagra 1177

National Guard Bureau 969

NAUTEL MAINE INC. 827

Intro: Nautel XL12, 12 kW (capable 13.5 kW) AM stereo transmitter; the XL series 12, 30 and 60 kW solid-state modular transmitters deliver power and modulation capability to spare; energy costs are lower than ever with overall efficiency typically 85 to 88 percent; Nautel offers complete duplication of exciters and on-air serviceability of modules to keep you broadcasting. FM4, 4 kW FM transmitter with NE50,

50 W digital FM exciter; the new 4, 7, 10 and 20 kW solid-state modular FM transmitters have a high AC-to-RF efficiency; this means less waste energy and cool reliable operation; the Nautel design keeps you on the air even with a module removed for service.

Contact: Gary K. Manteuffel, Mgr., Broadcast Sales
201 Target Industrial Cir.
Bangor, ME 04401
207-947-8200
FAX: 207-947-3693

Nemal Electronics International Inc. 1363

Intro: New line of flexible composite ENG cables, custom interconnect panels and breakout boxes; serial digital video patch panel.

Also: Precision audio, video and snake cables; 75 ohm BNC connectors and crimping tools.

Network Music Inc. 1152, 1154

Intro: Trakfinder CD-ROM catalog; Trakfinder combines sophisticated search tools with the ability to audition a 29-second sample of any theme in the Network Production Music Library with the click of a mouse.

Also: Network Production music, 140 volumes of music on CD with a new release each month; sound effects, 70 volumes on CD with more than 5,500 effects; shockwave and brainstorm, 14 CDs of ear-opening production elements; Network Classical Library, 15 CDs featuring the greatest composers of all time.

Non-Stop Productions 1165

Intro: New releases include more sports, solo instruments, rhythm and blues, as well as film and stage.

Also: The Non-Stop Music Library consists of various categories that include driving action, full orchestral and techno-rock themes.

NPR SATELLITE SERVICES 1045, 1047

On Display: NPR Satellite Services offers full-time satellite space (C-band, SCPC transmission) on Galaxy IV, Transponder 3. This satellite space accommodates both digital and analog audio. Also, uplinking services to get customers up and running; both fixed and transportable uplinks available. NPR state-of-the-art studio facilities now available for both broadcast and advanced production.

Contact: Miriam Lenett, Mktg. Spec.
635 Massachusetts Ave. NW
Washington, DC 20001
202-414-2613
FAX: 202-414-3035

Odetics Broadcast 1801

Intro: The SpotBank Disk-Based Spot Insertion and Automation System, using a Raid 3 Disk Array for reliability and protection; the MicroSpot Disk-Based Spot Replay System for Spots and News playback for stations with a limited budget; the Prophet Cache Machine, a new low-cost automated cart machine for program and spot playback with an integrated digital disk; RecordList, an option to any of the Odetics Broadcast cart systems for automated record of incoming feeds such as programs, special live events and news feeds.

Also: The TCS90 Cache Machine, which is capable of supporting automated record as well as playback on multiple channels of program and spots; incorporates a digital disk recorder for spot playback.

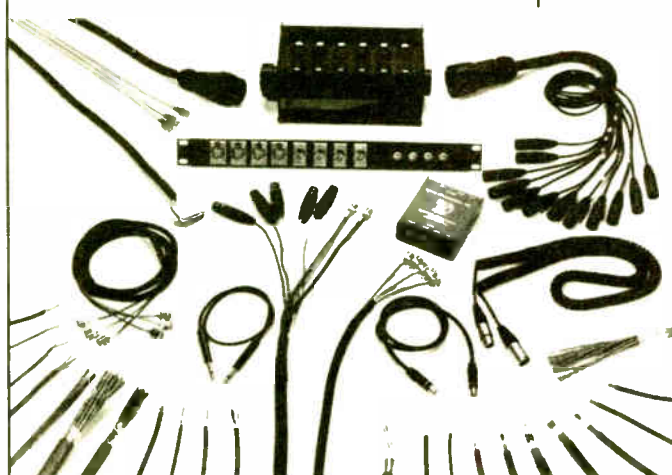
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Omnia Group, The 566

ORBAN 445

Intro: The 8208 Stereo Encoder, a stand-

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alone unit with all-digital processing; designed for large radio network applications, especially those using digital program distribution. New features being shown for the Orban DSE 7000 Digital Sound Editor: time compression and expansion by ±25 percent, networking capability to audio delivery systems, and software enhancements that include improved graphics and help screens, variable-speed copy over two octaves and reverse.



Orban DSE-7000

Also: Updates on other Orban audio processing equipment include: PC software for the Optimod-FM 8200 and demos of the digital Optimod-TV 8282.
 Contact: Amy Herndon, Dir. Mktg.
 1525 Alvarado St.
 San Leandro, CA 94577
 510-351-3500
 FAX: 510-351-0500

Orion Atlantic 1753
 On Display: The Orion 1 satellite provides Ku-band capacity services with coverage in Europe and North America. Features of Orion 1 include 34 Ku-band transponders, multiple spot beams and broad beam coverages, and high-gain antennas supporting low-cost ground equipment. Communications options include voice, audio, data distribution networks and transmission in both digital and analog video formats. Digital video transmission services include MCPC and SCPC satellite capacity services.

Otari Corp. 855
 Intro: CDC-600, a 360 capacity, dual-drive CD changer; Status, a digitally controlled analog recording and production console; B-10, an audio mixing console for broadcast applications; PicMix, mix-to-picture monitor and panning systems; DTR-8, a digital audio tape recorder; UFC-24, a universal format converter.
 Also: RADAR, an 8-, 16- or 24-track Random Access Digital Audio Recorder; MR-10 MiniDisc recorder/player; Concept 1, a digitally controlled automated mixing console; DTR-90T, a time code DAT mastering and production recorder; MX-50IIN, a two-track tape recorder.

Pacific Radio Electronics 1276
 Intro: AES/EBU transformers; AES/EBU cable.
 Also: Audio and video connectors and patch bays; audio and video amps; 10-inch racks and accessories; and audio, video and data cable.

POTOMAC INSTRUMENTS INC. 1049
 On Display: Antenna monitors, tower light monitors, field intensity meters, audio test equipment and transmitter remote control equipment.
 Contact: David Harry, Dir. of Mktg.
 932 Philadelphia Ave.
 Silver Spring, MD 20910
 301-589-2662
 FAX: 301-589-2665

PREMIERE RADIO NETWORKS 927
 Intro: Newstrack, call-out research for news and news/talkers.
 Also: Mediabase Music Research, music monitors and call-out research for all music formats. Talksongs, parody songs

for talk radio. Boot Scoot'n Saturday Night, four-hour live country show available nationwide every Saturday night.
 Contact: Ed Mann, Sr. V.P./Mktg.
 15260 Ventura Blvd. #500
 Sherman Oaks, CA 91403
 818-377-5300
 FAX: 818-377-5333

Prime Sports Radio 545
 On Display: 24-hour national sports information radio networks.

PRISTINE SYSTEMS INC. 849
 Intro: The Music Plus Multi-Pass allows smaller music categories (i.e., currents and recurrences) to be scheduled prior to the rest of your music library. With your playlist on screen, VoiceTraxx lets you record voice tracks days in advance with the push of a key. The Audio Commander makes recording your audio files quick and easy. Auto-trim removes the silence for you.
 Also: The Pristine Music Management

and Commercial Control System is a full-featured digital broadcasting solution at an affordable price. Pristine offers an integrated multipass playlist scheduler (music and breaks) and on-air playback combination for hard disk, CDs, DAT and satellite. Other essential features include overlapping Dolby AC2 and complete on-line redundancy.
 Contact: Boyce Williams, Pres.
 5855 Uplander Way, Ste. E
 Culver City, CA 90230
 310-670-7500
 FAX: 310-670-0133

Pro-Bel Inc. 1869
 On Display: Range of audio and video routing switchers (from 8 x 1 to 256 x 256); MADI multiplexers and demultiplexers; Procion, PC-based touchscreen routing, machine control and monitoring; Trilogi intercoms and SPGs.

Promusic 160
 On Display: CDs of production music and sound effects.

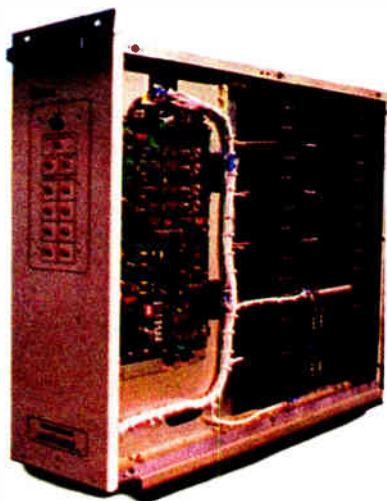
PROPHET SYSTEMS INC. 755
 Intro: Audio Wizard XPS1 for Windows, featuring Pentiums on every workstation and Dolby stereo; runs in live-assist, satellite and automated modes; options include time and temperature announce, voice tracking and hard drive automation; replaces carts, reels and CD players.

Also: Audio Wizard CFS4 for Windows, the company's original audio system built around a central file server; runs 30 or more workstations.
 Contact: Jacqueline Lockhart
 111 W. Third St.
 Ogallala, NE 69153
 800-914-9273
 FAX: 308-284-4181

RADIO COMPUTING SERVICES INC./RCS 627
 Intro: TalkBack, talk radio software with call screening, prioritizing and call history; NewsLink, computerized newsroom with digital audio editing option;

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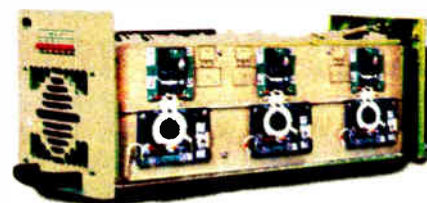
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FM Power Module



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 Nautel Maine Inc. 201 Target Industrial Circle Bangor, Maine 04401 U.S.A. Phone: (207) 947-8200 Fax: (207) 947-3693

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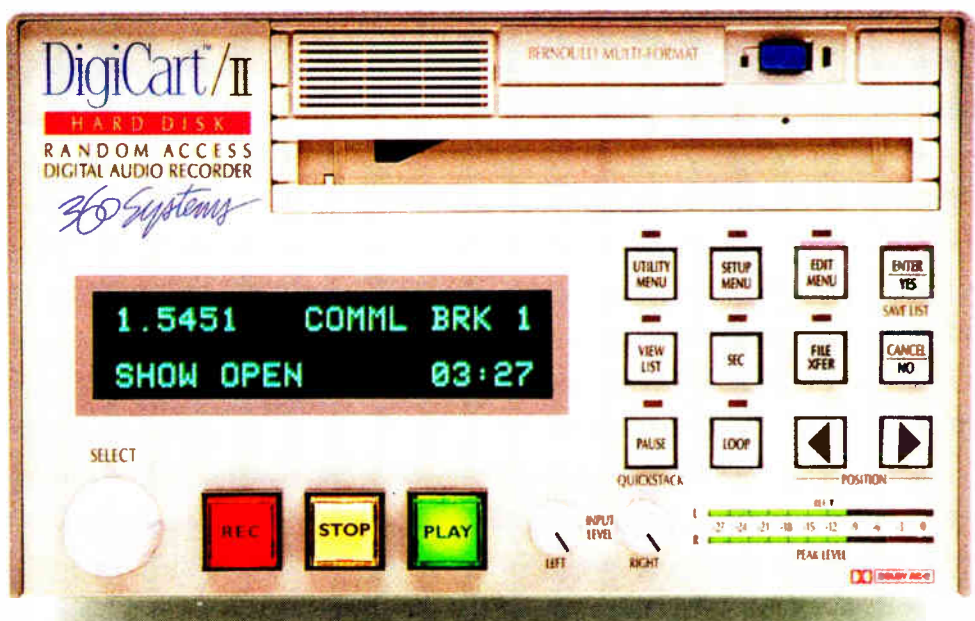
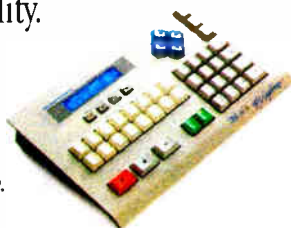
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ProSonix, full-featured multitrack digital audio editor.

Also: Master Control, all-digital paperless/cartless radio studio; Selector, music scheduling software; SongTrack, research software for callout, auditorium and perceptual testing; RCS Traffic, fully automated commercial scheduler with complete inventory control and wide range of custom reports; Linker, selector for promos plus traffic and music integration to view all on-air elements on a single log; Pro-Rate, field management sales software to sell more dayparts. Contact: Tom Zarecki, Dir. of Promo. & Mktg. 2 Overhill Rd., Ste. 100 Scarsdale, NY 10583 914-723-8567 FAX: 914-723-6651

RADIO DESIGN LABS/RDL 860

Intro: Stick-On Line, includes ST-MXL3 Mic Level Output Mixer and ST-TC1 Telephone System Coupler; Rack-Up Line (all connectorized), includes RU-VA2 Video Attenuator, RU-LA2D IHF-PRO Interface, RU-UDA4 Unbalanced Audio DA, RU-MP2 Adjustable Stereo Mic Preamp, RU-BLA2 Adjustable Stereo Line Amp, RU-BDA3 Balanced Audio DA and RU-MDA3 Microphone DA; Transformer Group, includes TX-10B Bridging Input Transformer, TX-1A Adjustable Line Transformer, TX-LM2, Line Matching Transformer and TX-70A 70/25 V Input Interface; accessories, including RC-1U Rack Chassis and JP-1 Universal Jack Panel.

Also: ACM-2 Synchronous AM Noise Monitor and AMX-84 Audio Matrix. Contact: Jerry R. Clements, Dir. of Mktg. P.O. Box 1286 Carpinteria, CA 93014 800-281-2683; 805-684-5415 FAX: 805-684-9316

Radio Express Inc. 939

Intro: The World Chart Show, which counts down the most popular songs in the world. Also: Rick Dees Weekly Top 40, Hot Mix; GoldDisc and HitDisc (outside the U.S. only).

Radio-Diner 227

On Display: Radio-Diner is a promotion vehicle for radio stations, a fully functional remote broadcast studio styled to match any format. This vehicle offers endless opportunities for programming, sales, sponsorship and vendor programs. All Radio-Diner stations benefit from the Radio-Diner Network, a national non-spot promotional rep firm.

RadioVision Inc. 154, 156

Intro: RadioVision is a creative marketing and advertising company that specializes in TV promotions for radio, automotive and entertainment programming. Also: TV commercials, 3D animation and custom original audio.

RE AMERICA INC. 1122, 1123

Intro: RE4500, a 45 Mbps component video codec. Also: RE660/661, layer II audio encoder and decoder; RE533, low-cost RDS/RBDS coder; RE532, full-featured RDS/RBDS coder. Contact: Cathy Huth, Sales Dept. 31029 Center Ridge Rd. Westlake, OH 44145 216-871-7617 FAX: 216-871-4303

Reef Industries Inc. 150

On Display: Roll-A-Sign, promotional plastic banners.

REGISTER DATA SYSTEMS 1027

Intro: Register Data Systems' new Windows-based Traffic and Billing System, designed from the ground up to meet and exceed the need of the most demanding broadcasters.

Also: The Phantom, the complete digital audio system for recording, scheduling and playback of on-air audio; automatically switches between networks, satellites and other sources; rotates voice elements; schedules voices and plays everything. Ideal for live, local automation and satellite; interfaces with RDS' complete line of computerized sales, traffic, billing and accounting systems. Contact: Thomas R. Mead, Exhibit Mgr. 404 Gen. C. Hodges Blvd., P.O. Box 980 Perry, GA 31069 800-521-5222; 912-987-2501 FAX: 912-987-7595

Reuters America Inc. 901

ROLAND CORP. U.S. (PRO AUDIO DIV.) 155

Intro: DM-800 Digital Audio Workstation, a portable, self-contained eight-channel workstation with nondestructive editing. AP-700 Advanced Processing Equalizer that eliminates feedback, offers parametric EQ, spectrum analyzer and graphic EQ. AR-7000, a two-channel digital recorder for message playback and recording.

Also: DM-80 Digital Audio Workstation, expandable to 32 channels; SN-550 Digital Noise Eliminator, for removal of buzz, noise and hum in real time; SRC-2 Dual Sample Rate Converter, for conversion of any format.

Contact: Erika Lopez, Mktg. Mgr., Pro Div. 7200 Dominion Cir. Los Angeles, CA 90040 213-685-5141 FAX: 213-726-3267

SADIE INC. 255

Intro: Octavia Modular Digital Editing System, a new digital multitracking system offering up to 80 inputs and outputs and up to 240 tracks. The unit as standard incorporates 20-bit delta-Sigma A-D and D-A, as well as DSPs that generate 133 mflops of processor power.

Also: Sadie Digital Editor will be showing Version 3 software that unleashes more DSP power to allocate various tasks in the background such as background recording, background autoconforming and background restore.

Contact: Julian Mitchell, Mktg. Mgr. 1808 West End Ave., Ste. 1119 Nashville, TN 37203 615-327-1140 FAX: 615-327-1699

Scott Studios Corp. 935

Intro: Digital audio hard drive music and commercial players with touchscreen control, preview (cue) of upcoming audio and APT, MPEG and Dolby AC-2 or uncompressed (linear) audio on hard drive for radio now including telephone recorder/editor. Free music service for Scott Studios clients via Computer Bulletin Board and Internet.

Also: Satellite and jukebox automation for radio; CompuCarts cart replacement system.

Seiko Communications Group 345

SHIVELY LABS (DIV. OF HOWELL LABORATORIES INC.) 464

Intro: MMDS antennas, low-power UHF antennas to 5 kW, broadband FM side-mount antennas.

Also: A complete FM antenna line, including transmission line and accessories.

Contact: Sarah A. Lunt, Sales Admin. P.O. Box 389 Bridgton, ME 04009 207-647-3327 FAX: 207-647-8273

SMARTS BROADCAST SYSTEMS 132

On Display: Sonic Fax, which allows you to do production and fax it anywhere in the world via standard, dial-up telephone lines, arriving in full stereo, full broadcast quality; no expensive, immobile satellite links or special phone hookups needed; audio can be sent in either direction. SMARTTOUCH, which interfaces between a SMARTCASTER conventional control board and a telephone line to allow for unattended control of the radio station from the remote site; using a dedicated phone line, the SMARTTOUCH detects DTMF (Touch-Tone) signals from a standard Touch-Tone telephone or broadcast set and converts them into switching and control signals for the SMARTCASTER and associated broadcast equipment; the broadcaster at the remote site can sign on the remote, play intro music, switch himself or herself on and off the air, play spots, and close the remote to return to regular programming from satellite or other automated source.

Contact: Dave Potratz, Sales Mgr. 2102 Main, P.O. Box 284 Emmetsburg, IA 50536 800-498-0487 FAX: 800-398-8149

Solid Electronic Laboratories 564

Solid State Logic Ltd. 1373, 1375

Intro: Axiom Digital Production System, a digital system offering a high degree of cus-

tomization. Integral to Axiom is SSL's DiskTrack, the multitrack hard disk recorder/editor providing a hard disk track per console channel. A networked preparation station provides import of files in a variety of formats, in addition to independent recording, editing and track laying to Axiom's DiskTrack.

Also: OmniMix Digital Surround Sound Audio/Video System, a larger relative of the Scenaria Digital Audio/Video System, configured for surround sound; features SSL's patented MotionTracking, enabling the dynamic automation/editing of single or grouped sounds in any surround format; configurable mix busses ensure maximum operational flexibility. G Plus Consoles, analog consoles; the range includes the SL 4000 Master Studio System, SL 6000 Stereo Video System and SL 8000 Multi-Format System; a choice of VCA or Ultimotion moving fader automation is possible, in addition to the Total Recall computer system.

SONY PRO AUDIO 2331

Contact: Dianne Kelley 120 Brighton Rd. Clifton, NJ 07012

Sound Ideas 666

Sports Byline USA n/a

Sports Network, The 360, 364

Stainless Inc. 1084

Intro: Master Tower Leasing, which provides tower users of all types the opportunity to build new or upgraded antenna support structures without the upfront capital commitment necessary to purchase a tower outright. Station Guard Insurance—broadcast station owners will slash their insurance costs and exposures to loss under a new program available through Stainless Inc. and J.C. Stevens Inc. The station's local insurance broker or agent will sell and service the policy in most cases, since J.C. Stevens is a general agency that does not sell direct. Your local broker is an integral part of the operation.

Also: Complete line of towers, erection,

inspection and maintenance, engineering studies and structural modifications.

STARDATE 1179

Contact: Susan Harm University of Texas 2609 University Ave. #3.118 Austin, TX 78712 512-471-5285 FAX: 512-471-5060

Storeel Corp. 1413

Intro: Double-drive mobile double-entry tape storage system, available up to 18 feet in length without motors or raised flooring.

Also: High-density, mobile and static, tape storage systems for all formats.

Strata Marketing Inc. 219

Intro: New features to the existing Axis contact management service, including a fully integrated yield management schedule pending system. You can base inventory pricing on pending business prospects.

Also: TV and radio quantitative and qualitative ratings, yield and contact management software services. Strata's contact management service, Axis, provides custom account reports, new business development, and desktop direct marketing capabilities. Strata's qualitative service, Q-View, uses powerful spreadsheets to analyze profiles assessing demographic, lifestyle and consumption patterns.

SUPERIOR ELECTRIC 135

Intro: Displaying new SP Series Stabiline Standby Uninterruptible Power Supplies with battery backup for voltage-sensitive electronic equipment. Electrical noise and surge suppression, available in 250, 400 and 600 VA models; UL, CSA and VDE certified.

Also: Full line of Stabiline voltage regulators, power conditioners and transient voltage suppressors/RFI filters.

Contact: Ted Gladis, Mktg. Ass't 383 Middle St. Bristol, CT 06010 203-585-4500 FAX: 203-582-3784

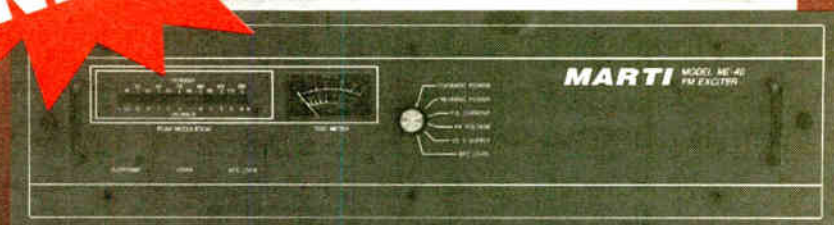
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SWR INC. 161
On Display: FM and TV antennas.
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619 Industrial Park Rd.
Ebensburg, PA 15931
814-472-5436
FAX: 814-472-5552

TA&A 1149

Tapscan Inc. 455

Tektronix Inc. 1201
Intro: TG2000 signal generation platform; a multiformat, analog and digital, precision signal generation platform.
Also: Television test and measurement equipment; digital disk-based recorder/player systems.

TELOS SYSTEMS 839
On Display: Zephyr digital audio network transceiver, capable of transmitting bidirectional, full-fidelity stereo audio over one ISDN line. Zephyr offers both ISO/MPEG Layer III and Layer II. Also on display: ZephyrNet ISDN point-to-multipoint hub for audio program distribution and backup to

satellite; range for broadcast-to-telephone interface to include the 100 Delta digital hybrid with digital equalization; the ONE-x-Six talk show system; the ONE plus ONE dual hybrid; and the Call Screen Manager software for talk show production.
Contact: Neil Glassman, Mktg. Dir.
2101 Superior Ave.
Cleveland, OH 44114
216-241-7225
FAX: 216-241-4103

TFT Inc. 136, 138
Intro: EAS 911 EAS Encoder and Decoder; EAS 930 Modular Receiver System.
Also: Model 844A FM Modulation Monitor, Model 850 BTSC TV Stereo Monitor and DMM92 Digital STL, Reciter FM STL Receiver/Exciter.

Thompson Creative 1053, 1055

TM Century 719
Intro: Gold Drive, music on hard drive system. Country House Promotion Library, fresh, new live music and promotional production library.
Also: GoldDisc music libraries on CD.

HitDisc, weekly current service. Station ID packages and production libraries. Ultimate Digital Studio.

UPI 1069
Contact: Ron McIntyre
1400 I St.
Washington, DC 20005
202-898-8000
FAX: 202-898-8041

U.S. Tape & Label Corp. 565, 567

USA Digital Radio 565
On Display: Audio/video demo of both AM and FM in-band, on-channel digital audio broadcasting (IBOC DAB).

USA RADIO NETWORK 765, 767
Intro: The Ron Seggi Show, a talk show with people in the entertainment business; Steve Crowley's American Scene; The Jack Christy Show, a wrap-up of news from the week; Market Wrap, Joe Battaglia focuses on current political and economic affairs, Wall Street, etc.; Working Mom, Debbie Nigro helps working parents.

Also: USA News; USA Sports; USA Business Reports; USA Radio Daily; Golden Age of Radio Theatre.
Contact: Becky Henson, Nat'l Dir. of Affil. Svcs.
2290 Springlake Rd. #107
Dallas, TX 75234
800-829-8111
FAX: 214-241-6826

Ward-Beck Systems 1074
Intro: M445 portable extended range meter/monitor; DK audio MSD 550 meter.
Also: Renaissance radio console; audio distribution amplifiers.

Wegener Communications 1369
Intro: VideoLynx MPEG-2 transmission system featuring compact variable-rate exciter; features 70 MHz output, uses selectable data rates and FEC encoding. VideoLynx JRD, an L-band receiver delivering broadcast-quality video at up to 15 Mbps.
Also: MPEG-1 T1 transmission system. DVE96 encoder outputs MPEG data at 1.536 Mbps. The receive is an L-band IRD in a single rack unit or desktop configuration. DR95 and DR96 digital audio SCPC receivers, and the ANCS, an addressable network-controlled system.

WHEATSTONE CORP. 745
Intro: Both radio and television audio console designs, including its new D-500 digital and TV-6000 audio consoles, as well as the A-6000 master console (with totally flexible architecture and comprehensive built-in logic and audio programming features), and the TV-600 master audio control console (with integral event computer, smart select automated source switching, and exclusive bus-minus IFB system).
Also: Two additional radio on-air consoles plus two eight-track stereo production consoles will be on display, along with a digital audio hard disk system, rack-mount signal processing gear and the Wheatstone line of modular studio furniture.
Contact: Ray Esparolini, Dir. of Sales
7305 Performance Dr.
Syracuse, NY 13212
315-452-5000
FAX: 315-452-0160

Who Did THaT MUSIC? 560

WIREREADY NSI 355
Intro: PhoneReady, telemarketing/contact management software for radio; SalesReady, sales promotion and event advertising tracking software for radio. All Ready software products can now run on the same computers and LAN for the complete digital radio station.
Also: CartReady, digital audio/cart replacement software; Reel-to-ReelReady, digital audio/reel replacement/long-form production software; ControlReady, digital automation software for satellite/talk radio; WireReady, wire service capture software; NewsReady, newsroom software.
Contact: David Gerstmann, Pres.
82 Herbert St.
Framingham, MA 01701
800-833-4459; 508-879-0080
FAX: 508-879-1199

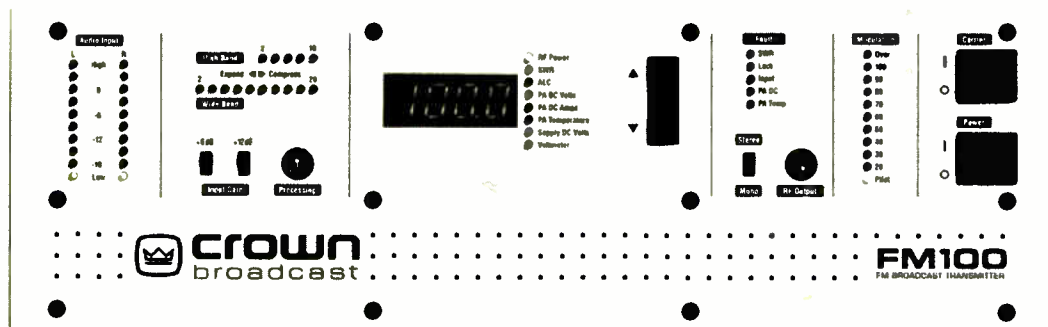
Wohler Technologies 1563
Intro: Audio alarm systems for loss of audio; also over-range and phase reversal. Serial digital embedded audio extractor. AES/EBU level meters for MSM level metering system.
Also: Most comprehensive range of innovative audio monitoring systems available; 1 U or 2 U rack-mount audio monitors (confidence monitors); 1 U or 2 U level metering systems and visual audio indicators; 5 x 1 to 20 x 1 ARS analog and AES/EBU source select.

Wolf Coach Inc. 1119
Intro: Wolf Pac, a self-contained newsgathering system, 12 VDC operated with 2 kW electrical system for sports utility vehicles.
Also: Power Truck, a new-generation satellite uplink truck, redesigned from the ground up for a more efficient use of space and to create an interior studio environment; Benchmark Van, a state-of-the-art turnkey ENG van.

Zaxcom Inc. 1860
Intro: ARRIA, an audio console for TV broadcasting, studio and field production, telecine; can be used as an add-on for DAWs.
Also: DMX1000, a digital audio console for post production; VTR/VCP100, studio controller; MTBC1400/1500, multiple TBC controller; HUB1000/2000, TBC control routers.

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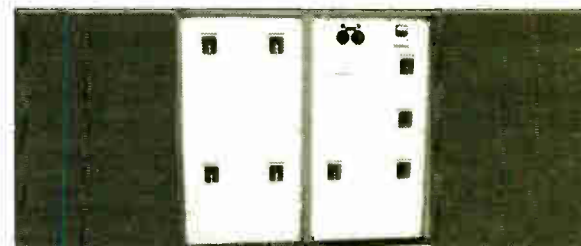
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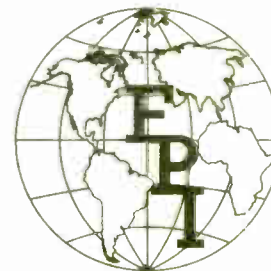
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READER SERVICE NO. 44

Directional Antennas Made Easy

► continued from page 46

be so simple we become stymied. What we actually measure at first glance seems to be far from what we would expect. It is almost as if we have broken the inverse distance law.

At AM broadcast frequencies ground conductivity plays a very important role in how well the measured ground wave signal compares to what we might expect if the inverse distance law was the only player on the field. As part of the original proof-of-performance measurements made on a directional antenna system ground conductivity

is determined. In addition, steel electric transmission towers, smoke stacks, wires, and numerous other objects cause absorption and re-radiation of the signal we are trying to measure. This causes the measured signal to sometimes behave erratically. Thus, we can not go out to a point one mile (or one kilometer) from the antenna, make one measurement, and determine inverse field. We must make many measurements and average them.

In the original setup and adjustment of a directional antenna system a complete set of non-directional and directional proof-of-performance measurements must be made to show that the array as

adjusted produces the radiation pattern described in the construction permit. These measurements consist of 30 or more field intensity measurements, made on each of eight or more azimuths (called radials), from close in to the antenna system out to 20 miles.

There are occasions after the array is in operation when a set of partial proof-of-performance measurements must be made. Specifically, when any portion of a sampling system above the tower base is replaced (73.68(d)(3), under certain conditions when an antenna monitor is replaced (763.69(d)(4) and

when there is reason to believe that the radiated field may be exceeding the limits for which the station is authorized (73.61(b).

In addition there are other circumstances when a partial proof-of-performance might be advisable or necessary: when one changes the location of a monitoring point (73.158(1), the hanging of other antennas on the radiator of a directional antenna system or the construction of another tower nearby that might affect the shape of the radiation pattern.

In these latter two situations it is advisable to make "before" and "after" partial proof-of-performance measurements. There are times when the commission

puts conditions on construction permits for other facilities that require these measurements to be made.

A partial proof-of-performance consists of at least 10 field strength measurements made on each of the radials established in the latest complete proof-of-performance. The measurements are made within two-to-10 miles from the center of the array. In so far as possible, the measuring points should be in the same place as the originals. Either the arithmetic average or the logarithmic average of the ratios of the field strength at each measurement point along each radial to the corresponding field strength in the most recent complete proof-of-performance may be used to establish the inverse distance fields (FCC Rules and Regulations 73.154).

Where to start

So where and how do we start? Pull out the file containing the last complete proof-of-performance measurements. It should be part of your records available to an inspector. Hopefully, you have the typographic maps that were used to do the complete proof. Reduced size maps contained in the proof folder are difficult, if not impossible, to use. If the full size maps are not available you will have to purchase them. Using a protractor, carefully replot

each of the radials on them. Using the reduced size maps and the distance information obtained from the tabulated data, plot each measuring point between two and 10 miles. Some proofs contain descriptions of each point measured. If yours has this information, so much the better.

Using the map, take a business card and draw a distance scale in tenths of a mile on it. This is most helpful in determining location (i.e. 0.6 miles from an intersection) when there are no recognizable physical features on the map.

Never make proof measurements at night. You run the very real possibility of measuring a sky wave signal. For this same reason, measurements should not be made until two hours after sunrise and should cease within two hours of sunset.

Date and time

Note the date and the time of each measurement. If you do not have measuring point descriptions write them as you go. These will come in handy for the next set you will have to make.

If more than 10 measurements were made on a radial between two and 10 miles in the last complete proof it is advisable to make an attempt to measure all points. Sometimes, due to building or highway construction it is

impossible to measure in some places. At other times, you will find your new measurement to be far above or below what had previously been measured. Nearby construction, overhead wires and other changes in the physical features of the terrain cause this to happen. When it comes time to analyze the measurements if you have more than the required 10 you can toss out measurements that are obvious aberrations.

Before and after

On a radial where there is a monitor point—a point designated for periodic sampling of the radiation pattern stabi-

Never make proof measurements at night.

adjusted produces the radiation pattern described in the construction permit. These measurements consist of 30 or more field intensity measurements, made on each of eight or more azimuths (called radials), from close in to the antenna system out to 20 miles.

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KRUD 800 kHz 1KW DA-D Tabulation of Measured Field Strength Data Partial Proofs-of-Performance Before and After STL Dish Installation 120 Degree Radial									
Point #	Distance mi	km	1960 DA-D mV/m	1995 "before" mV/m	3/24/95 Local Time	1995/1960 Ratio	1995 "after" mV/m	5/26/95 Local Time	1995/1960 Ratio
15	2.00	3.22	120.00	92.00	1309	0.767	90.00	1304	0.750
16	2.09	3.36	120.00	101.00	1314	0.842	105.00	1308	0.875
17	2.60	4.18	107.00	80.00	1330	0.748	72.00	1320	0.673
18	2.82	4.54	51.00	58.00	1336	1.137	50.00	1325	0.980
19	3.35	5.39	50.00	44.00	1344	0.880	41.00	1331	0.880
20	3.71	5.97	43.00	48.00	1432	1.116	46.00	1338	1.070
21	4.06	6.53	45.00	49.00	1440	1.089	47.00	1410	1.044
22	4.70	7.56	21.00	29.50	1449	1.405	26.00	1422	1.238
23	5.45	8.77	34.00	28.50	1458	0.838	26.00	1430	0.765
24	6.40	10.30	24.60	22.50	1512	0.915	22.00	1442	0.894
25	7.40	11.91	16.50	17.50	1534	1.061	17.00	1501	1.030
26	8.10	13.04	16.50	13.00	1542	0.788	12.00	1512	0.727
27	8.90	14.32	9.10	9.20	1552	1.010	8.80	1518	0.967
AVERAGE RATIO						0.969			0.915

FIGURE 2. The tabulated data for "before" and "after" partial proofs-of-performance done on one radial of a directional antenna system. In this example the arithmetic ratio of each measurement to the last complete proof measurement was calculated. The inverse field on this radial was determined to be 280 mV/m in the last complete proof. The "before" inverse field was determined to be 271.3 mV/m (280 X 0.969) and the "after" inverse field was determined to be 256.2 mV/m (280 X 0.915).

ty—this point must be one of those measured and included in the partial proof-of-performance.

Table 1 shows a set of "before" and "after" partial proof-of-performance measurements made on a radial using the arithmetic ratio method of determining inverse field. Each measurement is ratioed to the measurement in the 1960 complete proof. The average of all the ratios is then calculated. The inverse field determined in the last complete proof is multiplied by the average ratio to determine the new inverse field.

When all radials have been analyzed in this manner, prepare a summary page showing the average on each radial and the new inverse field (the old multiplied by the average).

While many readers will never be called upon to deal with a directional antenna system, this two-part article has been prepared to take some of the black magic, otherwise known as fear, out of a challenge faced by broadcasters and make it easier using the proper understanding and appropriate tools.

Jack Layton is the owner of Layton Technical Services in McMurray, Pa. He does directional antenna field work and also sells and installs broadcast equipment. Layton can be reached at 412-942-4054.

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World Radio History

LINE-OUT

WDRE-FM Brings Music Into the Studio — Live

by Bruce Bartlett
and Jenny Bartlett

ELKHART, Ind. Just as in the old days, live music is back on the air! Some radio stations are bringing in bands to play live in the studio. Producers mix the performers direct to air and listeners hear the concert as it happens. It is radio broadcasting on the edge, exhilarating to both musicians and station personnel.

The equipment to do a live mix need not cost much. A 16-channel Mackie 1604 mixer, for example, costs about \$1000. Good mics are from \$125 to \$300 each. I suggest using cardioid condenser mics on acoustic instruments and cymbals, and cardioid dynamic mics on guitar amps and drums. Electronic drums can connect to mixer line-level inputs. Finally, add mic stands, direct boxes, cables, and a snake. Some engineers like to monitor with good headphones; others use close-field monitors.

WVPE-FM concerts

Here is how we do such a program at WVPE-FM, the local public radio station here.

WVPE runs a show called, "The Blues Review," hosted by Harvey Stauffer. Normally he plays cuts from blues CDs, but because there are some good blues bands in the area, we wanted to add live music to the show.

The station lacks a big music studio, so we improvise by putting the band in the hall outside the main control room. The hall has good acoustics and is large enough to accommodate a six-piece band. Musicians get a kick out of playing in there.

Jim Biddle, recording engineer for the station, worked out this system to mix live to air. He puts a small 16-input mixer at one end of the hallway, and the band at the other. He mixes the band live over headphones and feeds the mix to the control room console. This way Jim can talk with the band and move the mics more easily. If Jim were in the control room with the DJ, his talk might go over the air. Additionally, it is hard to do a sound check over headphones in the control room when a different on-air program is playing over the control-room monitors.

Take notes

Currently I am mixing bands for "The Back Porch," a folk/bluegrass show hosted by Norm Mast. Before the show, I ask band members, "What instruments will you be playing? Will you switch instruments? How many singers? Do you need monitors? Do you want any effects?"

Based on this information, I draw a block diagram of the audio system and generate an equipment list.

In a notebook I assign each instrument to a mixer input, and note what mic or direct box to use on each. I run cables and set up mics accordingly.

The musicians need to hear what they are singing, so I set up a monitor mix with the aux knobs on the mixer. This monitor mix is sent to a power amp and two monitor speakers near the band.

It is hard to monitor the mix clearly over headphones because the band's live sound leaks through the phones ear seal. For this reason I use Etymotic earphones, which block outside sounds by 24 dB. After a sound check to set the mix, we are ready.

We listen to a hall monitor speaker playing the show. When Norm Mast announces the band, it starts playing, and the music is broadcast live.

A more elaborate system is run by
continued on next page ►



PHOTO BY LARRY STANFORD

The band Live performs on-air at WDRE-FM.

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FEEDLINE

Ready or Not, Disaster Lurks Near You

by W.C. Alexander

DALLAS In the radio business, as in any other part of life, disaster strikes from time to time. It can range from the little things that we experience every day—cart machines that will not cue or capstan motors with squealing bearings in the control room, you name it—to some really big and bad things. How quickly we recover is directly related to how well prepared we are in advance.

The pages of **RW** often contain stories of fires, fallen towers and floods. In most of these stories I am amazed how quickly stations get back on the air. This is a real

credit to the resourcefulness and creativity of station engineers and their colleagues.

How well prepared are you for dealing with disaster?

Big budgets

Stations with big budgets make it a practice of maintaining complete redundancy. Those working in these stations probably feel relatively safe. If a control room console goes down, no problem. Switch the production room to air and fix it. Should an STL transmitter fail, switch to the backup. Dead transmitter? They have it covered. Fire up the auxiliary antenna or line trouble? There are two of those, too.

What happens, though, if the tower falls? With the main and auxiliary antennas both located on the same tower, both antennas are going to be in the dirt if the supporting structure comes down.

Several years ago, a Navy jet struck the candelabra atop one of the 1,549-foot towers southwest of Dallas. This tower was home to three TV and several FM stations. The tower did not come down, but the antennas and the tower itself were seriously damaged—to the extent that the tower later had to be replaced.

That incident was a real wake-up call around the Dallas/Fort Worth market. Many stations now have complete auxil-

iary systems at sites located apart from their main sites.

Avert AM disaster

AM stations have a whole different set of problems. Few can afford a separate site or an auxiliary antenna, although stations with separate day/night sites have a built-in redundancy that can pay big dividends in a crisis. To a lesser degree, multi-tower directional arrays have some redundancy that can mean the difference between being on and off the air following a problem.

I was recently hit between the eyes with
continued on page 86 ▶

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WDRE-FM's Studio

▶ continued from previous page

WDRE-FM in Garden City, N.Y. WDRE also mixes bands live and puts the mix on the air. The show is networked to nine cities, fed from an uplink transmitter on the roof.

Chief engineer John Caracciolo told me how the station started doing live mixes. "Originally, a soloist would set up in the air studio. We would put up a couple of EV RE-20 mics and that would be it. Since then, the number of musicians has grown, more care has to go into the mix."

In March of '94, the station moved into a new facility. Caracciolo explained the station designed a 16-foot x 16-foot performance studio for the musicians.

"The band comes in, sets up, and plugs in its equipment and mics into wall jacks," Caracciolo said. WDRE-FM typically uses eight or nine mics. The mic signals travel to a routing switcher, which can take the signals to any one of the studios he added. For on-air concerts, the mic signals go to the station's eight-track analog studio.

"We mix it in there, and send the output right to air. We don't lay down an eight-track tape for them; we just do a two-track mix to air and to DAT. Effects can be used for sweetening," he said.

The band's producer decides how much reverb, how much guitar, and so on, added Caracciolo. "There is always somebody looking over our shoulders. Some producers are very picky; everything has to be perfect."

When Tori Amos played at WDRE-FM, the station brought in 15 listeners—like a mini "unplugged" concert—and put the jock in the performance studio. Someone else ran the audio. The band talked with the jock and took questions from the audience, so it was like a little concert, he explained.

If your station plans to air live in-house concerts but lacks someone who knows how to mix, you might consider hiring the band's mixer, or an engineer from a local recording studio or sound company.

□ □ □

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

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World Radio History

OFFBEAT RADIO

'Mystery Playhouse' Alive on KIRO

by Dee McVicker

SEATTLE The reports of radio drama's demise have been greatly exaggerated. As proof, one has only to walk into the Museum of History and Industry here, during a live taping of "KIRO Mystery Playhouse."

On such occasions, usually once a month, the auditorium is likely to be filled to its 400-seat capacity with radio drama enthusiasts of all ages, from school-aged children to the elderly. The only thing these people have in common is their love of a good radio mystery. This is what has been luring the Seattle

listener to 710 on the dial Saturdays and Sundays from 9 to 10 p.m., when KIRO(AM) airs the drama shows.

"It would be very difficult for me to give you the typical profile of the (KIRO Mystery Playhouse) listener because they come in all sizes, shapes and colors," said Jim French, the writer and producer of the shows who is now retired from KIRO.

"These audiences range in age from families in their 30s who bring along kids seven to eight years in age all the way to people in their 40s, 50s and 60s," said French.

The radio drama has been taping in this Radio City Music Hall-like auditorium

for several years and has been on the air in Seattle for over 10 years, producing a devoted audience and over 350 shows. Prior to airing on KIRO, the drama aired on KVI(AM), also in the Seattle area.

It is one of the few, if not the only, radio dramas being produced for commercial radio today.

Some tune in to hear the adventures of Harry Niles, a private detective who doesn't always solve the case but makes for a good half-hour mystery while trying. Others tune in to simply hear a good mystery yarn.

The appeal to listeners is rooted in radio's history. "Radio has always been

like telling a story. When you were a little kid, and your mother told you a story, there were no sound effects or music. But you created pictures in your mind. And that is something that is built in as standard equipment for all human beings," said French.

400 percent jump

The ratings bare out French's observation. During one week, KIRO listenership "jumped 400 percent" for the Sunday radio drama hour, according to French. "It has far and away the number one audience rating at that weird time of night," he said.

Even though the "KIRO Mystery Playhouse" gets little promotion (save for a few on-air mentions), the drama has no problem getting sponsors. Currently, the Oldsmobile Dealer Association and a local insurance company are sponsoring the weekend dramas on KIRO. Some of the funding for the production of the "KIRO Mystery Playhouse" is derived from selling cassette tapes of the shows.

French envisions radio stations everywhere reviving dramas, if only for a program segment. He points to the popularity of "A Prairie Home Companion" as an example of the potential, but readily admits that — given the large budgets for such productions — the radio drama is often overlooked by programmers.

Pricey production

Another problem is there is very little programming available in the radio drama genre, again most likely because these shows are costly to produce. "KIRO Mystery Playhouse" is acted out by union actors and actresses under contract with the American Federation of Television and Radio Artists (AFTRA) union.

"I use the very best talent I can find," said French, who started writing radio drama in 1949, when he was still in college and radio dramas were still very much a part of radio programming.

Few aspects of the genre has changed, he said, except for the production equipment. During on-stage performances, "We tape the dialogue, of course. We tape the live sound effects, such as doors opening, telephone's being dialed, footsteps... anything that can be done on stage live is done concurrently while recording the dialogue. If there are mistakes in places, we stop and go back (during post-production) just like they do when they film before a live audience for a television show," he said.

French uses DAT tape for post production, which he takes back to the KIRO studios and transfers onto four-track to add sound effects, some of which come from custom recordings off of a portable DAT player and some of which come from CDs. He does all the writing for the dramas, and his wife, actress Pat French, directs the shows.

French plans to continue producing the shows as long as there is an audience for them, which, if history dictates, will never be lacking. "There is something inherent in radio drama that turns on the imagination, unlike movies and television, which restrict the amount of visualization of the story to whatever the screen size is," he observed.

□ □ □

Those interested in "KIRO Mystery Playhouse" can contact Jim French at 206-728-5475.

Dee McVicker is a freelance writer and regular contributor to RW. She can be reached at 602-545-7363 or via e-mail at: roots@primenet.com.



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Circle (33) On Reader Service Card

Put Scanners to Good Use in 'Shop

by Richard Mertz

FAIRFAX, Va. Several years ago, I purchased a hand scanner to use at my station. I was intent on scanning client logos into a graphic file that could be used to customize sales presentations. Business conditions kept the account executives so busy that the scanner and logo idea got put on the back burner.

So, being the typical engineer, I said, "Mind if I try the scanner on my computer?"

It was now mine! Off with the CPU cover! Where was my screw driver? No not the green one, the one with the blue handle. I installed the interface card and *voila!* An interrupt conflict. (Interrupts are internal computer signals that let the microprocessor know data is ready to be processed.) After a few minutes I found the right jumper configuration and bingo: pictures on my screen.

No big deal

The only image I ever scanned was a "stat" of the station logo. I imported the image into WordPerfect 5.1 and made customized fax cover sheets. Big deal. Scanning images into computer memory was not exactly barrels of fun, so I lost interest.

Shortly after this time, I decided to straighten up my office—a task that even today, takes some doing—and came

across the Optical Character Recognition (OCR) software that came with the scanner. I loaded the program and scanned the left, then the right side of a typed page (the scanner was wide enough to scan only half of a normal letter-size page at a time).

The software should have combined these half-pages and converted the electronic image of the text into ASCII characters for word processing. The OCR software didn't work too well. I had to edit so many of the incorrectly scanned and converted characters that it would have been easier to type the document directly (even at my speed of about 25 to 35 words per minute).

So much for hand scanners.

Moving on, my son is a budding music 'zine publisher (for those over 30, a "Zine" is a small, often "really cool" magazine). About a month ago, we were in the newly opened Computer City store. While viewing the goodies I heard, "Hey Dad, this thing makes a scanner out of your fax machine. Can we (hug) get it?"

Okay, let's take a look; the box claims the product turns your fax machine into a high quality scanner. *Quality and fax machine* in the same sentence ... well, that's another story.

My curiosity finally got the best of me, so I broke down and spent \$58 for the gizmo. To make it work I needed a computer

equipped with a fax modem and (sigh) Microsoft Windows 3.1, in addition to a fax machine. I had all this stuff at home, so down to the basement I went.

Down in the lab

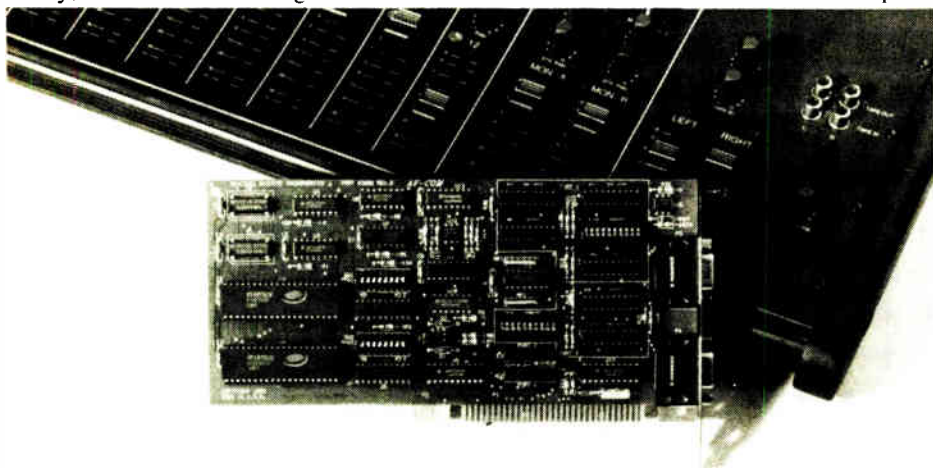
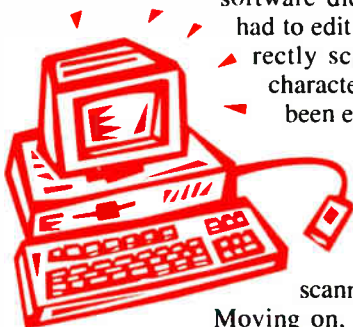
My home fax machine is a Panasonic FX series machine with answering machine, automatic line switching, digital announcement, toaster, hair dryer and so on. The fax modem is a Zoom clone fax modem which I bought for its 14.4 modem capabilities and never tried sending or receiving faxes.

Inside the box for the fax scanner is BitCom and BitFax software, and an honest-to-goodness manual. Also included was a

small plastic box for a 9 V battery, and connectors that plug in the standard telephone RJ11 jacks. This box connects directly between the fax machine and modem, and appears to provide a small DC voltage that fools both the fax machine and modem into thinking they are connected to Ma Bell. The box also attenuates the signal levels, replicating the loss normally experienced when connecting through the telephone company's wiring.

How does it work? First add the software into your hard drive (which must be done under Windows). Once installed, click on the "receive fax" icon. Next, load the picture you want to scan into your fax, pick up the fax phone (you won't get a dial tone) and press Start. You must quickly set the BitCom receive fax to "Manual Receive". This causes the fax modem to

continued on page 84 ▶



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WORKBENCH

Easy Cart Cleaning Technique

by John Bisset

SPRINGFIELD, Va. So the life of an engineer is not conducive to the best eating, staying in shape, or sleeping regularly. It is fun, right?

OK, don't answer the question ... continue reading.

The lifestyle of an engineer can easily lead to additional pounds. The extra

weight can be a factor in snoring, and the snoring can actually disrupt our sleeping patterns to a point where we think we get a good night's sleep, but do not.

Pick up a box of BREATHE RIGHT nasal strips. Jim Stanley, the former director of engineering for Colfax Communications turned me on to these, and you will not believe how much better you breathe (and sleep) with them.

Let me share a little information about BREATHE RIGHT. The inventor suffered from a deviated septum, allergic nasal congestion and stuffiness. To counter the effect of a narrowed nasal passage, BREATHE RIGHT is an adhesive-backed, flexible plastic strip: about the size of those little bandage strips our mothers put on our pinkies as kids. You expose the adhesive backing and bend the

strip over the bridge of your nose. As the strip comes in contact with the sides of your nose, the adhesive sticks. When you let go, the plastic strip attempts to return to its straightened "normal" state, and effectively expands the skin on the sides of the nose, opening up the nasal passages.

Because you no longer breathe through your mouth snoring is reduced. In the morning, you feel refreshed. BREATHE RIGHT strips come in three sizes, and enhance breathing for those who exercise as well. For more information on BREATHE RIGHT, circle Reader Service 121.

★ ★ ★

Frequent contributor Art Crane, from Desert R.F. Engineering in Arizona sent in the cart modification shown in Figure 1. Although cart machines are heading for extinction, there are still a few in service. Although the basic cart machine allows for easy pinch roller access for cleaning purposes, accessing a carousel is another story.

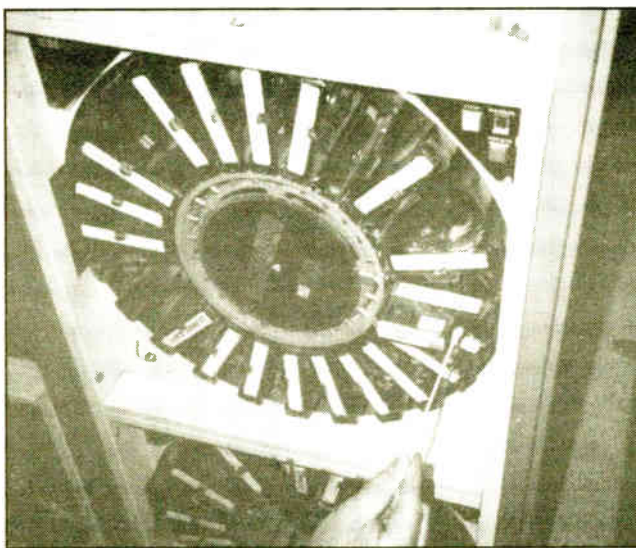
Bill Larson, the production manager at KAAA(AM)-KZZZ(FM) in Kingman, Ariz., cut a 1-inch by 1-inch square chunk out of the right rear corner of a cart, using a hacksaw. The tape was then removed. Placing this cart in a carousel slot permits easy access to the pinch roller for cleaning through the back of the cart.

Sometimes the simplest ideas are the best. Art wrote to tell about being awakened in the wee hours with the dreaded message, "We're off the air!" After driving to the transmitter site, on top of a 5400 foot mountain in Nevada, he found the problem. A bolt securing the cavity had come loose, began arcing, and burned itself into a lump of metal.

Although Art tends to carry an assortment of replacement hardware for field repair, there was another problem. The RF cavity was mounted 2 inches from the side of the transmitter housing. The

removable side wall of the transmitter was flush against the side of the steel cargo container shelter.

Art needed someone with an 18-inch reach, and a very skinny arm, or one of those flexible retrieval tools with the three pronged fingers at the end. He did not have either, and at 3 a.m., he could



On a carousel: keeping things clean

already hear the general manager screaming about morning drive make-goods.

Luckily, there was a cardboard box in the shelter. Art cut a 2-inch by 24-inch strip of cardboard from one of the flaps, punched a hole half-an-inch from the end, and inserted the new bolt into the hole in the cardboard. The stiffness of the card-

board made it relatively easy to maneuver the new bolt into place, and loosely secure the bolt with a new washer, lock-washer, and nut. A firm tug on the cardboard tore it loose from the bolt, the assembly was easily tightened, and the rig returned to air. Don't you just love tips like this?

I forgot to ask Art how much he charged the client for the cardboard! Art Crane can be reached at 520-453-3546.

★ ★ ★

We provided the schematic for a "poor man's hybrid" in the June 14 issue. G.P. Brefini responded via fax with a cheaper alternative to the Audisar transformers mentioned in the article. Allied Electronics in Texas stocks the Stancor TTPC-9, a 600 ohm, 1-2 splitter, for \$14.83 each. G.P. built a hybrid using this transformer and had excellent results. He had to use a capacitor in the range of 0.22 to 0.04pF and an LM386 chip to drive the send audio port, but otherwise his schematic was identical to the one provided by Walt Lowery of Symetrix. Expect about 20 dB isolation between the send and receive audio lines.

The Stancor transformer is Allied part number 928-9026, and Allied's number is 800-433-5700. You can reach Brefini by e-mail at gbrefini@aol.com.

□ □ □

John Bisset is a principal with Multiphase, a contract engineering company based in Washington, DC. He can be reached at 703-323-7180. Fax submissions for the Workbench column to 703-764-0751, or drop a line via America Online at wrbench@aol.com. Printed submissions qualify for SBE Certification credit.

Scanner in the Shop

► continued from page 83

seize the phone line without waiting for a "ring" sense. When the fax modem seizes the line, it will hear the attention tone from the fax machine and then do what faxes do best.

Modem reads

The modem reads in the scanned image data from the fax machine and creates an image file. Once the scan is complete the machine and modem say "goodbye" to each another and hang up.

Immediately after the receive fax function is completed, the viewing software jumps into action and tries to recognize characters. Yep, you guessed it: this software package has OCR capabilities. Because I scanned in a picture, I simply dumped out of the OCR operation and saw the scanned picture on the screen.

Go ahead, squint. That's it. There is the picture I scanned. The normal fax scan rate is really too fast to convert sufficient image data to convey a detailed picture.

Next, I tried using the Photo/Detailed setting on the fax machine and ran the procedure again. This time the image was better than the first try, but still lacked the quality my son and I were looking for. I would not recommend

this device if you are looking for a "frugal" scanner.

This Cloud does have a silver lining, though. I scanned a printed letter. Everything worked just as it did with the picture except this time the OCR software had something to convert. After about 90 seconds, the program finished and saved the converted text into an ASCII text file. Unlike the software I used several years ago with the old hand scanner, the new software did an acceptable conversion. With the exception of the letterhead and logo, the body of the text was about 98 percent intact. Not bad.

"How can I use this at my station," you may well ask. Convert PSA copy to text, edit in your station bumper liners and print—you have the announcement cleaned up and ready for your announcers. And, what about commercial copy? Think about it: you could also manually type the text into your word processor!

Let's see ... where's the letter "C" on the keyboard?

□ □ □

Richard Mertz is a principal at the consulting firm of Suffa & Cavell, Fairfax, Va. He can be reached at 703-591-0110; through CompuServe at 730,3026 or on the Internet at rmertz@dgs.dgsys.com.



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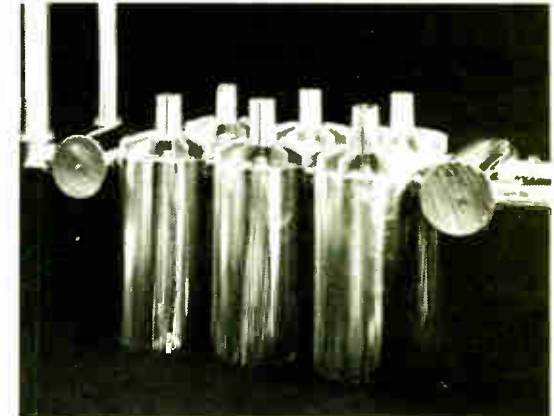
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READER SERVICE NO. 172

Designing Simple FM Stereo Demodulator

by Jim Somich

CLEVELAND In the last two columns I discussed the cookbook approach to circuit design. This month I will use cookbook techniques to design a simple FM stereo demodulator. The cookbook approach makes it simple.

Practical instrument

I had a need for a portable test instrument that would take a stereo composite signal and give me left and right channel audio in headphones. I was testing composite processors and needed some way to evaluate their sound without actually putting them on the air. I did not have easy access to an FM stereo modulation monitor so I began searching for an inexpensive, portable stereo demodulator. I found that no such animal existed.

Because I am a monitoring freak, I also thought it could be very useful to have a portable demod in my toolbox as a signal tracing tool. Let's say that you detect some



noise on the air and you are trying to track it down. It is relatively easy to monitor the audio at the input to your stereo generator, but not so easy to check its output. The simple FM demod fits the bill.

The demod is built around the National Semiconductor LM-1310 stereo demodulator chip. See Figure 1.

The LM-1310 is an integrated FM stereo demodulator using phase locked loop techniques to regenerate the 38 kHz subcarrier. The chip features automatic stereo/mono switching, excellent channel separation (40 dB typical) and requires no coils. You can run the chip on +12 to +15 volts.

The circuit layout is non-critical and can be constructed using perfboard, or you can etch a small circuit board using toner transfer paper and your laser printer. The

LM-1310 chip is available from Digi-Key for \$1.47. My demod is battery powered, using two 9 V batteries and a 12 V regulator, but you can use any source of +12 to +15 volts that is convenient.

The circuit only draws about 35 mA with the stereo indicator on. The finished circuit

2) The sidebands of a 38 kHz subcarrier that is amplitude modulated by the L-R (difference) audio (the stereo information). 3) A 19 kHz pilot signal at 10 percent injection, doubled in the receiver to recover the 38 kHz subcarrier.

The GE-Zenith stereo system allowed

broadcasters to convert to stereo yet remain compatible with mono sets by broadcasting a fully modulated mono signal receivable by any FM radio. The double sideband suppressed carrier 38 kHz signal carries the stereo (L-R) information. By suppressing the carrier, no modulation is wasted by the addition of the subcarrier to the composite signal. This is true because when L+R is at its maximum, L-R is at its minimum. By this interleaving of the L+R and L-R signals, the only modulation lost by the addition of stereo is the 10 percent injection required for the 19 kHz stereo pilot signal.

The stereo composite signal is coupled to the LM-1310 through a 2µF capacitor. Inside the chip, the signal is split into two paths. One path is to a phase-locked loop where the incoming pilot is used as one

input, and the output of a 76 kHz voltage controlled oscillator (divided down to 19 kHz) is the other input. This locks the VCO to incoming pilot. The other path from the input is to a stereo decoder circuit which derives a left and right audio channel from the composite. The phase-locked 19 kHz signal is used to synchronize this decoder.

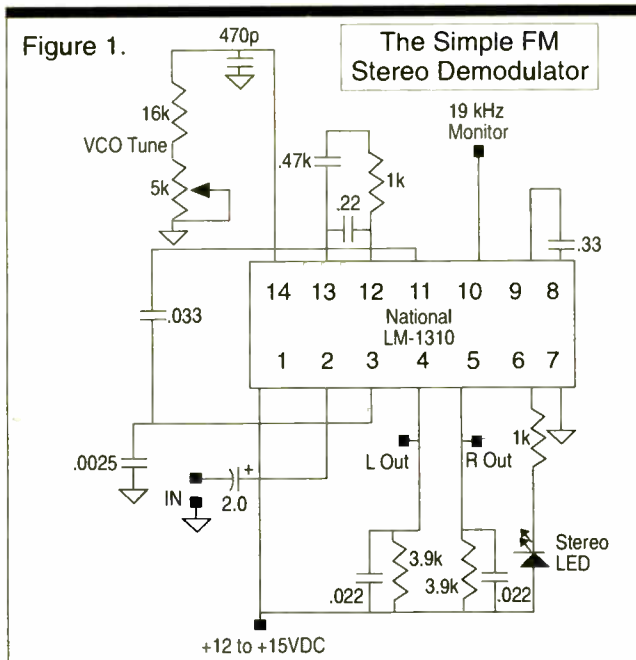
After you have constructed the circuit and double-checked your wiring, apply DC power and monitor pin 10 of the chip with a frequency counter. Adjust the VCO pot so that pin 10 reads exactly 19 kHz with no input to the demod. This is the only adjustment and sets the free-running frequency of the VCO.

Connect headphones to the output of the demod and a stereo composite signal to the input. The stereo light should come on, indicating that the chip is phase locked to the incoming pilot. You should hear stereo in the headphones.

The FM Stereo Demod is a handy piece of test equipment that you can easily construct yourself. To the best of my knowledge, there is no equivalent device available on the open market. It is very useful for testing and troubleshooting and, with a little help from your junkbox, can be built for about 10 bucks.

□□□

Jim Somich is a radio broadcast engineering consultant and president of MicroCon Systems Ltd., a manufacturer of broadcast equipment. He can be reached at 216-546-0967.



board can be mounted in a plastic or metal utility box.

Use a chassis-mount BNC connector for the input and a stereo headphone jack for the output. The LM-1310 will drive high impedance headphones directly. By the addition of a National LM831 power stage, you can drive low impedance headphones or even speakers.

Theory

Broadcasters have been using the GE-Zenith stereo broadcasting system since 1960, and after 35 years we take it pretty much for granted. Construction of the simple FM demodulator can also be an excellent review of the theory of multiplex stereo. The stereo composite signal consists of:

1) L+R (mono audio),

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Disaster Lurks Near

► continued from page 81

one of those wake-up calls myself. In Portland, this company operates a 5 kW fulltime station that is diplexed into a three-tower in-line array with a 50 kW station. Without warning, a diplex filter capacitor cracked and failed, allowing 30-some-odd kilowatts into one of our antenna tuning unit (ATU) networks.

Our transmitter immediately shut down, the other station's transmitter kept on pumping power into the system. The components in our ATU network were not rated to carry that amount of current. Two of the caps melted, burst and set the building on fire. Our ATU was toast, as was the other station's phasor also located in that tuning house.

Our engineer was able to get us back on the air within a couple of hours. He jumpered the transmitter output directly to one of the other towers' transmission lines. After retapping the tee-network there, we were back in business. Likewise, the other station was able to jumper directly to another tower and get back on the air. Because both remaining towers had diplex filters in their lines, both stations were able to operate at reduced power without isolation problems.

Let's face it: most stations do not have the budget for complete redundancy. Unless yours is a top-biller in a big market, it probably will not make good economic sense to invest heavily in seldom-used backup gear. Most stations can be off the air for a long time before

the cost of a \$50,000+ auxiliary system is realized.

The key to getting back on the air quickly when disaster strikes is planning. Every engineer should take a little time and think through different scenarios and plan for each.

For example, should the STL fail, use the RPU "backwards" to temporarily feed programming to the transmitter site. Should the transmitter fail, the output of the exciter could be fed directly to the transmission line to keep the station on until repair parts arrive.

Networking holds the key to quick recovery from some of the more crippling disasters. Your network of contacts with manufacturers, distributors and fellow engineers will be your source of emergency parts, equipment, labor and even tower space. How many times have you read about damaged stations getting back on the air from another station's site?

Let this column be your early wake-up call—not to a smoldering pile of rubble, but to preparedness for dealing with it if it happens. Stop, think, plan. When disaster strikes, you can implement your plan without wasting down time thinking up solutions. This means less down time and the pressure will be off you while you make repairs.

And let's not forget that you will be a real hero to the boss, too!

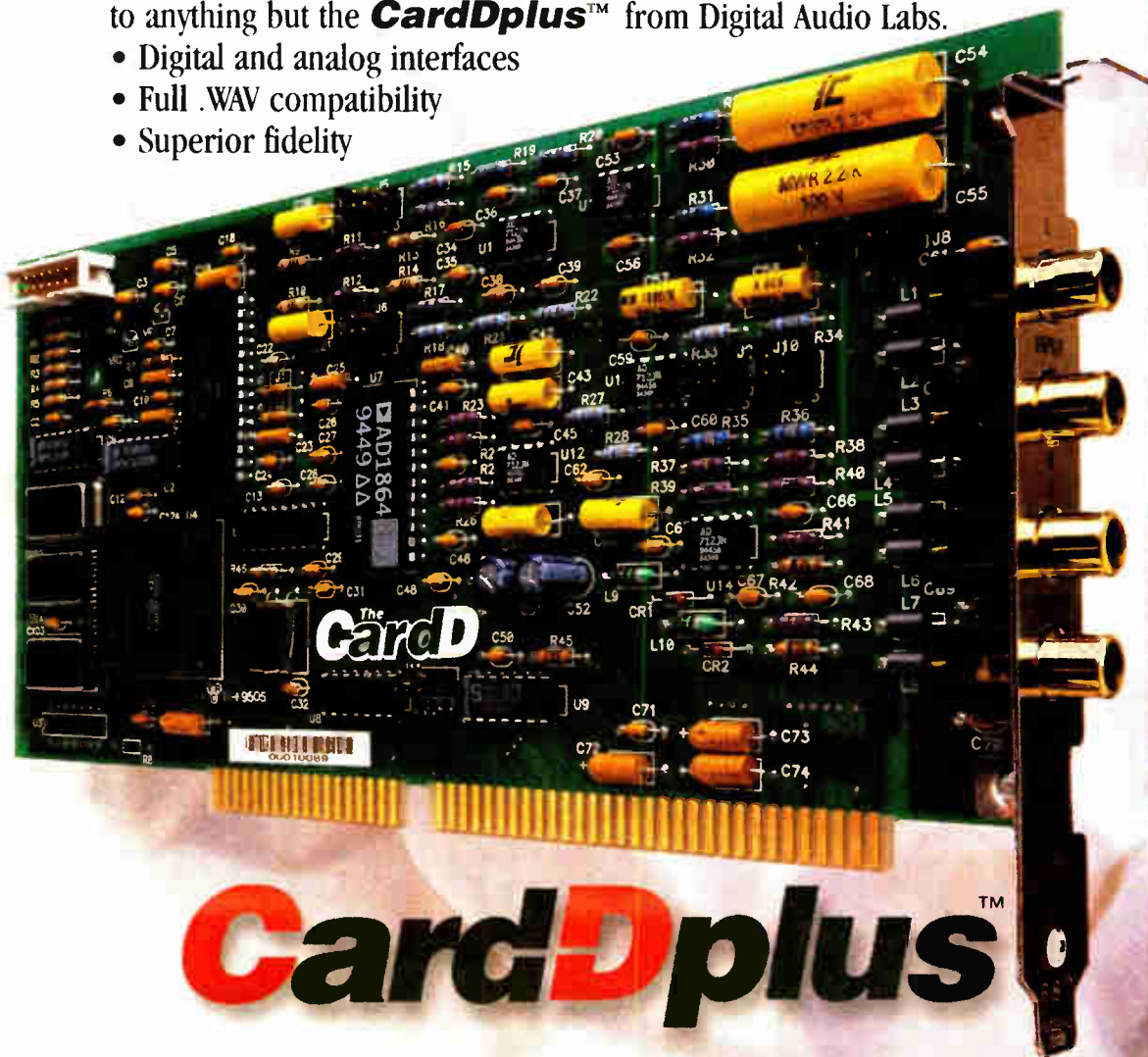
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Cris Alexander is the director of engineering at Crawford Broadcasting in Dallas. He can be reached at 214-445-1713.

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INSIGHT-ON-RULES

Explore Internet's New Resources

Part II

by Harold Hallikainen

SAN LUIS OBISPO, Calif. I'd like to continue with my discussion of valuable resources now available on the Internet. The full text of the Code of Federal Regulations, or CFR (including the FCC Rules) and the U.S. Code, or USC (including the Communications Act of 1934) are now available through the House of Representatives Law Library.

The Uniform Resource Locator (URL) for the CFR is <http://www.pls.com:8001/his/cfr.html> and the URL for the USC

is <http://www.pls.com:8001/his/usc.html>. Each of these includes a search engine where you enter a few key words, and it gives you a list of likely sections. You can force it to search for a particular phrase by surrounding the phrase with single quotes (''). For example, I used 'blanketing interference' to get the text of 73.318 for this article.

New resources

Note that new resources are showing up on the Net all the time. You can find them by doing a search (using Yahoo or Web Crawler) or by reading e-mail mailing lists, Usenet newsgroups or print

publications (like **RW**).

Picking up where we left off last time (talking about resolved and unresolved complaints of FM interference and their eventual outcome), lets move on to an unresolved complaint. One complainant bought her house in the FM blanketing interference area more than two years after the station began program tests. As such, the station is not obligated to solve the blanketing interference problems, but is obligated to provide specific information on proper corrective measures. The FCC states the station "should have provided... diagrams and descriptions which explain how and

where to use radiofrequency chokes, ferrite cores, Microwave Filter Company filters and/or shielded cable." The station "should have recommended replacement equipment that would work better in the high radiofrequency fields."

The FCC found that providing the complainant with copies of various FCC bulletins on interference was not sufficient. The complaint remains unresolved.

The complainant lists 10 devices receiving interference. These are four radios, a telephone, an answering machine, a cassette player, a CD player, a VCR, and an "audio system." The station replaced telephone wiring and equipment even though 73.318 specifically excludes stations from responsibility for interference to devices that are not radio receivers.

Although the station replaced several of the radios (the homeowner refused the offer to replace some of the radios), the FCC staff noted that on several radios in this home, various numbers of additional FM stations could be received when the new FM was off the air. This varied from two stations receiving interference on one radio to 17 additional stations being audible on another radio when the new FM was off.

The FCC determined that "interference" to the complainant's telephone was, as in the previous case, a telephone company problem.

Because these problems were present within the first year the station went into operation and were still present four years later, the FCC determined that the station did not comply with its responsibilities under 73.318.

Interference to telephones

The FCC points out that 73.318 specifically does not include interference to non-RF devices and that hard-wired telephones are considered non-RF devices. In addition, cordless phones are authorized under Part 15 of the rules. Section 15.5(b) states that cordless phones may not cause harmful interference and that interference to cordless phones caused by the operation of an authorized radio station must be accepted.

Accordingly, the FCC ignored all telephone interference complaints in this decision.

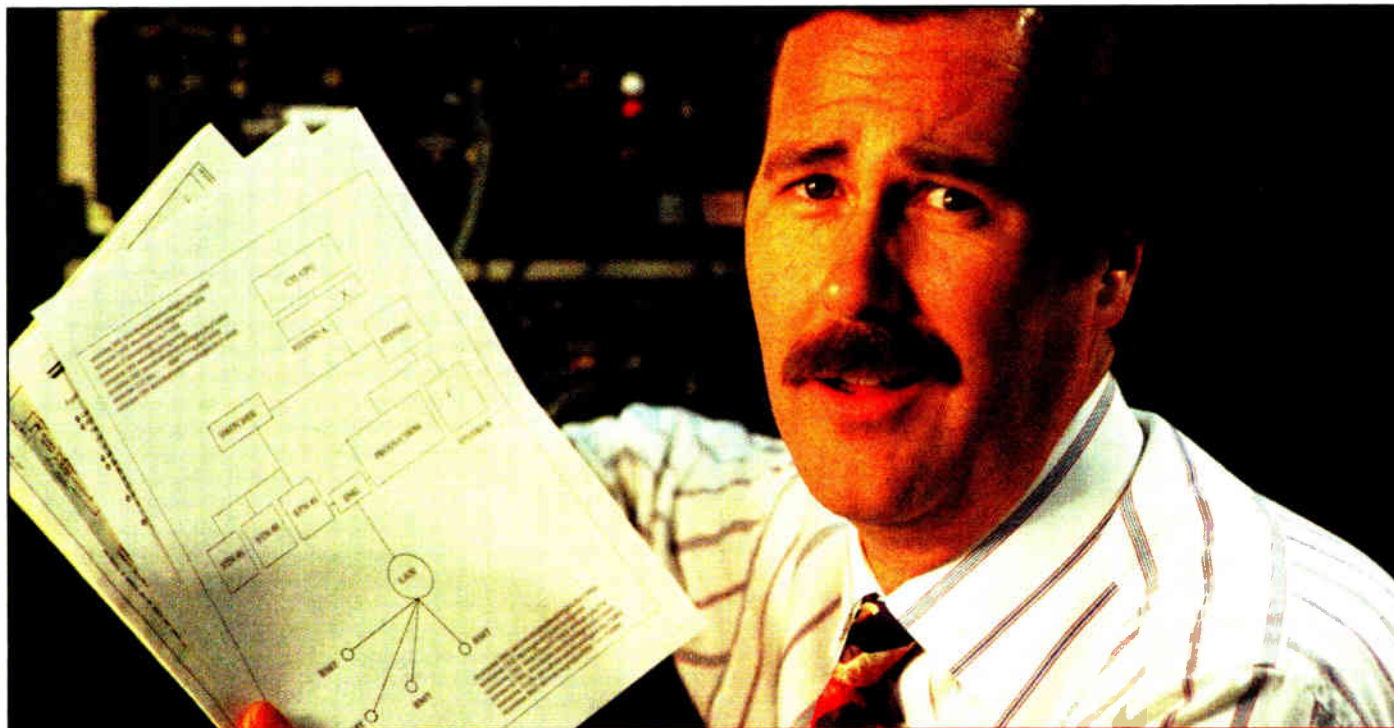
Defective cows

One of the complainants was concerned about the biological effects of the station's radiation on his health and on the health of his cattle. He stated that since 1990 he has had several unusual calf deaths, and a calf was born dead with seven legs. The FCC found that the radiated fields were lower than the ANSI standards, so it did not consider this issue.

The FCC points out that 73.318(b) requires the station to satisfy *all* complaints of blanketing interference that are received in the first year of program test operation. This station had not resolved them after four years of operation. In the Report and Order that adopted the rules (see 57 RR 2d 126 (1984)), the FCC intended to have applicants place blanketing interference high on their priority list when choosing antenna sites. They did not expect stations to replace inexpensive handheld radios with expensive FM tuners, but declined to include a clause that would protect only receivers of good design and further declined to set receiver interference rejection standards.

The station's consultant pointed out that

continued on next page ►



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Surfer4 has been designed specifically for radio: only those functions used in a radio station are offered, as opposed to other products on the market designed for video post production.

The system relies on the MPEG2 compression algorithm, which means that



100MB can hold one hour of stereo audio. On-line storage of music beds and effects libraries is therefore less expensive than traditional linear editors.

One of the major advantages of Surfer4 is that it is networkable. Audio files and projects are stored on the network's central server. They are not copied to the local workstation but are read directly off the server. As a result, projects can be shared by several users on a network.

For information, contact Steve Kelly in New York at 212-370-0665, or circle **Reader Service 96**.

Satellite Telephone

The MiniLYNXX M personal satellite phone from Mobile Satellite Products (MobileSat) is about the size of a notebook computer. From this self-contained global telephone system, anyone can connect through the dial-up public telephone network with standard phones, cellular or satellite telephones and fax machines. MiniLYNXX M can also communicate with e-mail subscribers over the Internet and provides direct access to business data networks and other networks.

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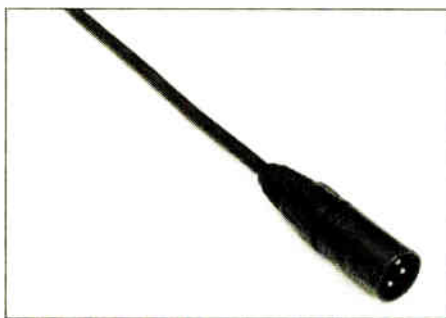
These T-5-size RGB LEDs contain four chips—one red, one green and two blue—encapsulated in a single epoxy package. Emitted color is changed by varying power to each chip.

For information, contact the company in Illinois at 708-359-2790; fax: 800-944-2790; or circle **Reader Service 160**.

Flexible Audio Cable

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For information, contact the company in California at 310-390-6608; fax: 310-391-8926; or circle **Reader Service 68**.

Cart Recorder

Developed to meet the demanding needs of broadcast professionals, production studios and the rigors of live show performance, the Denon DN-995R MiniDisc cart recorder offers both features and flexibility.

The DN-995R provides all the basic features of the DN-990R MD cart recorder, with the addition of new



options like external synchronization capability, PC control software for Windows and a switchable RS-422A/232C interface. The end trim, cue, search and disc-loading functions have also been upgraded to maximize performance.

A built-in calendar/clock function automatically logs the date and time on the MiniDisc when a new track is recorded for easy disc management. The clock is backed up by an internal battery in case of power failure.

The front panel features an easy-to-read FL window complete with 13-character information display, 24-segment peak-level meter, three-digit track number display and status indicators for Eject, Lock, TOC, Edit, Cue, Rem, Vari, Digital In and "*" for external sync.

For information, contact the company in New Jersey at 201-575-7810; fax: 201-808-1608; or circle **Reader Service 192**.

Internet Resources

► continued from previous page

some of the complainants would not be satisfied if there was any trace of interference to any station, whether they listened to that station or not. The FCC pointed out that station formats and listener tastes change with time, so all stations must be protected, whether they are currently listened to or not. The decision did not appear to take into account whether a station receiving interference was protected from interference at that location (protected from co-channel and adjacent channel such that a listener could hear it if the blanketing interference was not present). It might be unreasonable to protect someone from interference when they were listening to a distant station far beyond its predicted contour, but in blanketing interference questions, it appears such protection might be required.

Station PTA revoked

The FCC looked at the possibility of reducing the station's power to eliminate blanketing interference. However, such a power reduction would make the station not provide required coverage over its city of license. The FCC decided to revoke the Program Test Authority (PTA) and require the station to utilize its previous transmitter site.

When I spoke with the station manager, he indicated the station is currently operating from the previous transmitter site, and would like to set the whole mess behind him.

□ □ □

Harold Hallikainen is president of Hallikainen & Friends, a manufacturer of transmitter control and telemetry equipment. He also teaches electronics at Cuesta College and is an avid contradancer. He can be reached at 805-541-0200 (voice), 805-541-0201 (fax), and on the Internet at hhallika@slonet.org and <http://slonet.org/~hhallika/>.

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Radio World

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FREE each month. Yes No

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Please print and include all information:

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Business Telephone () _____

Please check only one entry for each category:

I. Type of Firm

D. Combination AM/FM station F. Recording Studio

A. Commercial AM station K. Radio Station Services

B. Commercial FM station G. TV station/teleprod facility

C. Educational FM station H. Consultant/ind engineer

E. Network/group owner I. Mfg, distributor or dealer

J. Other _____

II. Job Function

A. Ownership G. Sales

B. General management E. News operations

C. Engineering F. Other (specify) _____

D. Programming/production

Reader Service

Aug. 23, 1995 Use until Nov. 15, 1995

Please first fill out contact information at left. Then check each advertisement for corresponding number and circle below.

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004 026 048 070 092 114 136 158 180 202

005 027 049 071 093 115 137 159 181 203

006 028 050 072 094 116 138 160 182 204

007 029 051 073 095 117 139 161 183 205

008 030 052 074 096 118 140 162 184 206

009 031 053 075 097 119 141 163 185 207

010 032 054 076 098 120 142 164 186 208

011 033 055 077 099 121 143 165 187 209

012 034 056 078 100 122 144 166 188 210

013 035 057 079 101 123 145 167 189 211

014 036 058 080 102 124 146 168 190 212

015 037 059 081 103 125 147 169 191 213

016 038 060 082 104 126 148 170 192 214

017 039 061 083 105 127 149 171 193 215

018 040 062 084 106 128 150 172 194 216

019 041 063 085 107 129 151 173 195 217

020 042 064 086 108 130 152 174 196 218

021 043 065 087 109 131 153 175 197 219

022 044 066 088 110 132 154 176 198 220

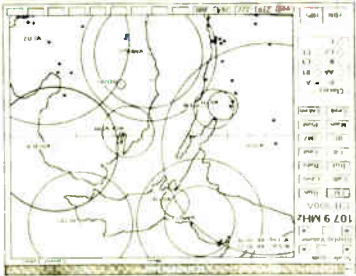
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300' guy wired towers (2), BO: Harris/Gates 2 tower phaser, Potomac Instruments antenna monitor AM-19(204), other misc phasing equip, BO: Jack, 304-765-7373. Jack, 304-765-7373.

Want To Buy

Horizontal antenna, lightweight, tunable to 98.5 MHz, 6-8 bay. F Holton, WAHI, Rt 1 Bix 72, Plymouth IL 62367-9730. 217-392-2340.

High pwr FM antenna on or near 107.1 FM, prefer 8, 10 or 12 bay. B Michaels, 409-244-4170.

AUDIO PRODUCTION

Want To Sell

Allison Gain Brain/Kepex (6), 4 Kepex, 2 LX-100 pwr splys, rackmount w/sply, Molex connectors, pins & crimp tool. BO: Fairchild 659A older 3 spring reverb unit, 3 amps, sounds like old WABC AM, BO: UREI 535 stereo EQ, like new in orig box, \$350. L Prezant, 718-248-1623.

Technics SH-9010 stereo paraphractic EQ, rack mount, 2-chnl, 5 bands +/- 12 dB/chnl, adj freq/bandwidth each chnl, unbal in/out, gc, \$225/BO+shpg. E Helvey, 703-877-2717.

Roland SRV 2000, \$490; dbx 503 expander/comp, \$350; Orban 414-A stereo compressor, \$425/BO; UA 565-filter, BO; Orban 245-E stereo synth, BO; Ross 15 band stereo EQ, BO; Urei 546 stereo parametric EQ, BO. T Coffman, 619-571-5031.

Urei 530 stereo EQ, BO; Orban 111B reverb, BO; Urei 533 mono EQ, BO. K Stokes, 504-383-5271 x229.

Digidesign ProTools 2.51 4-chnl workstation incl disk I/O card, 4-chnl audio interface, cable & software for both ProTools & Sound Designer, \$4500. Paul, Pissaurus Prod Inc, 402-341-9153. Roland 6209 1 octave pro EQ, rack mounts w/parallel low noise filters, \$50. E Davison, 217-793-0400.

Redg/prod studio setup, board monitors, dist amp, FX, carts, R-Rs, TT, mic, etc, bulk eraser, 200-300 music length carts, open reels, cassettes, BO. M Mattson, 414-783-5551.

ADC 1/4" patchbays and cords, NEW, UNDER HALF PRICE, ADC TT patchbays, \$129 up, NEW cords, \$9.95. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

Bulk eraser, \$49; Stewart 4 ch D-box, \$95; Cue command decoder, \$125; NEW Tascam midizer MTS1000, \$450; Infonics 7 reel copier 1-3 copies, 2@ \$125 ea; Furman elec crossovers, \$95; Peavey M2600 pwr amp, \$375; Crest FA800 PWR AMP, \$475. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

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Want To Buy

MXR-Neve-API EQs, mic-pres, delays, etc. T Coffman, 619-571-5031.

Ampex tube mixers, plug-in mic pre-amp modules for PR10's, Altec or other tube compressors, Mackie mixers. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

AUTOMATION EQUIPMENT

Want To Sell

Arrakis Digilink DL2-600, 540 MB HD, 15" color monitor, keyboard, mouse, etc, 6 mos old, BO. 904-477-6688

Digital DJ computer, monitor, stereo switcher, 1991 model, xint cond, BO. V Zandt, WLGm, 15 Walnut Hills, Springfield IL 62707. 217-487-7711.

Conex CG-25R 25 Hz gen, BO. C Mandel, 619-352-2277.

Digilink automation syst, compl w/key-board, mouse & monitor expander/doubler, 6 hr SCSI drive incl, BO. D Gaydos, WNYU, 721 Broadway 11th fl, NY NY 10003. 212-998-1663.

IGM 48 tray Go-Carts (3), model 4216, \$250/ea. Tony, 402-371-0780.

Sentry FS-12B automation syst, good cond, incl 2 stereo 48 Instacart, 4 stereo Go-Carts (2-24s, 1-48 & 1-42), computer, interfaces, manuals & cables. BO; IGM-EC automation syst, good cond, incl 2 stereo Instacart 48s & 1 stereo Go-Cart 24, computer, interfaces, manuals & cables. BO. C Mandel, 619-352-2277.

Gorman Redlick EBS decoder, \$225/BO. Steve, 402-438-4989.

Sentry Sys Format Sentry FS12C automation, incl PC & 2 IGM 48-tray Instacarts, orig incl 3 ITC 750 reels, BO; Schafer automation syst w/2 multi-tray cart machines, BO; ITC 750 PB reels (3), BO. K Stokes, 504-383-5271 x229.

SMC Carousels (4), mono, BO. GM, KWED-AM, 210-379-2234.

Want To Buy

All types & vintage, repairable OK. FAX 715-359-8213.

Conex CS-25 or other, will pay \$100 for working Conex 25 Hz tone sensor, will consider others, need 6. J Nichols, Rosemond Radio, 313 S St, Gastonia NC 28052. FAX 704-853-1776.

Audio Prophet computer syst w/Sat box & ribbon cables, 3 needed. Don, WSHN, 616-924-4700.

CART MACHINES

Want To Sell

Dynamax ESD10 cart eraser/splice finder, new, \$600; Harris Criterion 90-2 R/P cart deck, stereo, \$500; Harris Criterion 90-2 R/P cart deck, mono, \$400; Harris Criterion 90-1 ply cart decks (2), mono, \$200/ea; Harris Criterion 80 ply cart deck, mono, \$150; Audicord Series 100 "S" ply cart decks (2), mono, \$200/ea; Audicord Series 100 "S" double deck cart, mono, \$300; Spotmaster cart winder, \$200. J Franks, 614-522-8171.

ITC System 99B stereo record/play; tones, ELISA, auto head: \$1200/firm. C Scott, WKYU-FM, (502) 745-5489.

Audi-Cord TDS-1 dual mono PB, BO. AM Eich, 502-428-3655.

Tapecaster X-700-R/P new cond w/aux tone option, secondary cue tone gen/detector, \$500. R Franklin, 215-646-7788.

BE 5300C tripledeck, stereo, PB, 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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COMPUTERS

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Radio Shack 1000 computer, used for Sentry Automation, working, no HD, no opto interface, extended mem to 640K, one floppy drive, \$200/BO. A Wasilewski, 509-248-1460.

CONSOLES

Want To Sell

Arrakis 5000 SC, circa 1986, 13-chnl linear fader, some spare parts, new hi current pwr sply, works well, \$2000. M Martindale, KVN, 1124 Foster Rd, Napa CA, 94558. 707-252-1440.

Collins IC 6 audio console, BO. C Mandel, 619-352-2277.

Tangent 1202A 12-chnl mixing board, slide pots, reverb, pre- & post-FX, send & return, EQ, xint cond, \$1000/BO. L Prezant, 718-248-1623.

Gates 10-chnl Executive consoles (2), works except for monitor amps, some spare parts, \$300/ea+shpg. F Hogan, WGLS-FM, Rowan College of NJ, 201 Mullica Hill Rd, Glassboro NJ 08028. 609-863-9457.

Ramsa WR 8118 18-chnl, 4 bus, great cond, \$900. Brent, 800-359-9302.

Roland 49 cardframe (2) w/9 mic/line inputs, 600 ohm bal line output w/VU meter, rack mounts, \$100/ea. E Davison, 217-793-0400.

Sparta Cetec A-15B 6-chnl mono console, \$400. Tony, 402-371-0780.

Tascam M208 w/rack mounting kit, 8 in x 4 out, FX buss, foldback, low, mid, hi EQ w/parametric on mid, mic, line or tape inputs, vgc, \$450/BO+shpg. E Helvey, 703-877-2717.

INC CM-1056 150 hrs, xint cond, keypad & LCD display, will trade for Adtran #1SU128, \$800/BO. B Holms, Timeless Voyager Radio, POB 6678, Santa Barbara CA 93160. 805-964-3301.

McMartin B-502 stereo console, 5-pot, 10-input, stereo, \$500. J Franks, 614-522-8171.

Otari MX-70 16-chnl, never used, BO. G Pietragallo, KPSL, 303 N Indian Canyon, Palm Springs CA 92262. 619-323-5775.

Ramsa 820 20x8x16 w/meter bridge, \$1795; Quantum 23x16x24 as used by LA Philharmonic, \$3750. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

Want To Buy

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API/Neve whole or parts, working or not. T Coffman, 619-571-5031.

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Want To Sell

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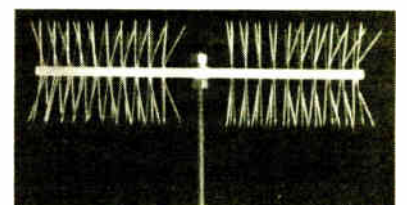
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AKG 460-EB, BO; EV RE-27, BO; Sennheiser 421, mint, BO. T Coffman, 619-571-5031.

EV RE 38 ND mic, \$275/BO. 206-839-9414.

Sony ECM377 large dia. cond mic, \$495; RCA 77DX with new ribbon, Crown GLM200 lavalier like new, \$125. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

Want To Buy

77-DX's, 44-BX's, WE KU-3A's On-Air lights, recording lights & audition lights. Top price paid. Fast response. Bill Bryant Management, 2601 Hillsboro Rd, G12, Nashville TN 37212. 615-269-6131, FAX: 615-292-3434.

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

RCA ribbons, AKG 451's, Neumann KM84's, U87's AKG 414's. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

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Harris 992-5118-001 encoder for System 90, \$50. Tony, 402-371-0780.

Powerpak SMG-400 excellent condition with manuals, schematics, \$400/Best Offer. D Thompson, 510-609-8631.

Alertlite 3-V vertical on-air light, disappearing lettering on 3 sides, same model sold by Collins Allied, etc, lexan globe, steel base, ceramic socket, new, \$35. R Franklin, 215-646-7788. Assorted radio/TV tubes, at least 80, old-fashioned carrying case, \$75+shpg. E Scott, 603-366-2013.

Duncan 442s (6) & 441s (17) timer ladders, full throw 10,000 ohms w/P&G style knobs, new, never used, \$20/ea 441 monos, \$30/ea 442 stereos; Beyer BV372 015 006 mic input transformers, 200 ohm primary, 100,000 ohm secondary, \$18/ea. B Wilson, 407-682-2346.

EMU Proteus 1 MIDI sound mod, \$425/BO. 206-839-9414.

Symetrix TI-101 phone interfaces (5), Best Offer. K Stokes, 504-383-5271 x229.

Want To Buy

Teac 3300SX head bridge, good; Optimod updated 9100A. D Schroeder, WSWL, 904-433-1141.

Jazz record collections, 10" LP/12" LP be-bop, swing, dixie, highest prices paid. B Rose, Program Recordings, 228 East 10th, NNYN 10003. 212-674-3060.

MONITORS

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Harris AM 80 air monitor, mono, \$150; TI 700 data terminal, \$40; Panasonic 920ma monitor TTL, \$20; Panasonic 930 monitor TTL, \$20; NEC monitor FVM125A TTL, \$20; TEC smart monitor model 70x, \$40; TEC screen & keyboard 1440-003, \$40. Tony, 402-371-0780.

Belar RF-1 FM RF amp, \$250. Craig, KSIW, 612 S 14th Ave, Yakima WA 98902-4327. 509-453-5492.

Pacific Rcdrs LSM-10 line selectors/monitors (2), BO. K Stokes, 504-383-5271 x229.

RECEIVERS & TRANSCEIVERS

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Dayton AF161 SCA receiver, wall mount, DIP switch selective carrier & SCA frequency with power supply, \$75/Best Offer. A Wasilewski, 509-248-1460.

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Gorman Redlick EBS decoder, \$225/Best Offer. Steve, 402-438-4989.

Johnson AT-4A modified multiplex tuner, used for data transmission on weather network, (150), Best Offer. D Leinen, 405-728-2525.

Yaesu FTC-1123 5 W, 150-160 Mhz front programmable handhelds w/PL tone & chgr, 10-chnl (10), \$150/ea. P Russell, Bowdoin College, 207-725-3066.

RECORDERS

Want To Sell

360 Systems Digicart random access digital recorders (2) with 400 MB HDs & Bernoulli floppy drives, like new condition, \$1195/ea. G Pyron, KOMC/KRZK, 202 Courtney St, Branson MO 65616. 417-334-6003.

Ampex AG-350 deck with 2-track R/P heads, Inovonics 3-speed elect, 3-speed reversible capstan motor, mounted in AG-440 studio console, \$600/BO+shpg; VSC C-4 Soundpacer cassette recorder with variable speech control to PB up to 2X speed & retain original pitch, AC/DC, can feed thru R-R deck to edit R-R tapes @ high speed, EC, \$50+shpg; Otari 5050BH deck with 2-track RP + 1/4-track play, 3-speed capable, manual, very good condition, \$1500/BO+shpg. E Helvey, 703-877-2717.

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Ampex 350 record/PB deck, \$200/BO; Ampex 350 PB deck, \$200/Best Offer; Inovonics 355/905 record/PB for Ampex 350 with power supply & manuals, \$260. D Thompson, 510-609-8631.

Ampex ATR 102 stereo R/P with VSO & locator, rare metal heads, excellent condition, needs export work, \$2000/BO; MCI JH-110 4-track in Russlang cabinet, good condition, \$1500/BO; Scully 280-B 4-track in cabinet, good condition, \$1000/BO. You ship. W Wawro, 214-977-6260.

Eumig FL-1000U rackmount cassette deck, optical export, Dolby, built-in reverb & mic mixing, very good condition. BO; Revox B77 1/2-trk R-R, 7 1/2-15, port, excellent condition, \$600/BO over; Pioneer RT-1050 1/2-trk R-R, 7 1/2-15, port, excellent condition, \$500/BO over. L Prezant, 718-248-1623.

Otari ARS 1000 open reel machines (5), Best Offer. C Mandel, 619-352-2277.

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Studer A710 stereo cassette deck, Dolby B & C, \$595. R Sumner, 703-450-2288.

Ampex 351 decks (2) with Inovonics electronics, mono, BO; Ampex 351 deck with original tube electronics, mono, BO. GM, KWED-AM, 210-379-2234.

Revox A77 1/4" 1/2-trk stereos (2), \$300/ea. J Franks, 614-522-8171.

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Scully 280B reel, BO; Revox B710 cassette recorder, BO; Otari MX5050 2-track reel, BO; Otari MX5050 4-track reel, BO; ITC 750 with recording amp & roll-around cabinet, BO; Revox A-77 reel, BO. K Stokes, 504-383-5271 x229.

Technic 85 MK 2 for parts, as is, \$75+shpg. H Sewell, Oakridge Music, 2001 Elton Rd, Haltom City TX 76117. 817-838-8001.

Ampex ATR100 taperecorders for parts. Circuit cards, heads, motors, machine parts, or electronic parts. Call 818-907-5161.

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Marti AR 10; Marti R PT 30; Potomac FIM 41 field strength meter; Potomac AG 51 audio generator; Potomac AA 51 audio analyzer; Delta RG 3 receiver generator; Delta OIB 3 impedance bridge; all in new cond with manuals. BO. C Chamberlain, WUCO, POB 69, Beletontaine OH 43311. 513-592-8606.

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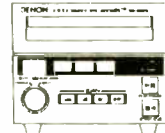
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Gates CB11 16" transcription TT, 33/78 rpm with model 120 tonearm, BO; Weathers tonearm with variable capacitance cartridge & self-powered oscillator, BO; Rysil M-R VS-12 tonearm in original box, BO. AM Eich, 502-428-3655.

Technics SP-15 (2) w/Gray arms, cartridges, BO. GM, KWED-AM, 210-379-2234.

Technics SP25 TTs (2), \$200/ea; Audiometrics S-220 tonearms (2), \$100/ea; Radio Systems PA-1 preamps (2), \$100/ea. J Franks, 614-522-8171.

Technics SP-25 33 1/3 & 45 rpm direct drive, quartz locked w/pitch adj, good cond, \$250. R Franklin, 215-646-7788.

Sparta TEP-3 (4) TT preamps, \$25/ea, \$75/all. A Wasilewski, 509-248-1460.

ADVERTISER INDEX

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Large table with 4 columns: Page No., Advertiser, Reader Service No., and another Page No./Advertiser/Reader Service No. column. Lists various companies and their corresponding page numbers.

Table with 3 columns: Role, Name, and Contact Information. Lists staff members like Publisher, Associate Publisher, Ad Traffic Coordinator, etc.

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Announcer/music director w/6 yrs on-air exper in Gospel, Urban formats looking for a station to take to the top, sports & news exper as well. John, 910-632-9826.

Subcarrier services market development, expand the reach of your station's investment, enter new markets, stake a claim in new info delivery capabilities. Tom, 206-361-9287.

Chief engineer, corp technical direction, career technical background, small & major markets & consulting firm with DJ, programming, operations manager & station manager, "reality" seasoning, prefer TX or adjoining states, resume & references. Ted, 409-863-7651.

Country/Oldies morning AT, promotions, remotes, adult, topical, humorous, no Gump, no puke, no liners! Mike, 510-432-6300.

Dedicated individual looking to expand horizons, any format, will move, enjoy prod, flt on-air. Brian, 313-374-1041.

Small market talent needs next step, prog/prod exper, creative & cheap. Luke, 815-244-8062.

Small market news director seeks oppy to move back to mid-CA, extensive announcing, prod & Spanish exper, xnt board skills! J, 415-431-1543.

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CHIEF ENGINEER

Clark Broadcasting seeks an experienced Chief Engineer with FCC general certification and SBE certification. Responsibilities include: complete maintenance of 3 FM and 2 AM properties within 30 miles of each other. Requirements for Chief Engineer include: extensive knowledge of all aspects of radio engineering as well as experience with UDS & DCS systems, computer-assisted broadcasts and all technical operations of a modern facility. Located in Central Virginia and the Shenandoah Valley, our stations are all market leaders in their format with proven formula for success. The intricate nature of our facilities as well as continuous maintenance requires a talented engineer who enjoys ongoing challenges and the ability to solve technical problems quickly. Please send your resume to: Clark Broadcasting Company, P.O. Box 2189-RW, Staunton, VA 24402-2189 or FAX it to 703-885 8662. Clark Broadcasting is an Equal Opportunity Employer. M/F

Well-established successful AM/FM radio seeks 2 FT talent, news & sports depts, we require team plyrs, hard work, self-starters, we offer competitive salary, 401k, 75% comp pay ins & supportive work environment, send resumes, air checks. J Kling, KWLM/Q102, POB 838, Willmar MN 56201. 612-235-1340.

Eden, NC: Looking for radio salespersons with the vision to become partners with our clients as their marketers. Must be aggressive with positive attitude. Honesty is a must to our advertisers and community. Contact John Messina, WCLW Radio. 1-800-761-8066.

Seeking a partner/investor to join our project in refitting our ship for use as an offshore shortwave broadcasting station that would be able to sail anywhere a radio voice is needed. If you are this individual or organization, please contact Lightwave Mission Broadcasting, 718-853-4301.

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