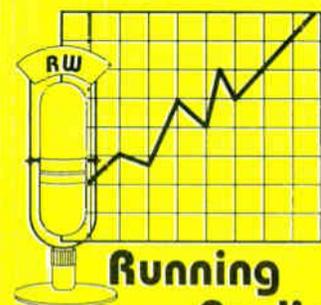


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**Running
Radio**
 See pp. 17-22

Vol 19, No 15

Radio's Best Read Newspaper

July 26, 1995

FCC Hikes Regulatory Fees

Schedule of Fees Based on Station Class Means 25 Percent Increases

by Lynn Meadows

WASHINGTON Radio broadcasters can expect to pay a hefty 25 percent more in regulatory fees than they did last year. This in spite of the Federal Communications Commission's (FCC) efforts to make the fee schedule more equitable.

Do not expect relief even if your market contains only 1,000 potential listeners. The FCC effort to make the fee schedule more equitable using Arbitron ratings was greeted with skepticism by many in the industry.

After the initial establishment of regulatory fees in Fiscal Year 1994, many stations questioned why they had to pay as much as the revenue giants in big markets like New York City and Los Angeles. In its Notice of Proposed Rulemaking (NPRM) for the 1995 fees, the FCC tried to address the complaints.

In addition to graduating fees in different classes as they did in 1994, the FCC suggested establishing separate fee schedules for stations based on whether or not they were in an Arbitron market.

Response to NPRM

Small stations in big markets and big stations in small markets greeted the idea with skepticism. Nevada-based Broadcast Media Associates, said in its comment that the rate changes demonstrated "little, if any, practical forethought to the matter."

"Certainly, there is no viable reason to charge the same fee for a facility in the number one Arbitron market as is charged for a comparable class of facility in the 200th Arbitron market," the letter reads.

When its Report and Order (R&O) on the regulatory fees was released last month, the FCC acknowledged that the original Arbitron idea was flawed. "The Arbitron rankings data is incomplete for fee determination purposes, and reliance upon it does not provide a sufficiently accurate and equitable methodology for determining fees," the commission said in its decision.

Alternate suggestions

Although it received alternate suggestions from the Montana Broadcasters Association, the Maine Association of Broadcasters, and others, the FCC did not select a different scheme to make the fees more equitable. Like last year, fees will be differentiated only by station class.

continued on page 3 ▶



Living curio: 'Marconi Kit' beginnings lead to a half century of success. See Features pp. 26-41

Ferguson to Lead NAB Radio Board

BRIDGEPORT, Conn. After working toward radio ownership deregulation for the past six months, Richard Ferguson, president and CEO of NewCity Communications and the new chairman of the National Association of Broadcasters (NAB) Radio Board hopes to see the legislation become law during his one year term.

Ferguson, who served this past year as vice chairman of the radio board under Chairman Doug Williams, had testified before the House Commerce Committee in May urging legislators to repeal the ownership caps. Now, in his new position as chairman, he says passage of that legislation is his first goal. "That is job one."

the issue is being debated but disagrees with the comment that the NAB is not representative.

"In specifically the issue of ownership regulations, I think NAB has been responsive. We have been doing a

poll of radio stations owned by groups and independents," he said. Ferguson sees people divided into three groups over the issue of ownership deregulation.

Two groups

First, there is an informed group of people who have split into two groups that favor and oppose lifting the ownership caps. Of these, says Ferguson, those favoring ownership deregulation are in the majority.

The third group, said Ferguson, are



Richard Ferguson

radio station owners and operators who have not really had a chance to focus on the issue. "Radio is a tough business. Just getting up every day and keeping the station on the air and selling commercials and all the rest of it is a full time job," said Ferguson.

He believes that as people focus on the issue, more people will come to agree with the NAB position in favor of ownership deregulation. He stressed that "The NAB position is not just the NAB position. It is the majority of the industry position."

Ferguson is also eager to see the industry move

continued on page 6 ▶

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NEWSWATCH

Court Rules On Indecency

WASHINGTON The United States Court of Appeals decided last month to uphold the regulations of the Federal Communications Commission and federal law that prohibit broadcasting of indecent material during daytime and prime-time hours.

Reed Hundt, FCC chairman said, "Parents and the public are the winners," adding that the 10 p.m. - 6 a.m. "safe harbor still serves the goal of confining this material to hours when minors are less likely to be exposed to it."

In contrast, the National Association of

Broadcasters (NAB) issued a statement saying it was disappointed with the ruling: "We will be consulting with the other media and public interest parties involved in the case to decide whether to appeal to the Supreme Court."

Arbitron Adds Scarborough Profiles

NEW YORK The Arbitron Company announced in June that it will include limited Scarborough qualitative information in its Spring 1995 Radio Market Report.

Subscribers to Arbitron in the 58 metro areas where Scarborough Research

measures consumer, retail, and media behavior will see the extra section at the back of the market report in their books.

One report will breakdown consumption of items like soft drinks and fast food by socio-economic categories and by selected media use. The second report breaks down cumulative audiences for individual radio stations by eight categories including household income and occupation.

Radio Board Elections

WASHINGTON Results from June elections of the National Association of Broadcasters (NAB) Radio Board make Richard A. Ferguson, president and CEO of NewCity Communications in Connecticut, the new chairman (see related story, page 1). Howard B.

Anderson, president and owner of KHWY Inc. in Los Angeles, will serve as vice chairman.

Ferguson began his radio career in high school and formed NewCity Communications in 1986. The company owns and operates 18 radio stations, NewCity Creative Resources, The American Comedy Network/Commercial Works, and the Marketing Resource Center.

Anderson, who has also worked with 20th Century Fox Television, ABC Film Syndication and WFAA-TV in Dallas, owns KHWY Inc., which operates three FM stations in California along with a duopoly in Honolulu.

FCC Chairman Pushes for Inclusion

CAMBRIDGE, Mass. Reed Hundt, chairman of the Federal Communications Commission (FCC), reaffirmed the commitment of the agency to include people with disabilities in the information revolution.

Speaking before the Eleventh International Telecommunications for the Deaf Incorporated Convention, the

continued on next page ▶

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Radio Regulatory Fees Based on Market Size

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The National Association of Broadcasters (NAB) said that the distinction between stations in Arbitron markets and those that are not was a "useful first step towards a system where the amount of regulatory fees more closely reflects differentials in station revenue potential." But the NAB urged the commission to grant waivers when the market ranking

NEWSWATCH

► continued from page 2

chairman listed ten goals "for making equal access a reality."

Along with holding a summit to develop an agenda for action, Hundt suggested that all televised commission meetings be closed-captioned and that all commission publications be available on the Internet in alternative formats such as braille, enlarged text, and audio text.

First Annual Radio Festival

NEW YORK The Museum of Radio and Television will celebrate the 75th birthday with its first annual Radio Festival to be held from Oct. 23 to Nov. 3.

The first week of the festival will explore the impact of talk radio with five seminars including one that features Rush Limbaugh. The second week of the festival will pay tribute to legendary and contemporary radio stations, personalities, and trends and include a seminar with Casey Kasem.

The festival will also offer "Re-creating Radio Workshops" where families can read scripts and work sound effects to create radio programs.

Case Winds Down

CLEVELAND More than a year after Howard Stern's on-air ritual "burial" of his Cleveland radio competition, WMMS-FM and WMJI-FM, the wheels of justice have turned toward a conclusion to this intrigue-filled case of derring-do.

Or have they? WMMS promotions director Heidi Klosterman (who went by the name Heidi Kramer on the air) has pled guilty to attempted disruption of public service and receiving stolen property (copies of a local entertainment magazine that put Stern on the cover), and another individual, Greg Smith, who is not an employee of WMMS-FM, pled guilty to attempted breaking and entering (sentencing for both individuals was scheduled for August 1). Former WMMS-FM engineer William Alford, who had previously pled guilty to disruption of public service, has been sentenced to 10 days in jail for his part in the saga.

But Craig Weintraub, assistant prosecuting attorney for Cuyahoga County, Ohio, who has been involved in the Stern case from the start, hinted that the end may not be in sight, despite the latest developments.

"We are going to continue with the investigation and see where we want to go with it," he said, adding that "the potential always exists" for more indictments in the case. ☹

resulted in "excessive fees for a particular station."

Others argued during the comment period that radio stations should be charged on a graduated scale by market size with the higher fees charged to stations in the higher rated markets.

According to the R&O, when the number crunchers at the FCC worked through the market size scheme, they found "unexpected inequities." Predictions of significant fee increases in the top markets and increases for stations on the low end prompted the FCC to drop that approach.

The Montana Broadcasters Association (MBA) recommended basing regulatory fees on the annual gross spot revenue of a station. "Such a system would much more precisely reflect the ability of each station to pay its fair share," it wrote. But the commission responded that it did not have a database with that kind of information.

Peter Herrick, acting associate managing director for program analysis at the FCC, says the commission intends to look at all its fees and see what can be improved for next year.

He said the FCC would like to "take into consideration the population served" by broadcast stations when determining fees. One possible idea, said Herrick, would be to combine a database with a Grade B Contour. "There didn't appear to be any time left this year to do that," said Herrick.

Clifford Hunter, president of Broadcast Media Associates and owner of KBOX in Santa Maria, Calif., agreed that population would be a good basis for establishing fees. He pointed out that a larger population usually means a station can charge more for spots.

Not everyone has an opinion about the new fees. Some in the industry point out that manufacturers of transmitters and microphones do not give special rates to stations based on revenue generated or size of population served. They argue that discussion of graduating the fees is unnecessary.

Lucky few

The 1995 increase could have been much worse. Congress told the FCC that it has to raise \$116.4 million for this fiscal year. That is almost 93 percent more than it was required to raise in 1994. Mass Media is responsible for \$21 million of the tab. The cable industry will cover \$29.9 million and the common carrier industry will pay \$57 million. The final \$8.5 million will come from Private Radio.

The commission unearthed some additional fee payers this year. Those lucky enough to escape the regulatory fees last year include FM translator and booster stations which the R&O says were unintentionally omitted. Licensees will pay \$170 this year.

The fees are due by Sept. 20. Herrick says the process this year will be similar to last year where stations will receive public notices and instructions on where and how to pay.

Meanwhile, Congress is discussing the 1996 budget so save your change for next year. ☹

AFCCE Hears Eureka-147

by Lynn Meadows

MONTREAL The Canadian Association of Broadcast Consultants (CABC) and the U.S. Association of Federal Communications Consulting Engineers (AFCCE) held a joint meeting in June that included a demonstration of Eureka-147.

The group visited a digital audio broadcasting (DAB) transmitter site in Montreal and heard mobile demonstrations of the Eureka-147 system. The demonstration and visits were sponsored by Digital Radio Research Inc. (DRRI), a joint initiative between the Canadian Broadcasting Corporation (CBC) and private broadcasting organizations.

John Browne, who was president of the AFCCE at the time of the demonstration said: "We were impressed with the performance of the Eureka system and also with the level of effort that is being applied to this in Canada."

AFCCE member Bob Culver said the group of engineers left the demo with different impressions. Several left wondering how L-band could be used in the United States if it were chosen as the U.S. system. The rest, he said, either learned a lot about the technology or were simply unimpressed.

Both Culver and Browne praised the effort with which the Canadians are moving forward on DAB using Eureka-147. Although Eureka-147 was developed in Europe, Culver said the Canadians have tried to make the system better by asking Eureka to allow for expanded Single Frequency Network (SFN) usage. SFN provides very efficient use of the spectrum.

DRRI is building transmitter sites in Ottawa and Vancouver to add to existing sites in Montreal and Toronto. Michel Tremblay, executive vice president of DRRI, said he expects receivers to go on sale in Canada in the spring of 1996 although some are available now. "Both price and size will come down rapidly," he said of the receivers.

Whether or not Eureka-147 will be included when field tests of DAB begin in September is still undetermined. Unlike the in-band, on-channel (IBOC) and in-band, adjacent-channel (IBAC) systems scheduled to be tested, Eureka-147 needs to be tested on at 1.5 GHz (L-band). The National Telecommunications Information Administration (NTIA) has opposed using the L-band for DAB since the World Administrative Radio Conference in 1992.

The Electronic Industries Association (EIA) is waiting for a definitive answer as to whether NTIA will grant temporary use of L-band for the San Francisco tests. DRRI is under contract with Eureka-147 to build a transmission site in San Francisco to be used in the EIA/NRSC tests should the spectrum be allocated. ☹

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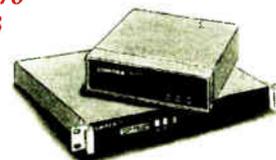
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Serving the Mainstream

Dear RW,

The May 17th RW carried a letter in *Readers Forum* by Kevin D. Powell, a producer for Public Radio in Stony Brook, N.Y., defending public radio's current federal funding. I have often listened to public radio, and while many of its offerings are very interesting and valuable, public radio can never serve the mainstream of radio listeners. If I were incorrect, such stations would consistently appear as at least one of the top-10 rated stations in their markets.

If Powell is correct in reporting that each public radio station's budget is supported by the feds at only about 13 percent on average, certainly that small amount could be replaced by local funding, which could be achieved, provided of course that local sponsors believed that the stations in question had a good-sized listening audience. No sponsor in his right mind would support any station without a sizable audience—commercial or non-commercial. And if the funding is only 13 percent, then it will likely not be missed. If the government is to shore up these stations with tax dollars from the general public, then these stations must in turn serve the general public, which I define as the mass audience.

This is not a matter of liberal versus conservative, but simple common sense. Public radio stations that excel in meeting the needs of the widest possible audience will rightly survive by themselves, with local public support of a grateful audience. As for the current 13 percent spent on them, as reader Powell guesstimates, there are plenty of helpless people afflicted by diseases, unemployable and otherwise, who could be much better served by those millions of wasted dollars.

On the matter of music licensing ("Unravel the Maze of Music Licensing," RW, May 17), it has always astounded

me that the music industry forces radio stations to play their music—which in truth is advertising their music, and paying for the privilege of doing so! I've never purchased any music I didn't hear first on the radio. Have you? Let's not charge BMI, SESAC, et al. for this free advertising. But at least stations ought to band together, and by a show of force, persuade the music licensers to abandon their detestable, monopolistic policy of radio station blackmail. Station groups ought to do so this very minute. After all, where would the Beatles or Michael Jackson be without radio and all of its free PR.

Sheldon J. Swartz

The Opportunity Radio Network
West Palm Beach, Fla.

Editor's Note: The reason public radio stations do not appear in the top 10 of any given market is because Arbitron does not include data gathered on non-commercial radio stations when formulating its rating reports.

Divine intervention

Dear RW,

Paul Montoya (RW, April 19) suggested that your publication's close proximity to D.C. might have something to do with your support for public broadcasting (RW, Feb. 22).

Being a broadcast gypsy, I have been overexposed to Wisconsin, Denver, Minneapolis, Indianapolis, Chicago and San Francisco radio. In Wisconsin and Minneapolis, public radio is largely educational, the cheese-heads in particular maintain both an arts and entertainment network and an education and information network. This short-summer society has determined that public schools and higher education are in its best interest, if not necessary for the survival of civilization. Making the leap to support continuing and rural education is rather easy.

San Francisco's power-house educational station is the home of 24-hour continuous news and information, that forms a nice balance with the remaining commercial and non-commercial stations.

In Indianapolis, only one major public radio station survives with a simple "All Things Considered" (ATC) and music of Northern European 17th-18th centuries. The other station was sold (in order to build educational channel 69) and 104.5 MHz, now "The Bear," fights mightily (and successfully) for one of three, lucrative and socially redeeming country music slots. Education is rarely heard on the Indy air waves, and the full-power ed-station (we used to call them that) does not carry "Prairie Home Companion" (PHC), "Car Talk," "Chapter a Day," "What Do You Know?" or produce anything in house (this may have changed in the year or so since I lived there).

Still there are alternatives in Indy. Indy is particularly blessed with high school stations. It should also be noted that while Indiana supports many of the nation's finest universities, it also has one of the lowest literacy rates in the nation. I would assert that those values are unfortunately in evidence on their public airwaves.

Denver is somewhere in between. I can receive six ATC broadcasts from my

Idea Man Whose Time Has Come

As the radio industry prepares to celebrate the 75th anniversary of the first commercially licensed broadcast, it seems fitting that one of the industry's most hardworking and innovative entrepreneurs—Richard Ferguson, president and CEO of NewCity Communications—will preside over the NAB's Radio Board.

At age 75, the industry faces technical challenges that will fundamentally alter the way it operates in the future. The politics involved in handling those challenges, however, are even more important than the challenges themselves.

Ferguson's track record reveals a forward-looking idea man. Case in point, his work with the Futures Committee. In mid-1994 the committee initiated a "search for ideas to integrate radio into the information superhighway and the business opportunities presented by new wireless digital technologies."

His innovative strategies can be seen in some of the moves his own radio group has made. Back in the late 1980s, NewCity was one of the first to blanket a market with two FM signals that simulcast programming but split off the advertising to geographically targeted areas.

But what he can do for the industry is more important than anything he has done to date. On the issues facing radio and the NAB at this moment, here are some suggestions:

As the testing stage of Digital Audio Broadcasting by the EIA and the NRSC winds down, the NAB board should choose the system that is best suited for the United States. If no one system, of the seven currently being tested, comes out a clear winner, then the NAB board should have the resoluteness to say so.

But if the winner is clearly an out-of-band service (something the NAB opposes), then the board must also have the resoluteness to seek a new answer.

Radio must push for additional spectrum of its own, either through increased duopoly limits or by bidding on other available frequencies. The FCC is seeking comments on a proposed rulemaking for digital audio radio satellite (DARS). Rather than oppose DARS, the NAB radio board should seek to have the process reopened so that group broadcasters could invest in DARS services.

If radio interests controlled DARS, it could serve as a complement to terrestrial broadcasting, not as a foe. Broadcasters can win this fight if the list of services they can deliver over full AM and FM and satellite channels is enough to impress policymakers.

Services planned via RBDS at 1.2 kilobits per second (kbps) or FM sub-carrier systems at 20 kbps—paging, global positioning, transmission of a few characters or graphic logos—are creative and useful. Imagine what is possible when radio broadcasters can also work with hundreds of kilobits per second.

Ferguson's search for ideas to integrate radio into the digital future is still well worth the energies of as many radio broadcasters as possible, and should continue apace.

The time for decisive action and political legerdemain is close at hand. Richard Ferguson and the NAB Radio Board have the ideas and the clout to draft a new chapter in radio's history; defining the industry's obligations and innovations for the demands of the next century.

—RW

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home and lots of the hot hits of the 18th century. I also get one run of PHC, and some of the college-related stations do step out into non-commercial music. We do not get "Conversations from Wingspread" or any of the press club addresses. Living in Denver, Paul probably does not know that educational radio exists, and might be persuaded that public radio is simply liberal-leaning (read that educated, long-format) news and commercial classical music.

While Paul claims that much of the programming on public radio is commercially viable and would continue without public support, I would point out that like days when the Earth stops rotating, this does not happen very often, and never without divine intervention. Many of the syndicated entertainment and educational programs are available to commercial stations, yet outside of a few cases involving PHC, I do not believe any commercial station has taken advantage of this.

I have been in broadcasting long enough to remember a day when some of the money that now goes to serve the leveraged debt went to the broadcasting community, arts, and educational programs that did not have a chance of selling spots. Certainly that environment has changed.

But I ask you to return to first principles. Radio is (was) a form of free speech. It was once thought necessary to provide alternative opinions and public service.

The entire concept of radio's purpose being to promote consumer consumption is an economic convenience and not an inherent attribute of radio. Broadcasting was once thought to have great educational potential. I suppose it has, and like many of my fellow Rush fans I will be playing my copy of "Hooked on Phonics" while consuming vast quantities of colored water made from "the best things on earth," all the while happily knowing that there are simple answers for everything and what we do not know is not worth the science to discover.

I suppose that if I was an educational station, I would be confused now. After years of pressure to carry my own weight, people are now upset that public stations are competing for production business and sponsors? Certainly it is idiotic to have underwritten competitors in a free economy, but it is hard not to recognize that this is in fact self-inflicted idiocy.

I would say simply, that for those of us who spend 90 percent of our radio time in the bottom 10 percent of the FM dial, that it will be a dark day indeed when what is left of educational radio is hawking garlic cures and learn-to-read courses. Shouldn't we be pressing to put the education back in educational radio instead of trying to convert that last 5 percent of spectrum into commercial radio?

Fred Baumgartner
Denver, Colo.

Ferguson Maps Out Radio Agenda

► continued from page 1

forward with Digital Audio Broadcasting (DAB) and adopt in-band, on-channel (IBOC) as the standard. Asked about the potential for enhancing revenue by broadcasting different

your local community." He offered an example of a small town with seven stations some of which are extremely marginal. "All of a sudden somebody puts a satellite up and beams down 60 channels of stereo sound into your marketplace.

Futures summit. He said the committee has been quiet for the past six months because the "telco bill has turned the future into the present."

Significant legislation

The bill is a very significant piece of legislation, said Ferguson, "not only in what it does for radio but in what it does for all of the other segments of the telecommunications industry—television, cable, and telephone."

Asked if the future holds a place for radio, Ferguson does not hesitate. "I think there will undoubtedly be room for a local audio service that can be received on a mobile basis and we know that today as radio."

Mindful of his primary goal—passage of the telecommunications bill—Ferguson added "I think radio clearly has a place in the future but it has to be operated under a set of rules and regulations that provides the kind of flexibility that is needed so radio isn't sitting in a 1934 mode of regulation."

—Lynn Meadows ☺

Ferguson is eager to see the industry move forward with Digital Audio Broadcasting (DAB) and adopt in-band, on-channel (IBOC) as the standard.

programming on the analog and digital signals if IBOC becomes the standard. Ferguson pointed out that like CD Players and VCRs, DAB will undergo a transition period.

"The number of people who could hear the digital signal on day one would probably be very few and the number of people who could hear it six months later would be very few. For all practical purposes, I think very few people will do anything but simulcast.

"Now if you look 20 years out, I think people will ask if it makes sense to keep broadcasting an analog signal because then the vast majority of the country can receive digital sound. The opportunities may exist to use your spectrum in other ways."

As the FCC considers how to release spectrum for Satellite Digital Radio, Ferguson offers a two-pronged defense for terrestrial broadcasters worried about competing: "One, get rid of the ownership rules and regulations so that local broadcasters particularly in small markets can make the adjustments they need to compete with the satellite if and when it gets up there and before it gets up there."

The second half of the strategy, said Ferguson, involves "being connected to

The only way you may be able to compete is to provide good local programming and be able perhaps to have all seven of those radio stations in that marketplace."

Keep the FCC

Congressional and private-sector rumblings that the FCC should be abolished are not shared by Ferguson. "I personally believe that the FCC plays an important role in the area of technical supervision and in the licensing process as it relates to broadcasters filling news, public affairs and public service obligations.

"Now people have raised question about whether the FCC should be in the EEO business and whether it should be in content regulation." The debate that will follow should prove "interesting," said Ferguson.

"I'd like to make sure, if the radio industry is relieved of cumbersome EEO paperwork that we can create private initiatives and send a clear message to all people especially minorities that there are excellent opportunities for them in the radio business and that we need them and want them in our industry," Ferguson said.

He is hoping to have an active Futures Committee this year and sponsor a

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Circle (117) On Reader Service Card

WTIM Back On Air after Fire Chaos

by Lynn Meadows

TAYLORVILLE, III. It has been a turbulent winter and spring, but summer is looking up for WTIM(AM). After enduring fire, delays, and flooding, the station returned to full power in June.

It all began Jan. 24, on the Tuesday before Superbowl Sunday. The station powered up as usual at 5:30 a.m., but was off the air within half an hour. As general manager Randy Miller drove out to the transmitter site, the first thing he noticed was that the tower lights were out.

The second nightmarish thing he noticed as he came closer was that smoke was coming from the backside of the building. The fire had started in the air conditioning and heating unit of the building and totally destroyed both the building and the transmitter.

Seventy-six hours later, the talk station was back on the air using a leased, non-directional setup and sending out 250 watts—only a quarter of its licensed power.

Although the station ended up buying the transmitter, it had to lay low waiting for replacement equipment to be delivered before it returned to full power. The troubles did not end, however, even when the equipment finally arrived.

As Miller describes it, the road to the transmitter site stops 400 feet short of the transmitter building and the building itself sits on stilts in a swamp-like area. Although the distance from the road to the building appeared dry on the day they attempted to deliver the broadcast equipment, heavy rains had made the unpaved area soft.

On June 1, as station personnel watched, the bobcat carrying the 750 pound phaser sank gently into the soft ground and remained there buried to the top of its wheels. A four wheel drive caterpillar was called in to save the day and met a similar fate.

Another three-week delay ensued as rock and gravel were brought in to connect the road to the building. When the day arrived for the next delivery attempt, the new road lay partly buried under water thanks to more rain. A thousand dollars worth of gravel was brought in and the equipment made it to the building on June 22.

After two days of wiring and testing, the 1000 W station was brought back up to full power five months to the day that it first went off the air.

News Director Dan Deicher does not believe the station lost any listeners during the chaos. He says that during the 76 hours that the station was dark, they received more than 370 phone calls from listeners wondering what was happening. ☺

Plan for AES Show

by Alan Peterson

NEW YORK Audio in the Interactive World will set the tone at the Audio Engineering Society's 99th annual convention, scheduled for New York's Jacob K. Javits Convention Center Oct. 6-9.

Owing to the impact of interactive technology on the pro audio industry, the primary theme of the convention will be Audio in the Interactive World. A number of workshops and exhibitions will be of particular interest to radio broadcasters.

David Immer of Digifon will moderate a workshop on ISDN, the quickly growing technology delivering high quality audio over telephone lines. ISDN has widespread radio applications, especially in music and commercial delivery, remote broadcasts and high speed data transfer.

Improvements in infrared audio transmission have made infrared headsets popular in hotel and theater installations. The same technology is applicable to studio monitoring for multiple guest headsets, especially in talk radio formats. Scott Shumer of Sennheiser Electronics will chair a workshop on infrared audio transmission.

The World Wide Web is emerging as an international communications medium, and Scott James of SoundWave Technologies will head a session on specific applications of the Internet. This session will be of interest to radio stations looking to establish a presence on the Web.

The subjects of data compression techniques for audio transmission and Wavelets: mathematical principles applied to areas of signal processing are among the topics of papers that will be presented at this year's AES.

To participate in the 1995 AES Convention, call AES at 212-661-8528. ☺

Safe



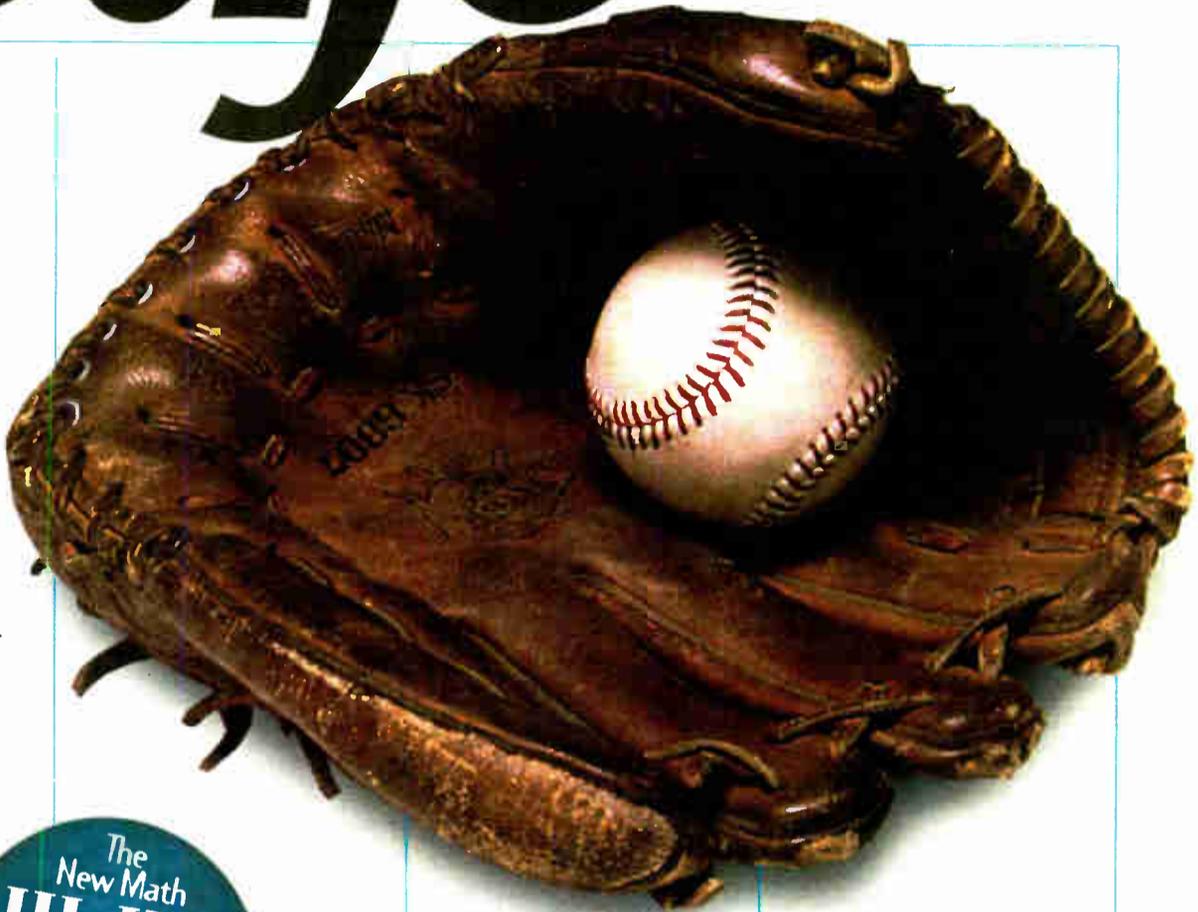
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WAVA(FM) Unveils New Facility

by Alan Peterson

WASHINGTON Referring to it as a "high watermark in the name of God," members of Salem Communications and the National Religious Broadcasters dedicated new studios and office facilities of Contemporary Christian WAVA-FM in Arlington, Va., on Monday, June 26.

WAVA was widely known for album rock and CHR programming, as well as originating the Don and Mike show (now broadcast nationally via Westwood One from WJFK(FM) Washington). Emmis Broadcasting, WAVA's former owners,

sold the station to Salem in 1992 for \$20 million.

Salem Communications realized the

Air and production studios are equipped with Auditronics consoles and the Scott Studios hard disk playback system.

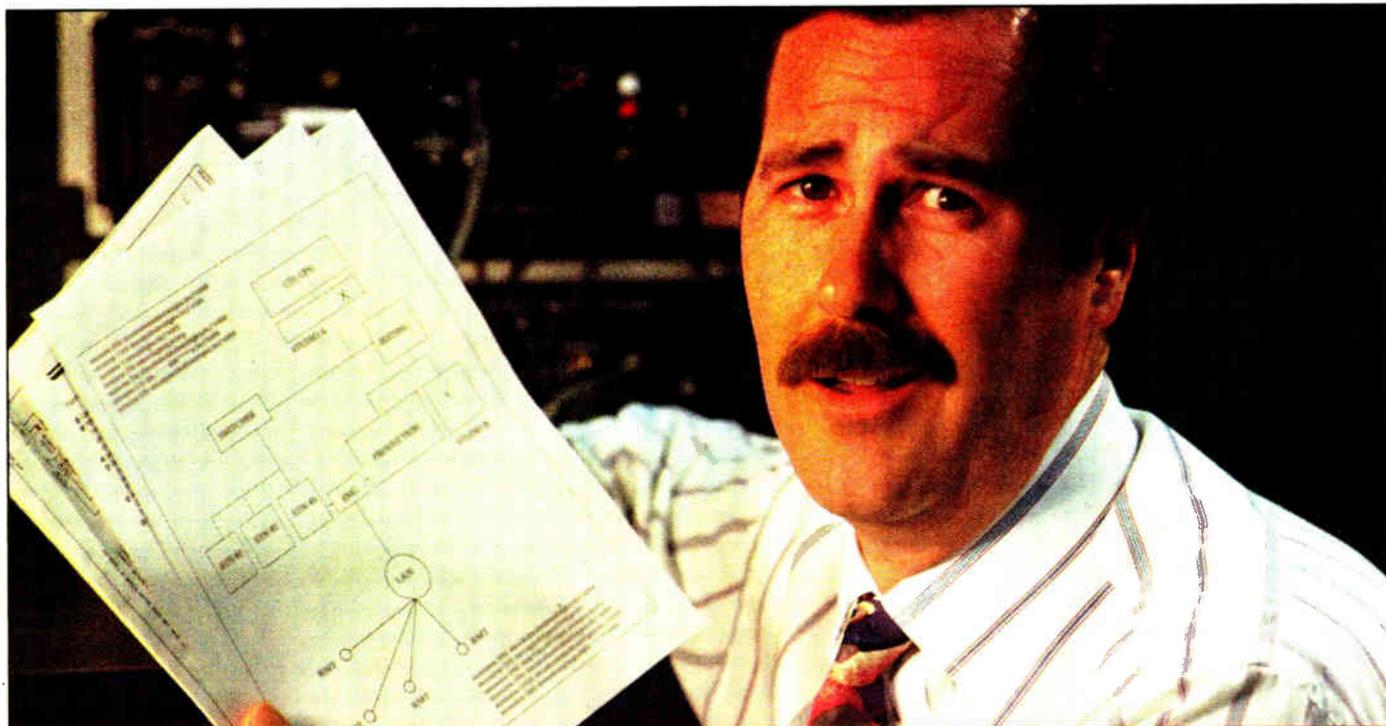
need for a state of the art facility, not only for prestige (the station overlooks the National Cathedral) but for

clean, quality transmission of its programming. The dream was

realized when the move was made from its former Lee Highway location to a newly constructed physical plant in the RCA Building on North Moore Street in

Arlington.

Air and production studios are equipped with Auditronics consoles and



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the Scott Studios hard disk playback system. Production assembly is done on EdDitor for Windows and transferred to the Scott system. The two remaining cart machines left in the entire station are used only to record Metro Traffic feeds.

Program material for the Salem Network originates from the WAVA studios and is transmitted via ISDN using a Telos Zephyr (ISO/MPEG Layer III) to the Dallas satellite uplink site.

Local talk programming includes Janet Parshall's America and The Right Side, hosted by Armstrong Williams. Both delivered remarks at the dedication.

JGM Construction of Maryland performed the physical plant buildout, while in-house Salem engineers designed and performed wiring and studio construction.

TM Library Option on DCS System

by Lynn Meadows

DALLAS Computer Concepts' DCS digital hard drive systems will be sold with TM Century's Gold Drive digital quality music libraries pre-loaded.

TM Century Inc. and Computer Concepts Corp. formed a strategic alliance that they believe will save radio stations precious startup money and download time.

The cost for the system will ultimately depend on the size of the hard drive purchased. The loaded library itself will cost around \$1500. John Schaab, international sales director for TM Century, said the pre-loaded library could save two to three weeks of time spent downloading music.

Although other companies have or are planning to have pre-loaded music disks, Schaab says what makes this system different is TM Century's NoNoise trademark source material.

Several music libraries, starting with Country, will be available by fall. "We are using highly researched libraries," Schaab said.

A full range of Gold Drive formats will be unveiled at the National Association of Broadcasters Radio Show in September.

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World Radio History

INTERNATIONAL UPDATE

World Investing in FM Paging Networks

by Bev Marks

BATTLE, England As society and business grow more mobile and more transnational, people are seeking new ways to remain in communication with each other.

Particularly in Europe, part of keeping in touch in this new paradigm is expanded use of paging networks, which provide advantages and benefits for both operators and subscribers.

Paging networks can cover entire nations and can link with other operators worldwide, offering competitive communications services to people who need to stay in touch no matter where they travel. Pocket pagers are small and easy to carry, making them very attractive to active, mobile people.

Numerous advantages

The advantages of national paging systems are numerous, but the construction and investment required for single frequency networks are relatively high. This has tended to restrict both the coverage

and expansion possibilities of such systems and, consequently, few networks currently offer nationwide services built around the single frequency concept.

An alternative approach is to make use of data transmitted on existing VHF/FM broadcast transmitters, which already can be networked to provide national coverage. This solution is technically feasible and has been in commercial use in Europe since the early 1980s.

Two different FM paging standards are in use. The first method, MBS paging, which comes from the Swedish phrase "Mobile Sökning" meaning "mobile search," was developed in Sweden as a paging-only service.

The Radio Data System (RDS) was developed after MBS and quickly became an international standard. RDS was specified by the European Broadcasting Union (EBU) in 1984 and was defined under the European Standard CENELEC EN 50067 in April 1992 and in the United States RBDS Standard of January 1993.

The biggest difference between the two

systems is that while MBS is intended solely for paging, RDS is capable of many features in addition to paging.

An MBS service can accommodate 250,000 subscribers per network of transmitters. RDS service, on the other hand, serves approximately 80,000 subscribers per network of transmitters, assuming that the RDS system is dedicated primarily to paging. For example, a three network configuration, which is common among public broadcasters in Europe, could support 240,000 subscribers.

Environmentally friendly

As FM paging systems utilize existing VHF/FM radio networks, they are more "environmentally friendly" than other systems. They do not require the building of a new national network, and thus save a non-renewable natural resource: the frequency spectrum.

Also high-capacity paging networks that use existing FM broadcast transmitters can be built with minimal investment of capital. The only additional equipment needed is a simple data connection from a paging service center to the transmitter for connection to appropriate encoders.

Input to an FM network can occur either at the broadcast studio center or at one or more FM transmitting stations.

Input to an FM network can occur either at the broadcast studio center or at one or more FM transmitting stations. At each transmitter site a subcarrier generator or encoder is used to modulate the data onto the subcarrier. The stereo multiplex will have the subcarrier added before finally modulating the main carrier. The configuration will be similar at each FM transmitting station.

At each transmitter site a subcarrier generator or encoder is used to modulate the data onto the subcarrier. The stereo multiplex will have the subcarrier added before finally modulating the main carrier. The configuration will be similar at each FM transmitting station.

Synchronizes

Each RDS transmission includes the country code and the group code of the pager, to which the pager synchronizes itself.

The same infrastructure used for FM paging can be used for other applications as well, such as remote control and value added services, such as global positioning (DGPS).

time, it is missing information 'between the samples,' and that analog, because it is continuous in time, has therefore, an 'infinite sampling rate.' This is tripe.

"An infinite sampling rate requires an infinite bandwidth. This leads to a problem. A system with an infinite bandwidth must exist for an infinite time, and even the analog audio industry is not quite that old."

The afternoon session, "Ergonomics and User Interface... How Do the Workstations Stack Up?" was created by past AES New York Section Chairman Bob Katz. "We thought it would be instructive to see how well each of the workstations could produce a 30-second radio spot," he said.

continued on page 14 ▶

continued on page 13 ▶

New York AES Sponsors DAW Demonstration

by Ty Ford

NEW YORK DigiExpo, held here June 3, at the Marriott Marquis by the New York section of the Audio Engineering Society (AES) was a one-day digital audio workstation conference and exposi-

amplitude, because that requires the system have no noise and infinite output capability. Said another way, infinite resolution means infinite dynamic range, and no system can have infinite dynamic range. In fact, the resolution of an analog system is limited by the noise in the system. More



photo by Mary Kent

Orban designer Dick Pierce talked about digital vs. analog audio.

tion. The multifaceted show consisted of two seminars, hands-on demos and demonstrations by dealers and manufacturers.

The first presentation, titled "Smoke and Mirrors in Analog and Digital Audio" by chief software designer for the Orban DSE-7000, Richard D. Pierce, explored some of the misconceptions of analog and digital audio. Perhaps the most important point concerned resolution, both in amplitude and time.

"The myth is that analog, because it is continuous, must somehow have infinite resolution," Pierce said.

"Analog cannot have infinite resolution in

noise simply means less resolution."

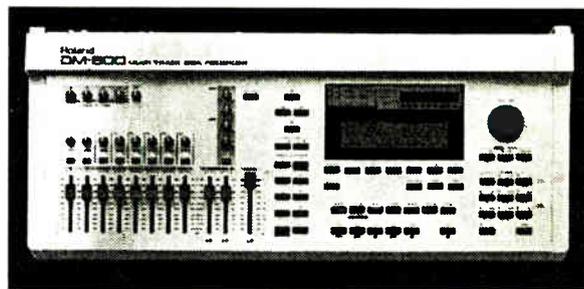
Pierce continued by noting that, "In an analog system, the resolution is limited by random noise. The presence of the noise hides any information below the level of the noise. What you end up listening to is the signal plus the unpredictable, uncertain value of the noise.

"In a digital system, the resolution is limited by quantization. The presence of the quantization hides any information below the level of the smallest bit. What you end up listening to is the signal plus the uncertainty due to quantization."

"In a similar way, a pervasive myth suggests that because digital is sampled in

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FM Paging Networks Growing Rapidly

► continued from page 11

The biggest obstacle to the widespread introduction of FM paging is the importance of designing a small auto-scanning receiver that is acceptable to pager users and that fulfills the requirements of the CENELEC standard. RDS pagers must balance size with weight, sensitivity, displays, alerts and operating time.

The RDS system supports both numeric and alphanumeric paging options. Numeric pagers can receive from 10- to 18-digit messages and are equipped with enough memory to hold up to 10 messages. Alphanumeric pagers, on the other hand, can display messages of up to 80 characters and usually offer extensive message memory capacity as well.

For example the Nokia Finder FM 110 alphanumeric pager is quite portable, weighing only 148 grams, but it is also quite powerful, displaying up to 60 fully alphanumeric messages.

Widespread use

FM paging—both RDS and MBS—is in widespread use through out Europe and North America, and interest is growing rapidly as more pagers become readily available and affordable.

After introducing MBS in 1979, Sweden inaugurated an RDS service in 1987, which eventually supplanted the MBS service. MBS is currently used in

the United States by Cue Network, reaching more than 90 percent of the population.

Operator Hungaria operates a national MBS system in Hungary using the OIRT FM band (66 to 74 MHz). Nationwide MBS paging services also have been started in Poland in 1992 and in Latvia in 1994.

RDS radio paging is in place in many nations, making use of existing FM broadcast transmitter networks. The costs of an RDS paging network are comparable to those for other standalone networks, and RDS radio paging can be quickly set up, providing profits to the radio station and the paging service operator. Once a dynamic service such as RDS paging is in use, other RDS features and services can be implemented easily.

The French RDS paging service, provided by TDF and known as "Operator," demonstrates how profitable RDS paging can be for an FM network owner. It also underscores the advantages of offering a truly comprehensive national service to the customer from the onset, as opposed to the more limited possibilities of a fixed frequency network.

Cooperative ventures

Based upon its success with FM paging in France, TDF is taking its technology and business management skills to other nations in cooperative ventures with other operators.

Other nations where RDS paging is in use include: Slovenia, Croatia, Sweden, the Czech Republic, Slovakia, Mexico, Ireland, Bulgaria, Spain, China, Ukraine, Russia, Belarus, India and Germany.

In the United States, interest in RDS is increasing, and its use is sure to become more widespread over the next year thanks to an industry effort to promote RDS to broadcasters and customers. Interest is also growing rapidly in Latin America and in the Asia-Pacific region.

As a science, RDS paging is maturing, and recent improvements in the international and multiple operator standards can be expected to satisfy both operator

and consumer needs for many years to come.

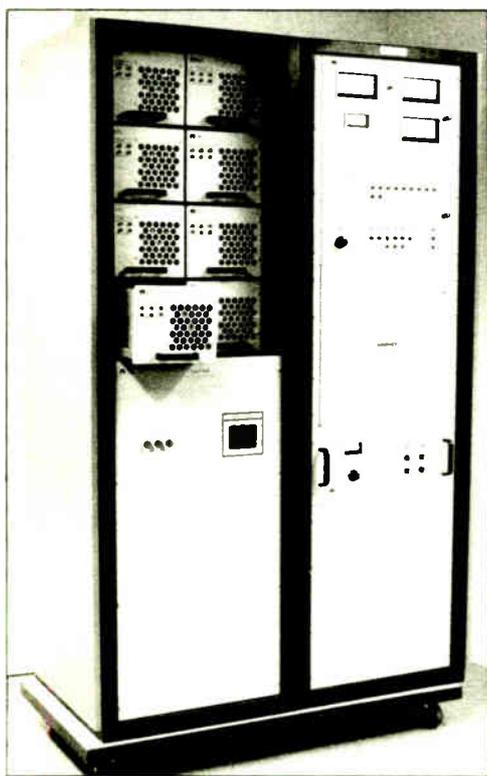
Broadcasters, too, can expect to gain from FM paging because implementing such a service requires minimal investment and effort. They will also gain from the revenue that such facilities can provide them.

FM Paging appears to be "the" solution for cost-effective, but profitable, wide-area paging applications.

□□□

Bev Marks is a broadcast engineer with more than 10 years experience in RDS systems developments. He is a free-lance advisor on RDS systems and co-editor of the RDS Forum Newsletter. Contact him in the United Kingdom at telephone: 44-1424-775-606; or via e-mail at 100042.2374@compuserve.com.

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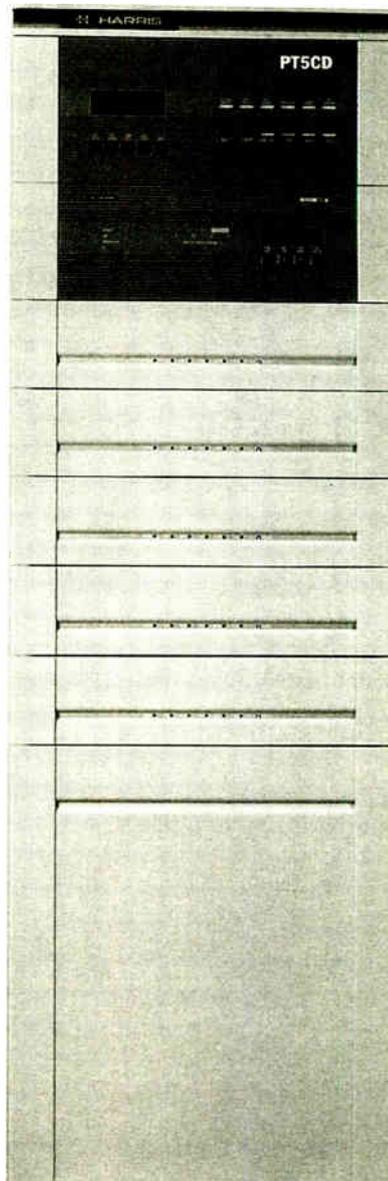
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KEX Succeeds with Floral Parade

by Bob Rusk

PORTLAND, Ore. When KEX(AM) operations manager Duane Link suggested that the station broadcast the Portland Grand Floral Parade, he got a few strange looks.

A parade on the radio? Why would anyone listen to the radio when they can see it in living color on TV? The doubters are quiet now, because KEX's airing of the parade was such a rousing success that

Midday personality Mike Phillips and afternoon news anchor Heidi Tauber provided coverage from the outside reviewing stand, while the morning anchors did play-by-play of the parade from inside Memorial Coliseum, where the parade started.

"Eleven-thousand seats are sold inside the coliseum for people that want a reserved seat to watch the parade at the very beginning," Link explains. "Jim Howe and Pat Boyle described the floats

was on the spot letting listeners know why there was a delay in the parade, including listeners along the parade route who had radios and were wondering why they weren't seeing anything. Link says the KEX crew was not at a loss for words during the 12-minute delay.

"Believe me, it wasn't a problem," he says. "We had more information than we knew what to do with. Because it was our first time broadcasting a parade, our anchors were very excited. They had so many stories to tell."

The parade is the culmination of the Portland Rose Festival, an annual celebration that began in 1907, and has been called "one of the top 10 festivals in the world." Carol Fenstermacher, community relations director of the Rose Festival Association, has high praise for KEX, the first commercial radio station to broadcast the parade since the inception of television.

"Everyone at the association was ecstatic about the coverage KEX provided," she says. "So many people think of a parade as just being a visual event; they don't think about listening to it on radio. KEX did a remarkable job of describing it and capturing the essence of the parade."

"One of the floats, the sweepstakes winner, was a tiger leaping through a ring of fire," she continues. "KEX described the float in such wonderful detail. They talked about how real the tiger actually

waving at people was a fun thing."

In order to insure a good viewing spot, some spectators showed up the day before the parade and camped out overnight on the sidewalk. Two of KEX's reporters checked in with some of the campers and found one family that brought their entire living room.

"That was very funny!" Link says. "They had a couch, a lamp, and a coffee table. They put a picture up on a fence behind them. They were sitting on the couch just as if they were home watching TV." KEX initially approached the Rose Festival Association last year, then held monthly meetings to plan the broadcast. All of the final details were put together in the month prior to the parade.

Adds Link, "Radio has the ability to bring the parade to people everywhere—people in their cars, people at home who can't or don't want to come out to the parade, people who are visually impaired, or who are working." ☺



A View of the Grand Floral Parade, As Seen from the KEX Reviewing Stand

the station plans to make the broadcast an annual event.

KEX, a clear channel, 50 kW station, had no fewer than seven staffers covering the June 10 parade—including its midday personality, morning news anchors, and traffic reporter.

"We have a very entertaining, informative traffic reporter, Commander Dennis Nordin," says Link. "He provided reports and commentary from his plane. He was tracking the parade and added his own colorful description of the parade and the floats."



The KEX Broadcast Crew at the Grand Floral Parade Reviewing Stand

to the people inside the coliseum. That was not over the air; they were PA announcers for people in the coliseum. But we brought them up live on the air twice, to give listeners a sense of what it was like inside the coliseum."

KEX also had two reporters out in the field covering the parade from the spectators' perspective, while also keeping an eye on the flow of the parade. Broadcasting a live event like the Grand Floral Parade, which attracts 500,000 people along the parade route and is one of the biggest parades in the country, invites all sorts of unpredictable possibilities. But radio loves a challenge—and that is what KEX got even before the parade started.

"The very first float couldn't get its engine going," says Link. "So Neal Pendland, our assignment editor, was reporting for us with a wireless. He was able to get over to the parade director and find out what was happening."

Several people got behind the float, gave it a push, and jump-started it. KEX

looked and how the ringmaster called your attention to the center ring, with the fire lighting up. You could close your eyes and see it."

KEX, which has a rich history of inventive promotions, also involved listeners with the broadcast.

"We did little secret contests," Link says. "If we caught anyone (along the parade route) listening to KEX, we'd give them KEX merchandise or cash. We'd go up and hand them certificates if we caught them listening."

"We also passed out 5,000 rating cards that had either the number 9 or 10 on them, so people could rate the floats and bands as they went by. The people who lined the parade route just loved that," continues Link.

"Nine was for great, 10 was for extraordinary. For this type of parade, there's nothing below a 9. People put so much time and money into it. The 9 and 10 were also significant because it was a bridge to the positive. Especially for the kids and the families, holding up the cards and

DAW Demos By AES

► continued from page 11

For the test, a DAT of voice tracks of different takes, some at different levels, and a 60-second music bed were sent to each of the nine participants; Orban, Digidesign, Digital Expressions, Fairlight, RCS, Roland, SaDiE, Sonic Solutions and Soundscape. Each was asked to continuously videotape the process of assembling and mixing a 30-second spot and time it.

The clock was started after the audio was loaded into each system. This was an attempt to show the basic features, how each workstation approaches those tasks and, in a microcosm, what could be applied to a larger multitrack production.

When asked about the results, particularly the elapsed time of each participant, Katz said, "The last thing I'd want to do is call this a shootout. I'd prefer to call it a demonstration of ergonomics. The abilities of the operators and systems varied all over the lot."

"Jay Rose's Orban DSE-700 presentation was an exception. Finishing (first) in just over one-and-a-half minutes, he moved so fast you could not really see how easy or hard it was to operate the system. Then too, the Orban DSE-7000 is geared to produce that kind of spot."

According to Katz, even the response sheets filled out by those who viewed the tapes were so broad that reaching conclusions was difficult. "We realized that you cannot put a single number value on those things," said Katz. "When you start simplifying statistics to that level, you can get very misleading answers."

In addition to the two seminars, those registered saw 30-minute presentations by RCS, Sonic Solutions, Avid/Digidesign, AMS/Neve, Orban and Roland and were invited to participate in hands-on demonstrations of the dozen manufacturers' systems on the exhibit floor. ☺

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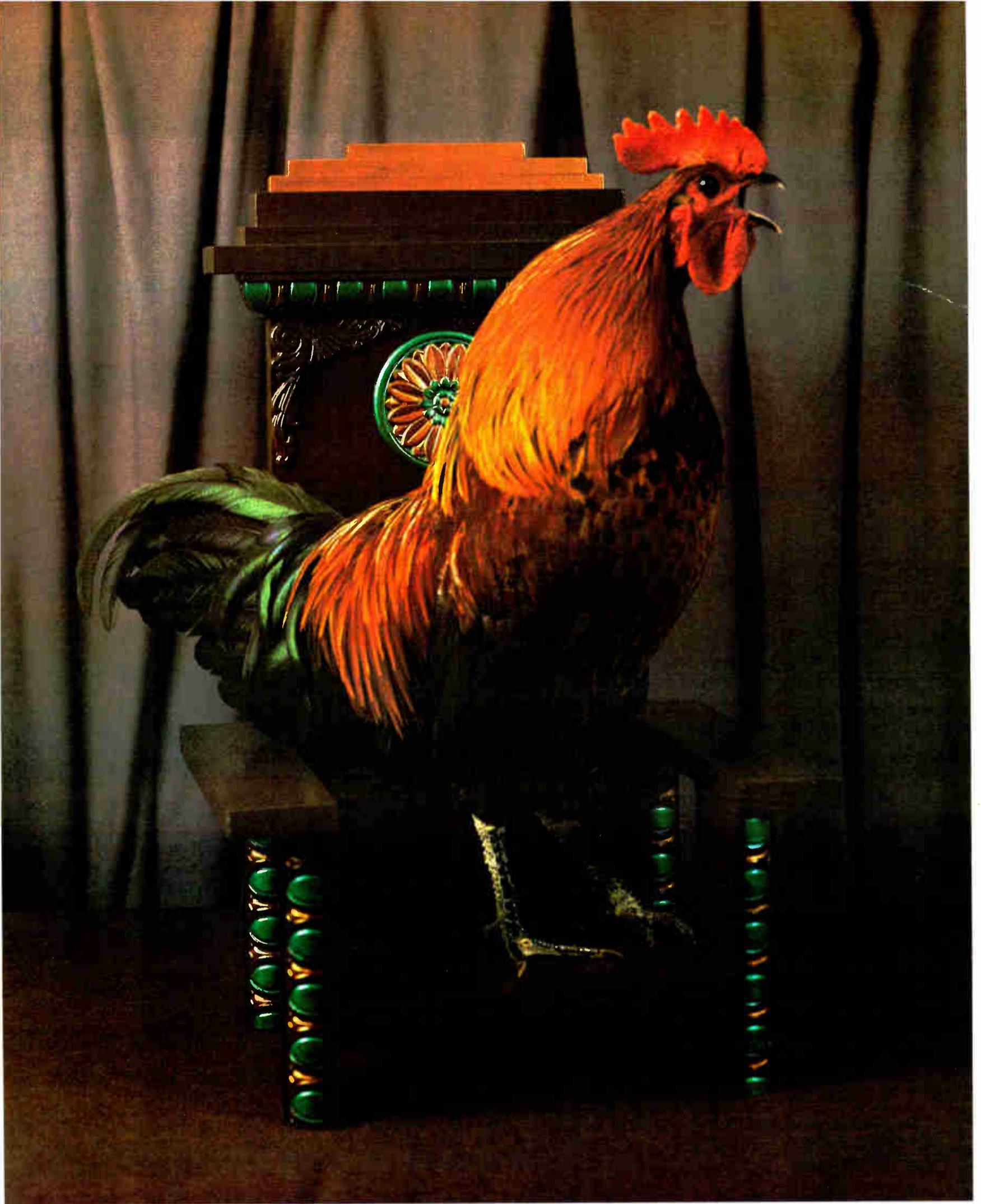


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Roots of Radio:
Carlton Morse's
Labor of Love
See page 21

Surfing with Swine on the Web

by Alan Haber

ALEXANDRIA, Va. I was thinking about getting from here to there as the screen saver on my notebook computer kicked in (I was also thinking about Chubby Hubby, a new flavor from Ben & Jerry's ice cream, but never mind that).

I was on Amtrak's Times Square train, which was winding its way through Maryland, Delaware and New Jersey toward New York City. All of this to and fro prompted me to think about how people get from one place to another, and not just in the physical sense.

Cyber drives

I was making my way up to the Big Apple by train, but I could just as well have been flying or driving (but, my, that long drive up the New Jersey Turnpike!) Thankfully, in cyberspace, there are no long drives, or plane or train rides (just long waits to download complex graphics from Web sites).

"Pure Pork Programming?"

KPIG's Web site gets somewhere in the neighborhood of 28,000 hits a week (!), according to site and operations manager, morning DJ, and Cyber Swine Bill Goldsmith (thank heaven for TI lines). The site proudly proclaims that the station shoots out "2.850 watts from a little knoll (bare, not grassy) two miles directly east of the Moss Landing power plant in scenic Prunetucky-by-the-Slough."

A funny, colorful graphic of a wiseguy pig, suspended in space, wearing a beanie with a whirligig on his head greets you.

From the home page, you can link to the various pages on the site, all irreverently named. Like: Pork Futures (what is in store for KPIG on the Web), Artist Links, and Pig People, which links to a page slugged Pure Pork Personnel that serves up pictures of KPIG's air staff, along with, yes, their irreverent bios.

This is a Web site that would make

KFDI Country Store outlines the wealth of station merchandise available—shirts, mugs and the like; an address for orders is included.

Spike Santee, general sales manager at KFDI, told me that graphics—from album covers to pictures of the "ranch hands"—are on the way for the currently text-only pages on the site. Keep an eye out.

Come on in

I have talked about some of the great radio resources on the Net, from the comprehensive lists of station links to the radio newsgroups. Now, there is a new Web site that bills itself as "the essential resource for radio station personalities, producers and news directors." It is called RadioSpace, and it looks like it might

well develop into a place you will want to come back to again and again.

Managed by North American Network, a radio broadcasting agency based in Bethesda, Md., RadioSpace makes a lot of sense, especially with so much radio information being scattered all over the Net. All sorts of information is available on the site, from ready-for-air audio (both news and features) to tips on upcoming interview opportunities with national celebrities, and corporate and organization spokespersons.

There is also a list of links to around 200 radio stations across the country; links are also provided to a variety of radio resources such as the National Association of Broadcasters and National Public Radio.

RadioSpace looks promising, and is well worth a visit at <http://www.radio-space.com/welcome.html>.

How many radio stations are on the

continued on page 21 ►

PROMO POWER

Outrun Radio's Best With Race Events

WASHINGTON When the Quick 'n' Speedy Race Management Company said it would make an additional \$15,000 if I would just include Nissan in the radio mentions, I realized that my station had been selling itself short.

We had been promoting this particular 10K race to help a non-profit raise funds and to expose ourselves to a lot of runners in our target demo. Sure, we had the ability to bring in a couple of clients to supply beverage product, but that was all my predecessor had negotiated. This had to change.

Profit lurking

When you stop to consider it, you will realize that there are a lot of profitable sports marketing companies out there. They have learned something that many radio stations still have not discerned—that many product advertisers, big and small, like to attach their name to athletic endeavors. Whether deserved or not, sports have an unbeatably clean cut, upwardly mobile image.

Once you have this knowledge, you are one step ahead of your local sports marketer. Why? Because you have the medium that has the speed needed to do the most important thing—bring in the participants.

There are many sports activities in which you can involve your station. For reasons of space and simplification, I will focus on how you can make money and influence the runners in your market. If you are either an 18-34 or a 25-49 male-targeted station and if nobody else in your market owns the running position, you belong in the race promotion business!

Step One: Find out who is the best and most active race management company in your market. Race information is generally available in weekend activity sections of newspapers. If that fails you, hit a few running stores and collect brochures for upcoming races.

After you have a name, try checking around with any runners you may know about this company's reputation. Any runner who participates a lot will have opinions about ease of registration, cost of race, results, goody bags and even award ceremonies.

Introduce yourself

Step Two: Phone the company and introduce your radio station. Explain that you are interested in beginning a promotional partnership with a sports management company such as theirs that does a lot of races. Schedule a meeting.

Step Three: At the meeting, listen closely to how they feel you might be able to help them. Typically, a race company will be searching for additional publicity to bring in more runners (they get a fee from each entrant); any help with sponsorship

continued on page 19 ►



Cyber Swine welcomes surfers to KPIG site.

Getting from here to there, in fact, is pretty easy in cyberspace. Merely key in an address, hit return and you are there. It is that easy for your listeners to connect to your station's Web site and find out what is going on with your station. It is that easy for your station to reap the benefits of being on line.

Everything swine

Meanwhile, there is a station in Freedom, Calif., serving the Santa Cruz/Monterey area, that is reaping the benefits of being in a pig sty. Well, not really. KPIG, 107-oink-5 (I am not making this up), has a wholly irreverent Web site at <http://www.kpig.com/>, and, when I say irreverent, I mean irreverent.

What would you expect from a station that, according to its Web site—uh, I mean site—carries "a format-defying blend of adult rock, acoustic music, blues, country, Hawaiian, Cajun, bluegrass and folk" and—get ready for this—calls its product

Porky proud. KPIG has taken care of business and done the dirty deed—here is a radio station resource that is informative, and, perhaps most importantly, fun to use often. Five sloppy oinks, then, for my Neat Site of the Month.

Up and comer

Keep an eye out for KFDI-AM-FM's Web site at <http://www.elysian.net/kfdi/kfdi.htm>. The country duo, beaming out of Wichita, Kan., since 1964, presents a very attractive home page with a colorful logo—cowboy boots topped by a western hat—backed by a wallpaper background consisting of the station's call letters.

The site is informative. There are program schedules on offer, and a page called Meet the Ranch Hands gives site visitors the chance to find out about KFDI's air staff. The KFDI Corral of Country Hits presents the hot country songs the station is playing. And the

Building Station's Database with Appropriate Tool

by Phil Wells

SAN DIEGO Back in the 1970s, at a station in Milwaukee, Operations Manager Bill Conway kept track of about 4,000 listeners that entered contests with a database of 3x5 index cards.

Every two weeks, he and his staff would hand address letters to these listeners and soon after starting his newsletter, station TSL increased. About three years after Conway left, the station discontinued its mass mailings; TSL dropped and the station changed formats.

Nowadays, stations can track listeners like Conway did in Milwaukee using a

fairly inexpensive microcomputer. The computer makes it much easier to track much larger numbers of listeners.

Building a database can be done simply by tracking contest winners, or a station can enlist the aid of a telemarketing company. Telemarketers can make a large number of random phone calls in a given ADI, offering to mail a contest entry form to listeners.

The firm then provides the station with a generic database of all the contacted people who agreed to the offer. Many respondents will provide a fax number in addition to their address.

The base data can be manipulated and

maintained with a database program, such as FoxPro, dBase or Filemaker Pro. Such programs let you store basic demographic information about listeners, including gender, age, how you got their name, favorite announcers and when they listen.

At the erstwhile Sunny 103.7 KJQY(FM) (now KMKX(FM)), each week a list of listener birthdays was generated from the database. During the week, the air staff would call listeners, wishing them "Happy Birthday." It was a great way to maintain personal contact with core listeners.

A database program can also be used to print mailing labels for mass mailings or

for generating listener profiles. Demographic information can be used to break down listeners by age, ZIP code, or favorite songs.

Rather than designing your own database, premade programs for contact management are available. One program designed specifically for radio stations is NameTrack by DataSys (817-498-4902). Written in FoxPro, NameTrack imports almost any kind of database.

One way to maintain quasi-personal contact with core listeners is through a faxed weekly newsletter. Depending on how you solicit listeners for your database, you should be able to include a fair number of usable fax numbers. (We have fax numbers for about 20 percent of our total database.)

Each week's newsletter could include a station events calendar, lists of recent contest winners, the week's Top 10 songs, concert information, jokes and a list of interactive services, such as ski, beach or request lines. Perhaps an occasional crossword puzzle containing station phrases and artist names could be included—just make sure it faxes well when you lay it out.

A friendly, non-commercial (i.e., informative, not junk mail) missive containing your calls and logo, delivered fresh each week is a great way to maintain top-of-mind awareness for your station with potential diary keepers.

Mass faxings are easily handled by a fax

One way to maintain quasi-personal contact with core listeners is through a faxed weekly newsletter.

bureau. If your staff is too small, or if you simply want to leave all the details to professionals, a fax bureau like Global Fax Network (619-491-2900) in San Diego can handle the entire process.

These companies can take a group of stories and produce a newsletter for faxing, or you can send them a completed newsletter and a current call list, and they will take care of sending the newsletter.

Rainbow Software (604-732-8027) of Vancouver, British Columbia, offers a fairly low-cost system for mass faxing called Broadfax. This DOS-based program runs on 286 or better computers and requires relatively little memory. Broadfax works with Intel 200- and 400-series Satisfaxion fax/modem cards.

Like more expensive PC cards designed for heavy-duty faxing, these boards include an on-board processor (80186) and RAM, letting the card work independent of the host PC. The card also lets a 286 handle more than one fax job at a time. Intel stopped manufacturing these cards in November 1994, but they are still available from PureData Ltd. (800-661-8210).

Broadfax can schedule many different fax jobs. Each job can have an individual "phone book" of names and fax numbers, as well as, individual schedule and error logs. The program is suitable for sending one fax to thousands of people, or a number of different faxes to a select group of people.

Other high-end fax boards are available from companies like Brooktrout and

continued on next page ▶

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Is Easy

Gammalink. These products have more than one fax port per card and are generally faster than the Satisfaxion cards, but they are also more expensive. Some companies, such as Just The Fax (702-644-3299) in Nevada, offer specialized fax broadcasting and fax-on-demand systems.

Just The Fax offers BroadcastFAXR, a multiline 486-based turnkey fax system. The company may even be willing to trade part of the system cost for airtime. Just The Fax also acts as a wide-area mass fax bureau.

Jim Reese at KODA(FM) in Houston uses Softney FaxWorks software for his listener newsletter. FaxWorks is a Windows-based program that requires a 386 or better. He runs it with four Hayes JT Fax two-port fax cards, and the system doubles as a fax server when not mass faxing. He reports trouble-free operation.

At KYXY(FM), we selected an Intel/Broadfax system primarily for fiscal reasons. Initially, I used two surplus 286s from the office with 1MB or less of RAM each and ran three Satisfaxion 200 cards in each machine.

Ten cards

When a 386DX/16 machine became available, I swapped out the slower 286 and installed four cards in the 386. Broadfax can handle up to 10 cards in one machine and since they share one IRQ, conflicts are not a problem; however, with slower machines, four boards seems to be the optimum setup.

Our start-up costs ran less than \$3,000. Eight cards cost \$250 each and two copies of the Broadfax program ran \$400. We also had to install eight lines (\$560) and a \$25 switch box.

The Satisfaxion 200 cards are virtually the same as the 400 series: The 200s have a 2400 baud modem instead of the 9600 baud modem in the 400, and the 400 cards cost considerably more. Since the fax data rates are the same, the 200s are a better value.

Initially, the system was quite buggy, but last year Instant Information in Oregon released improved drivers for the Satisfaxion cards. Broadfax now ships with these drivers and a utility to monitor the fax cards while running. We now send nearly 9,000 faxes every weekend with no problems.

A typical Friday goes like this:

The newsletter, "KyXy Kwips," is proof-read and then printed to a file. At the same time, final database maintenance is performed, such as removing the fax numbers that did not work last week and those that people have requested we remove. (In these cases, the fax number is deleted, but not the complete records. The addresses are probably still good for mailings.)

Next, a batch file performs a series of tasks. Using a batch file helps reduce operator error and leaves humans free to perform other tasks.

The batch file starts a FoxPro application that extracts valid fax numbers and names from NameTrak to a temporary .DBF file. It then converts the .DBF file to two ASCII phone books, one for each fax machine.

A Satisfaxion program that converts the "printer file" of the newsletter to a .DCX file for faxing is then run.

The batch file then sends a test fax to an in-office fax machine to ensure that

there were no errors in conversion and that the right file is being sent. The operator then tells Broadfax that the test fax is OK. It then waits until after 5 p.m., when telephone rates go down, to begin faxing.

A copy of the converted newsletter is then sent to the other fax computer via a local area network. The other machine is then tested.

Both computers wait until Broadfax sends faxes to all the numbers on its list, retrying busy numbers twice. Another FoxPro application then exports the Broadfax error list (the calls that did not connect), turning it into a new phone book.

Second set

The batch file then restarts Broadfax, using the new phone list for three more retries. I have found that we hit many more operating fax machines if the second set of retries is delayed until the start of office hours on Monday morning.

After the retries, a list of all the numbers that did not connect to a fax machine is printed out. On Monday morning, we take the list and dial each number to try and get updated information for the database. Bad numbers are removed; changed numbers are noted.

The latest release of Broadfax makes some of these batch file steps unnecessary, but I have yet to install it. My system works so well right now that I am hesitant to make any changes!

Somewhere on the newsletter should be a notice, telling people where to call if the fax is not desired. You will receive calls all week, so a dedicated answering machine or voice mail box or a form for the receptionist to fill out is a good idea. Then be sure these fax numbers are removed from the database promptly.

You will also receive calls from listeners who have heard about the newsletter and want their own copy. Be sure to get as much information as possible from them to make another useful entry for your listener database.

□□□

Phil Wells is engineering manager for KMKX(FM)-KYXY(FM) in San Diego. Contact him at 619-467-4178.

Align Station with Races

► continued from page 17

dollars; free food/beverage to give to runners; masters of ceremonies for awards; PA equipment; and volunteers to help with day of race setup.

Step Four: Help the race company realize that its lucky day has arrived! Your radio station can help with nearly everything. Publicity is what you do for a living. You can run live and recorded announcements. You can help tie in a non-profit group that can plug the race through its mailing list and promote the race on your public service shows during the weekend.

Propose splitting sponsorship fees if it allows you control over signage, art in the brochure, logos on the t-shirt, and exclusive food and beverage rights. The master of ceremonies will be your best appearance DJ. You have public address equipment because you do a lot of remotes. Finally, you will be able to help with the volunteers by soliciting help on-air. This is a marriage made to order!

Step Five: Sign a letter of agreement that lays out the responsibilities of each party. Spell out who is taking care of what and how the expenses and profits are divided.

Step Six: Designate sponsorship levels. The title sponsor may get its name next to yours as part of the race. "The WXXX Nissan 10K to benefit underprivileged disc jockeys." It may also get its name on everything from the brochure to the t-shirt. The medium level sponsor may be the store that you use to distribute the brochure. A tertiary sponsor might only get to serve a product at the race, with no on-air mentions.

Step Seven: Here are a few final tips: Hold regular race meetings with the race management company. Make sure you have either an ambulance or immediate access to medical help if it is needed.

The race brochure should contain a "hold harmless" release statement signed by all runners. Ask runners for their name, address, phone number, fax number and on-line number (if they have one) for your database. You will want to be able to reach them for subsequent races and other station activities.

Rain or shine

Hold the race rain or shine.

Because runners frequently have weekly obligations and train for specific races, it is better that the show go on. Do not allow non-participants to partake of the on-site food and beverages. Do permit the volunteers to have what they want before the runners begin coming in. Invite local television people and politicians to fire the starting gun and to hand out awards at the end.

If this race is held around a holiday, you may want to have a costume competition for children of runners (or runners themselves). If you are having trouble getting the best runners, consider adding a cash prize or a nice trip. An incentive can work wonders in attracting the fastest in your market.

Step Eight: See if you can convince at least one of your disc jockeys or managers to run. It adds another relatable dimension to the promotion if someone from the station really takes part. If all else fails, maybe your general manager can walk the course. That is one way to make sure the chief attends this gathering of your best looking listeners!

□□□

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

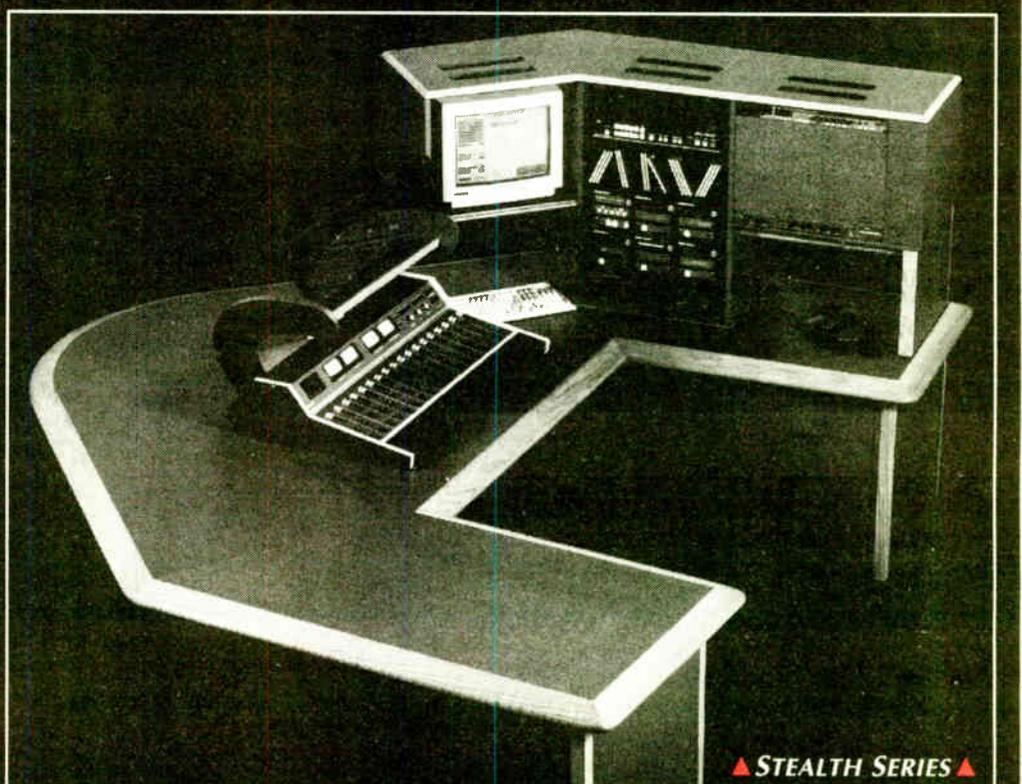
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FAIR LAWN, N.J. Vintage Productions expanded the "Seems Like Old Times" nostalgic music format to include more interviews with some of the greatest pop singers and performers from America's Golden Era of pop music.

Hosted and produced by Ed Z. Pell, the program features pop standards, Big Band and novelty music from the 1930s, 1940s and 1950s, as well as: "Feature Year", bringing music and tidbits from radio's Golden Era; "Spotlight Feature," including Big Band hits, love songs and novelty songs; "An American Treasure," a weekly vignette that highlights the career of a star performer, composer or songwriter, and trivia contests, Mystery Artist games and Whodunit skits complete with prizes.

For more information, contact Ed Pell at Vintage Productions at 800-851-2434; or circle **Reader Service 95**.

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Contact Chris Cornelison at the Broadcast T.E.A.M. at 800-353-1420; or circle **Reader Service 164**.

New Outsource Service From Radio Potato

DALLAS Thanks to the technology of the Integrated Services Digital Network (ISDN) telephone line and other high speed digital transmission options, Radio Potato can now provide radio stations with state-of-the-art production on an outsource basis.

Services include production of on-air imaging, commercials, promos and contests, as well as creative writing for ads and promos. The Potatoheads can also provide out-of-market voice talent, plus many of the Radio Potato products to subscribing stations.

Benefits to stations include: top notch creative production, major savings in operation expenses, near instantaneous delivery of product and solutions for maximizing current staff positions.

Fees are based on a sliding scale and can be very cost effective in most medium to larger market stations.

Facilities who already own a Telos Zephyr or a computer based audio system can take immediate advantage of this exciting new program without having to invest in additional equipment.

For information contact Marshall Such

at Radio Potato at 817-481-4453; or circle **Reader Service 101**.

Enhance Your Listener's Quality Time at Home

VIENNA, Va. "Family Time" is a new nationally syndicated radio show from the Ringling Bros. and Barnum & Bailey Combined Shows Inc. It focuses on ways to enhance the time families spend together.

Now airing in Norfolk, Va., Charleston, W.Va., Providence, R.I., and Worcester, Mass., "Family Time" is scheduled to be broadcast in more than 90 markets.

Hosted by Ringling Family Consultant Jody Clay, each five-minute program spotlights a different family topic. The 13-week series addresses the concerns and interests of parents whose time with their children is often limited due to hectic work schedules and multiple extracurricular commitments.

For information, contact Jody Clay at Ringling Bros. and Barnum & Bailey at 703-448-4000; or circle **Reader Service 77**.

Fast-growing Hobby Talked About on the Radio

ORLANDO, Fla. "Homebrew America" with Stan Richards and Bob Miller has been entertaining some of the more than 5 million home brewers in the United States that are involved in this quickly growing hobby. The team of Richards and Miller has been entertaining and educating home brewers in the Southeast for the past year with the combined wit and knowledge of home brewing.

Stan and Bob host "Homebrew America" with enthusiasm, knowledge and a bit of humor. The object of the show is to help hobby brewers make and drink better beer, wine, mead and even soft drinks made in their own home. The hosts interview many interesting brewing experts and get them to spill their secrets to the listeners. Stan and Bob make it easy to brew and constantly reveal secrets and formulas that anyone with a sink and a stove can use. "Homebrew America" is informative, novel and just plain fun to listen to, even if you do not brew beer.

"Homebrew America" is a BrewUnion Production and is transmitted on Satcom C5-T15-16-1 and is available on tape.

For information call Richards or Miller at 407-381-6158; or circle **Reader Service 173**.

Larry King Specials On the Radio

LOS ANGELES Westwood One Entertainment presents a radio exclusive, "The Larry King Super Specials" featuring some of this century's most stunning superstars and most renown world leaders. The announcement came from Westwood One Chairman Norm Pattiz.

In addition to the esteemed status of the guests, "The Larry King Super Specials" will be listener interactive, via the Internet, phone calls and faxes. Scheduled to kick-off in July, the six 90-minute specials will continue through mid 1996.

For information contact Renee Casis at 212-641-2052; or circle **Reader Service 82**.

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ROOTS OF RADIO

Radio Writers Toiled in Anonymity

by Read G. Burgan

LAKE LINDEN, Mich. Carlton Morse... Ring any bells? "Creator of the Morse code?" Wrong.

"Inventor of the telegraph?" Wrong, and getting colder.

Ironically, Carlton Morse entertained millions of people on an almost daily basis on radio for more than 25 years, yet he probably could have appeared anywhere in public without fear of recognition.

Why? Because that is the curse of his profession. Mention Jack Benny, George Burns or Bob Hope, and you will see instant name recognition. Mention Hilliard Marks, Harry Conn, John Whedon or Carlton Morse, and you will be met with a blank stare. They were some of the hundreds of writers who turned out the scripts that made the stars of radio famous.

Surf with KPIG(FM)

► continued from page 17

Web? A couple hundred, by my estimate. There may be more, however; I would like to find out just how many.

If your station is on the Web, why not drop me an e-mail telling me so? Let me know your site address, what kind of information you have on it, how many hits you are getting, and don't forget to tell me a little about your station's vitals—you know...s frequency, call let-



ters, favorite foods. The works.

If nothing else, this will help us get a better handle on the number of stations on the Web. And who knows, we might do something else with this information. What, I could not tell you just now. But something. Something wonderful. So e-mail me today (my address is at the end of this column).

Aye, Captain

Well, Scotty is telling me the good ship Haberspace is running out of power for this voyage, so I bid you a fond adieu until next time. Reach me anytime at zoogang@ix.netcom.com. Long live the Federation.

Carlton Morse was probably the most prolific of all the radio writers. His two most famous series were "One Man's Family" and "I Love A Mystery." Morse was born in 1901 in Louisiana but grew up on a ranch in Oregon. He studied for two years at the University of California, but quit to take a job on the Sacramento Union. Writing was in his blood and he moved on to jobs at the San Francisco Chronicle and the Seattle Times.

Radio infancy

In 1929, the stock market crashed, ending the fortunes of many. But radio was in its infancy, and new careers were emerging, including that of Carlton Morse who discovered that this new medium needed all the writers it could get. Morse joined the West Coast staff of NBC in 1930. For a while he turned out a variety of scripts for comedy, dramatic and adventure series.

Morse intuitively sensed that radio listeners had the same appetites as readers of literature: women wanted romance; men wanted mystery and adventure. These two subjects would become the hallmark of Morse's writing to the end of his career.

Early in 1932, Morse approached NBC's West Coast production department with the pilot script for a new radio series, "One Man's Family." They were unanimous in turning him down. One executive called it "pure tripe!"

Undaunted enthusiasm

Undaunted, the 30-year-old Morse went over their heads and brought the script to NBC Vice President Don Gilman. Gilman was only mildly enthusiastic, but radio desperately needed programming. He agreed to a six-week trial period if Morse would write the script so that they could terminate the series succinctly after six weeks.

The rest is history. "One Man's Family" continued on network radio until May of 1959. The story was loosely based on John Galsworthy's "The Forsythe Saga." Following a book format, the story was written with each episode constituting a chapter of a book.

Each episode opened with the announcer saying something like this: "'One Man's Family' is dedicated to the mothers and fathers of the younger generation and to their bewildering offspring. Tonight we present Chapter Nine, Book Fifty-two titled..."

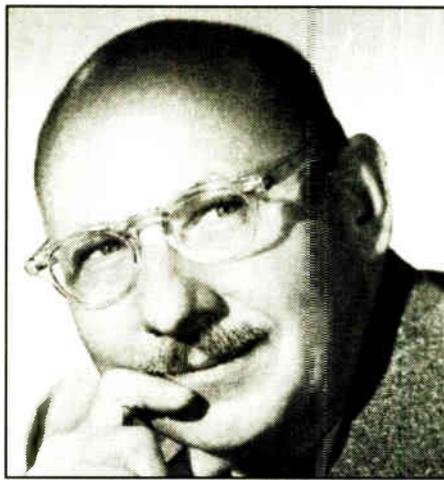
Paul Carson was organist for the series, and created his own theme titled, "Patricia." (Carson made his first radio appearance in 1922, was a staff organist for both NBC and ABC, had his own program, "The Bridge to Dreamland" and in the 1950s recorded dozens of organ albums for Hugh Edwards' Alma Record Company.)

While Morse created a radio dynasty, the program basically dealt with generational differences. This was something that every American family could relate to.

The program was about the Barbour clan who lived in the Sea Cliff district of San Francisco. Father Henry Barbour was the president of a bond house. He was an opinionated patriarchal figure

who often lectured his sons and daughters. He was as immovable as an oak tree. Mother Fanny Barbour supported her husband, loved her children and served as a mediator between them.

Their oldest son Paul was wounded in



Carlton Morse

World War I where he lost his bride and as a result of his experiences, loathed wars and remained single. Living in an apartment in the family home, he often provided the sympathetic ear to his younger siblings that their father could not provide. In the beginning there were four other children: Hazel, the oldest daughter, twins Clifford and Claudia, and

the youngest, Jack, who began the series as a 15-year-old.

"One Man's Family" was added to the coast-to-coast NBC network on May 17, 1933. It was carried as a 30-minute show on Wednesday evenings. Eventually it moved to Friday evenings, and in 1939 moved to Sunday evenings where it continued for another 10 years. In 1950 the program became a nightly 15-minute series. Finally in 1955 it was moved into a daily matinee time period where it remained until 1959.

Plodding and stodgy

By today's standards, the stories are plodding and stodgy. But it was Morse's ability to craft detailed family scenes that made the program so popular. Millions of people identified with the Barbours and followed all of the twists and turns of their lives as if they were their very own.

Occasionally the program pushed the envelope. In the mid 1930s NBC received a series of letters complaining that the program was too sexually explicit. What was their specific complaint? Did they talk about pregnancy? Birth control? Masturbation? The problem was not what they talked about, but where. Morse was crafting conversations that took place in the Barbour bedroom. One listener wrote, "... We began to hear 'in bed' confidences of husband and wife—so frightfully intimate, that one gasped, in anticipation of what might be next..."

Morse gave credit for the success of the show to its actors. Morse's productions

continued on page 26 ►

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MANAGER'S NOTEBOOK

Micro-management Can Backfire

by Sue Jones

BURKE, Va. Where does a manager draw the line between guiding the staff and micro-managing? There can be several layers and varying degrees of micro-management.

Everyone can recall a boss who simply would not allow employees to complete the simplest task without intervention, advice, and supervision. Mix in some attitudes such as, "I can do this task faster and better than you" or "I know that you will botch the job so I have to help you" and you create instant resentment.

Pre-conceived attitudes about the capabilities of men, women and ethnic groups

have thwarted and continues to block the development of capable and talented people. Some managers are unable to let someone else do the job for fear that it will be done in an unacceptable manner or it will not meet the standards.

Instant resentment

Besides the instant resentment that can be created, micro-management can lead to other problems. Capable people will find overly used micro-management insulting and demeaning to their talents and abilities. Micro-managing staff can demoralize a staff to the point where employees will perform only the minimal requirements of the position.

When a staff person is confronted with

an exception to the minimal routine requirements, he or she is often unable to think through a problem because he has only been allowed to do the most basic

Some managers are unable to let someone else do the job.

part of the job. Often times, the problem will not be corrected until the boss can evaluate the problem and find a solution.

This works if all staff members always have routine tasks, which is not realistic.

If staff members are told that their creative initiatives or ideas are not the way things have always been done or they are punished for attempting additional related tasks, they will soon function at the lowest acceptable level. Eventually, the employee(s) will leave in frustration or for opportunities to grow professionally somewhere else. You may be dealing with a high staff turnover rate that is costly in recruiting and learning curve dollars.

Another source of micro-management is the manager who is unskilled in setting the parameters for delegating work. The best managers know they cannot do all of the work. They give others an opportunity to do the assigned tasks and grow professionally.

Is micro-management always negative? Are there times when it can be effective and useful? Certainly there are times that close supervision would be appropriate. Delegating work becomes unthinkable if the subordinate staff member is improperly trained, inexperienced, or new to the position. Close oversight for new employees, trainees, or interns is vital to define the job requirements.

After an acceptable amount of time, all new hires must demonstrate they have the skills and training to complete the job's tasks. The new employee must establish a comfort level with the manager that the minimum skills have been mastered and he or she is ready for additional tasks or responsibility. Once this comfort level has been achieved, the manager (trainer) needs to limit the close oversight and allow the employee to move into the next level of minimal supervision.

So how does a manager alter micro-management traits? First, have a clear understanding of the micro-management style that needs improvement. Next, determine if the situation requires temporary additional management oversight such as a newly hired person.

All adults here

Treat all staff members like adults, that is, you believe they have been properly trained and are capable of performing the task to be done.

Give the employees an assignment such as new quarterly sales goals or a special holiday promotion.

Clearly define the objectives and special directives for this effort.

Define the parameters for the task to be completed. Give the employee(s) the budget or funds amount that will be allocated to the task. Perhaps you will have the department manager develop the bud-

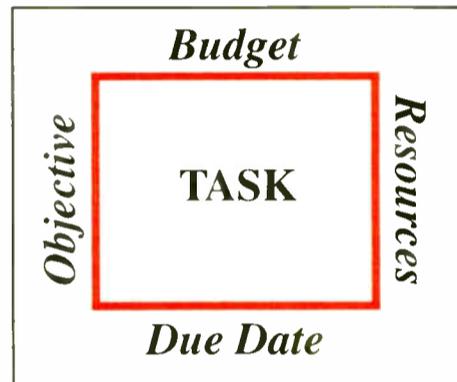
get and get your approval before proceeding.

Set a deliverable due date. In our examples this would be the last day of the quarter for the sales goals or the day the special promotion is planned.

Identify the available resources such as the number of staff members that will be needed for the task and their availability to perform the task. The staff person(s)

responsible for completing the work will have to schedule staff to do the work. In the case of a special holiday promotion that is on site, the DJ's time must be scheduled and the engi-

neers scheduled to be available for on-site preparation and breakdown. Other resources must be identified such as the equipment that would be needed to set up a remote broadcast site. The coordination of a sponsor and site must be done as well. A new sales promotion may require new marketing collateral materials. Enough time has to be planned to allow for development and printing.



After the parameters have been defined, allow the employee to use his or her talents and abilities to work within that defined framework to produce the desired results.

Schedule regular reviews of the work in progress on an agreed upon time. Depending on the size of the project, these meetings could be daily, weekly, monthly, or quarterly.

After the project is completed, conduct "lessons learned" sessions with the staff that was involved. This type of analysis right after the completion of a project will identify the things that were done well and those things that need to be improved. If they are identified, you will have a better chance to measure the improvement on a regular interval. This type of post project analysis will also be an excellent learning tool for all those involved in the effort. Hopefully those lessons will be retained for the next similar event.

If you have clearly defined the project objectives, guidelines, due date, budget, and needed resources your staff should be able to successfully perform the task without unnecessary intervention.

They should be aware that they are accountable for all of their activities. Exceptional performance or poor performance of the tasks should be reflected in the staff members's performance evaluation and influence any bonuses or merit increases in pay.

Remember, your job as manager is to coach. You and your staff will grow and will be richly rewarded if you are the coach and not a babysitter.

□□□

Sue Jones is a senior manager for Computer Data Systems Inc. in Rockville, Md. She can be reached at 703-323-0491.

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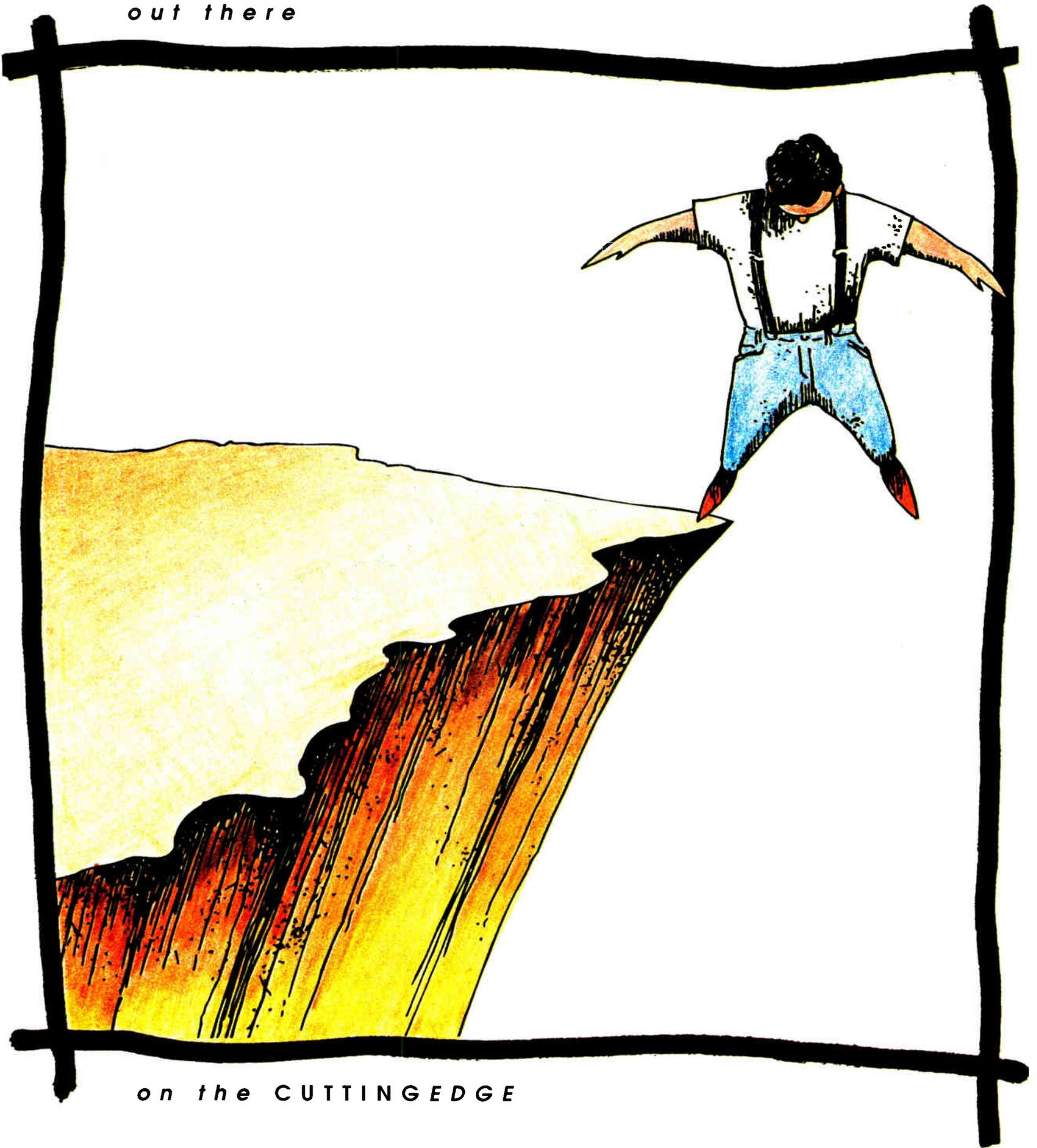
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Brothers Build KDAC(AM) from Kit

by Bob Rusk

FORT BRAGG, Calif. One of the wonderful things about the radio business is, no matter where you travel you are never far from a radio station that makes you feel at home.

Such was the case recently when I was driving through the majestic redwood forest of northern California and decided to take a side trip along Highway 20 to this peaceful little town on the Pacific Ocean.

Tucked away

Tucked away about a mile from the ocean is the white stucco, two-story



KDAC's Lobby Museum

building that houses KDAC(AM). Walking into the station is like taking a delightful journey back to the Golden Age of radio.

Antique equipment is on display in the lobby, including wire recorders, an

original 1947 Collins mixing board, and a Hallicrafters SX 38 Sky rider receiver.

A picture of the station's founders, the

The RCA kit included blueprints for constructing a radio station building and a list of equipment needed to operate the station.

Myrtle brothers, is prominently displayed on the wall. Around the corner, there is a blow-up of legendary radio star Jimmy Durante.

Chief Engineer Tom Hale came out to

greet me and then took me on a tour of the station, which has a fascinating history.

Hale explained that when the Myrtle brothers were granted a construction per-

mit in 1947 they contacted RCA, which sold a kit that included blueprints for constructing a radio station building and a list of equipment needed to operate the station.

KDAC staffers called this the Marconi kit, named for Guglielmo Marconi, inventor of the wireless telegraph.

According to Hale, the five Myrtle brothers knew nothing about radio, so the kit was the only way for them to get their station up and running.

The brothers, however, did not make the doorways large enough, causing a major problem.

"They didn't realize how large the transmitters were," said Hale, "and the building was constructed before the equipment was ordered. There was a special room in the basement that was made as a transmitter chamber. But the doorways were not large enough to get the transmitters into the basement. As a result, they ended up putting the transmitters up in the main studio."

The Myrtle brothers were in the brick
continued on page 35 ►

Writer's Labor of Love

► continued from page 21

were very much like a family. Actors from "One Man's Family" also appeared in his other major radio show, "I Love A Mystery." Michael Raffetto, who played Paul Barbour, played Jack Packard on "I Love A Mystery." Barton Yarborough who played Cliff Barbour played Reggie Yorke. Two of the actors remained with the show for its entire 27-year-run: J. Anthony Smythe, who played Father Barbour, and Page Gilman, who began the role of Jack Barbour when he was only 12 years old. (In real life Smythe was a bachelor.) Michael Raffetto remained with the cast to the end, but along the way switched from actor to assistant writer and director.

Art imitated life

Occasionally, art imitated life and life imitated art on the show. In the 1940s Page Gilman was a second lieutenant

stationed at Fort Sill, Okla. During this period, the scripts were written so that he could appear on the program when he was home on leave. To accommodate this circumstance, the character of Jack Barbour was also in the army during this period.

On May 29, 1945, the program merged fiction and reality in an episode titled,

Occasionally, art imitated life and life imitated art on the show.

"Lieutenant Jack Barbour Leaves for the Pacific." The story was about Jack Barbour's attempts to say personal good-bys to each member of his family while waiting for the army jeep that would take him away for active duty in the Pacific.

As the story began, the announcer informed listeners that Page Gilman who played the role of Jack would be shipping out for the Pacific that very week. The episode was touchingly written and undoubtedly rang true in the hearts of millions of Americans who had experienced similar scenes in their own homes.

Such was the essence that endeared "One Man's Family" to millions of listeners for more than two decades.

Gumshoe stories

"I Love A Mystery" began on NBC radio in 1939, first on just the West Coast feed, and then on the entire network hookup. Where "One Man's Family" was originally a weekly show, "I Love A Mystery" aired as a 15-minute-a-weeknight program during its early years. It concerned the adventures of the members of the A-1 Detective Agency of Hollywood, Calif.

Jack Packard who led the team was a former medical student and methodical and level headed in the face of the most difficult circumstances. Doc Long was a red-headed Texan with a western drawl. Reggie Yorke sported a British accent.

Their adventures took them all over the world and included werewolves and vampires. Morse often did not know how the story would end when he began writing, but he knew timing, and usually managed to bring the story to

completion in three weeks.

By today's standards, the shows are plodding. A considerable portion of each episode is taken up with one or more of the characters tediously recounting the incidents that brought them to today's episode. Because Morse often did not know how the program would end, the listener was even more at a loss to successfully guess a program's outcome in advance. But a cult following has grown up around the program, and fans eagerly ferret out new sources of recordings of the series.

There were actually two periods of the "I Love A Mystery" series. The first ended on NBC in 1944. After a five year hiatus, the Mutual Broadcasting Sys-

tem resurrected the series using the original Carlton Morse scripts and producing the program in New York. In the new series, Russell Thorson was Jack, Jim Boles, Doc and Tony Randall played Reggie Yorke. This second series continued until 1952.

At his peak

During Morse's peak period, these programs kept him going seven days a week. Weekday mornings he churned out one "I Love A Mystery" script a day, and on weekends he concentrated on "One Man's Family." He was one of the most prolific radio writers of his time. When "One Man's Family" ended, Morse had written 3,256 chapters comprising 134 books.

And his popularity continues. On a recent Internet Old Time Radio Digest bulletin board, one fan left a message pleading for help because he has a recording of book 73, chapter 3 in which Paul announces his impending marriage; his wife is hounding him to find out what happens next. More than 25 years after the last episode, families are still hanging on to Carlton Morse's every word.

Interesting. Maybe each generation's not as different as we think. And... maybe there is still a market for radio drama.

□□□

Read Burgan is a free lance writer and a former public radio station manager who can be reached at 906-296-0652 or through e-mail at AH746@detroit.freenet.org.

For further reading: *The One Man's Family Album*, Carlton E. Morse, 1988, Seven Stones Press, Star route, Box 50, Woodside, CA 94062.

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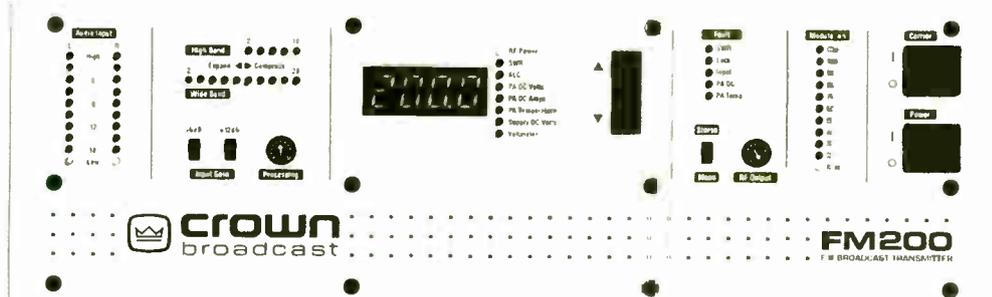
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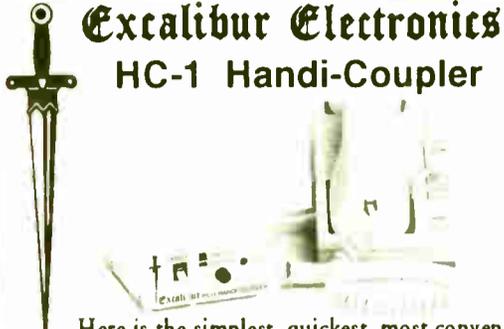
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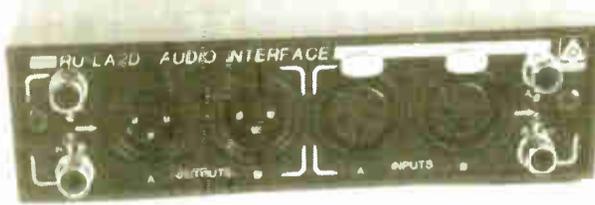
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READER SERVICE NO. 213

KEYBOARD CONNECTION

OS/2 Warp, Win95: Which One for You?

by Barry Mishkind

TUCSON, Ariz. At the core of every computer is the Operating System, or OS. The OS issues all the low-level instructions that control the computer and integrate the programs used in day-to-day activities. Because everything else runs off the OS, the decision of which one to install is not a trivial one.

The introduction of OS/2 Warp from IBM last fall, and the forthcoming introduction of Win95 from Microsoft late this summer, is prompting many computer users to consider which system to purchase to meet their needs. The ramifications of the decision could be significant when you consider the software that will run under these OSs.

Ongoing debate

Over the past several months, I have debated how to approach the matter of which operating system to recommend. Based on testing and many e-mail messages, there are several strong reasons for using each one. A lot has been written both pro and con about OS/2 and Windows; each program having zealous proponents, not to mention those who still prefer plain old DOS, or even UNIX.

It is very tempting to simply acknowledge that each system has strong points and weaknesses, and that if your facility is running well, there is no need to make any changes. After all, one of the primary reasons for upgrades, both in programs and operating systems, is to generate income for the software manufacturer from those who purchase the newer versions. Both IBM and Microsoft are hoping to get your business.

And it is also true that most users find themselves using fewer and fewer of the features of many applications as they mature. One study done indicates by Version 3.0 the average person uses less than one-third of the features available.

Nevertheless, there are sound reasons for upgrading your operating system.

OS/2 Warp vs. Win95

First, there are the power users. Their main concerns are speed, memory handling and network compatibility. Some major advances have been made in the past several years, and OS/2 and Windows are much better now than in past versions.

An important facet of this is multitasking, or the capability to run more than one program at a time, such as editing a letter while you are downloading files from somewhere else. In this area, OS/2 Warp's preemptive multitasking clearly outperforms Windows 3.1, which has more software written for it. And, while Win95 has made some gains, most serious Windows users will be moving on to a version of Windows called NT, because of NT's better multitasking and security capabilities.

Furthermore, many of the latest programs have gotten extremely large, yet much faster when teamed with an optimized operating system. For example, Excel Version 5 from Microsoft has an .EXE file of over 4MB all by itself, not counting the needs of the OS or the file with which you are working. Computers

with an old OS, or a small amount of RAM, will run significantly slower, if at all, with such programs. Hence, if you are planning to upgrade to one of these, a newer OS is essential.

But what about those of you who are using stand-alone computers? Do you really need to worry about OS/2 or Win95?

Should you buy

No... and yes. The answer boils down to two separate issues. If your computer is dedicated to a particular task, and you find the software runs well, you do not need to spend a dime.

On the other hand, if you are hesitating about upgrading to a newer version of your word processor or spreadsheet, something will likely happen late this year that you need to consider. That something will be a literal deluge of "32-bit" programs as soon as Win95 is officially released in late August. IBM's recent purchase of Lotus will certainly lead to more OS/2 product versions. Designed to run on the new Win95 and OS/2, they take fuller advantage of newer speedy processors and operating systems.

The downside is 32-bit programs will not run on older computers. And, there may be a trend towards squeezing out existing 16-bit programs if Win95 (or NT) is popular enough. Software sellers will not have shelf space for everything, so in time you might have trouble finding new copies or upgrades of the programs you now use, in versions that will run on your current DOS or Windows 3.1 platform.

Some experts recommend planning ahead for software purchases. If you foresee needing more copies of existing programs, it might be best to budget for them within the next nine to 12 months. However, if everything is basically running well right now, wait for the bug fixes for Win95 and OS/2 to stabilize, then upgrade everything to the newer versions.

A couple of items to finish this month. Mindscape's new CD-ROM of the Grammy Awards is now available. Filled with more than 40 minutes of video clips of music and interviews from the past 35 Grammy Award shows, as well as biographies and discographies, this is a good resource for show prep, or just nostalgia.

Traffic aids

If you've been waiting for a simple, easy way to set up Internet access, here are some suggestions. First, Spry's Internet-In-A-Box, based on the Mosaic browser. Also included are e-mail, ftp and gopher clients. Just purchased by Compuserve, their Version 2 upgrade is now out. Included is a list of providers and some special deals to get you started.

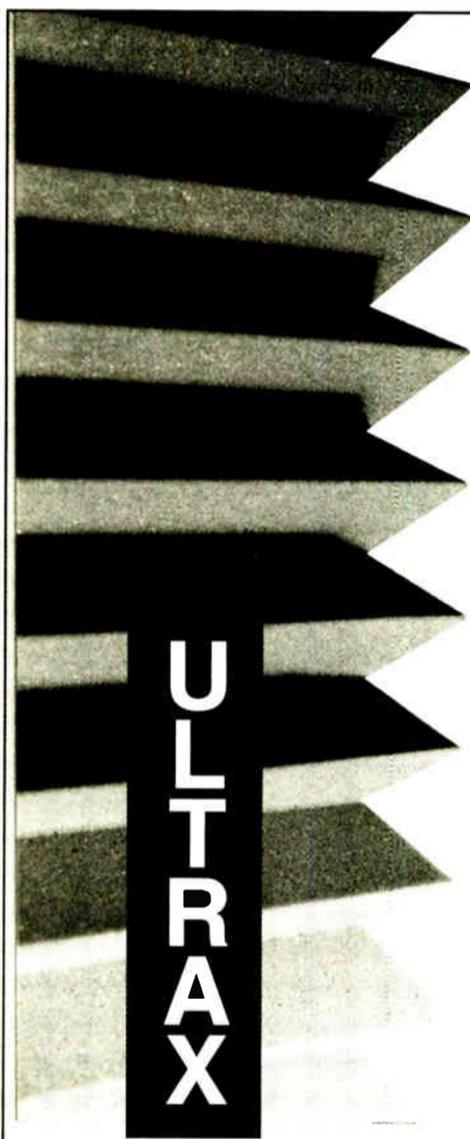
NetManage has gone a step further. Internet Chameleon not only promises five minute installation, and only five minutes to get on-line with a new Internet account, it has more than a dozen Internet tools to get the quickest possible access to what you are seeking. A strong point to the product is another NetManage product: Ecco Professional Information Management System. Ecco is a super PIM with a customizable calendar, phonebook, dialer, outliner and more.

NetManage's products are also designed for full flexibility in inter-networking. Chameleon NFS brings all of the above benefits to the local network, including group scheduling. Once you get on the Internet, you might wonder where to find some information. Try the New Rider's Official World Wide Web Yellow Pages. It indexes more than 4,000 web sites offering information from art to zoology. Good for browsing, the book also includes the index on diskette for quick searches so on-air programs can zero in on material fast.

Finally, I'd like to mention the Que Books' "Using" series of Internet books: Using Netscape, Using Eudora, Using Usenet Newsgroups and Using the World Wide Web and Mosaic. This last book is especially noteworthy because it contains a CD-ROM filled with dozens and dozens of Internet tools, including a trial version of Chameleon and several hundred pages of directions on how to find and access sites on the Internet.

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Barry Mishkind can be reached at 520-296-3797, or barry@coyote.datalog.com via the Internet.



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Switching with UART Circuitry

by Jim Murphy

MORGANTOWN, W.Va. In an earlier issue of *RW*, I described a remote switching system that controls up to 16 relays from multiple locations, with only two switches required at each position.

While this "function execute" system eliminates many switches, and provides for parallel control of the main relay bank, there are two drawbacks which may be important in your operation.

First, the old system requires a multicable; there are four data lines, a common return, and an enable line. If it is necessary

for you to use existing single pair wiring within building walls, or underground, this requirement may render the old system unusable.

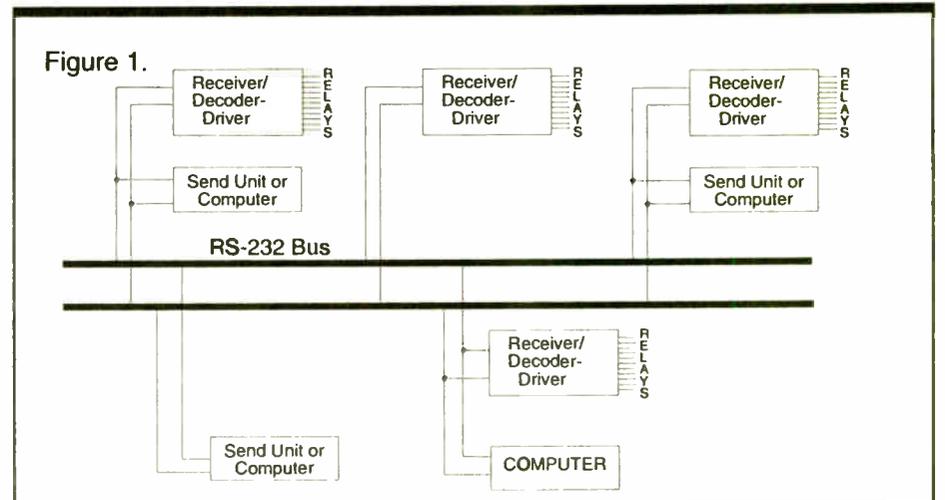
Secondly, only a single bank of relays can be accessed from the locations. In a simple system, these may be enough, but if you require more numerous functions, especially in different locations, perhaps the system described herein will be more appropriate.

Figure 1 shows the general flowchart and design objective for the new system. Note that there can be numerous receivers/decoders/drivers (RDDs) and transmitters connected to the two-wire bus. Each RDD provides drivers for up to 16 relays, and these relays can be controlled from any transmitter.

Serial transmission

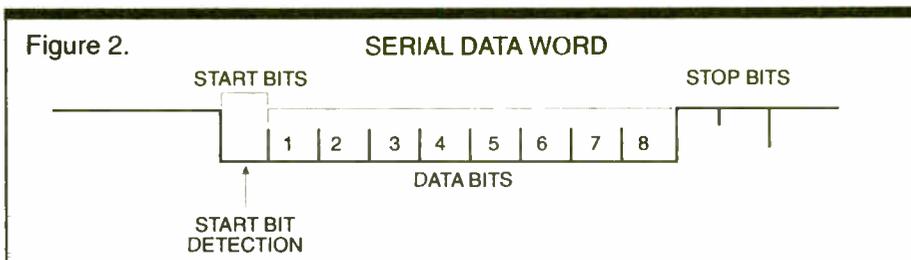
Although other methods—perhaps DTMF or pulse counting—could have been used, I decided to use a serial transmission system. And, rather than developing my own serial bit string, I used the 6402 UART. Building the system of receivers and transmitters provides a good lesson in asynchronous data transmission, and may be helpful to you in future trouble-shooting situations.

(optional) and stop bits. This is called asynchronous transmission because timing and sync bits are not required. The system can be set up for 5, 6, 7 or 8 data bits, 1 1/2 or 2 stop bits and even or odd parity bits. The baud rate is determined by the external clock, which, in our design, is



a 555 strapped as a multivibrator.

Figure 3 shows the topography of the RDD unit. Q3 is used to interface the +12, -12 voltage levels of the RS-232 standard, and is necessary if you use a computer to drive the system. Otherwise,



First, let's discuss the characteristics of the serial communications system. Figure 2 shows the general layout of the transmitted word. Note that the input line is high until data transmission starts. Once the start bit is verified—approximately halfway through the start pulse—the data bits are decoded, followed by the parity

you can eliminate this stage.

As will be shown, the RDD is configured for a 2400 baud rate, 8 data bits, 2 stop bits, and no parity. The low 4 bits, or nibble, is decoded to activate any one of 16 relays or functions. The four higher-order bits are used for addressing. IC3 performs this function by comparing

inputs A and B. If the A0-A3 logic matches the data at B0-B3, the 7485 output goes high, is inverted by the 7404, and enables the 74154 demultiplexer. Using this system, we can address 16 receivers.

Nibble data

Low nibble data comes directly to the 74154, and is used to select the function. The received binary number is decoded and, if the chip is enabled, places a low on one of 16 outputs. This logic condi-

tion can be handled in a number of ways, depending on your requirements and equipment.

Shown are three different driver circuits. You can use inverters, such as the 7404, which will provide an active high to drive other TTL loads. For heavier uses, such as lamps or relays, two transistor circuits, a PNP and an NPN (3906 or 3904 series) are shown. One of these drivers should satisfy your requirements.

Setting the address on the RDD is done with a DIP switch and pull-up resistors. Closing all switches gives the receiver an address of 00. Lifting the A0 line makes address 01, lifting A0 and A3 makes address 09, and so on. This binary system provides addresses 00 through 15.

The 6402 UART

At the heart of the RDD is the 6402 Universal Asynchronous Receiver Transmitter, or UART. This is a smart chip, and makes serial transmission easy. It is used for both receiving and transmitting, and is readily available. To help you with this chip, I will include some pin-out information.

Pin 4 should be low, unless you want to force RBR1-RBR8 (the data word pins) into high impedance state. There is no need for that here.

Pins 5 through 12 are the decoded data pins for the receive mode. The clock is on pin 17, and should be 16 times the baud rate. If you need to slow the system down by using a lower baud rate, keep this in mind.

Serial input is placed on pin 18.

Pin 21, the MR input, is a critical pin. At startup, this input needs to go high for a few clock cycles, then return to a low state. This accounts for the RC circuit at pin 8 of IC-4.

In the receive mode, pins 34 through 39 set the baud rate, stop bits, parity, and data bits. Tying all these high set our parameters of 8 data bits, no parity, and 2 stop bits.

In the next issue I will add the transmitting unit, which uses the same chip with some additional circuitry. Meanwhile if you want to test your RDD, or simply drive it with your computer, type in the listing in Figure 4. With this short program, you can enter an address, then a function. And because the computer's COM port

continued on page 35 ►



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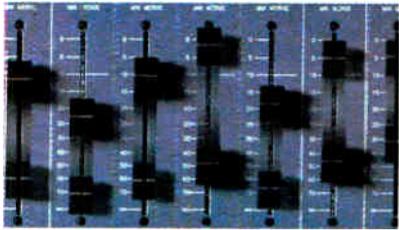
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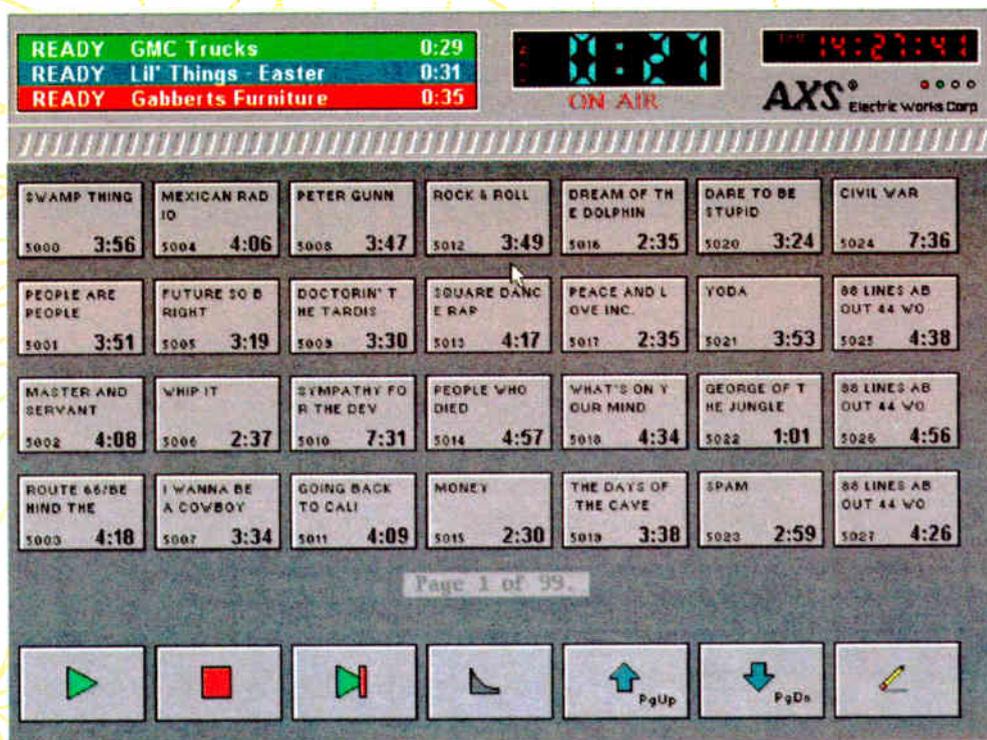
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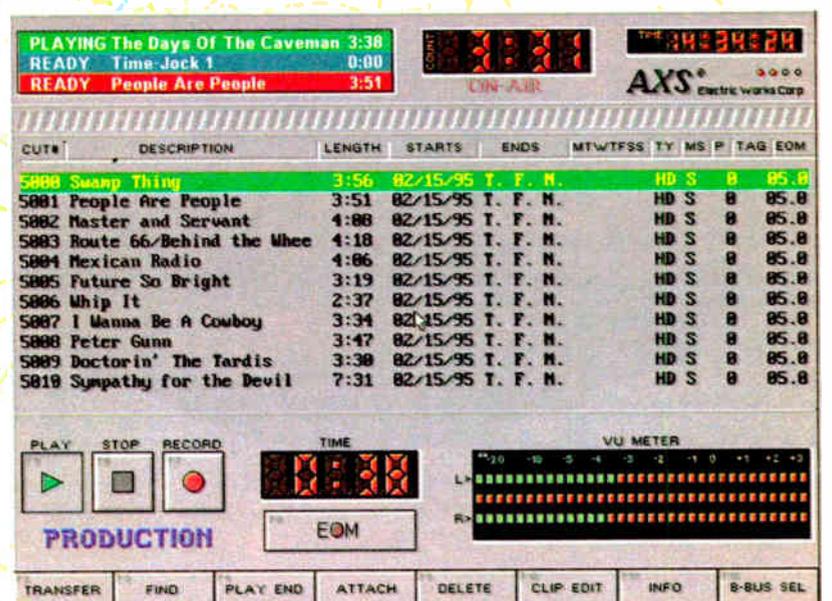
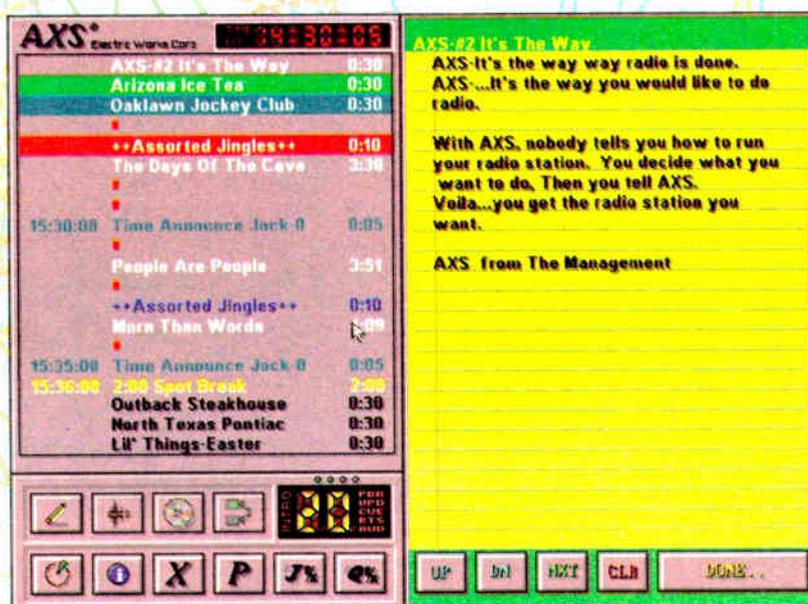
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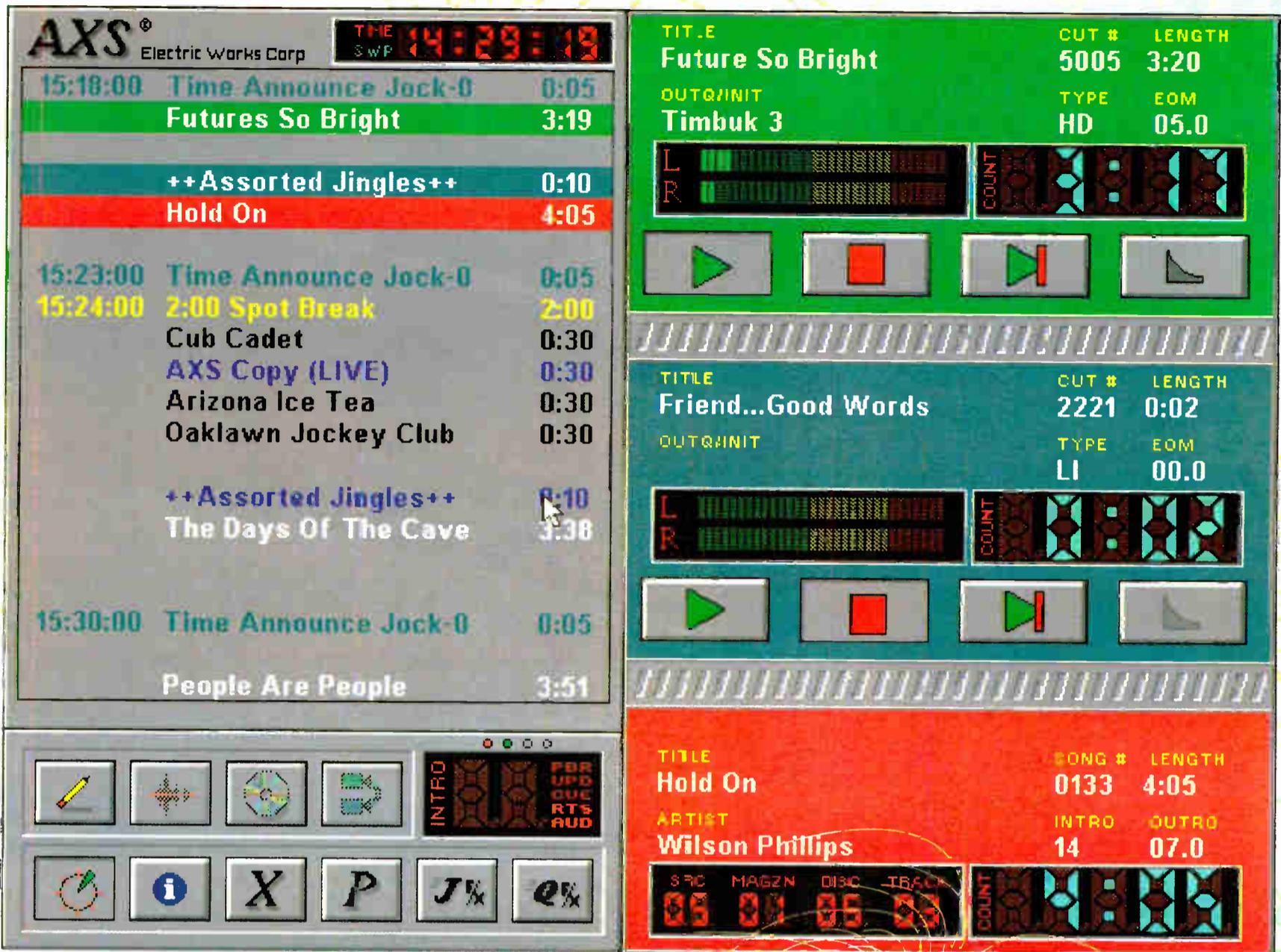
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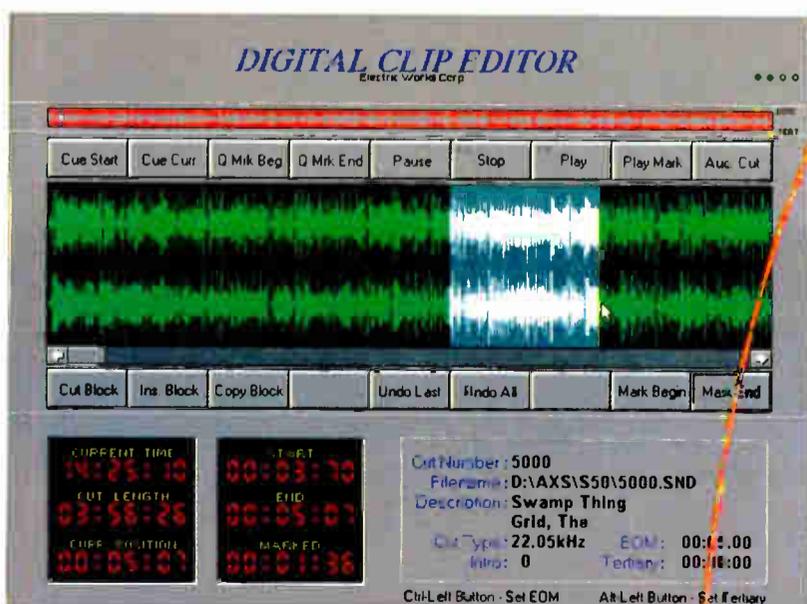


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World Radio History

Brothers Build KDAC-in-the-Box

► continued from page 26

business—which came in handy. Using their own bricks, they built KDAC on the brickyard.

"This style of building was supposed to house both radio and TV studios," Hale says. "If you're sitting in what was originally the control studio, to your left and right are what were to be the two TV studios. Directly in front of you would be

the radio studio.

"The Myrtle brothers never put in the TV station. They were happy with just the radio station. As a result, the TV studios were turned into offices," said Hale. The remaining two studios were left for the radio station.

"The problem with that was you had to walk around the entire perimeter of the building to get from Studio A to Studio

B," Hale said. "So when the station was sold in 1972, the new owner decided to cut a door through that wall.

"Unfortunately," said Hale, "there is a main beam that supports the building right through that wall. So he was only able to make the door about four feet tall. But from the dents in my head, I'd say it's a little less!"

Hale, who has been at the station since 1987 and is a walking encyclopedia of station history, says the doorway is sound-proof—but only in one direction.

"I've done everything I can to try and insulate that doorway," he said. "You can hear from Studio A to Studio B, but not from Studio B to Studio A.

"I know that does not make any sense, but radio's been like that to me," he said with a hearty chuckle.

Fort Bragg U.S.A.

The original format at KDAC was country-western, with a lot of local interest man-on-the-street interviews sprinkled in. Long before talk became a major format, KDAC began doing local talk shows in 1952. One of the most popular shows, "Fort Bragg, U.S.A.," ran 25 years.

The station continued its country format until 1972, when it switched to adult contemporary. In 1991, a local real estate broker purchased the station, and the format went back to country. About a year ago KDAC went all-talk, airing Rush Limbaugh and other national shows.

KDAC has been an ABC affiliate since 1952, but got hooked up to the network in a most unconventional way.

"When the station originally decided to carry the network news, it was not cost effective to bring a phone line out here," says Hale. "So they strung long wires between the guy wires of the tower and received top of the hour news from KGO, the ABC affiliate in San Francisco. It was like that until 1972."

Tragic fall

That is not the only story involving the tower. There is one with a tragic ending. "When the tower was first put up in late 1947," Hale said, "they tried to assemble it on the ground and then hoist it. The tower got about halfway up and came back down with a man on it. He was killed and the tower was badly damaged.

"The tower was later untwisted and set back up. The twisted, mangled tower was on the air for about a year before it was replaced in late 1948 with the tower we're still using today."

Like many older radio stations, the KDAC building has nooks and crannies that hold interesting contents. There are two attics that are used for storage, and a basement that holds two tons of rock. It seems a previous owner was a rock hound.

Now that CDs have replaced vinyl, it is nice to take a nostalgic look at a record library. KDAC's library includes something you almost never see anymore: those big, thick Edison records from the early 1900s.

The station also owns about 3,000 original 78s, including the McGuire Sisters singing "Sincerely," which was a number one hit for 10 straight weeks in 1955.

Hale likes to joke that "it was played so many times that the 'S's' are worn off!"

In addition to his engineering duties, Hale co-hosts the station's "Morning

Edition" news block weekdays from 6-8 a.m. with staffer Russ Faust.

I am glad I decided to make that side trip down Highway 20, a long and winding two-lane, tree-lined road. You cannot go much more over 30 mph, but I was on vacation and was not in a hurry.

It was worth the drive to see the station and meet some of the people who make radio such a wonderful business to be in.

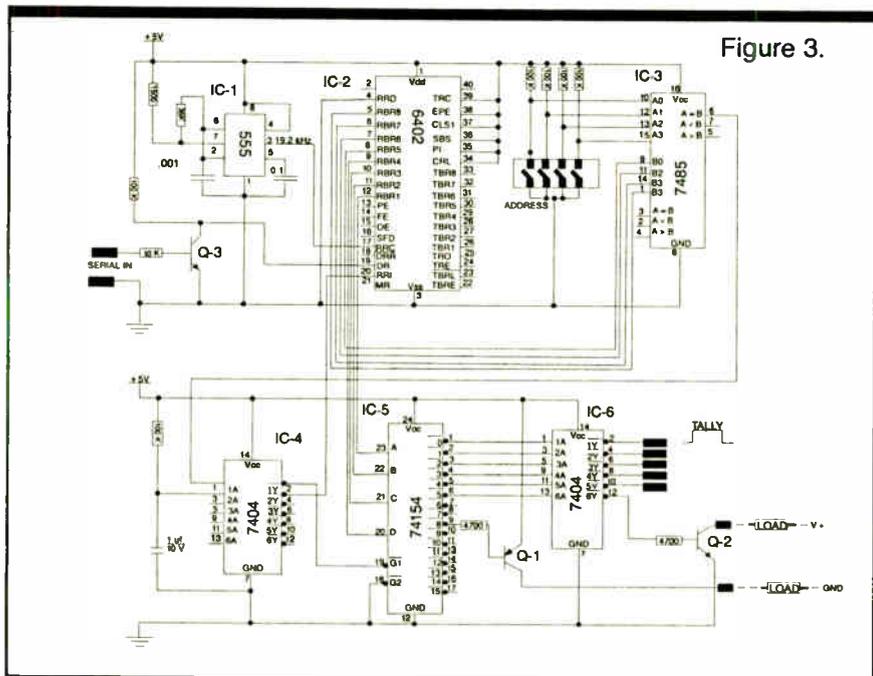
(Author's Note: The Broadcast Pioneers Library at the University of Maryland provided a copy of an article from RCA Broadcast News (March 1948) that was used for research in completing this story. In the 1930s and 40s RCA's Functional Design Department assisted radio stations in planning broadcast facilities.)

Construct Switcher

► continued from page 30

has an output impedance of about 300 ohms, you should be able to drive quite a few receivers.

Again, I added the QuickBasic program just to help you check out your RDD. Driving a complete system with a computer would require a seri-



One point to keep in mind is that the 6402 latches the data, so if the address is proper, the selected line from the 74154 will go low and remain low. The only way to turn the

ous software development program which is beyond the scope of this article.

While this may look like an ambitious project, it is really not. Note that there are only 11 pins used on the 6402 for data. Add the few connections to Vdd and Vss and your chip is ready to go. The 555 timer is routine, as is the 7404, the 74154, and the 7485. Because the highest frequency is 19.2 kHz, point to point wiring can be used.

Conclusion

Whether you use this system to its fullest potential, or just as a single switcher, it is a good project to introduce the student to the basics of serial data transmission, digital logic, and addressing techniques.

And, as usual, most of the parts can be found in and around your workbench.

James Murphy is director of engineering at the West Virginia Radio Corp. Reach him at 304-296-0029.

Figure 4.

```
' Program PORTWEST.EXE to Control Switch/Driver Circuit
' Bits 1 - 4 represent relays 1 through 15
' Bits 5 - 8 represent addresses 1 through 15
CLS
OUT &H2FB, 7 ' Sets COM2 parameters
' to 8 bits, 2 stop, no parity
' < < NOTE 1 > > use the command
' OUT &H3FB if com port 1 is used
Main:
LOCATE 10, 10
INPUT "Enter Address (1 - 15)"; An
LOCATE 12, 10
INPUT "Enter Relay #(1 - 15)"; Rn
LOCATE 15, 20
N = Rn + (16 * An)
PRINT N; " Sent to RS 232 Devices"
OUT &H2FB, N ' < < NOTE 2 > > use the command
' OUT &H3FB if com port 1 is used
Choice:
LOCATE 20, 20
INPUT "(S)end another command, or (Q)uit"; yn$
IF yn$ = "S" OR yn$ = "s" THEN
LOCATE 10, 33
PRINT STRING$(2, " ")
LOCATE 12, 32
PRINT STRING$(2, " ")
GOTO Main
If yn$ = "Q" OR yn$ = "q" THEN SYSTEM
GOTO Choice
END IF
```

function off is to send out the same address with a zero function. The transmitter unit incorporates this feature, but the computer program in Figure 4 does not. You will need to add a routine to shut the unit off after a few milliseconds.

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Demystifying Directional Arrays

Part I

by Jack Layton

MCMURRAY, Pa. Many owners—and some chief engineers—consider the subject of AM directional antenna systems to border on “black magic.” Even folks who are well versed in the environment of audio, transmitters and computers begin feeling uncomfortable at the mention of base current ratios, loop current ratios, phase, monitor points and field intensity meters.

Although the term “black magic” might go a bit far in describing the DA system,

there is no doubt that it is probably one of the most complex and misunderstood systems one is likely to encounter in the field of radio broadcasting.

In part I of this article I will review some DA basics and terminology. In part II, I will discuss some of the practical aspects of maintaining the DA system: Relocating monitor points, partial proof-of-performance measurements and the like.

Pertinent details

Figure 1 shows the pertinent details of a typical two-tower directional antenna system. What does all of this mean?

The two towers are numbered as shown; (1) and (2). The 330° T at the end of the arrow on the line through the center of the towers shows the orientation of the array, reference true north. Antenna systems are always referenced to true north; never to magnetic north.

In broadcast antenna terminology, wavelength, including the length of transmission lines, the height of towers

that energize the towers. In the case of an array with equal height 90° towers the field ratio (field strength radiated from the tower) and the base current ratio are essentially synonymous. In this array the current ratio is 1:1: equal amounts of current will energize each tower. The 0° and the +90° denote the phase or the timing of the currents in each tower.

In very simplistic terms, as the energy radiated from tower No. 1 travels toward tower No. 2 it is further delayed in phase. By the time it reaches tower No. 2, it is delayed by 90° due to the spacing between towers. The two signals, the one from tower No. 1 now -90° and the signal from tower No. 2 at +90° are 180° out of phase at points along the 330° azimuth. Voltages equal in magnitude and 180° out of phase completely cancel. A null centered on the 330° azimuth is formed.

In the opposite direction, on the 150° azimuth, the signal radiated from tower No. 2 starts out at +90°. Due to tower spacing it is delayed by 90° when it reaches tower No. 1. The two signals, the one from tower No. 2 now 0° and the signal from tower No. 1 at 0° add together to deliver twice the field strength that would be delivered by either radiator alone at points along the 150° azimuth.

Complete cancellation

A major lobe centered on 150° is formed. At all other azimuths the two signals are neither totally in phase nor totally out of phase. The resultant signal strength will be less than twice that from either radiator and more than zero or complete cancellation.

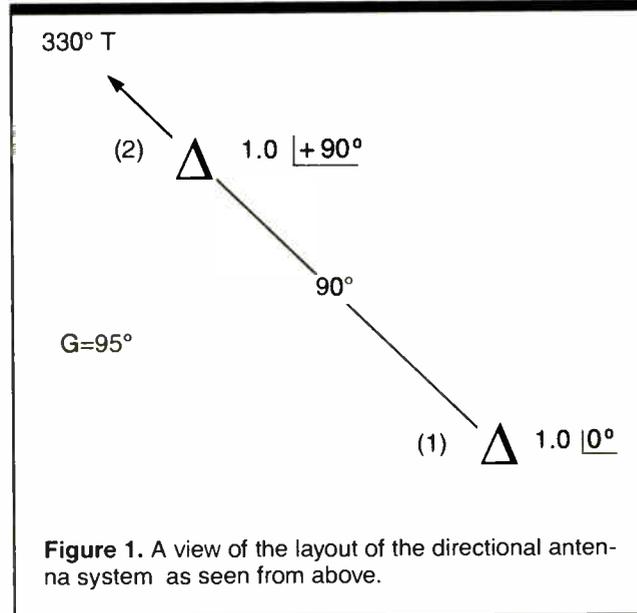


Figure 1. A view of the layout of the directional antenna system as seen from above.

used as radiating elements, and the spacing between antenna elements, is noted in angular measure or electrical degrees.

One wavelength is 360 degrees; a half wavelength 180 degrees; a quarter wavelength 90 degrees. Two simple formulas to determine electrical degrees in free space are:

- 1) electrical degrees = $.366 \times \text{frequency (MHz)} \times \text{length (feet)}$
- 2) one electrical degree in feet = $\frac{2.73}{\text{freq (MHz)}}$

The 90° shown on the line, in between



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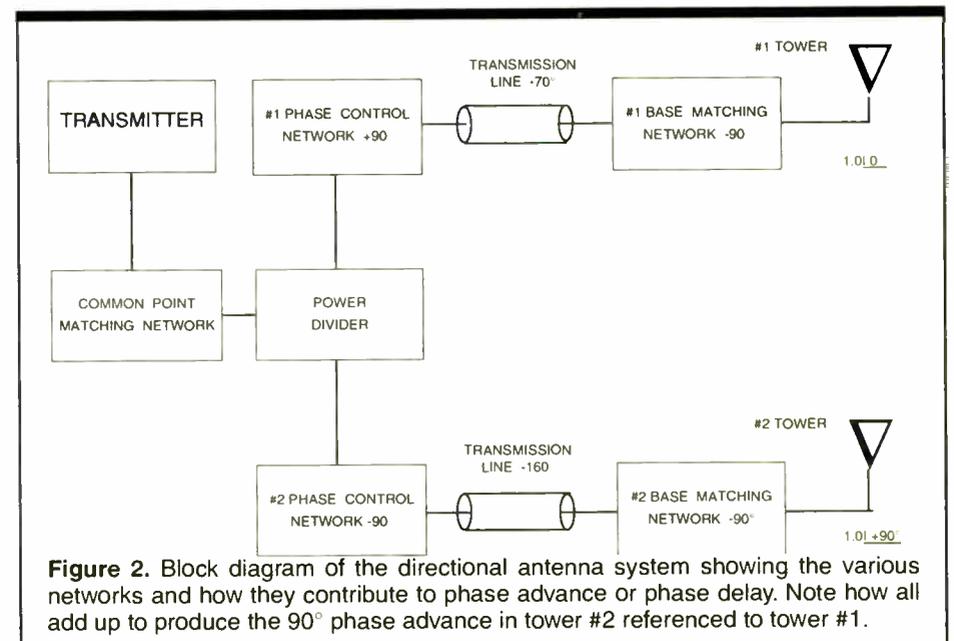


Figure 2. Block diagram of the directional antenna system showing the various networks and how they contribute to phase advance or phase delay. Note how all add up to produce the 90° phase advance in tower #2 referenced to tower #1.

towers, denotes the spacing in electrical degrees between the two towers. The symbol sometimes used to denote spacing is S. The symbol G denotes the height of the radiating elements in electrical degrees, which in the case of an AM directional antenna system are the towers themselves. In the event of unequal height towers being used the G of each will be noted.

Essentially synonymous

The 1.0 | 0° and the 1.0 | +90° denote the field ratios and the phase of the currents

If complete cancellation were not needed or desired in the null area the currents in the towers would be made unequal. Even though the two signals would be 180° out of phase at points along the 330° azimuth due to unequal field being radiated by each tower total cancellation would not occur. The operating parameters of this imaginary directional antenna system were chosen so as to easily illustrate the addition and the cancellation of the individual signals radiated from each tower.

continued on page 38 ▶

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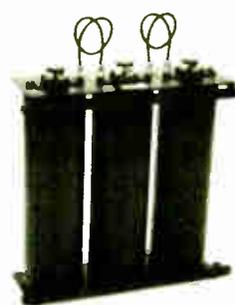
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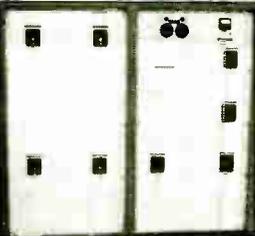


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Elements of DAs Explained

► continued from page 36

In the real world, while such a configuration would work, it is not commonly put into service. If protection off the back of the system at 330° were desired the phase would probably be adjusted to somewhat more than +90° creating two nulls a few degrees either side of the line of towers. Directly in line with the towers, at 330° a minor lobe would be formed. This arrangement would offer protection over a wider angle than would the single null.

When a single tower stands alone as a radiator, one can easily measure its feed point impedance by use of an RF bridge and signal generator. If we were to simply open the feed point off the No. 1 tower and measure its impedance we might well find that it is somewhere between 45 +j50 and 55 +j80; 45 ohms resistance and 50 ohms of inductive reactance.

Inductive reactance

Inductive reactance is +j and capacitive reactance is -j. This is called the self impedance of the tower. It is primarily determined by the electrical height of the tower, the physical construction of the tower (uniform cross section guyed or self supporting) and the ground system under the tower. Base impedance of approximately 45 +j50 is about what we might expect of a guyed tower a little over a quarter wavelength in height.

Now, if we placed an in-line operating impedance bridge in the feed point of the tower when the array is energized with the proper current ratio and phase we would find that the measured 45 +j50, or the self impedance, had changed substantially. This is due to the coupling of energy from tower No. 2 into tower No. 1. This new input impedance at the base of the radiator, with the system in operation, is known as the driving point impedance. It is dependent on the self impedance of the tower, the spacing between it and other towers in the system, the current ratios of the various towers in the system, and the phase of the currents that energize the other towers. The driving point impedance of each

radiator in a directional antenna system will change as the system is tuned. Only when the current ratio(s) and the phase(s) of all elements are adjusted correctly can the driving point impedance(s)

a T network—two series arms and a shunt arm. Depending on the configuration of this network there will be a phase delay or phase advance. When the series components are inductors there will be

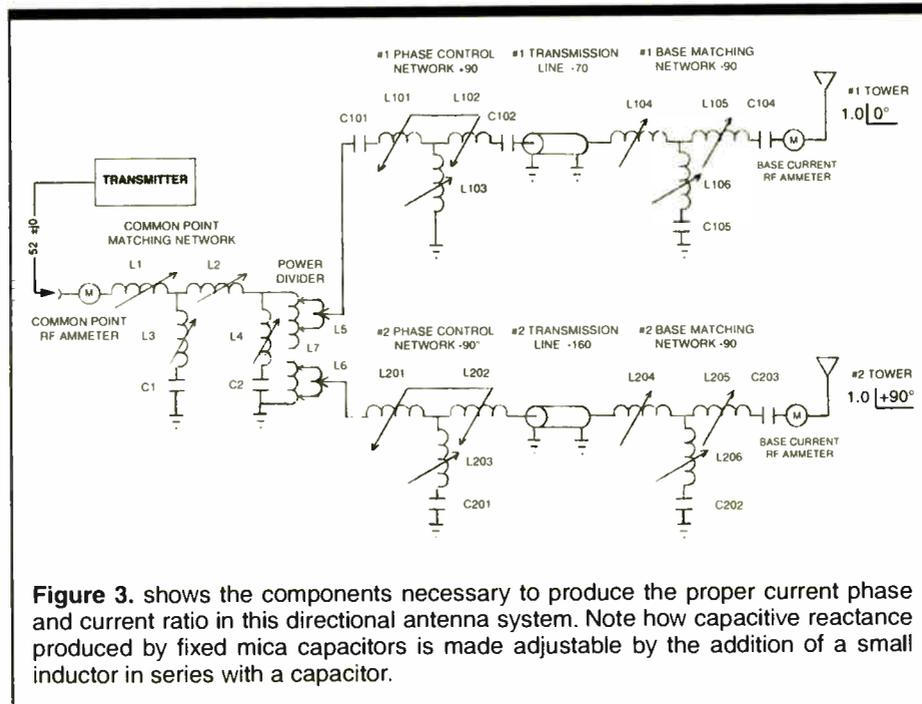


Figure 3. shows the components necessary to produce the proper current phase and current ratio in this directional antenna system. Note how capacitive reactance produced by fixed mica capacitors is made adjustable by the addition of a small inductor in series with a capacitor.

be accurately measured. In a directional antenna system, even though the self impedance of each tower will more than likely be close to the same value, especially when the towers are of the same height and construction, in almost all cases, the driving point impedance of each tower will be different from the others. Figure No. 2 is a block diagram of our imaginary two-tower directional antenna system.

System parts

Lets examine the parts of the system that produce the current ratios and phases that make the system work. We will look backward from the towers. The base matching network sometimes call an antenna coupling unit (ACU) or line terminating unit (LTU), matches the driving point impedance of the tower to the coaxial transmission line. These are located in the "dog houses" at the base of the towers. They usually take the form of

phase delay. When they are capacitors there will be phase advance.

There is always a phase delay in the transmission line. The signal travels slower in the coaxial line than it does in free space. The designer of the feeder system must take the velocity factor of the transmission line into account. The dielectric insulation between the inner and outer conductors is the characteristic of the coaxial cable that has the greatest influence on velocity factor. For solid dielectric cable the velocity factor can be as low as 66 percent. For some large air dielectric cables the velocity of propagation of the RF energy through it can approach 100 percent.

Inside the transmitter building, usually located immediately adjacent to the transmitter and the antenna monitor, is the phasor cabinet. Phase control networks, power divider and common point matching networks are housed inside this cabinet or cabinets.

T networks

The phase control networks in our imaginary DA feeder system are T networks. They may be either phase advance or phase delay networks. The series arms are ganged together and brought out to a front panel control on the phasor to allow for adjustment of the array. In Figure 3, note that the series arms of the No. 1 phase control network consist of C101, C102, L101 and L102. The capacitors are the dominant reactances in the series arms. L101 and L102 are small inductors that serve to adjust the reactance of the fixed capacitors. If vacuum capacitors were being used C101 and C102 might very well be vacuum variables. L101 and L102 would then be eliminated. Note also the same arrangement for adjusting the capacitive shunt elements in the other three T networks.

The function of the power divider is exactly what its name implies. It distributes the transmitter power in the proper ratio to each tower. L5 and L6 are variable inductor power controls adjustable from the front panel of the phasor cabi-

net. Due to mutual coupling between towers and the fact that phase and power controls interact, no one adjustment of a DA system is independent of any other. An adjustment of the No. 2 tower power is apt to also cause a change in its phase. The opposite is also true. This interaction is not too troublesome in a simple two tower array, however, when there are many elements it takes much time, patience and skill to properly adjust such a system.

Common point

Last, but not least, on our journey back toward the transmitter, is the common point matching network. The input impedance to the power divider is apt to be far from ideal. In the arrangement shown in Figure 3, the feeder system for both towers are in parallel. The resistance is apt to be quite low and an appreciable amount of reactance is likely to be present. AM broadcast transmitters are most happy when they see a non-reactive load of near 50 ohms.

The function of the common point matching network is the go between; it transforms the power divider input impedance to a resistive load to be hung on the transmitter's output. The network is adjusted for zero reactance and 50 or 52 ohms. Power output from the transmitter is measured with an RF ammeter at this point using Ohm's Law.

In Part II we will discuss what to check for when you perform preventive maintenance on your DA, how to trouble shoot your DA and how to carry out and analyze partial proof-of-performance measurements.

□ □ □

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.

61 Years Ago

Reprinted from Radio World
July 28, 1934. Editor's note: The RW of old, printed for a time in the 1920s and 1930s and today's RW are unrelated except in name.

Foot Police Using One-Tube Portable

Individual portable radio equipment recently was put into use by the police of Los Angeles, Calif. These tiny one-tube sets are strapped on to a specially-designed Sam Browne belt which carries an aerial sewed into the shoulder strap. An earphone is attached to the policeman's hat and he is in constant contact with the central station by a short wave. The set uses a National Union type 30 tube.

NEW MICROPHONE FINISH

A silvered crackle finish will be used on the base of all floor microphone stands from the Universal Microphone Co., Inglewood, Cal., taking the place of the former chrome smooth finish. The new finish has been created on the demand of stations and microphone users who found that rough usage (the scraping and shuffling of feet) soon showed on the chrome. The crackle will be used for the standard floor stand, the banquet model and the manufacturers' combination floor stand.

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OFFBEAT RADIO

TST Talk Service Via Satellite

by Dee McVicker

PHOENIX, Ariz. The place could be Anywhere, U.S.A., where pay-for-programming has just come to town. Entertainment is being brought in from distant cities through the magic of a black box hooked into the home entertainment center. Just about every household has one, and everyone is ecstatic about all the new channels they can flip through. Everyone, that is, except the local broadcasters, many of whom are a little miffed by what they perceive as the new competition in town.

The year is 1995, August of 1995 to be exact, when Taylor Communications Corp. will launch its subscription-based talk programming service, Taylor Satellite Talk (TST), through direct-to-home satellite service. And, this time, the local broadcaster is radio.

No need to worry

But not to worry, said Ed Taylor, founder of TST and owner of several radio stations himself. His reason: TST is going after a niche market that is 1/2,000th of the homes in any given market.



"We're not going to affect the ratings of a radio station as much as one of his fellow stations does in his market," he said, adding that many of the service's subscribers will be in areas currently underserved by radio.

Taylor is no stranger to the subscription-based and broadcasting media. He built the WTBS-TV satellite distribution company, Southern Satellite Systems/Tempo Enterprises, and founded what later became CNBC. In more recent years, Taylor pioneered a multiple-format cable audio package that was marketed under TEMPO Sound, and became owner of stations WACT-AM-FM in Tuscaloosa, Ala.; WTND-FM in Grifton, Ga., and WIBB-AM-FM in Fort Valley and Macon, Ga.

His current ambition is to make four program channels available to a small, widely-scattered audience using new 18-inch satellite dishes and specially designed 10-inch-wide receivers made by DirectCom Networks. The receiver and dish are available to subscribers for \$300; the receiver

can be pre-programmed by setting up the service on unused FM frequencies. Subscribers, who pay a monthly fee of \$6 per channel and \$3 for additional channels, can punch up the service as they would a broadcast station. "It will just look to them like they have a little bit more radio than the other person," remarked Taylor.

Scrutinizing radio

Taylor began to see the marketability of subscription radio by taking a scrutinizing look at radio's talk show following. By his estimates, there are 20 million Rush Limbaugh listeners across the country and another 20 million talk show listeners that tune into any of the growing number of talk shows that broadcast locally or are syndicated nationally.

Of these 40,000 listeners, a small fraction—roughly 2,000—are what he calls enthusiasts, those who listen three hours or more a day. This is the primary market for TST, which will initially launch four channels of programming: health, conservative political, liberal political and "ask the expert" special interest.

Most talk show enthusiasts are women over 50, an audience that radio no longer caters to, according to Taylor. "That audience has been driven away by... what an advertising salesman can sell over the air on radio. It

is a lot easier to get big numbers with controversial programming—can sell that to an advertiser—than it is with a health talk show, as an example," he said.

Indeed, health issues are at the top of the programming agenda for TST. Beck Dixon, once a co-host of ABC's "Wide World of Sports," is now the program director for TST's health channel and will host a program segment, one of the few programs that will be initially produced in-house from TST's new studios in Tulsa, Okla. Most programming on TST will be piped in via Switched 56, ISDN, two-line Comrex, or brought in direct satellite from around the country, some of which will be time shifted to avoid conflict in local and syndicated markets airing these programs live.

Psychiatrist Harvey Ruben, who delivered some seven million listeners during peak week for TalkNet, is scheduled to host a show on the new service.

Taylor has many of the 100 or so hosts he needs to launch the service, but said he is constantly on the lookout for the best talk shows with the least amount of radio

audience. "The consumer is paying me for a delivery service, and they're paying me to go out and collect the best of radio from around the country," he said.

TST listeners also will be paying for programming not readily available on radio. Expert advice shows like those covering pets, gardening, and computers are examples of programming that radio largely ignores, according to Taylor. "Commercial radio has relegated them to Saturdays and Sundays, and normally has relegated those shows to a local store owner and local host (for) driving traffic into that shop," he said. There are no

plans to cover the sports market, which Taylor is convinced talk show "enthusiasts" abhor.

Filling a program niche, or narrowcasting, is what distinguishes subscription radio from broadcast radio, summed up Taylor. "It's a whole different experience," he said. "We're doing many things that are not conventional radio."

TST plans to eventually deliver 10 channels or more of talk radio shows from around the country to subscribers throughout the United States, Canada and Mexico, with distribution via the telephone company and cable systems a future possibility.

□□□

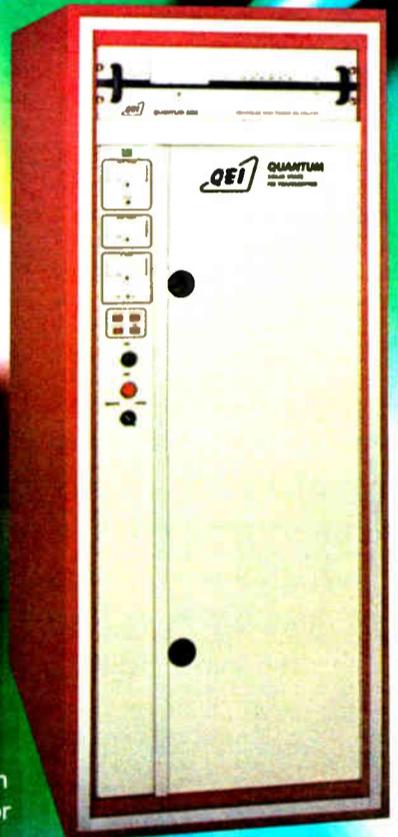
Dee McVicker is a freelance writer and regular contributor to Radio World. She can be reached at 602-545-7363.

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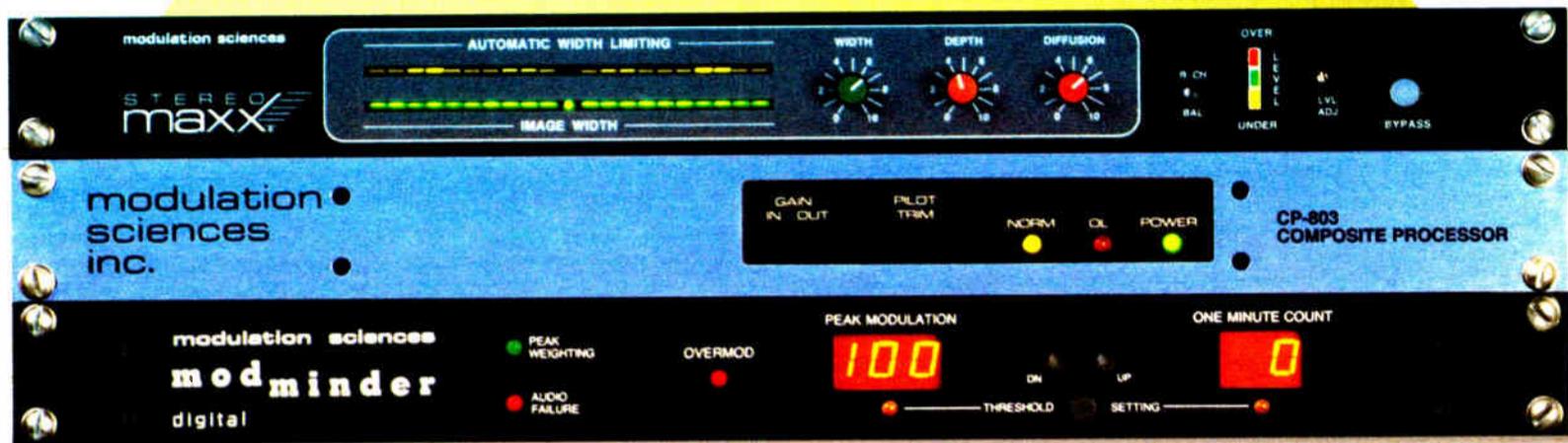
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MARKETPLACE

Recently Introduced Products for the Radio Broadcast Professional

Audio Transmission System

An all-new series 1320B/1320SB audio transmission system from Fiber Options Inc. converts two channels of line-level audio to CD-grade broadcast-quality digital signals that are transmitted over a single fiber. The 1320B multimode system operates over two to three kilometers; the 1320SB single-mode version over distances up to 20 kilometers.

The system transmitter incorporates a diagnostic indicator used in verifying a valid video signal and dual 10-segment audio input displays. The system receiver provides an optical level/loss LED in addition to output signal status LEDs for video and audio.

For more information contact the company in New York at 516-567-8320, or circle Reader Service 71.

UPS Systems

A new line of ultra-compact UPS systems from Computer Power Inc. (CPI) cover a power range of 300 VA to 2.2 kVA, and provide power protection for standalone PCs, multimedia systems, multiple file servers and networks. The Survivor and Survivor Pro UPS series feature CPI's exclusive battery management system, which doubles battery life and improves energy efficiency to 99 percent.

The Survivor is available in four models covering 300 to 650 VA, and also provides power outage protection with surge suppression. The Survivor Pro is available in five models covering 600 VA to 2.2 kVA and offers the same features as the Survivor, plus



on-line regulation and monitoring.

For more information contact the company in New Jersey at 800-526-5088; fax: 908-638-4931; or circle Reader Service 12.

Portable Podium

Spacewise Broadcast Furniture offers the Live Action Portable Podium, complete with rack shelves, storage shelf, a top notation shelf with windshield and wheels for portability. All broadcast equipment, including remote pickup transmitters, tuners, amplifiers and mixers can be permanently mounted for a ready-to-go presentation. One model also offers installation of monitor speakers.

Standard features on all models include AC power, microphone stand and pre-mounted audio connectors.

For more information contact the company in Arizona at 520-744-3660; or circle Reader Service 163.

Color Analysis Software

The new STI-9000 Version 2 color analysis software from Survey Technologies Inc. automates drive test signal measurement, analysis, and report of RF signal strength coverage over terrain. The STI-9000 features graphical, color contour plots and plotter-generated oversized contour plotting capabilities utilizing Windows-compat-

ible printing devices.

A touchscreen interface provides easy control in the test environment. The system runs on the user's current receiver or spectrum analyzer with GPIB or RS-232 interface.

For more information contact the company in Oregon at 503-848-8500; fax: 503-848-8534; or circle Reader Service 138.

Digital Audio Adapter

Antex Electronics Corp. introduces the SX-11, a playback-only, digital audio adapter that supports apt-X encoding. The

SX-11 supports both ISO/MPEG-1 Layer I/II and Dolby AC-2 compression formats, delivering compression rates up to 16:1.

The SX-11 adapter incorporates balanced and unbalanced analog and AES/EBU or S/PDIF digital output, allowing a direct digital connection to digital audio equipment, and network transmission of audio in digital format. A built-in EEPROM-based software security is also included, which allows systems integrators to assign each Antex adapter a unique ID number. For more information contact the company in California at 310-



532-3092; fax: 310-532-8509; or circle Reader Service 129.



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World Radio History

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"Broadcast Equipment Exchange" accepts no responsibility for the condition of the equipment listed or for the specifics of transactions made between buyers and sellers.

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Want To Sell

Ramsa WP 9055 50 W stereo audio amp, needs work on 1 chnl, \$50. A McCarthy, 707-446-0200.

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LPB dist amp DAI-16, new, nvr used, BO. J Gelo, 941-642-6899.

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6-bay medium pwr CP on or tunable to 100.1 MHz. D Michaels, 916-938-2833.

Cablewave A 10R 50507 1 5/8 in coax foam filled, 6-approx 275' rolls w/connectors, \$1100/per roll. S Ross, Quinn Bldg, 733 N Green St, Brownsburg IN 46112. 317-852-9119.

Moseley ICU-1D 940-960 MHz isocoupler, \$175. Paul, 912-632-1000.

Rohn 45 G tower sections, \$125/BO. Rick, KBZO, Lubbock TX, 806-763-6051.

Dielectric 8-bay high pwr CP ant w/beam tilt & null fill, deicers, 97.9 MHz, BO; Dielectric 6-bay high pwr CP ant w/radomes, 92.1 MHz, BO; 400' 3 1/8" hard line, 20' sections, very clean, BO; Lapp AM base insulators (2), perfect cond, BO; AM base insulator from utility tower, vgc, BO; Shively 3-bay low pwr CP ant w/deicers, 99.5 MHz, BO; ERI 3-bay low pwr CP ant w/deicers, 99.5 MHz, BO; 6 150' rolls of 1 5/8 Andrew foam xmission line w/ connectors, new, BO. CE, Eclipse Bldg Inc, 207-947-4487.

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Shively 4 bay CP antenna tuned to 97.7, BO. 910-754-5582.

Pirot/Harris 2-tower directional antenna syst, 2-198' Pirot guyed towers on ground, Harris phasers & BTUs, BO. J Slitt, 606-282-1160.

Shively 6813 3-bay, new in 1990, xint cond, tuned to 103.1. \$2500. KC Stuart, WFKZ, 93351 Overseas Hwy, Tavernier FL 33070. 305-852-9085.

Want To Buy

Scala 5 or 10 element antenna on or near 98.9 FM or broadbanded log periodic, McMartin or similar FM composite receiver. J Hart, KDAB, POB 949, Prairie Grove AR 72753. 501-846-0949.

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Digidesign ProTools 2.51, 4-chnl workstation, cinl disk I/O card, 4-chnl audio interface, cable & software for both ProTools & Sound Designer, \$4500. Paul, Pissaurus Prod, 402-341-9153.

Fostex 3180 24 msec pre-delay, will trade for old UREI "Cooper Time Cube"; AKG R-25 remote cntrl w/connector & 33' cable, will trade for Teac RC-170 or RC-90 remote cntrl. J Roper, Imperial Sound, 383 N Studio St, Terre Haute IN 47803-9773. 812-877-2663.

AKG D-190E headphones (2), in box, \$40/ea. D Jackson, 203-762-9425.

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Roland SRV-2000, \$525; dbx 503 expander/comp, \$290; Orban 414-A stereo compressor, \$425/BO; UA 565-filter, BO; Orban 245-E stereo synth, BO; Ross 15 band stereo EQ, BO. T Coffman, 619-571-5031.

Valley People 440 monophonic audio proc, passes proof, great cond except paint around rack holes, \$400; ARP Odyssey 2800 keyboard synth, 3 octave keyboard, completely programmable w/foot pedal, manuals & patch sheet, \$500. F Vobbe, 419-228-4199.

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Yamaha RM-804 recdng mixers (2), 8-channel, \$400/ea, Shure SE-20 mixer/gated compressor, \$100; Shure M-68P mic submixer, \$75; Yamaha SPX-90 Type II, \$400; Audiologic NT66 stereo compressor limiter, \$200; DOD R-830B graphic EQ, \$125; Spectro Acoustics 210 stereo graphic EQ, 10 bands, \$100; Furman LC-2 comp/limiter w/de-ess, adj attack & release, \$300; DBX 2-124 NR system, \$75; Teac AN-180 NR unit, \$75. D Jackson, 203-762-9425.

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.

Crown DC-150As (2), great cond, \$200/ea, \$350/both. K Thomas, Rebel Rcdg, 5555 Radio Ln, Jacksonville FL 32205. 904-388-7711.

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ITC 750 reel plybk only, as is, 5 decks avail, \$10+shpg. A McCarthy, 707-446-0200.

Sentry FS-12B compl automation system, gd cond, incl 2-stereo 48 Instacart 4 stereo Go-Carts, 2-24s, 1-48 & 1-42 computer, interfaces, manuals & cables, BO; IGM-EC complete automation system, gd cond, incl 2 stereo Instacart 48s & 1 stereo Go-Cart 24, computer, interfaces, manuals & cables, BO. C Mandel, 619-352-2277.

SMC Carousels (4), mono, BO. GM, KWED-AM, 210-379-2234.

25 Hz tone generator, good cond, downlink TC, \$440. J Gelo, 941-642-6899.

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BE 5400C 3 stack stereo PB cart machine, 3 tones, xint cond, low hrs, \$1295; Fidelipac CTR10 R&P stereo, 3 tones, \$900. Jose, 809-895-2725.

BE 5504B 5 deck stereo PB w/cue tones, good cond, duro-heads, no wear, meets factory specs. \$950. G Garcia, KPEZ Radio, 811 Barton Springs #967, Austin TX 78704. 512-474-9233.

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HE HALL Electronics

BE 5300C tripledeck AB, clean, \$450; Harris PB, mono, works, \$185. Paul, 912-632-1000.

BE 3000A mono PB/delay rcd, rack mount, new, \$500; Dynamax ESD 10 eraser splice finder, good cond, \$400; BE 3000A stereo R/P w/tones, very good cond, \$850; BE 3000 mono R/P w/tones, good cond, \$650; B.E. 3000 2 ea mono PB w/tones, \$450/ea. D Kelly, 402-372-5423.

ITC Delta mono cart plyrs (3), xint cond, \$450/ea. G Zelinger, 213-953-5310.

Ramko Primus stereo R/PB w/manuals, xint cond, almost new, \$1200. R Trumbo, New Life Bldg/KNFL, POB 117, Quincy CA 95971-0117. 800-397-4146.

Roland DEP-5 (5), all work fine, \$225/ea-\$1000/all. S Russell, 616-782-9258.

Gates mono triple ply cart decks (2), both work OK, BO. CE, Eclipse Bldg Inc, 207-947-4487.

ITC S/P stereo PBs (6), snl stereo, 3 tone cart machines, \$395/ea. D Matyis, KEVT/KASE, 512-495-1300.

ITC Omega mono PB cart machines (3), work fine w/manuals, will incl 50 Audiopak A-4 carts free, \$500/ea+shpg. R Hendryx, KVLF, PO Drawer 779, Alpine TX 79831. 915-837-2144.

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Want To Buy

Audi-Cord 100 various circuit cards for R/PB machines. B Sheffield, WFDU-FM, 1000 River Rd, Teaneck NJ 07666. 201-692-2806.

ITC 99B mono or stereo R/P, must be in working cond, good heads, will pay good money. J Ambrutis, WJTO, POB 308, Bath ME 04530. 207-443-6671.

ITC, BE, Fidelipac cart machines: single, triple, mono, stereo, play & record/play. Call M O'Drobinak @ 619-758-0888.

CD PLAYERS

Want To Sell

Otari ARS 1000 open reel machine, BO. C Mandel, 619-352-2277.

Otari 7308 8-trk 1" rcd, very low hrs, heads xint, 15/30 ips, w/remote, \$1500; Sluder/Revox PR99 2-trk tape deck, 7 1/2 & 15 ips, low hrs, xint cond, \$1400; Ampex 440 tape decks, 2-trk, \$250-\$500; Ampex 300 & 440 xports, motors & parts, \$100-\$200; Teac A-2000 tape deck, 1/4-trk rcd & ply, 7 1/2 & 3 3/4 ips, xint cond, \$200. L Wagner, 407-299-1299.

Pioneer 300 deck jukeboxes (3), \$3500/ea; 18 deck Pioneer CD jukebox, \$450; 60 deck Sony jukeboxes (3), \$1000/ea; Digidart early model, \$2500; 16 source 360 Syst rotor w/stereo expander, \$650. R Lockhart, KOGA-AM/FM, Box 509, Ogallala NE 69153. 308-284-3633.

Studer B-67 rcd, 7.5, 15, 30 ips, 1/4" 2-trk, compl w/remote cntrl, owners manual & xport cover, fully svcd, xint cond, good heads, \$1600. R Streicher, 818-359-8012.

Want To Buy

Marantz 610 CD (red/orange book) rcd, perf wkg order, manuals. Sound Dynamics, Box 278, Dennisport MA 02639-0278.

CD plyrs (3) w/remote start capabilities C Bullock, WEJT, Decatur IL, 217-428-4487.

Alesis MMT-8 & Datadisk, xint cond, MIDI sequencer & universal MIDI data storage to standard DSDD floppy disks, \$320. E Scholl, TGT Rcdg, 829 Seymour, Lansing MI 48906. 517-371-2226.

Radio Shack 1000 computer, used for Sentry Automation, no HD, no OPTO interface, ext mem to 640K, floppy drive, works, \$200/BO. A Wasilewski, 509-248-1460.

CONSOLES

Want To Sell

BE 5M250 5-input stereo bdct console w/audition buss, xint cond, \$450; Yamaha M512 12-input, 4-output prod mixing console, xint cond, \$250; Stevenson-Interface 8 mic/line input 4 output buss port mixer in Zero case, \$250. G Zelinger, 213-953-5310.

Collins IC 6 audio console, BO. C Mandel, 619-352-2277.

Opamp Labs 2008-RS board, 20 input, 8 buss + stereo out, 2 16x2 remix/cue sections, \$1200. L Wagner, 407-299-1299.

Ramco DC 8-MS 8 pot solid-state stereo on-air console, 18 inputs, fully functional, good cond w/book, \$900. J Cunningham, KEOR/KHKC, Rt 2 Box 113B, Stonewall OK 74871. 405-265-4496.

Russco 50G mono, \$300; Ramco DC5AR, like new, \$200. J Parsons, 904-532-0192.

Snake 16 phantom-pwr inputs w/ext ps, 250' Belden 19-pr cable/mil connectors/ss strain reliefs, 10' Neumann XLR snake males w/box or Belden snake, \$750. R Katz, FAX 818-505-0149.

Soundcraft 3200 32x24x2 w/patch bay, 5 yrs old, xint cond, \$56,000/BO. Jeff, 312-559-1845.

Spotmaster, clean solid-state mono board, 16x2, looks & works great, lightly used, \$500+shpg. G Kirby, Gray Fox Video Prod, 13613 US 36, Marysville OH 43040. 614-261-8871.

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BA-44 monitor amp for RCA board for parts, \$25. Doug, 616-782-5106.

McMartin stereo console, 8 pots, \$895. Jose, 809-895-2725.

McCurdy audio board, good shape w/18 inputs, 1 echo return, SA 1371-06 timer, 4 banks of monitor buttons, EQ 1550, RTG mod, CM 7441 mod, OT 157B mod, intercom mic, 5 patch bays w/small rack, needs 3 PS boards, \$500/BO. Doug, 616-782-5106.

McMartin 10-chnl mono console, cosmetic cond fair, proofs well, solid state, BO. CE, Eclipse Bdcg Inc, 207-947-4487.

RCA BA-7 console, 2-chnl mono, dual chnl mono, or stereo, 1st 5 chnl mic inputs, next 3 line inputs, last 2 remote/line inputs, internal speaker amps, cue, muting relays, passes proof, clean cond, \$850+shpg; Gates Gatesway mono console, mic & line inputs, 2 holes in front panel where automation & 2-way cntrl was, passes proof, clean, \$500+shpg. F Vobbe, 419-228-4199.

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

Manual &/or parts for Micro-Trak 6509 5-chnl stereo Ditty Desk console. Steve, 214-491-2804.

Neve consoles: any condition or parts Also: UA, UREI, Teletronics, Fairchild, RCA, Pultec, API, any TUBE GEAR or COMPRESSORS Call 201-656-3936 or fax 201-963-4764

API/Neve, whole or parts, working or not. T Coffman, 619-571-5031.

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Want To Sell

EV MS-802 monitor speaker systems (2), wood grain, beautiful, \$550/pr; Jensen bookshelf speakers (2), approx 12"x20", \$50; Bose Model 901 active EQ, \$40. D Jackson, 203-762-9425.

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CRL PMC 300A, \$500; CRL SMP 400A, \$500; CRL SMP 400B, \$500; CRL NRSC pre-emphasis/filter, \$300; CRL NRSC de-emphasis/filters (2), \$300/ea. GM, KWED-AM, 210-379-2234.

CRL 400 Series AM limiter system, also Harris system, BO. J Stitt, 606-282-1160.

CRL PMC 300A, \$500; CRL SMP 400A, \$500; CRL SMP 400B, \$500; CRL NRSC pre-emphasis/filter, \$300; CRL NRSC de-emphasis/filters (2), \$300/ea. GM, KWED-AM, 210-379-2234.

MAP II audio chassis (2), partially wired, 16 slots per, Molex connector, 19" rack mount, \$20/BO. A Wasilewski, 509-248-1460.

Optimod-FM 8100A, new in 1983, manual incl, \$1000. KC Stuart, WFKZ, 93351 Overseas Hwy, Tavernier FL 33070. 305-852-9085.

Orban 9100A AM stereo multiband proc, \$2500/BO. D Matyis, KEVT/KASE, 512-495-1300.

Want To Buy

Gates, Inovonics, Fairchild, RCA, UREI, Teletronics, all types, solid state and tube. T Coffman, 619-571-5031.

Fairchild 670 or 660 tube compressor/limiter, Teletronics LA-2A tube compressor/limiter or UREI LA-3A solid state compressor/limiter, call after 3PM CST. 214-271-7625.

MICROPHONES

Want To Sell

EV RE-20 recond & new paint, \$300. M Miller, WSDM Radio, POB 650, Brazil IN 47834. 812-446-2507.

Telefunken/Schoeps CM61 tube mic, extremely rare & compl, uses std 6AU6 plug-in tube, orig ps, new cable, mint cond, BO/trade for C24. R Katz, FAX 818-505-0149.

HME-WM 252 wireless with SM58 mic transmitter, \$150; Telex transmitter & mic WT-200, \$195; Telex transmitter & mic WT-50, \$150. J Price, 214-321-6580.

AKG 460-EB/EV RE-27, more, BO. T Coffman, 619-571-5031.

AKG D-190E mics (2), \$80/ea; EV RE-15 mics (2), \$150/ea; Sennheiser MD-421 U5 mic, no clip, \$200; Shure 555W unidyn dynamic mic, vintage, \$50; 3 sets lapel mics, condenser/piezoelectret, in pouch with 3 Canons out, 2 with phone plugs, \$75; Shure 571 dynamic lapel mic with tie clip, long cord, Canon out, red velvet-type bag, \$35; Shure 444T controlled magnetic desk mic, grey with PTT bar & gain control grey, \$25; Astatic T-UG8-D104, chrome finish, stand with PTT bar, new in box, BO. D Jackson, 203-762-9425.

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AKG 190E, excellent, BO: EV 664 Judge Ito mic, excellent, BO. Steve. 214-491-2804.

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Want To Buy

AKG C24 mic. R Katz, FAX 818-505-0149.

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RCA 44 black/chrome mic, CBS/NBC or radio station call letter plate/flag. M Harrington, 501-223-9056.

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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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Want To Sell

A-Line rotating cart racks (2), very good condition, one holds 800 carts, one 400. Barry, KDES Radio, 619-325-1211.

Andrews HJ7-50A 1 5/8" coaxial heliax, 100', new on shpg reel with connectors & hanging accessories, \$1500. S Hill, KZZE-FM, 1016 Court St, Medford OR 97501. 503-857-1063.

Aristocart A W 20 110 cart racks, holds 20 carts ea, \$550. D Kelly, 402-372-5423.

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Road cases, 24"x27"x15" suitcase style, double handles, heavy duty, military spec, \$100/ea. L Wagner, 407-299-1299.

Giant radio boom box trailer w/4 kW gen, BO. D Matyis, KEVT/KASE, 512-495-1300.

MCI JH 110B 2-trk roll-around metal cabinet, good cond, BO. J Gelo, 941-642-6899.

Want To Buy

Altec 9067A or 9069A hi-lo pass filter or equiv 600-ohm type adj hi-lo pass filter set. D Dintenfuss, 206-784-4803.

Collins 831 D2, 5kV 1A secondary 220 V 10 plate xformer. A McCarthy, 707-446-0200.

Jazz record collections, 10" LP/12" LP be-bop, swing, dixie, highest prices paid. B Rose, Program Recordings, 228 East 10th, NUNY 10003. 212-674-3060.

MONITORS

Want To Sell

Collins 54-2 AM freq monitor, digital readout, frequency agile with manual, \$75/BO. G Bamett, 619-328-1104.

RCA/Belar SCA FM monitor, \$550; RCA/Belar FMM-15 stereo monitor, \$550. Jose, 809-895-2725.

TFT 724/734 stereo mod monitor, needs work, \$200. Paul, 912-632-1000.

RCA BW-50 (Belar AMM-1) AM mod monitor, calibrated 1/95, very good condition, \$75. F Vobbe, 419-228-4199.

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Want To Sell

Ampex 351 decks with Inovonics electronics, mono, BO; Ampex 351 deck with orig tube electronics, mono, BO. GM, KWED-AM, 210-379-2234.

MCI JH110A stereo recorders (2) in variable profile cabinets, excellent cond, \$800/ea. G Zeinger, 213-953-5310.

Pentagon C4322 & C4422 hi speed cassette duper, master & slave units, 7 copies per run, erase heads, auto rew, very good cond, \$2500/both. S Omlas, Zoo Prod, 1228 E 10 St, Brooklyn NY 11230-4719. 718-252-5274.

Revox PR-99 ply R-Rs (4), \$1495. Jose, 809-895-2725.

Studer B-67 rcdr, 7.5, 15, 30 ips 1/4" 2-trk, compi w/remote cntrl, manual & xport cover, fully svcd, xint cond, good heads, \$1600. R Streicher, 818-359-8012.

Studer C270/2, low hours, \$2950/BO; Revox HS77 Mk IV full-track mono, 10 hours use, \$750/BO/trade; port case for A77 with mon speakers & power amps, \$450. R Katz, FAX 818-505-0149.

Teac A7030SL, 40 hrs use, very clean mastering deck, \$700; Teac X3R, \$300; Realistic/Teac X3, \$300; Ampex AG-440C, \$550; Akai GX77, \$200; Inovonics 370 rcd amps (2), \$1250/ea. J Parsons, 904-532-0192.

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Ampex 351 decks (2) with Inovonics electronics, mono, BO; Ampex 351 deck with original tube electronics, mono, BO. GM, KWED-AM, 210-379-2234.

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Otari MTR10-2C stereo recorder, \$2195; MCI Sony JH110 B stereo in console, excellent condition, \$1250; MCI JH110 stereo in console, excellent condition, \$1000; Otari 5050 2SHD2 stereo in console, \$1000; Ampex 440 stereo in console, excellent condition, \$995; Ampex & Scully motors, parts, 8- & 16-track heads, BO. J Price, 214-321-6580.

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Teac Tascam 80-8 8-channel 1/2" tape R-R, \$1500; Crown 800 Series stereo R-R 10", \$200; Ampex 1091 stereos (2), \$50/ea; Wollensak 2770 cassette duper, stereo unidirectional, \$150; Pentagon 1100 Series 4-channel cassette duper, \$250; Sony TC-142 port cassette deck, \$150; Sony TC-152SD 2-speed stereo cassette deck, \$150; Wollensak Model 2851 cassette R/PB, heavy duty, BO; ITC Encore R/P mono cart R/P, S/N 434, \$300; Dukane Model 28A18 R/pulsers (2), 50 Hz @ 0.45/2.0 sec, BO. D Jackson, 203-762-9425.

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

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Tascam ATR 60 8 trk w/stand, remote, \$2250; Otari 5050-8 new heads, rebuilt, \$1595; Ampex 440B-8, \$1950; Tascam 25-2, \$495; Ampex ATR700, \$495; Scully 16 trk 2", \$2950; Tascam 52 top of line, \$650; M79-24 fully rebuilt, \$9,500; Tascam locator for 85-16, \$375; Foslex E22 1/2" timecode deck, \$950; Foslex A80 8 trk w/450 mixer, \$995. W Gunn, POB 2902, Palm Springs, CA 92263. 619-320-0728.

Want To Buy

Stereo Nagra w/NAB heads. R Katz, FAX 818-505-0149.

MCI capstan motors. J Price, 214-321-6580.

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Want To Sell

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Want To Sell

Avcom SCPC-2000E SCPC satellite receiver, 1 yr old, BO. E Stanford, WAFM WAMY, POB 458, Amory MS 38821. 601-256-9726.

Comstream ARB200 incl sat receiver, LNB-also sat-Q 400, \$2000. B Hearst, 814-226-4500.

Zephyrus 304 mainframe satellite receiver, Best Offer. C Mandel, 619-352-2277.

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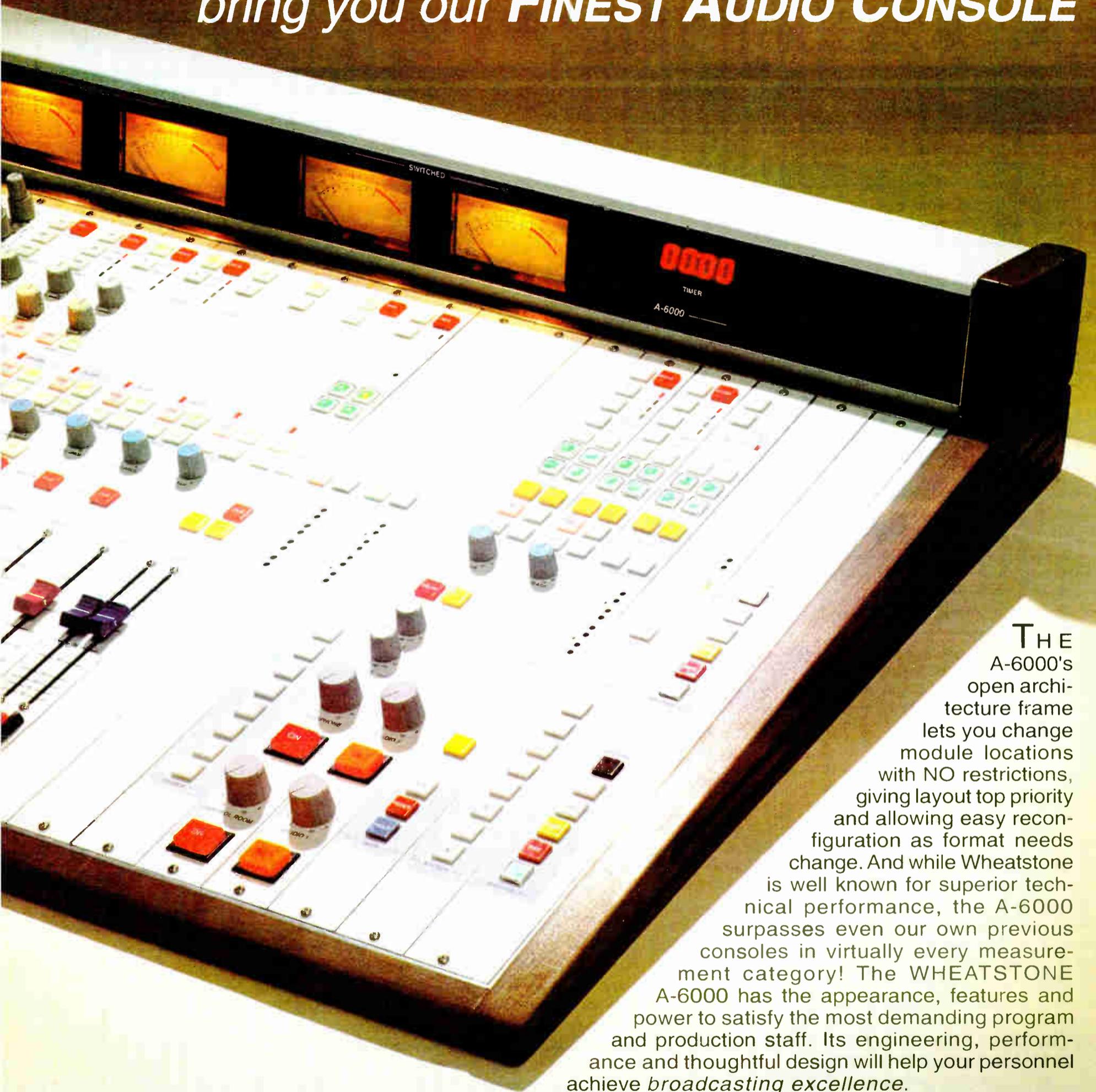
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