BULK RATE
US POSTAGE
PAID IN
DES PLAINES IL
PERMIT NO 321

Radio World®

Buyers Guide
Automation
Equipment
see pages 23-31

PO Box 1214, Falls Church VA 22041 | February 15, 1988 | Volume 12, Number 4

No Surprises In AM Stereo

by **David Hughes**

Washington DC ... There were few surprises in comments from station owners and receiver manufacturers on the Commission decision not to take a stand on AM stereo.

The commissioners voted 3-0 on 14 January not to select an AM standard. They also refused to require multimode receivers or to protect AM stereo pilot tones.

Most industry participants who were already in the C-QUAM camp agreed with Motorola in viewing the FCC's decision as an acknowledgement that a defacto standard—the C-QUAM system—has been reached.

Motorola's AM Stereo Manager Chris Payne called the FCC decision a "blessing" which confirmed that C-QUAM was a defacto standard.

Traditional Kahn system supporters said they were glad that the Commission's decision left room for broadcasters to decide on which system they think is best—including the Kahn system.

Leonard Kahn has refused to comment on the decision.

However, there was little concensus from either side of the AM stereo battle that the FCC action would result in a firm and final standard anytime soon.

Moot point

ABC/Capital Cities Director of Engineering/Radio Al Resnick said he is "fearful that, in a way, the AM stereo issue is growing moot—with the industry, the public and the receiver manufacturers. I am disappointed to see that."

He said that even if the Commission had selected a standard, "AM stereo would still be an uphill road. Now, things are beyond stereo" into the NRSC preemphasis standard.

Resnick maintained that the public, faced with a wide variety of technical advances in areas besides TV or radio, "just does not get excited about AM stereo anymore."

ABC/Capital Cities owns 11 AM stations, six of which have converted to AM stereo. "We have a mix of systems," Resnick said.

Winfield Standiford, CE of Washington DC's WKYS-FM, who had asked the FCC for a multimode receiver standard, said he was "happy to see that (the Commission) did not select an exclusive (transmission) system."

He stresses that the C-QUAM system has problems when it is used on AM synchronous transmitters.

"Right now, broadcasters still have a lot of options. We don't want to be locked in," Standiford said.

John Wright, president of Delta Electronics, which makes C-QUAM system exciters, said the FCC action "did not surprise me, considering the stage of the game. The FCC does not want to get back into the (AM stereo) game."

He admitted that the Commission was faced with a "no win" situation. If it decided to select the Kahn system, the Commission would have to face the wrath of the majority of AM stations that have already selected the C-QUAM system.

And, Wright added, if it had picked the C-QUAM system it would most surely face a "legal battle" with Kahn.

"The decision now rests with broadcasters," he indicated. Wright said a major boost for AM stereo would be the proliferation of low cost receivers that could be used in promotion efforts, such as the Target Tuning product.

Glynn Walden, the engineer in charge of Group W's AM operations, also said the FCC's action did not come as a surprise.

"I didn't expect them to choose a standard. It was not surprising," said Walden. In late 1986, Group W converted its AM stations to the C-QUAM system.

He refused to comment on whether the FCC's action would cause more stations to convert to stereo.

As for Kahn system supporters, Herb Squire, CE of New York's WQXR, accepted the Commission's decision with "relief."

"It would eliminate the problems of forcing a single system on the market," Squire said. "It is a step in the right direction."

"The FCC does not want to take a stand—or to risk misinterpretation that its decision might not be fair," he maintained.

Squire added that it is "too early to tell" the impact of the decision on the Kahn system.

C-QUAM supported

Ed Anthony, an audio design engineer with Broadcast Electronics, another C-QUAM exciter manufacturer, said he was "very pleased" with the FCC's decision.

Like Motorola, he said that the commissioners sent a "loud and clear statement ... for a single defacto standard."

Yet, he said he did not want to comment on whether the FCC action would create a surge in sales of C-QUAM transmission gear or receivers.

"There have been times when I thought there would be a great C-QUAM jump, and the industry produced a resounding yawn," Anthony said.

For more information on the FCC's decision see the article in the 1 February issue of **RW**. The FCC's contact is Marcia Glauberman at 202-429-6302.

NBC Exits Radio In O&O Sale

New York NY ... General Electric (GE), which owns NBC, has announced its intention to sell the network's radio properties. Last summer, the NBC radio programming networks were sold to Westwood One.

The NBC stations date back to the mid-1920s, with the formation of what is now WNBC-AM in New York.

The network's stations also include WYNY-FM in New York, KNBR-AM and KYUU-FM in San Francisco, WKQX-FM in Chicago and WJIB-FM in Boston. NBC has already announced the intention of selling another station it owns, WKYS-FM, Washington DC.

The firm recently sold WMAQ-AM, Chicago, to Group W/Westinghouse. That transaction was approved by the FCC 21 January, according to NBC Radio Division President Randall Bongarten.

"We are talking with a small number of investors for the sale of our (other) radio properties," Bongarten said. However, he would not disclose which firms GE/NBC was talking to, nor would he disclose the potential value of the deal.

Reportedly, the transaction could be worth $150 million—with another $45 million for the pending sale of WKYS

(continued on page 7)

NBC's Bongarten confirms plans to sell network radio properties.

REGULATORY NEWS

FM2 Band Proposed For UHF

by David Hughes

Hackettstown NJ ... The owner of a New Jersey AM daytimer has asked the FCC to allocate a portion of the UHF-TV band for a second FM radio band—a new twist on the FM2 idea.

The plan, dubbed "High Definition Radio," requests the shared use of UHF TV channels 32, 33 and 34 to be used by current AM daytimers, as well as some disadvantaged fulltime AMers and low powered FMers.

"The (UHF) spectrum is already assigned to broadcasters," said Larry Tighe, president of Radio New Jersey (RNJ), which owns WRNJ, an AMer in Hackettstown, NJ. It would be "just a matter of moving some (fellow radio stations) onto a lightly loaded band."

The issue of sharing the UHF-TV band comes at a time when TV interests are fighting attempts by the land mobile industry to share the TV broadcast band. TV broadcasters want to preserve unused frequencies in the band for advanced TV systems, such as high definition TV (HDTV).

The FCC has placed on hold a 1985 plan to allow increased land mobile sharing of UHF, while an advisory committee, which was formed in late 1987, studies advanced TV systems.

Original plan

Tighe's original FM2 plan, which was filed in 1986, asked for reallocation of the the 225-230 MHz band. It died last year when the FCC said that the band had been reserved for military uses and could not be given to broadcasters.

Thomas Stanley, head of the Commission's Office of Engineering and Technology, said that the frequencies the original plan sought were "vital to national security interests" and would "displace government operations."

"FM2 died in a skirmish with the military," said Tighe. "But no small amount of experience was gained in the process."

He had also proposed using but did not formally ask for the neighboring 220-225 MHz band for FM2. Early on, that idea was met with opposition from amateur radio operators, who use that band.

Tighe adds that he is trying to find a second FM band that would allow AM daytimers, as well as AMers that share time or fulltime AMers plagued by interference, to move to the new band.

Eventually, the affected AM operations would be discontinued, thereby reducing clutter on the AM band, Tighe said.

In its latest attempt for find new frequencies, Tighe's RNJ has asked the FCC to allow radio stations to use "existing Channels 32 through 34" to create 90 new FM channels—from 578 to 596 MHz.

Stations on the new band would be able to run 50 kW ERP, based on 150 m above average terrain. The primary service contour would extend out an average of 28.4 miles from the transmitter site.

The 200 kHz wide band would be spaced as—578.1, 578.3, 578.5, 578.7, 578.9, 579.1 ... 595.5, 595.7, 595.9.

"This request is in concert with the Commission's acknowledgement that those (UHF) frequencies were available to land mobile interests on a shared basis with TV broadcasters," states the RNJ petition, which was filed in late 1987.

RNJ questions the need for advanced TV systems, while contending that there is a strong need by daytimers, low powered Class IV stations, AMs that must share time and low powered Class A FM stations to improve their services.

"Presently, there is no indication of public interest in ATV and one is hard-pressed to understand why the Commission is attempting to solve a spectrum problem that is not known to exist," the RNJ petition contended.

AM problem more pressing

"It is well known, however, that the AM and FM bands are congested and serving the public poorly. Until that problem is solved by the reassignment of UHF spectrum to radio broadcasting, ATV has no right to consideration."

"For years now, the AM broadcast industry has been languishing in technical and economic despair," the petition indicated. "The same second class status that the TV industry fears has long been pushed on AM broadcasters and nothing in the way of massive roadblocking of bands was considered."

RNJ maintains that the TV industry "has used two carriers to carry their program material. This wasteful system could be converted over several years to a single carrier system. By frequency modulating the visual carrier as well as amplitude modulating the same carrier, both the aural and visual information can be carried on the same frequency.

"The removal of the aural carrier then gives additional bandwidth to the upper sideband of the visual signal," the company said. "That represents a spectrum and energy savings."

Tighe maintained that his filing "could not come at a better time." The issue of land mobile sharing of the UHF band has been "stopped dead" with the Commission's advanced TV inquiry, he stressed.

TV interests

Greg DePriest, VP of the Washington DC-based Association of Maximum Service Telecasters, which represents TV broadcast interests, said the RNJ plan was "crazy."

"Is there really a need to create more FM stations?" DePriest indicated. "For example, there are already 50 FM stations in the Washington area."

He added that in some areas there are already too many radio stations, causing some AMers to go "belly-up."

"Anytime someone sees a slice of unused spectrum, people will line up for miles for it," DePriest maintained. "There is no need for another FM band, and no need to expand the existing one."

"Look," responded Tighe, "TV stations use 6 MHz of spectrum. My AMer uses only 10 kHz. Instead of sharing the UHF band with non-broadcast interests, it could be shared with fellow broadcasters. That would be more of a natural situation."

At press time, Tighe said that he has not received much input from TV or other radio broadcasters because the "news is not out yet. I do know that there are come Class A FM stations that are interested, though."

For more information on the proposal, contact Larry Tighe at RNJ: 201-850-1000.

INDEX

FCC Clips

Super Bowl Rules

The FCC suspended its rules for auxiliary broadcasts in San Diego and Los Angeles for Super Bowl XXII.

The Commission lifted Section 74.24 from 25 to 31 January to permit advance coordination of auxiliary broadcast frequency usage.

Broadcasters were permitted to use whatever frequency necessary as long as they went through a designated frequency coordinator in Los Angeles, said Barbara Fair, of the FCC's Mass Media Bureau. The suspension allowed broadcasters to use different frequencies without seeking FCC approval, she explained.

The FCC took the same action for the re-dedication of the Statue of Liberty in New York, Pope John Paul II's visit to the United States and Soviet Gen. Mikhail Gorbachev's recent visit to Washington.

The FCC suspends the rule to eliminate uncoordinated use of auxiliary broadcast stations on an automatic STA basis which it fears might result in spectrum congestion and excessive interference causing less complete broadcast coverage.

The contacts at the FCC's Mass Media Bureau are James Durst and Barbara Fair, 202-634-6307.

Ax Cross-Ownership Rules

The NAB asked the FCC to modify or drop its newspaper/broadcast cross-ownership rules—but the move could prove fruitless with Congress having prohibited cross-ownership in television.

Before Congress adjourned for Christmas, it passed legislation prohibiting the FCC from changing cross-ownership rules as they apply to television. The move was widely viewed as targeting publisher Rupert Murdoch, who owns TV stations in the same markets where he owns newspapers. The FCC had granted him temporary waivers to hold both properties.

The NAB filed comments at the FCC in support of the rulemaking petition of the Freedom of Expression Foundation (FEF). The NAB said the FCC's concerns about diversity of broadcast properties when it adopted the rules in 1975 are no longer valid because of tremendous growth in the number of diverse information sources in the marketplace over the past decade.

The application of the newspaper/broadcast prohibition "may have led to the demise of papers, or stations, which would otherwise be serving the public," the NAB said.

The most recent Congressional action prohibits the FCC from extending waivers.

In wake of the action by Congress, the FCC said it could halt consideration of any changes in newspaper/broadcast rules, which apply to radio and TV.

For more information, call Bob Hallahan at the NAB, 202-429-5479.

NAB Endorses Class A Upgrade

by David Hughes

Mauna Lani HI ... The NAB Board of Directors, meeting in Hawaii in mid-January, approved a plan for Class A FM upgrades, continued its push for changes in FM translator regulations, and has earmarked funds for AM improvement.

The Class A power hike plan differs from one proposed by a group of New Jersey Class A stations. While the NJ group, which has a petition before the FCC, has argued for a blanket increase to a 6 kW level for all stations, the NAB wants each station to file individually.

The board said that stations "upon individual application to the Commission ... should be allowed to upgrade their powers from 3 kW to 6 kW, provided that the Class A station meets certain mileage separation minimums."

Differences noted

Mike Rau, head of the NAB's Science and Technology Department, confirmed that the plan endorsed by the FCC specifies different mileage requirements, which offer more protection to more powerful Class B's and Class C's, in comparison with the NJ plan. (For details of the NJ group's plan see **RW's** 1 February issue.)

"We are offering a plan that would allow about 60 percent of Class A's to upgrade," he said.

The board also directed the NAB staff to appoint an engineering subcommittee to examine other alternatives for Class A stations, apart from the power hike proposal.

The new subcommittee, which would be composed of some of the members of the current FM Transmission Subcommittee, along with some "Class A interests from the northeast," Rau said, would exist just for a few meetings to discuss problems specifically affecting Class A's.

Some backers of the NJ plan maintained there are relatively few Class A owners on the FM Transmission Subcommittee. At press time, the NAB said that the committee was expected to hold its first meeting by February, although no date had been set.

FM translators

The NAB board also passed a resolution asking the FCC to "begin an immediate proceeding to review FM translators including the financial and technical aspects thereof."

> *... the NAB wants each station to file individually*

It asked the Commission to enforce its existing rules while it continues an investigation into so-called translator "abuses."

The NAB has said it is concerned about the proliferation of "third-party" translators, which are not owned by any station, which relay a station's signal outside its market for a fee.

The NAB said it "strongly opposes any expansion of the current translator rules leading to the creation of a low-power radio service or in any other way which would undermine the local broadcast service now provided by full-power FM stations."

The association maintained that it wants to "restore the FM translator service to its original purpose"—mainly to allow a station to serve its entire coverage area adequately.

The board stressed that the FCC created the FM translator service to "provide FM radio service to underserved areas on a non-interfering, non-profit basis ... The abuse of FM translators now poses a severe threat to the economic viability and technical quality" of the FM band.

"The translator issue is one of our biggest issues this year," Rau said.

AM improvement

In other technical matters, the board of directors passed a resolution to spend up to $500,000 "if warranted—to take whatever step necessary to salvage the AM industry."

The NAB said that the resolution "followed an exhaustive and comprehensive discussion" of AM radio's plight."

Rau said that the NAB staff will determine in the near future where the funds should go. "We're looking at a number of areas such as the super radio project, the antenna project, and other areas. No specific projects have been targeted yet," he indicated.

Areas where the money could be spent, the NAB said, include the Radio Executive Committee, the AM Improvement Committee and the NAB/Radio Advertising Bureau Radio Futures Committee.

The board also said it supports a plan to increase effective signal-to-noise ratios at radio stations "where these developments would be consistent with reasoned technical integrity of the radio bands and which would avoid degradation of existing radio service areas, day and night."

In other developments, the board authorized the NAB's Legal Department to appeal the FCC's indecency decision in court. The NAB maintains that the decision is still "too vague and does not give broadcasters enough direction."

On the issue of the All-Industry Music Licensing Committee, the board agreed to form a task force to "develop ways to raise funds needed to settle the committee's debt and to help reorganize and restaff the committee."

NAB President Eddie Fritts pronounced the NAB "healthy." He said membership is at an "all time high ... Our budget is in good shape and we've had our game plan to continue that way even if there are a few bumps in the economy."

The association approved a budget of $14,397,050, a increase of 6.2 percent over the previous budget.

For more information on technical issues addressed by the board contact Mike Rau at 202-429-5346. For information about general issues contact Bob Hallahan at 202-429-5479.

"Radio Days" Over at 30 Rock

by Judith Gross

Falls Church VA ... The **Golden Age of Radio ends** at 30 Rockefeller Plaza ... and not with a bang but a whimper, after all.

First **NBC** sold its three **radio programming networks** to Westwood One. Now it's the **radio O&O's** that are on the block.

There was a time when belonging to a prestigious national network was a source of pride ... when **"going to the net"** was a sacred operation at any local station.

The network used to be the **last word** in news and programming ... this was true, by the way, right through the **hit radio days of the sixties.**

(I can still remember switching from **WABC** to **WMCA** five minutes before the hour when ABC news came on to hear those few more precious moments of music then back when the Good Guys station went to the net at the top of the hour for their newscast.)

Those days are gone. But maybe it's just as well. Now it's up to the local folks to make radio something worth listening to. The rules of the game sure have changed ...

Meanwhile **religious broadcasters** are in the midst of changing the rules for their members—making them more stringent when it comes to **financial accountability.**

Still reeling from the scandals of this past year, the NRB was about to have its annual gathering in DC as we went to press.

They were expected to take up proposals for self-regulation and strict new enforcement rules.

Billy Graham was slated to talk about financial and moral accountability from a Biblical perspective.

Gone are the days when the **media ministry** was *only* accountable to a **Higher Power.**

☆☆☆

The **NAB Board** left the snow and blustery January of much of the mainland for **Paradise** when they held their annual meeting in Hawaii.

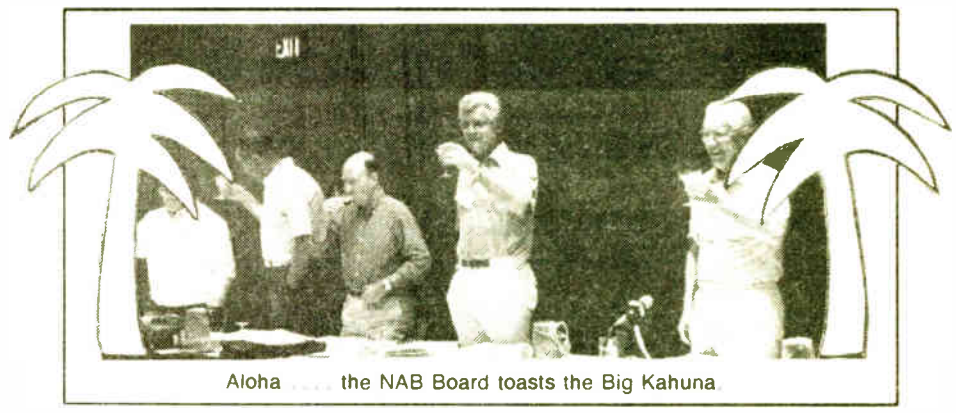
In addition to **toasting President Eddie Fritts**, several substantial issues came out of the Kohala Coast jaunt.

There was a lot of time devoted to continuing efforts to foster **AM improvement.**

There were a number of ownership items on the agenda as well.

For one thing, the Board wants to see the legal department do a **"white paper"** to analyze and critique the FCC's attitude that the public is best served by **licensing more and more stations.**

Yeah, we know that in cases like AM and now even FM, there's overcrowding and all its resulting headaches.



Aloha ... the NAB Board toasts the Big Kahuna

But sometimes those who already hold the licenses act like they want to remain an **exclusive club** ... no new members allowed.

Sure increased competition puts the pressure on. But there are some instances (AM's tendency to stagnate, is one) where **new blood** coming onto the scene could help, not hurt.

☆☆☆

It was kinda surprising that when **receiver manufacturers** were polled at the last NRSC meeting about supporting a **trademark certification** for new, improved fidelity wideband AM radios they said okay, but *only* if the description **did not include AM stereo.**

Hmmmm ... thought the whole idea was to describe **improved** AM radios. Don't they consider **stereo** an improvement?

Two suggestions for names, in addition to those sent in by **RW** readers came out of the meeting as well.

One was **AMNR**, probably for AM with the NRSC standard, the other was **AMWB**, presumably for AM wideband.

And from an associate comes yet another suggestion. Along the lines of Hi-Fi, Lo-Fi and whatever-fi, how about **"In-Fi"**?

What's it stand for? Why **Infidelity AM** of course. With the success of the movie *Fatal Attraction* and the hoopla over the antics of **Gary Hart**, it just might fly ...

☆☆☆

Hear and there ... Paul Kaminsky, the voice and the brains behind **Motor Sports Radio** says from now on the only stations he's doing custom motorsports reports for are those with **single line frequency extension equipment.**

Kaminsky, who operates out of **beautiful Johnson City** in upstate NY (right next to Binghamton where I spent 12 crazy years, six of them on-the-air), says it's a matter of quality ...

A shootout at high noon, or maybe its more like all day long, is taking place down under.

It's a battle to find an **SCA standard** in New Zealand and Australia. Fighting it out are **Modulation Sciences** of Brooklyn and **SCA Data Systems** of Santa Monica, CA.

Hmmm ... I guess that kind of makes it an **East coast-West coast** battle.

Had a nice chat recently with Jeremy Millar and Rodger Clamp who work at an AM-FM combo in **New Zealand.** The two were visiting to see what's hot on radio here in the States.

They say that you wouldn't find the **heavy processing on FM stations** there as you do here. Also, the Nashville country sound isn't quite so big down there, but Jeremy thinks it's going to be.

A couple of columns back I lamented the fact that **WLS**, one of the last of the great AM giants had gone all talk.

I'm happy to report that's not so. They're still **playin' the hits** during the day.

And last time I mentioned the **copy-code** debate I called the device which would be placed in recorded music a tone. Of course it's not. It's a **notch at 3840 Hz.**

Just wanted to see if you were paying attention ...

Heard something interesting? Spill your guts to **Earwaves.** *Write PO Box 1214, Falls Church VA 22041, or call me at 703-998-7600. Best tidbit of the month wins a coveted* **Radio World** *mug.*

OPINION

Readers' Forum

Got something to say about *Radio World*? Any comments on articles? Call us at 800-336-3045 or send a letter to Readers' Forum (*Radio World*, Box 1214, Falls Church VA 22041 or MCI Mailbox #302-7776).

It's up to AMers

Dear **RW**:

The station that responded to Judith Gross that "We will go stereo when a majority of AM radios on the market are stereo" is asking the manufacturer to do their job for them.

AM broadcasters must begin to realize that no one else but the AM broadcaster is going to bring about an AM signal of fidelity sound in stereo *except* the AM broadcaster.

Manufacturers have their own problems and sales oriented goals and they do *not* include providing radios of a signal that is *not* being broadcast.

If you are an AM broadcaster *you* should be doing all you can to provide your listeners with the best today's technology offers . . . to do less is a disservice to your audience.

Dick Schlipp, VP/GM
WEEU
Reading, PA

Not for engineers only

Dear **RW**:

I am sure you have heard the phrase, "I am not an engineer." Well I certainly am not. I am an owner and manager of a couple of radio stations.

And I want to let you know something that you have known for a long time. And that is that I, for one, look forward to and would not miss an issue of **Radio World**.

The basic reason for my letter to you today is to encourage all managers to get a bi-monthly copy of **Radio World**.

Although some of the articles are a little too technical for me, I can follow along pretty well. And boy do I gain knowledge in a part of my industry that I need to learn more about.

It seems to me that all managers should have a working knowledge in the technical department. Let's face it, without the engineers we would not have a station.

And also by reading **Radio World** one keeps up to date on the latest news and equipment. I read the advertising and I read the editorals and enjoy the contributing articles from engineers around the country.

Keep up the good work **Radio World**. And encourage other managers to become readers. It sure can't hurt. And it might even help a little.

Shelly Davis
President
WKKX
St. Louis, MO

More on IGM

Dear **RW**:

A lot has been written about IGM's change in service policy.

Our station is no stranger to their quality having used their systems for 25 years on our FM side.

And over the last 16 years they have been helpful in tracking down a bug or two during my time here.

But looking at the costs we see in everything we purchase today, I guess the question is: do we want to have IGM's (and other's) costs built into the purchase cost, or just the users paying for it?

Jack Thomas Vobbe, CE
WLEW AM/FM
Bad Axe, MI

Decline of A Dynasty

When the National Broadcasting Company signed on the air more than 60 years ago it marked the beginning of the networks' rise to power.

NBC's alliance with the Radio Corporation of America helped sell receivers which fostered the fledgling network and began a symbiotic relationship between broadcasting networks and the development of new technologies.

NBC's recent sale of its radio networks, and now its plans to sell off its O&O stations are signs of how far the mighty have fallen.

There have been others. The closing of the CBS Tech Center and the donating of the David Sarnoff Research Center by NBC to SRI are two.

The fragmenting of network programming is another indication of this trend in the radio industry.

This appears to be part of a continuing move away from network leadership which, while mourned by some, may offer increased opportunities for individuals and smaller group owners.

The loss of influence from New York City has meant a greater role for localized management of stations and more community-related programming.

And the changes at the networks have also been the result of much needed cost-cutting and an end to the free-wheeling spending habits.

The rest of the industry should be reading these signs carefully for guidance on what the next few decades will bring.

Equipment vendors will have to cultivate more individual and small group owners instead of always "thinking big."

Trade associations will have to do likewise, recognizing that their future strength will come not from a few very big players, but from many smaller players with diverse interests.

And smaller broadcasters will likewise have to realize that they can no longer rely on the networks to provide new technology and programming.

All factions must begin to find ways to support tomorrow's innovations—with the resultant costs and benefits—themselves.

The recent decline of network domination is a call to greater participation and initiative from the rest of the industry.

—RW

Radio World

Vol 12, No 4 February 15, 1988

Publisher: Stevan B. Dana
Editor: Judith Gross
Buyers Guide: Marlene P. Lane
News Dept.: David Hughes, Mgr.
Alan Carter
Production Editor Alex Zavistovich
Circulation Mgr.: Marion Alsup
Advertising Coord.: Simone Leeser
Production Dept: Jean Barnes, Mgr.
Gina R. Rosario,
Jeanne Pearson/
Graphic Artists

Radio World (ISSN: 0274-8541) is published twice a month by Industrial Marketing Advisory Services, Inc., 5827 Columbia Pike, Suite 310, Falls Church, VA 22041. Phone: 703-998-7600.

Advertising Sales Representatives
East Coast
Ernest Robitel **516-671-2502**
Midwest
Steve Dana **800-336-3045**
West Coast
Patricia B. Macsata **415-786-2198**

Free subscriptions are available to professional broadcasting and audiovisual equipment users. For address changes, send current and new address to RW a month in advance at the above address. Unsolicited manuscripts are welcomed for review; send to the attention of the appropriate editor.

AM Stereo: A Call For Action

by Dave Van Allen

Murrysville PA . . . Before sitting down at the word processor to write this I decided that I would not do a few things.

I would not categorically condemn the entire FCC system for its recent actions on the AM stereo issue and the petitions they had to act upon.

I also would not blame the issue on Leonard Kahn for his years of confusing and oftentimes lethal propaganda.

Nor would I give up hope that someday we as AM broadcasters could enjoy transmitting AM stereo to our listeners.

But reality prevails . . . we are set back at least three years. We waited and hoped for the NTIA to "fix" the AM stereo machine; they did not.

We secretly hoped that AM stereo would mend itself; it has not. We said receiver makers would sort out the mess; they couldn't.

And where has the NAB been hiding in all this?

Furthermore, how can the Commission justify a "we know it's broken but we can't fix it" attitude while still claiming to operate in AM radio's best interest?

The Texar petition for a single AM stereo standard clearly pointed out to the Commission that a standard is needed. They chose to ignored it.

The Commission must have heard the rounds of applause each and every time a broadcaster stood up at a trade show said "give us a standard."

Or if they heard that applause, could they somehow have not gotten the hint? We need and want an AM stereo standard.

Guest Editorial

The Commission has also failed to realize the important link between AM stereo and the implementation of the receiver manufacture's end of the NRSC standard.

Without both . . . we may have none. The fact in this statement will emerge in due time, just watch.

There is no need to go into the intrinsic details here of why we are losing this battle.

Suffice it say that the caustic mudslinging between Motorola and Kahn was a big factor, with the threats of law suits, anti-trust violations and patent infringements sailing around.

Seriously, if you ran a multi-million dollar receiver company would you get involved in all of that . . . for a lousy AM radio line?

We are no closer to having a thriving, growing AM stereo system on the air today than we were when we started this brouhaha years ago.

So what do we do now?

The Commission has closed the book on AM stereo. Fine.

The hue and cry from Kahn and Motorola will continue to be heard. Great, we're all used to it by now.

AM radio will stay smack dab in its current lethargic state . . . well, no way!

Now that we are clear on who our friends are, and who are not, we have the answer.

I for one am going to recommend to all my clients that they put on the Motorola C-QUAM system, right now. Why? Because it has the best shot, period.

I am going to strongly advise them to implement the NRSC curve because it works and makes AM sound better.

And I am going to hope everyone reading this does exactly the same thing. If we all do this you can count on receivers, lots of them, playing to the ears of your listeners and clients.

So listen up FCC, NAB, NTIA, receiver manufacturers, Kahn and Motorola: We've had enough . . . we're going to win this one for ourselves!

Dave Van Allen is a consulting engineer who installed 50 of the earliest AM stereo systems in North America. He can be reached at 412-733-7975.

ALLIED

The *FULL SERVICE* Broadcast People

The new 3rd choice may be your 1st

ANDREW and **ALLIED** announce new 2¼" **HELIAX®**. Class A to Class B. . . Class B to Class C. 2¼" may just be what you've been waiting for. The money-saving choice is here!

"TEST DRIVE THE MIDSIZE"℠

3" HELIAX®
Mfr. List $22.30/ft.

Loss per 100 ft. . . 0.013 dB*
Average Power. . . 37 Kw*

2¼" HELIAX®
Mfr. List $17/ft.

Loss per 100 ft. . . 0.169 dB*
Average Power. . . 20.1 Kw*

1⅝" HELIAX®
Mfr. List $12/ft.

Loss per 100 ft. . . 0.207 dB*
Average Power. . . 14.4 Kw*

*Reference: 100 MHz
Air Dielectric

A complete selection of accessories for the new 2¼" **HELIAX®** is available. EIA flange connectors assure compatibility.

BOOTH 557
NAB BROADCASTERS

Prices are in U.S.$ excluding freight & handling.

ATLANTA, GEORGIA 404-964-1464
LOS ANGELES, CALIFORNIA 818-843-5052
CHICAGO, ILLINOIS 312-470-0303
RICHMOND, INDIANA 317-962-8596
DALLAS, TEXAS 214-423-8667
SEATTLE, WASHINGTON 206-838-2705
RICHMOND HILL, ONTARIO, CANADA 416-731-3697

USED EQUIPMENT DIVISION 317-962-1471
BROADCAST SYSTEMS DIVISION 714-752-6664
SATELLITE EQUIPMENT DIVISION 317-962-8596
NIGHTS/WEEKENDS EMERGENCY 317-962-8961

ALLIED
Broadcast Equipment
P.O. BOX 1487 • RICHMOND, IN 47375
Join Our FAX Network • Prompt Response on Your RFQs
FAX 317-962-8961
Log In. . . Bulletin Board Modem. . . 317-935-0531

Not All Daytimers Going Night

by Alan Carter

Washington DC ... Some AM daytimers are turning down the opportunity to operate throughout the night, despite a long-fought battle for this rule change by most AMers.

Of about 1,200 qualifying stations 444 responded as of late January to an FCC Show Cause Order specifying the nighttime power levels for individual stations.

Of these, 62 said they did not want to go full time. That is according to Henry Straube, who supervises AM licensing at the Commission.

Stations declining the offer said the power level allocated was too low, Straube explained. The stations were authorized to operate during nighttime hours with a maximum power of 500 W, reduced as necessary to avoid interference to existing full-time stations.

Most stations, however, received power levels substantially below the maximum.

The FCC's plan allowed daytimers on regional channels and on 940 and 1550 kHz to add nighttime operations effective 1 December. Their power level calculations are based on protection to existing full-time stations, but not the proposed nighttime operation of the other former daytime-only stations.

Regional channel extension was the latest rule change increasing night operations for daytimers. The Commission adopted rules in October allowing daytimers on the 14 Class I-A foreign clear channels to operate at night.

Stations did not question their power level authorization, but "a few" asked about other stations, Straube said. "In one case, I know they were right (about interference)."

WKCW case

One station turning down the nighttime offer is WKCW in Warrenton, VA, which was granted 42 W, compared to a 5 kW daytime power level.

With its tower approximately eight miles from the largest town in the coverage area, the signal would not be strong enough to reach there, said Program Director Ben Burrows.

"It wouldn't help us in our area," Burrows said. "We try to maintain the same sound that the radio had when it went on the air 28 years ago. With the sound that we do, the beauty of radio is we sign off at night."

WKLY in Hartwell, GA, also turned down the chance to stay on the air around the clock. "We do not have the equipment to modify (our signal), and the power would be so low," said General Manager Jo Ann Moore.

> *"...(the nighttime signal) probably wouldn't get across town."*

The FCC granted the station 149 W for night, compared to its 1 kW daytime power. Moore explained that for her operation, it was not economically feasible to continue to broadcast at night.

She also said the nighttime signal "probably wouldn't get across town." WKLY's tower is about 2½-3 miles outside Hartwell. "That (the 149 W) is just pitiful," Moore added. "I would settle for 500 W."

Taking advantage

While some are opting to sign off at their usual time, the majority of AM daytimers responding are choosing to begin night broadcasts.

In Sayre, PA, WATS continued its programming the first day it could, according to CE Larry Brown. "The hardware was in place, and it was a matter of just not switching off."

WATS was given 50 W, the same as the post sunset power level. The station operates at 5 kW in the daytime. Located in a valley, 50W is enough power to carry WATS's signal into the three towns the station mainly covers, Brown said.

Going full time also "simplified our operations significantly," Brown said. He has "innumerable memories" of someone forgetting to turn the station's equipment off at the right time. Now, the operations are computerized for the 24-hour operation.

"In my opinion, it simplified and removed the jeopardy of some operator not turning the transmitter off at the right time," Brown said. "It's given me some peace of mind."

The opportunity to continue operations was a natural extension for KACT in Andrews, TX, said PD Sharon Nichols. Sister station, KACT-FM already was on the air 24 hours, and the stations just began around-the-clock simulcasting. "It was more convenience than anything," she added.

The FCC granted KACT 240 W for night, one of the higher allocations. The station operates at 1 kW in daytime. Nichols said the nighttime wattage gave the station "fairly good" coverage. "It covers our side of town."

When the FCC issued the Show Cause Orders, the FCC's Straube said, the Commission granted the nighttime broadcasting rights automatically. Now, the FCC will have to go back and change the authorizations of the stations who do not go 24 hours, he explained.

Processing responses

The FCC asked stations to notify the Commission within 30 days of the announcement on 19 November if they would go to nighttime. Straube said he assumed the stations that have not responded will retain the night allocation unless they tell the FCC differently. "We probably wouldn't say anything if people were to respond today," he added.

At the NAB, Deputy General Counsel Barry Umansky is "a little bit surprised" that some stations are turning down this opportunity. He said, however, that the decision is a business judgement for stations.

"There have been some tremendous success stories of stations with no more than 20 W," Umansky said. He encourages engineers to contact the FCC's AM branch if they have questions about the allocations. "I talked to some stations that were befuddled on why the watts (allocated for nighttime) were lower than the PSSA."

Umansky said he believed the FCC should remind stations about the deadline to get a more accurate picture of what stations are doing.

"I have talked to some broadcasters who have as much as 100 W who are not using it," said Bud Walters, chairman of the NAB Daytimers Committee. "In the real sense of the word, no matter the power a person has ... they have the ability to have some meaningful coverage in their area."

He admits the move to full-time broadcasting is a "personal business decision. In some instances it involves some expense."

He said that if a station receives less than 20 W, the extension "may be questionable if their tower is 10 miles out of town. Everything is relative to where your tower is, and your frequency."

Walters, president of the Cromwell Group based in Nashville, TN, said one of his stations, WHRS in Winchester, KY, has a 40W nighttime authorization. He is going full time but did not face additional expenses because the station is equipped for multiple powers.

He encouraged stations to consider all the possibilities posed by this authorization. "At least now there is a choice," Walters said. "It may not be exactly what they want, but it's more than has been possible."

For more information on nighttime authorization by the FCC, contact Louis Stephens at 202-254-3394.

NBC Wants To Sell Off All O&O Radio Stations

(continued from page 1)

which is being handled separately, an NBC official speculated.

Several firms have been mentioned as possible purchasers of the stations including Emmis Broadcasting, which owns stations in New York, Washington DC, and Los Angeles, and Quantam Media, which is owned in part by MCA and by Robert Pittman, formerly the head of the MTV cable network.

Group W, which already owns stations in New York and Boston (and now Chicago) and Westwood One have also been mentioned.

NBC spokesperson Dom Giofre said the firm of Kidder Peabody and Co. will handle the sales. "We are talking to a limited number of prospects," he added. Like Bongarten, he would not discuss possible purchasers.

GE, which purchased NBC two years ago, had obtained waivers from the FCC in order to temporarily hold on to its radio stations in markets where it owns TV stations. The affected markets include New York, Washington and Chicago, where the network owns WNBC-TV, WRC-TV and WMAQ-TV, respectively.

Commission rules prohibit a firm from acquiring radio—TV combinations in common markets. Previously, RCA-owned NBC had been grandfathered from the rule's effect.

GE sold the NBC radio networks—NBC Radio Network, The Source and Talknet—to Westwood One, which owns the Mutual Radio Network, last July. The individual stations were not affected by the action.

In related news, NBC spokesperson Cathy Lehrfeld, who handled the network's radio division, has been named director of public relations, east coast for Westwood One.

For more information on the NBC radio station sale, contact Dom Giofre at NBC at 212-664-2540.

Audiopak Carts Still Available

by Alan Carter

Los Angeles CA ... The supply of Audiopak broadcast cartridges appears to be plentiful as negotiations continue to sell off the broadcast cartridge portion of Capitol Industries.

Of five distributors contacted at press time, no one reported major problems in obtaining Audiopaks from Capitol, and only one said he had a drop in sales.

Capitol announced in December the company would withdraw its Capitol Magnetic Product Division from the magnetic tape business and close the Winchester, VA, plant. Capitol sustained losses in its cassette manufacturing business due to overseas competition.

Interest in the cartridge and cart tape division, however, came to light when Capitol announced the shutdown. The company now is looking at offers from prospective buyers.

But in the meantime, distributors said customers are buying the product and Capitol is reported to be filling orders on time.

After an initial dip in sales following Capitol's announcement, Audiopak sales have rebounded, according to Bryant Ellis, owner of Broadcast Cartridge Service (BCS) in Huntington Beach, CA. "It was our best-selling cartridge here," he said. 'It seems to be coming back."

BCS's Audiopak sales declined about 25%, Ellis noted, while sales of 3M's Scotch cartridges increased about 25 to 30% and sales of Fidelipac cartridges rose between 4 and 5%.

Smooth and orderly

He said Capitol initially withheld Audiopak shipments for about a week, but processing now is "going through smoothly and orderly." BCS has no back orders, Ellis continued and asked, "How many would you like to buy?"

BCS, however, is not aggressively selling Audiopaks until questions around the sale of the company are answered, Ellis said. "We hope to continue to be able to offer it to our customers."

Meanwhile it's "business as usual," said Allied Broadcasting National Marketing Director Dave Burns in Richmond, IN. Customers continue to place orders for the cartridges with Allied, and Burns speculated Capitol had stockpiled a supply because he had no problem filling orders.

Burns added that he expects the Audiopak to continue in production and said he hopes the new buyer will continue production, so customers will not notice any change.

Crouse-Kimzey General Manager Mark Bradford, Fort Worth, TX, said he had 24 carts on order but expected no problems because Capitol filled recent orders for associated supplies.

He admitted he is "leery" because of the uncertainty. But Bradford said, "If somebody wants the product, we go ahead and take the order and try to fill it."

Taking orders

"So far, we've had excellent luck (in filling orders)," said Northeast Broadcast Lab (NBL) Sales Manager Criss Onan, based in Glens Falls, NY. He recently placed three or four orders for about 1,000 carts, and Capitol filled the shipment.

"Customers are still placing orders," Onan continued, "and they want what they can get." He added that NBL warns customers "that it can be a potential problem" because of the sale.

"We've had absolutely no problem at all (filling orders)," said Broadcasters General Store President Bill Shute, headquartered in Ocala, FL.

Shute said he suspected a change at Capitol and stockpiled Audiopaks, so he could fill his orders. "But as we ship it out," he added, "we are not having any problem filling it back in." Shute has not noticed a drop in orders.

Capitol's response

"There is plenty of raw material to keep in production, and we're certainly supplying all our customers with their needs at this time," said a Capitol spokesman who asked not to be identified.

Capitol Magnetics is running its "normal shifts," the spokesman said, and the parent company is not saying how long its manufacturing plant will operate. "At this point, we're continuing on. There is no set date."

On the sale negotiations, the spokesman declined to release any information. There is no date for a possible sale, he said. "In fact, we're still negotiating with several parties."

He would not disclose the names of those involved. "I can't release that. It's privileged. I will not disclose that information."

Fidelipac, who has confirmed it is one of the companies interested in buying the rights and certain manufacturing assets and keeping the Audiopak line going, continues to report nothing new in the negotiation but remains hopeful.

Industry sources say there may be as many as three or four other interested parties looking at a possible purchase.

For more information Sue Satriano at 213-462-6252.

VOA Settles Dispute Over PCBs

by David Hughes

Washington DC ... The Voice of America (VOA) has settled a dispute with a Virginia-based consulting and engineering firm that requested it be released from a contract because of the presence of toxic PCBs.

Multiphase Consulting, of Falls Church, VA, entered into an agreement with the VOA in January 1987 to do wiring work in connection with the $6 million project to rebuild 19 studios at the VOA's Washington DC headquarters.

However, after it noticed that its workers were coming in contact with a wire lubricant that contained PCBs, Multiphase asked to be released from the contract and be paid for the portion of the work it had performed.

For almost a year, the VOA refused.

Then, in a late December 1987 letter to Multiphase General Manager Henry Stewart, VOA Director of Administration Earl Klitenic indicated that the government broadcaster would pay a portion of the $7650 contained in the original purchase order with Multiphase.

Multiphase was contracted to connect and solder wire to terminal blocks in the master control equipment and wiring room at the VOA headquarters.

Compensation sent

"VOA recognizes and is prepared to compensate Multiphase Consulting for the efforts put forth on the wiring project," Klitenic said in the letter to Multiphase.

He added in the document that the VOA would pay $1880 to Multiphase—for the most part what Multipath had requested.

In the claim, Multiphase said that the US Information Agency (USIA), the VOA's parent organization, contracted with the firm in January 1987 to work with wires that leaked oils containing toxic PCBs.

However, Multiphase claimed that the USIA's contract indicated that its workers would have no exposure to the dangerous substance.

The VOA's "statement of work to be performed" indicated that while the old wiring in the project "contains some level of the carcinogen PCB in an oil compound that was used in manufacturing of the wire, there will be no exposure to PCB while working in this area ... "

Contamination reported

Stewart indicated that while handling wires in early February 1987 he "became contaminated by the PCB oil. Closer inspection revealed that although the ends of the wires were sealed to prevent leakage, the oil was leeching out through the wire jacket and onto the adjacent wires that we were handling."

"It was at this point, after our close examination of the mainframe, that we determined the PCB oil had not been contained, and that contrary to the terms (contained in the contract), work on the (project) would expose our technicians to PCB oil," he maintained in the complaint to the VOA.

While Multiphase said it continued its work on another phase of the project, it stated that since the terms of the contract involving the containment of the PCB oil was invalid, the USIA should pay for the work Multiphase had performed to date and release it from further obligations contained in the contract.

On 9 February 1987, Multiphase asked for $1880 for the work it had performed. However, in a March 1987 letter, Dorothy Tyler, a VOA contracting officer, disputed a Multiphase contention that the work was awarded on a labor hour pricing arrangement. She stated that the firm would only receive payment after all the work was completed.

"Your claim that there was danger in the area has not been substantiated by the VOA health and safety office and therefore is not an acceptable reason for not completing the work."

However, following a claim Multiphase submitted in June 1987 to the USIA Office of Contracts, Philip Rogers, the director of the office, recommended settlement in December for the $1880 figure. However, the VOA refused to pay late charges, which were also requested by Multiphase.

Satisfied

Stewart said despite the delay in receiving the payment, he was satisfied with the final outcome. "They were fair with us. It took a while."

While Stewart admitted that the VOA official in charge of the wiring project, Richard Majestic, "did not hide the problem, when I saw it on my hands I became concerned. We would be working on thousands of terminals. I just wanted to bow out."

Although he reported no symptoms from exposure to the PCB lubricant, Stewart said he is still concerned about long term effects from having the oil on his skin.

He added that the VOA did find another firm to perform the work.

For more information contact Henry Stewart at Multiphase Consulting: 703-532-1220.

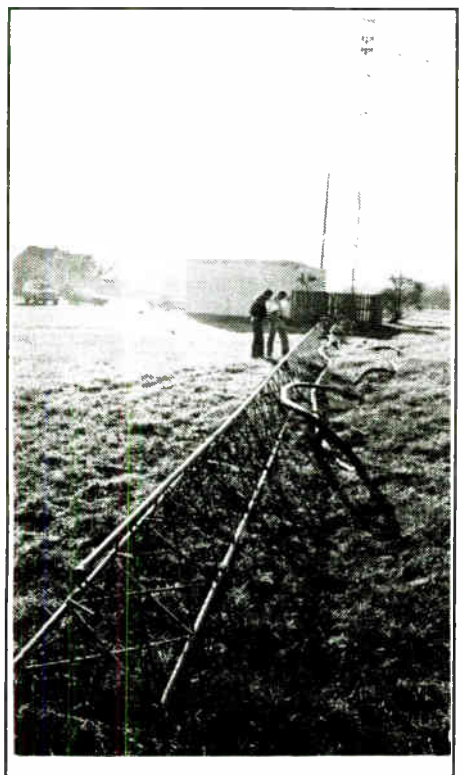
Vandalism Blamed In Tower Collapse

Fredericksburg VA ... Late one December night, the tower of WFLS came crashing down, a victim of vandals. While there are no firm statistics, industry observers say there seems to be an increase in vandalism to towers in the mid-Atlantic region.

"Vandals cut the guy lines," said Gary Harrison, CE at WFLS, located in Fredericksburg, VA, a town halfway between Washington DC and Richmond VA. The action caused the top 100 feet of the 350 foot tower to fall into a field. No injuries were caused.

Off air for two days

The incident, which took place 22 December at 11 PM, knocked the 50 kW, country formatted FMer off the air for two days. A temporary antenna on the 150-foot level of the tower provided an interim power level of 6 kW, which was restored by 3 PM, 24 December, he said.



The collapse of Fredericksburg, VA WFLS-FM's tower was an act of vandalism.

According to Harrison, the vandals cut two guy lines on outside anchors to the tower, which was located in a field near a housing development.

While the temporary antenna is operating from the portion of the tower that is remaining, he said the tower was damaged sufficiently that it will have to be replaced.

Harrison stressed that there is "no motivation" for the vandalism. The police investigation continues.

Other reports

"It seems that in the last two years, I have heard of more towers falling than in the 18 years before that," says Norm Jeweler of Rockville, MD-based US Tower, which sells and installs towers.

Jeweler said he had heard of at least four serious tower vandalism incidents in the Virginia—Maryland region since 1986.

For example, he indicated, in a Waldorf, MD, incident which occurred in November 1987, vandals pulled the cotter pins in the turnbuckles causing three of the four guy wires at WXTR to be separated.

"It was a miracle that the tower did not fall," Jeweler admitted.

Other incidents of vandalism have been reported during the past two years at WAYZ, Waynesboro, PA, and at WQSF, Williamsburg, VA, he indicated. The latter case, Jeweler said, involved someone in a jeep driving into the guywires.

Apart from the WQSF case, police have not been able to determine those who were responsible for the incidents, he added. There is no indication that any of them are connected.

For more information about the WFLS incident contact Gary Harrison at 703-373-1500.

Vendors Look At FMX

by Alan Carter

Greenwich CT ... Several firms interested in making FMX generators say they are still waiting for the technology to take hold before they begin full-fledged production and marketing.

This follows reports of successful testing of the modified FMX system and prototype receivers during the January Consumer Electronics Show (CES).

"We are in a position to ship, but we have received no orders," said Inovonics President Jim Wood. "We're ready."

Inovonics offers a FMX plug-in option for its stereo generator, Model 705. The FMX equipment fits any Inovonics generator sold to date, Wood said.

The firm also will sell an "update privilege," he explained, that allows users to upgrade their FMX equipment at no additional charge. He said there is no time restriction on this.

Adaptable units

Another manufacturer, CRL, has stereo generators that are "FMX adapatable," according to sales and marketing director Ray Updike.

Once the FMX equipment is proven, he said, CRL can have the product on the market. The company's turnaround will be "quick," according to Updike.

CRL tested the FMX technology in early fall but has not evaluated the results, Updike said. CRL equipment has 80% of the FMX technology included, he added.

For processor manuafacturer Aphex, FMX is definitely not out, said product manager Jon Sanserino.

"We are definitely leaving a port for FMX, so if they can create a workable circuit, we will include it or certainly make it an option," he said. "It has not been discounted."

Sanserino stressed that Aphex is waiting for the latest test results to see that the multipath problem which existed with the original technology has been corrected.

Tests slated

A fourth manufacturer involved in FMX generators, Orban Associates, is proceeding with tests at a "Monterrey Bay area" radio station.

Sales Manager Howard Mullinack said tests were delayed because of construction at the radio station, which he declined to name at this time.

Mullinack has said Orban's lab tests of a prototype delivered "somewhat promising" results.

The generator manufacturers said they were pleased to hear that FMX on-air tests conducted at CES in January in Las Vegas were favorable.

FMX co-developer Emil Torick, whose firm, Broadcast Technology Partners, based in Greenwich, CT, controls the development of FMX, said the tests, involving FMX-equipped automobile radios, were "quite successful." These tests came after the system was modified to reduce multipath problems.

He also said 12 manufacturers displayed prototype receivers and tuners with FMX capability.

For additional information on FMX development, call Emil Torick at BPT: 203-622-2643.

TV To Cuba Opposed

by David Hughes

Washington DC ... The NAB says it is concerned about increased Cuban AM band interference if the US government goes ahead with plans to develop a TV service similar to Radio Marti.

In late December, Congress approved $100,000 for a study to investigate the feasibility of a US Information Agency (USIA) operated television service to Cuba. The service would be similar in scope to the Radio Marti service now beamed to the island nation by the USIA's Voice of America (VOA).

Unlike the VOA's Spanish language services aimed at Latin America and Europe, Radio Marti, which is beamed from an AM transmitter in the Florida Keys, provides Cuban-oriented programming.

Outside study

The funds, part of the $12.75 million Congress has earmarked for its broadcasting operations to Cuba, would go to an outside, non-government organization to study a wide range of issues such as the feasibility of using satellite transmissions and the legality of such an operation, according to VOA spokesperson Judy Jamison.

The study, she said, is being sponsored by several Florida legislators including Senator Lawton Chiles, and representatives Dante Fascell, Dan Mica and Bill Nelson.

NAB Counsel Barry Umansky said that his organization is concerned about the possibilities of increased AM band interference from Cuba if such a TV service were inaugurated.

Before additional US government broadcasts to Cuba are authorized, the NAB wants the US government to resolve the existing interference complaints, he indicated.

"Radio Lincoln"

Bill Haratunian, a consultant the NAB has hired to study the Cuban interference situation, said Radio Marti has caused still unresolved problems such as Cuban leader Fidel Castro's demand for a clear AM channel to broadcast an English language service to the US. Industry observers have dubbed the service "Radio Lincoln."

While the NAB has voiced its concern about the possibility of increased Cuban interference from more US government broadcasting to Cuba, David Dickerson, a spokesperson for Rep. Nelson, said his office had not heard of any opposition from Florida broadcasters.

"No, we haven't had any complaints from broadcasters yet," Dickerson indi-

(continued on next page)

FCC Reinstates Minority Policy

by Alan Carter

Washington DC ... Heeding Congress's demand, FCC Commissioners voted in January to reinstate preferential treatment policies to minorities and females when making comparative licensing and distress sales decisions.

Congress forced the issue in the 1988 federal budget bill. The measure restricted the FCC from using funds to continue a self-conducted examination of the Commission's comparative licensing, distress sale and tax certificate policies based on racial, ethnic or gender preferences.

The budget bill, signed by President Reagan in December, appropriated money for FCC salaries and expenses with the proviso that the examination be halted.

In December 1986, the FCC put the preferential treatment on hold when the US Court of Appeals for the District of Columbia asked the Commission to evaluate the constitutionality of the policies pending three challenges.

As a result of Congress' recent action the Commission instructed the presiding administrative law judges, the FCC Review Board and the Office of the General Counsel to process all comparative licensing cases consistent with the Commission's policy in effect prior to 12 September 1986.

The Mass Media Bureau also was instructed to process all applications for distress sales authority pursuant to the minority ownership policy statement consistent with the Commission policy.

Those policies allow broadcasters who are in danger of losing their licenses to sell the stations for up to 75% of the fair-market value. Also involved is a provision giving preferences to women and minorities in comparative license proceedings and tax breaks to broadcasters who sell their stations to minorities.

Process cases

The Congressional action also requires the FCC to lift the suspension of any pending proceedings. The three cases involved are *Steele, Winter Park Communications* and *Shurberg*, according to Barry Bozzelli, special assistant to the general counsel.

The court questioned the constitutionality of several items, including the application of racial, ethnic and gender preferences in comparative proceedings for broadcast licensees.

It also questioned the administration of its minority distress sale policy and the issuance of tax certificates for broadcast station sales to minorities.

Interest groups including the National Black Media Coalition (NBMC), the National Organization for Women, American Women in Radio and Television and the Washington Legal Foundation fought for Congressional action on the issue.

Following the will

NBMC Chairman Pluria Marshall believes the FCC wanted to eliminate minority preference. "If they can't follow the will of Congress, Congress has to mandate it, and that's exactly what Congress has done," he said.

The court asked the FCC to examine its policy pertaining to preferences for women, Marshall claimed, not minorities. "They put minority preference on a hit list."

Sens. Ernest Hollings (D-SC), Frank Lautenberg (D-NJ) and Lowell Weicker (R-CT) were instrumental in attaching the measure to the budget bill, according to Thomas Hart, a Washington communications attorney representing the coalition.

The issue almost died when the Fairness Doctrine legislation failed, a measure to which the preference matter had been connected.

However, the three senators all serve on a Commerce subcommittee that approves FCC funding and were able to tie the two issues together, Hart said.

Although Hart expects the cases that brought the issue to a head will be appealed, he said he believes the Congressional move indicates support for the policy, a matter questioned in the court cases.

For additional information on the preference policies, contact Marilyn Mohrman-Gillis in the FCC's Mass Media Bureau at 202-632-7792.

NAB Against "TV Marti"

(continued from previous page)

cated. He added that the level of complaints of increased interference when Radio Marti started several years ago was not as high as expected.

"But we do know from people who have left Cuba that the Radio Marti broadcasts are getting through and have lots of benefits. We want to investigate the added impact that a TV service would have on (Cuban) audiences," Dickerson maintained.

The study will also look at whether a TV signal to Cuba, either from a satellite or a terrestrial transmitter, could be jammed so easily that it would not be worth the trouble, he added.

Dickerson said that, as of late January, the parameters of the study were still being written. The study is expected to be completed by the end of 1988.

"Now that we have Radio Marti," said Gretchen Siebach, a spokesperson for Rep. Fascell, "we want to see if TV Marti would be the next step."

The VOA's Jamison pointed out that the USIA is not a novice to TV satellite transmissions. It already operates its World Net satellite service that she categorized as "successful. Congress is eager to get this (TV Marti) study underway."

For more information on TV Marti, contact Bill Nelson's office at 202-225-3671, or Judy Jamison at the VOA, 202-485-6231.

Circle Reader Service 43 on Page 22

Station vs Agency Production

by Tyree Ford

Baltimore MD ... While speaking to an advertising agency friend with whom I do a fair amount of contract voice and production work, we hit on the subject of station produced spots versus those produced by agencies or other production companies like mine.

My friend's perception was that station production quite often just couldn't compete with the work he did on the outside.

I remembered how statements like this used to make me bristle when I ran into them as a station production director.

I decided to press on for more information so that I could pass it on to you in this month's *Producer's File*, especially if you're considering going after this kind of work at your station.

The two main factors regarding my friend's perception were circumstance and talent. For the sake of our conversation, having a fully operational studio and a commercial music and sound effects package were a given.

Logistic considerations

Under circumstance came ease of booking the studio, ease of arranging for talent and production elements and the flexibility to move them around on a time base to accommodate the client, the latter being most important.

As a rule of thumb, most of the outside production work is done between 10 AM and 3 PM.

This gives both the client and the agency time to check in at the office in the morning and before the end of the business day.

If your station's production facilities are like most, they're pretty busy then as well. If the talent they've requested is on the air, at a remote, in a meeting, or asleep, the job can't be done.

If the talent is available, the studio is not in use, and the client is not delayed in traffic, the next consideration is time in the studio.

Quality vs quantity

Radio stations and agencies often differ in how they take pride in their work. For an agency the benchmark of excel-

Producer's File

lence is not how many spots can be produced in an hour, but how good they (and the client) feel about the job they've done.

Average time for one spot for an agency is one hour, which includes music search, copy revision, direction, editing and dubs.

That can be an expensive hour if it falls in the late afternoon when half the sales department converges on the traffic and production director's offices wanting to know why they can't deliver the "immediacy of radio" they just promised their client by getting four or five spots cut and on the air *now*.

Circumstance also comes into play when the radio station across town objects to the use of another station's airstaff voicing a spot which will end up on their station.

There are times when a particular airperson's voice is highly recognizable. If this is the effect the client or agency is going after, it's not your problem.

Another negative aspect of circumstance is the construction of the radio station production studio.

When an agency books time in a studio and calls in a voice person, everyone's full attention is focused on that particular project.

Events outside the walls of the studio cease to exist. Windows into adjacent studios where "outsiders" can look in are distracting.

In addition, most radio station production studios are single room studios.

Agency people usually feel more comfortable with a "split studio" where they and the client can be on one side of the glass and the talent on the other.

These split studios are usually designed and furnished for client comfort. Radio station production studios seldom are.

This configuration also requires an audio engineer. Good full-time audio production engineers are now an endangered species at most radio stations.

Lack of skill

Although there are some great combo production people at radio stations, problems happen when the person with the voice the client wants can't handle the production.

Unfortunately too many people who never learned (or were never taught) good production are getting on-air jobs at stations.

Production is more than knowing how to run tape machines, clean heads and splice tape. Too often, because of bad copy or lack of direction, station-cut spots sound unconvincing. The words are read but the ideas are not conveyed.

The generation of on-air people who have been trained only to read liner cards often sees production as a necessary chore.

Station management looking to improve the station's commercial sound would do well to consider production ability when hiring new people.

Time and energy spent in developing incentives and in direction can make a

> *Radio stations and agencies often differ in how they take pride in their work.*

big difference. There are simple techniques that can provide a quantum leap in performance. If you've missed previous articles concerning power words and copy delivery, call me and I'll prove it to you.

Sure, there are some great people at radio stations who write great copy, have good pipes and delivery and know their way around a patch bay and an effects rack.

In fact their work is so good that most agency people would never guess that their work is in-house. Some, but not all, of these people even make good teachers.

Management would do well to recog-

(continued on next page)

An Alternative to Null Talkdown

by Tom Osenkowsky

Brookfield CT ... Winding up the series on array tune-up, let's look at an alternative to complete null talkdown.

For arrays with generous null fill (i.e. an array not having tight nulls) using the talkdown method may not be necessary.

In such cases modification of the power divider may be necessary in order to achieve unity field ratio. Unity fields are, of course, necessary for a complete null to exist.

When there's null fill

Here's an alternative method which involves several important steps.

First set up the array to the theoretical licensed parameters. Remember, if you are using loop sampling you must translate your field ratios to loop ratios using the appropriate formulae.

If you are using base sampling a more rigorous routine is necessary. Schelkunoff offers a simple and usually quite accurate method as does MININEC 3, a computer program developed by the Navy.

The most accurate base data would be generated by a full-blown NEC model.

Next, locate a radio-equipped field man at a known good monitor point on the first radial.

Third, adjust the phasor and power divider for the desired field intensity at that location.

The desired value of field would be determined by IDF calculated during the non-D proof. If possible base your adjustment on a vector sensitivity matrix.

Then log the antenna monitor readings. And finally repeat steps two, three and four for the remaining radials.

Borrowed algorithm

The adjustments are made without regard for the previous radial. The data collected may be analyzed by computer in order to correlate a set of antenna monitor readings which should produce the desired pattern.

I prefer to use a complex vector-averaging algorithm which, in the final trial, would produce a set of antenna monitor readings with the same cumulative error-vectors on each azimuth.

This same algorithm was borrowed from that which I use in the talkdown procedure.

The exercise may have to be repeated a few times for best results. The main difference between this and complete talkdown is mainly one of time and convienence.

RF Reader

Where reradiation and very tight nulls exist, a complete talkdown will work better since the culprits "come out in the wash"—mathematically that is.

Another fact to consider when tuning up an array is that of symmetry. Phase symmetry can be used to determine the exact value of proper phase angle on a given tower.

For example, if you perform a $\pm 10^\circ$ phase change from the correct central phase angle on a given tower and azimuth, you should observe an equilateral field intensity change.

If the ratio were unity on a two tower array and you were on the null bearing you should (theoretically) observe zero field and a rise to some finite field intensity for the $+10^\circ$ and -10° phase change.

For the incorrect central phase angle, different field intensities would result for the equilateral phase angle variations. A useful fact to keep in mind during tune-up.

This article will conclude our discussion of tune-up for the present. We will continue next time focusing on the topic of broadbanding ... both from a pattern as well as transmitter point of view.

Information regarding the computer procedures mentioned herein may be obtained by writing or calling me.

Tom Osenkowsky is a radio engineering consultant and president of MASTER Software, and a regular **RW** *columnist. He can be reached at 203-775-3060.*

In-House Production

(continued from previous page)

nize these people and their importance to a great sounding radio station.

If you are a manager working toward the goal of a better commercial sound for your radio station, I'd enjoy hearing about your use of incentives and direction.

If this article has started you thinking about ways to improve the commercial sound of your station, begin by acknowledging that while you may have been hearing what's on your air, you may not have been listening.

Hearing and listening are quite different. You can only progress after you understand the difference.

Ty Ford, a radio audio production consultant, helps stations optimize their use of production and airstaff skills. He can be reached at 301-889-6201.

Circle Reader Service 8 on Page 22

THE PLAIN TRUTH! Check the facts

DYNAMAX invites comparison

When you evaluate cartridge machines, you need to look beyond the bells and whistles. With 35 years background in cartridge technology, we've built benefits into our cartridge machines that less experienced manufacturers haven't even considered, but professional users rely on every day. That's why we've compiled a short list of important items for your comparison. Get our complete list. Contact Fidelipac or your Fidelipac Distributor.

	DYNAMAX CTR124 $4000	OTARI CTM10S $4518
Manufacturing Location	Moorestown, NJ U.S.A.	Tokyo, Japan
Automatic selection of recording and playback level, bias and EQ	✓	
Automatic selection of discrete or matrix record and play modes	✓	
Automatic selection of stereo or mono record or play modes	✓	
Automatic activation of external devices (such as noise reduction equipment)	✓	
Automatic Fast Forward at beginning *or* end of secondary tone	✓	
Automatic audio muting at beginning *or* end of secondary tone	✓	
Dual rate, multi-function replay lockouts	✓	
Vari-Speed with tracking cue tones for fail-safe tone detection	✓	
DC servo capstan motor with separately removable electronic module for easy servicing	✓	
On-board audio mixer and switcher	✓	
Relay *and* logic tone sensor outputs	✓	
Patented splice finder unaffected by tape debris	✓	
Cleaning switch for easy pressure roller cleaning and diagnostic checks	✓	
Simplified report-by-exception blackout status panel	✓	
Signal-to-Noise Ratio (Ref 250 nWb m, no tape)	61 dB	53 dB
Crosstalk, cue to program channel	Inaudible	Audible
Audio squelch in Fast Forward	Better than -70 dB	-25 dB
Cost of replacement stereo play head	$68.50	$195.00
12-tone on-board test oscillator	✓	
Active bias and signal mixing with no bias trap adjustments	✓	
Simplified constant current solenoid engagement mechanism with no microswitches	✓	
Ball-bearing pressure roller for constant stereo phasing	✓	
All IC's socketed for easy maintenance	✓	
Precision reference head bridge assembly w/no protruding screws for repeatable cartridge positioning	✓	
Micro-adjustable tape guides for easy alignment	✓	
Rack width required	1/2	2/3
Number of optional card extenders required for maintenance	1	3
Cartridge sizes accommodated	A, AA, B and BB	A & AA only
Microprocessors used	None	3
Manufacturer produces carts, tape and machines and is system-responsible	✓	
Manufacturer's years in related NAB cartridge manufacturing technology	35	zero
Installed base of over 6000 cartridge machines	✓	

DYNAMAX®
BROADCAST PRODUCTS BY FIDELIPAC

Fidelipac Corporation ☐ P.O. Box 808 ☐ Moorestown, NJ 08057 ☐ U.S.A. ☐ 609-235-3900 ☐ TELEX 710-897-0254 ☐ Toll Free 800-HOT TAPE

DYNAMAX products are designed and manufactured in the U.S.A.

Circle Reader Service 15 on Page 22

When Your Power Supply Fails

by Bill Higgs

Louisville KY ... The old-timers among us have an old axiom that says, "find the power supply problem, and then find the rest of the problems."

It is not only old—unfortunately it is true as well.

While we have progressed from vapor rectifiers to eraser-sized chunks of silicon, watts are still watts.

AC still has to be coaxed into going only one direction and this process still produces heat, hum and trouble.

The power supply is usually the most stressed circuit in a given system, and stress usually results in poor health!

Unfortunately, with most equipment all of your eggs are in one basket. It is not uncommon these days to see an entire card cage powered from a single power supply.

BottomLine—Broadcaster—

Line cards and the like can be pulled and replaced but when the DC dies you are likely to be down until the power supply can be repaired.

Many problems can be avoided by using good ventilation techniques and keeping the heat sinks clean but failures still occur in spite of our best efforts.

When you least expect

A console power supply in my station decided to fold up one Saturday just prior to an important football game.

The station was kept on the air through a vacant production room but a frantic trip was made to the studio to make the repairs before gametime.

Although the story had a happy ending (I had a spare regulator chip), I realized at the time how vulnerable a smaller station can be to power supply failure.

In a perfect world one would have a spare for each piece of equipment. This, however, is a luxury that not many stations can afford.

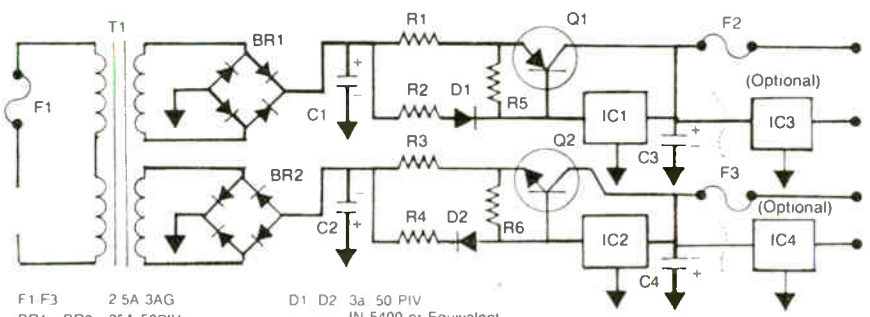
At first glance a "universal" power supply may also seem to be impractical. After all, different equipment may use vastly different designs. At second glance it begins to look downright sensible.

The end result of any power supply is that it supplies (obviously) a regulated DC voltage to power the equipment to which it is attached.

There are various ways of doing this—some complex, some simple. Most circuits however, can be made relatively happy in an emergency with a rather simple supply.

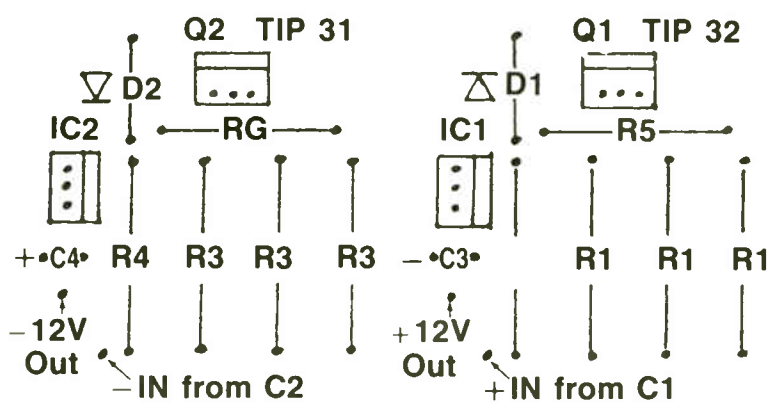
(continued on page 21)

Figure 1. Schematic for Utility Power Supply.
(All "grounds" are floating bus, not chassis)



F1-F3	2.5A 3AG	D1 D2	3a 50 PIV IN 5400 or Equivalent
BR1 - BR2	25A 50PIV		
C1 C2	6800 μFD 35 V	IC1	7812
C3 C4	10 μFD 25 V Tantalum	IC2	7912
R1 R3	0.1 Ohm 10 W (3 0.3 Ohm 5 W in parallel)	IC3	7805 (Optional)
		IC4	7905 (Optional)
		Q1 Q2	(See Text)
R2 R4	0.33 Ohm 5 W		

Figure 2. Circuit Board - component side



Circle Reader Service 23 on Page 22

"Features and specs sold us on Auditronics 200 consoles."

Robert Lankton, Chief Engineer
WDUV/WBRD in Bradenton, Florida

"Their performance and reliability keep us sold."

"We wanted a console flexible enough to use in master control, production and news. We shopped for features and specs, but we also looked for ease-of-use and reliability. We got just what we wanted in our four Auditronics 200s."

Features

"I insisted on outboard power supplies and no monitor amps in the console for noise reasons. I was impressed with Auditronics' VCA technology, which at the time was not available elsewhere. We wanted the self-contained clock and timer. We needed the switching logic to interface between the A and B inputs, (a neat concept most other consoles don't offer). And we needed a lot of extra line inputs to support our satellite feeds. We needed a first-rate telephone interface. Auditronics beat its competitor hands-down on this. And, of course, modular design was a must for serviceability. We got it all in the Auditronics 200."

Specifications

"We go for the widest dynamic range we can get because much of our programming originates on CD. So the 200's 3dB better S/N is really important. Everything on the Auditronics 200 tests out better than the specs they publish, and you can't ask for more than that."

Ease of Operation

"I found the 200 logically laid out and very easy to train our people to use. The jocks like them and can easily understand them, which is very important to management."

Reliability

"We're just ecstatic about the Auditronics consoles. They've run 24-hours, 7-days since turn-on without a failure. What's more, they've held their specs, which I check every month to audiophile standards."

"Would I buy Auditronics again?"

"At WDUV/WBRD everybody is happy with both the Auditronics consoles and the support we've received from the company. We look forward to doing business with them again." If you'd like to know more about why Rob Lankton swears by Auditronics consoles, call 1-800-638-0977 or contact

auditronics, inc.
3750 Old Getwell Road, Memphis, TN 38118
901-362-1350

Circle Reader Service 40 on Page 22

Selecting, Integrating and Maintaining Recording Equipment To Meet Your Needs

BACKGROUND AND PURPOSE

To fully understand audio tape recording it is important to view the process with a system approach. In any system there are a number of elements that must work together if a satisfactory result is to be achieved. System design requires tradeoffs. You've heard it many times: **"THERE'S NO FREE LUNCH."**

We will take a step-by-step look at the recording system to see where and why the tradeoffs were made and how they relate to the end product. To complicate matters further, tape recording and CD recording are electro-mechanical processes this means we need motors to make the system work. Motors produce motion and it's here that all the systems exhibit their weakest links.

It's also here that most engineers and operating people have the greatest difficulty in understanding and dealing with motion systems.

This seminar is specifically designed to give you a better understanding and knowledge of how to deal with these relatively complicated systems.

WHO SHOULD ATTEND:

If you design systems, purchase recording equipment, operate or maintain tape machines and CD players, this seminar will help you and your company select, integrate and maintain your equipment.

ABOUT THE SEMINAR LEADER

IRV JOEL brings to bear over 30 years' experience in the recording, broadcasting and audio fields. A former Eastern Vice President and elected Fellow of the Audio Engineering Society (AES), he has played a key role in pioneering efforts which have led to present day standards in the recording and broadcast industries. For fifteen years Irv was involved at Capitol Records with the early stereophonic recordings made in the U.S., both on tape and disc. Later while chief engineer for A & R Recording Studios in New York, he was responsible for the installation of advanced, state-of-the-art studios and a complete film recording complex.

He also worked closely with leading manufacturers on the special modification of Compact Disc products for broadcast requirements.

One of the many projects Mr. Joel developed for the AES was "THE WORKSHOP ON STUDIO TAPE RECORDERS" at the 41st convention. He has delivered many papers and seminars for the AES, NAB and SBE.

For over twelve years, **IRV JOEL & ASSOCIATES** has served the broadcast and recording industries with a variety of professional consulting services including complete facilities planning, site location assistance, plus development of maintenance programs and system profiles.

ANOTHER SEMINAR?

YES!

One you can't afford to miss.

Selecting, Integrating and Maintaining Recording Equipment To Meet Your Needs

You will learn how to:

- **Specify the right equipment**
- **Maximize tape machine and CD player performance**
- **Increase system reliability with routine maintenance**
- **Decrease down time**
- **Decrease costly component replacement**
- **Increase your ability to trouble shoot and fix the system when it does fail.**

Presented by:

Irv Joel & Associates
The Audio Consultants

528 River Road
Teaneck, New Jersey 07666
Telephone: 201/692-0010

YOU WILL LEARN ABOUT:

Analog reel to reel recorders from 1/4 inch to 2 inch and from one track to 24 track. With tape speeds from 15/16 to 30 ips.

Digital formats from two track to 32 track and from PCM to DASH and from R-DAT to S-DAT.

- Compact disc players with analog and digital filtering.
- Broadcast cartridge systems.
- Audio recording for video.
- Compact cassette systems.
- The tape and its part in the system.
- Noise reduction systems.

SOME HIGHLIGHTS:

1. Choosing the best recorder for your application:

Learn how to read spec sheets and make decisions on which devices will do the best job for you. Costly mistakes can be made if equipment purchased does not fit your needs.

We will focus on how to achieve maximum performance for minimum dollars.

2. Recording formats:

Both analog, digital tape and disc formats will be discussed, focusing on the advantages and disadvantages of each.

3. System overview:

Including: the fundamentals of magnetic recording; the tape and its role in the recording process; the basic recorder and all the elements that make up the system.

4. Optimizing performance:

With any system there are many options. We will look at your individual needs and optimize the system for best performance.

5. Maintaining the system:

We will outline practical and easy to use methods for keeping the equipment in top operating order.

6. When the system fails:

Proven test procedures which will help you analyze the problem and fix the equipment in the shortest possible time.

PROGRAM INFORMATION: Register now at only $229 per person a $31 savings over on-site registration fee. The fee for this 1-day seminar is $260 per person. For registration of 3 or more persons from the same company, deduct $30 each. The fee includes all workbook materials, seminar instruction, refreshment breaks, buffet lunch and follow-on assistance. Program hours are from 9:00 AM to 4:30 PM.

PLEASE REGISTER EARLY. Seminar capacity is limited. To guarantee your place, please register now. Just call **(201) 692-0010** or fill out the form below.

REGISTRATION FORM–SELECTING, INTEGRATING & MAINTAINING RECORDING EQUIPMENT.

Pre-registration Fee per person $229, received by April 1, 1988; on site registration will be available at 8:00 AM to 9:00 AM, April 7th at $260. Las Vegas, Nev. Holiday Inn, Center Strip, April 7, 1988.

☐ I can't attend at this time, but I am interested in knowing about future programs.

Please make checks payable to:
Irv Joel & Associates.
Return this form to:
Irv Joel & Associates
528 River Road
Teaneck, New Jersey 07666
Phone # (201) 692-0010

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

TELEPHONE ( ) _____

☐ Payment enclosed (check)
☐ Charge my credit card ☐ VISA ☐ MasterCard

Card No. _____ Expiration Date ___/___

Signature _____

REGISTER TODAY–CALL (201) 692-0010

HOTEL RESERVATIONS:

Seminar participants are responsible for making their own reservations. A block of rooms have been reserved for IRV JOEL & ASSOCIATES at the Holiday Inn Center Strip for the night of April 6. Rooms can only be held until March 5. We therefore recommend that you make your reservations early to assure availability. A special rate of $65 a room has been offered. Please contact the hotel directly TODAY. **Call (702) 369-5000.**

SEMINAR SCHEDULE
LAS VEGAS HOLIDAY INN
CENTER STRIP, APRIL 7, 1988

8:00 AM-9:00 AM Registration
9:00 AM sharp, Seminar begins
10:30 AM Coffee break
12:15 PM Lunch
1:15 PM Seminar resumes
2:45 PM Refreshment break
4:30 PM Seminar ends

PROGRAM INFORMATION:

Register by April 1 for only $229, a savings of $31 over on-site registration.

For registration of 3 or more persons from the same company, deduct $30 each. The fee includes all workbook materials, seminar instruction, refreshment breaks, buffet lunch and follow-on assistance. If necessary you may cancel before April 1 and receive a full refund. If you need to cancel after April 1 you may apply your enrollment fee toward another seminar in the future.

PLEASE REGISTER EARLY

Seminar capacity is limited. To guarantee your place please register now.

IRV JOEL & ASSOCIATES
THE AUDIO CONSULTANTS

528 RIVER ROAD
TEANECK, NJ 07666

BULK RATE
U.S. POSTAGE
PAID
HACKENSACK, NJ
PERMIT #897

DATED MATERIAL

Visualizing Antenna Patterns

by Ron Nott

Part I of II

Farmington NM ... Directional antennas came into being over half a century ago.

Because of the rapid growth of the broadcast industry on a limited number of channels, the need arose to reduce nighttime interference between radio stations on the same frequencies in different areas and to increase signal strength in certain directions.

The design of directional antenna systems developed into a highly specialized field.

Soon everyone in the broadcast and communications industries became familiar with antenna patterns, the graphic representations of the performance of the systems.

To the engineers designing and operating the systems, these patterns are known as "effective fields."

When describing their characteristics, terms such as lobes, nulls and vertical angles are often used.

The results may be observed with a field strength meter or an ordinary radio. In lobes, the signal is "strong" and in the nulls, the signal disappears down in the noise.

The vast majority of FM radio stations utilize multiple element antennas to provide increases in "effective radiated power" (ERP) in order to increase the range of the station.

Although differing in details and dimensions, the principles of multiple element FM antennas are the same as AM directional antennas in that the ultimate results are effective fields, which are known as radiation patterns.

A great deal of experience and knowledge has been accumulated, but the complex math involved in chase angles, mutual coupling, spacing, etc. sometimes puts engineers off.

But there are ways to understand the basic facts, even if you aren't a consulting engineer.

Here is a two-part look to help you visualize individual antenna fields and their effects.

First we'll discuss a simple pattern for an AM directional array then a multi-bay FM antenna. Then we'll take a brief look at the Yagi-Uda antenna which sees much use in RPU, TRL and translator applications.

The principles discussed in the AM example apply to VHF and UHF antennas as well, so don't skip this part.

Probably the simplest directional antenna to evaluate would be of two elements.

The directivity of such a two (or more) element array may be manipulated by controlling several variables, including the spacing of the elements, the timing or phase angle, the ratio of power divided between them and the electrical height of the elements.

For simplicity, the parameters of this example will be very basic. As illustrated in Figure 1, they are:

- Spacing: 180 electrical degrees
- Phasing: 0 electrical degrees (the two elements are driven in phase with each other)
- Power ratio: 1:1 (each element receives the same amount of RF power)
- Element height: 90 electrical degrees (a quarter wavelength) with vertical polarization.
- Orientation: 0 degrees true (north-south)

If it would help in the visualization process, a convenient frequency may be selected, such as 1000 kHz.

(continued on page 21)

Figure 1. Two-Element Directional Antenna Array.

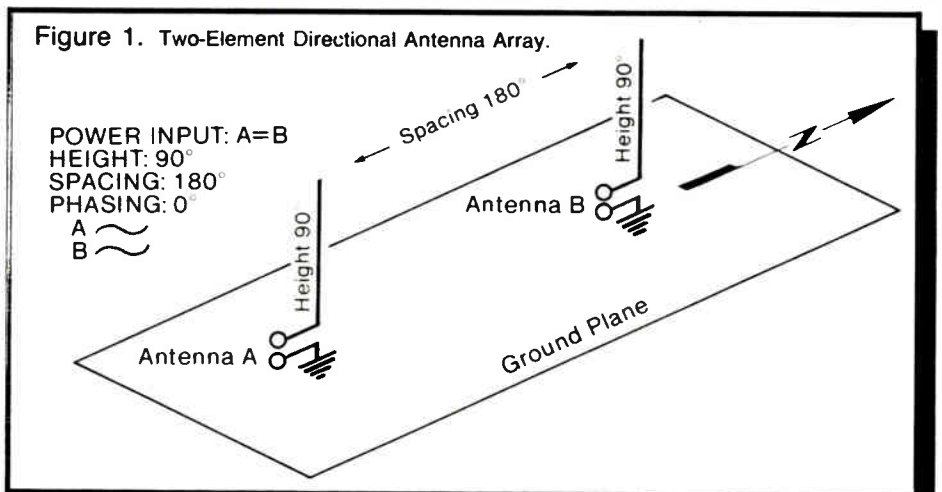
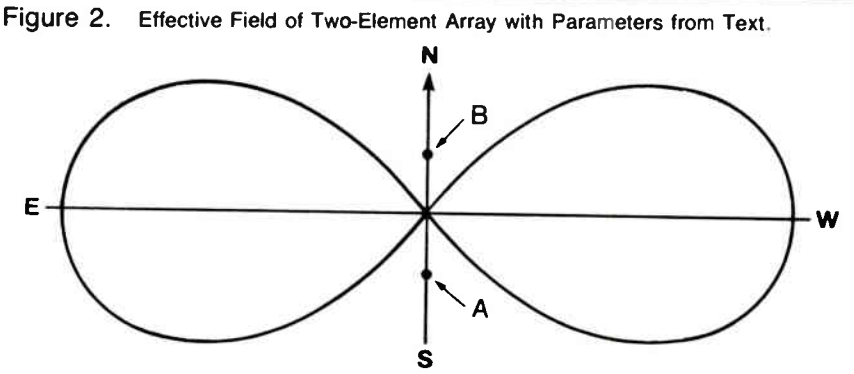


Figure 2. Effective Field of Two-Element Array with Parameters from Text.



CONTRACT ENGINEERING

Calculating Contracting Fees:

by Jeffrey Baker

Fairport NY ... Very often both the clients of contract engineering services and the practitioners thereof make the mistake of equating contract engineering fees with hourly wages paid to technical employees.

The truth is that they are very different. I like to discuss a method for calculating fees based on sound business principles.

A contract engineer may recognize that in addition to the equivalent of hourly pay, there should be an allowance for certain fringe benefits and expenses.

But very often such an allowance is inadequate and results in the failure of the contract engineer to keep the business alive.

The key word is "business" because that is what contract engineering is. Whether it is engaged in full-time or as a supplement to employment income it has all the aspects of any service business.

One of the key causes of business failure is neglecting to recognize all applicable expenses. In contract engineering, some of these expenses are not obvious and so are often overlooked.

Let's look at typical costs of operating a contract engineering practice to see what is involved. Most of the expenses apply to the part-time as well as full-time operation.

Basic calculations

First we want to set the hourly rate which would be the equivalent of employment salary. We will then add typical employee fringe benefits and the costs of doing business.

Finally we will add a figure for business risk and take a look at the possibility of other general and administrative expense.

Salary surveys have shown that broadcast engineer salaries are variable depending on market size and experience. However, the median for all markets has been around $30,000 per year.

Assuming that a contract engineer offering services on a professional basis would have a good deal of experience, he or she would probably be earning at a higher level.

For the purpose of this example we'll use a salary level of $36,000 per year—the top 50 market median in 1986.

This figure represents staff as well as CEs and is the mid-level (half above, half below) income.

Since there are 52 weeks or 2080 hours for a year of 40 hour weeks, we divide 36,000 by 2080 to get an hourly rate of $17.31. This assumes that we work and bill for 40 hours every week.

Hidden expenses

But in a contract business there may be many non-billable hours spent in finding clients, travel for non-client purposes, administrative functions such as bookkeeping or meeting with accountants or lawyers, and in professional development.

And it would be nice to have some vacation, a few holidays and some time to recover when the engineer is not feeling well.

It would also be reasonable to have the additional benefits accorded to most working people such as life, health and disability insurance, and retirement income.

Because of customary time off and non-income producing tasks, a typical individual consulting practice in other areas of engineering bills only about 1750 hours per year.

Therefore, we must adjust our hourly wage equivalent to reflect that and apportion the cost of fringe benefits appropriately. Table 1 shows how this might be accomplished.

If we are running a part-time business, some of these expenses may not be applicable. For instance, we probably get our life and health insurance from our full time employer.

However, it is just possible that our employer's plan is not so good and we could do better by taking our contributions to that plan and combining them with the equivalent earnings from our part-time practice to provide a better plan of our own.

Such plans are available through professional societies and local business organizations as well as direct from insurers.

A few expenses may even be higher on an hourly basis for a part-time business because they are amortized over a smaller number of billable hours.

So it is probably wise to calculate expenses of a part-time business on the same basis as if it were full-time rather than assuming that certain costs do not apply.

Costs of doing business

In running any business there are operating costs and contract engineering is no different.

These costs may include business insurance, rent and utilities, stationery and office supplies, amortization of office and technical equipment and travel for non-billable purposes.

Other costs could be accounting and legal services, professional society memberships, marketing expense, course and reference materials, secretarial help,

(continued on next page)

CONTRACT ENGINEERING

More Than Just Hourly Wages

(continued from previous page)
answering service and copying.

Again, some of these expenses may not apply in a particular case but often they should be included anyway.

If we work from home there won't be a rent expense but utility costs might increase if we can't turn down the thermostat or need to burn the lights longer because someone is working when otherwise the place would be empty.

Therefore such expenses must be considered carefully before they are dismissed.

There is also the issue of general and administrative expense.

In government contracts, there is often a provision for the contractor to charge a fixed percentage (15% is typical) to allow for the expense of managing the contractual obligation with its attendant paperwork and rule compliance.

It is my feeling that these expenses are accounted for elsewhere in our itemization but some contract engineers may wish to add such a percentage. It will be ignored in the example shown in Table 1.

Whenever one goes into a business of any kind a risk is being taken. The entrepreneur is giving up the security of a steady employment income and interest on investment capital to provide a needed service.

Therefore he or she is entitled to some additional compensation for the sacrifice. This is known as profit.

The contract engineer is a business person assuming the same type of risks. Therefore, adding a profit is definitely in order.

Such profit can range from 10% to 20% or higher in typical businesses, but in standard contracts it is often set at the low end. In New York, the Public Service Commission allows our utilities around 15%.

> *some engineers . . . fail to understand that they are earning much less than they think.*

Of course it is also possible to operate a business at a loss, a possibility which is more likely if an allowance is not made for profit in the first place.

Market conditions

When we are through adding up our wages, fringes, operating costs and profit, we will arrive at a figure which we feel is reasonable to bill for our service.

However, we cannot blindly charge this amount because like other businesses ours does not operate in a vacuum.

We have competition which may unknowingly work at a loss, and we must deal with the expectations of our potential clients.

Some users of contract engineering services may be in for a shock as this type of service becomes more typical than employing full-time staff.

They are accustomed to paying wages rather than fees and so expect that an outside contractor will work for about the same amount that they paid an employee.

While they are aware of overhead and operating expense in their own business, a bit of compartmentalized thinking often prevents some of them from associating those factors with the contract engineering business.

Cutthroat competition

We also must face the fact that some engineers who are employed fulltime and do contract work part-time fail to understand that they are earning much less than they think.

They are giving away their administrative time and the opportunity to put something away for the future by working for less than a fair fee.

They could put money in a Keough plan for retirement and they should since many broadcast stations don't provide for it.

They may take a vacation from their regular job, but they spend the time working on their contract assignments to the detriment of their private lives.

They should take a real vacation, otherwise they may burn out. To do these things, they have to learn to charge adequate fees.

It is obvious that the cost of providing contract engineering services is not limited to a wage equivalent. There are many other factors.

But right now both practitioners and clients do not always recognize them.

What is needed is a program to teach, both those practicing contract broadcast engineering and those using the service, the true value of the services provided.

If it costs $36 an hour to have the GM's car repaired, $50 per hour for the emergency generator repair and $90 per hour to fix the traffic computer, should an engineer charge $10 to repair a high powered transmitter or automation computer, or to do antenna proofs and calculations?

Not if that person wants to make a living.

Jeffrey Baker is with Heritage Media Inc. and principal of Technical/Design Services, a contract engineering service. He is a Certified Senior Broadcast Engineer and is also a doctoral student at Nova University. Contact him at 716-227-9510.

Table 1. Calculation of Billing Rate

1. Wage Equivalent	$36,000/2080		$17.30
2. Overhead			
2.1 Fringe Benefits			
Medical Insurance	2,400		
Retirement (Keough Plan)	5,400		
Vacation 20 days x 8 hrs x $17.30	2,768		
Sick Leave 10 days x 8 hrs x 17.30	1,384		
Holidays 11 days x 8 hours 17.30	1,522		
Life and Disability Insurance	800		
	14,274	/1750	8.16
2.2 Operating Costs			
General Liability Insurance	800		
Commercial Auto Insurance	700		
Added Home Utilities	400		
Stationery and Supplies	300		
Office Equipment Amortization	700		
Technical Equipment Amortization	3300		
Accounting and Legal	500		
Secretarial	500		
Answering Service	600		
Marketing	1000		
Professional Society Dues	150		
Professional Subscriptions	200		
Seminars, Conventions	1000		
	10,150	/1750	5.80
			$ 31.26
3. Profit 10%			3.13
			$ 34.39
4. Rounded Fee			$ 35.00/hr.

These are only examples. Actual amounts will vary greatly with market size and individual circumstances.

Circle Reader Service 39 on Page 22

Capacitor Troubles? Check the Shelf Life

by Tom Vernon

Harrisburg PA . . . One of the caveats of operating an efficient repair shop is having an ample stock of spare parts and components on hand.

In some instances however, components go bad sitting on the shelf before they're ever put into service.

There's little more frustrating in troubleshooting than to trace a problem to a bad capacitor, replace it with one from stock and have the same problem as before.

Then you sit and wonder if your diagnosis was really correct, or is the new capacitor bad.

This month's column reviews some guidelines on the shelf life of capacitors and batteries, with some thoughts on extending component shelf life.

Reasons for failure

Most manufacturers agree on the maximum shelf life for different types of capacitors. For paper, dipped and molded mica and ceramic discs it's about five years.

The main reason that these capacitors fail on the shelf is a gradual breakdown of insulation resistance. This deterioration is hastened by temperature cycling and high humidity enuironments.

Such cycling breaks down the seals and allows moisture to enter the capacitor. This breakdown can also cause a change in capacitor value.

Ideally capacitors should be stored in an area away from heat and moisture. For this reason parts cabinets mounted on the wall over radiators or baseboard heaters are bad news.

Electrolytics

Electrolytic capacitors typically have a shelf life of about two years.

This can be extended somewhat by applying a polarizing voltage through a current-limiting resistor every few months. Again, storage away from heat will prolong shelf life by preventing a rapid loss of moisture from the electrolyte.

Electrolytics have four major failure modes, any of which can occur by just sitting on the shelf too long.

The most common problem is dielectric absorption, also known as the "battery effect." In this instance the capacitor retains a charge even after it has been discharged.

Electrolytics are also prone to leakage current and a problem known as increased ESR, or effective series resistance.

In this case a high resistance forms inside the capacitor, often at the point where the leads connect to the foil.

More bad news

If all of this isn't discouraging enough, the rated value of capacitance can change and an electrolytic can have any combination of the four possible reasons for failure just discussed.

For this reason it's a good idea to check new capacitors with a reliable tester before installing them in equipment.

This means checking for leakage at the cap's rated voltage, ESR, dielectric absorption and value.

Checking for leakage with an ohmmeter can give misleading results as many defective caps will only reveal themselves at higher voltages.

If a good capacitor analyzer is beyond your budget keep only a small quantity of electrolytics in the shop. Resist the temptation to buy 500 assorted electrolytics for $1.59 from an unknown surplus wholesaler.

Instead deal with a distributor who maintains fresh stock. They're the ones who seem to always have popular capacitor values on back order.

Coding information

Many capacitors and batteries are stamped with a date code and this is important information to have available.

Typically it's in the form of a four digit number, with the first two digits for the year and the last two for the week when the device was manufactured. The number 8214 for instance, would be the 14th week of 1982.

Battery manufacturers have a fairly scientific definition of the term "shelf life."

Station Sketches

It's the length of time after which a battery retains 90% of its original charge, at a storage temperature of 70 °.

Typically, the shelf life of mercury and alkaline batteries is one to two years. Carbon-zincs are a little less than this.

It's well known that the shelf life for carbon-zinc batteries, and to a lesser extent alkaline and mercury batteries, can be extended by storing them in the refrigerator.

This is because the breakdown of a battery is really a chemical reaction and chemical reactions slow down at lower temperatures.

Cold storage tips

There are a few precautions that go along with cold storage however. No rough stuff! Excessive handling of chilled batteries may break internal seals which are more delicate at reduced temperatures.

When removing batteries from the refrigerator to place in service let them come up to room temperature in their original cartons.

This way you'll avoid moisture condensation which can increase electrical leakage.

Don't put batteries in service until they've come up to room temperature. The power capacity of the battery is reduced at lower temps.

No cyrogenics! Some people figure that if batteries last longer in the refrigerator they'll last forever in the freezer. Not so. Freezing destroys internal seals, crystallizes some chemicals and totally ruins the battery.

Buying capacitors and batteries from a dealer with fresh stock, maintaining intelligent storage practices and handling them on a first-in-first-out basis can do a lot to reduce monthly parts expenses.

Tom Vernon, a regular **RW** *columnist, divides his time among broadcast consulting, computers and instructional technology. He can be reached at 717-249-1230*

Taking a Look at Antenna Fields

(continued from page 17)

A simple way to determine the approximate length of an electrical degree in feet is to divide 2733 by the frequency in kHz.

The result will be the length of one electrical degree in feet. Then convert to metric if you like.

Now look at Figure 2 for the resultant effective field of this configuration.

Recall that the elements are located north-south, in which directions two nulls will be noted.

This may seem obvious, because the 180° spacing of the elements will cause "cancellation" to the north-south signal. But is it that simple?

Look at Figure 3 which shows the fields of the two individual elements, and not the resultant of the algebraic addition of the two phases.

Each element is an individual antenna with a circular field traveling outward from it at the speed of light.

By the time the two fields have covered a substantial distance from the antennas (say a mile or more) they become almost concentric (but not quite) and are of the same diameter.

The electromagnetic (EM) field energy is there, but if you go out on the N-S radial a mile or two from the antennas, you will note little or no signal strength with a field strength meter.

Since from Figure 3 we know that the full strength EM energy is there, what has happened to it?

Cancelling currents

The receiving antenna, whether a fancy loop, a rod or a simple piece of wire, is an integrating device.

Recalling the phase relationship from the parameters given, you can see that while the field of one transmitting antenna is trying to induce current upward in the receiving antenna, the field from the other transmitting antenna is trying to induce current downward.

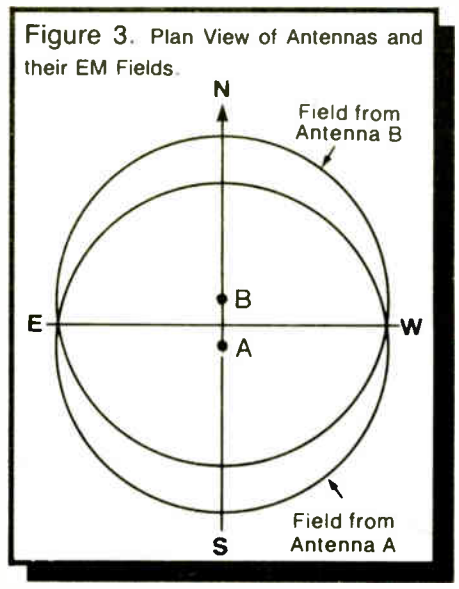


Figure 3. Plan View of Antennas and their EM Fields.

Because of the 180° spacing, the field of the farther of the two transmitting antennas arrives 180° later than the field from the nearest one and so has exactly the opposite phase angle.

It is extremely important to understand that the EM fields have not cancelled each other, but their effects within the receiving antenna have cancelled the two currents that were induced.

These currents could be graphically represented by two vectors of equal magnitude but of exactly opposite direction.

The end result is that no RF current or voltage appears at the terminals of the receiving antenna to be detected by the field strength meter or receiver.

But again, what is important to remember is that the energies of the two EM fields are still there.

Even though the meter or receiver implies that there is no field energy there, the two EM fields still exist separately at full strength.

Now examine the two lobes to the east and west in Figure 2. They are the result of not one, but two separate EM fields, one from each of the two antennas in the array.

In this case the fields have arrived at the receiving antenna exactly in phase, and each of the two fields induces an electrical current into the receiving antenna in the same direction.

Again, the receiving antenna has functioned as an integrating device, summing the two currents this time. Vectors would be of equal magnitude and pointing in the same direction.

The field strength meter or receiver takes this sum into its input terminals and the meter indicates a value of field strength that is greater than what would have been received from a single antenna transmitting the same total power.

This is known as "effective field gain," the understanding of which is crucial to the evaluation of a directional antenna system.

Ron Nott is the president of Cortana Corp. He can be reached at 505-325-5336.

Plant Juice: A Spare Power Supply

(continued from page 15)

Most modern audio equipment uses op amps in its circuitry, and contains a bipolar supply of between 10 and 20 V.

Designs featuring the popular NE5530 and TL070 series prefer higher voltages; earlier designs lower voltages.

After looking at the various boxes in the studio, I settled on a compromise of + and – 12 V at about 2 amps. I also added + and – 5 V in order to power any TTL and low-voltage relay circuitry that might be present.

The circuit shown in Figures 1 and 2 has been featured in various data books, but has been found to work very well.

The types of transistors used are not critical; just be sure that they will handle the current.

I designed my supply for approximately 2 amps per side, and found that inexpensive plastic TIP31 (NPN) and TIP32 (PNP) transistors worked fine.

If you use a transformer that will handle as much as 4 amps, you might want to use a 2N3055 (NPN) and a 2N2955 (PNP). Layout is not too critical but the transistors and regulators should have a heat sink.

In Figure 2 a PC board layout is shown for those who desire, but other methods should work fine. Don't forget the fuses!

There are at least two approaches to building the unit. One is to construct it in a portable cabinet.

This has the advantage of allowing the supply to be taken on location to power portable equipment if needed (the RPU battery always seems to give out in the middle of the remote!).

With a small series resistor the unit also makes a hot little battery charger.

My approach was to build the supply into a central rack and route the output to every studio. One drop is routed to the shop where it is handy for troubleshooting and experimenting.

Three-wire #16 AC power cable works well for this, and is inexpensive as well. Use the white wire for positive, the black wire for negative and the green wire for ground.

I terminated the cables on barrier strips but the more ambitious among you may wish to wire a plug-and-socket arrangement.

Note that the power supply ground is floating and is not connected to the chassis.

The ground wire should be attached at the equipment common ground. This reduces the possibility of ground loops and hum.

Although I did not find it necessary in my situation it is also good practice to bypass both sides of the supply to ground at the termination with a pair of .1 ufd disks.

Caution required

There are several caveats. Always disconnect the defective supply before connecting the utility supply.

Do not connect the supply hot; always power it down, connect and then power up. Otherwise op amps may go into latchup.

Finally, be sure that the equipment doesn't show a short. Two dead supplies make for more frustration than one!

There is a certain comfort in knowing that a backup voltage is at the ready if needed. Our supply earns its keep by powering a small cassette interface in the main rack.

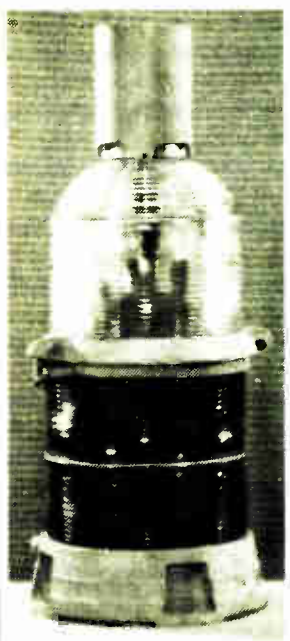
In addition, the unregulated voltage pulls the relays in the muting project from last month's column.

The total cost of this project should not exceed $50. If a little careful shopping is done the cost will be much less. It can keep you going and that always helps the bottom line!

Bill Higgs has been CE for WXLN/WFIA for six years and has also done station consulting work. He has a PhD. in Theology which helps explain his patience with small market radio. He can be reached at 502-583-4811.

Radio World Marketplace

If your company has a new product you wish us to consider in *Radio World Marketplace*, please send a press release and black and white photograph to Radio World Marketplace, P.O. Box 1214, Falls Church, VA 22041



Dual-lighting strobe

Broadcast Communications Systems' new SB-2001 is a dual lighting system with white strobe and red fresnel lens.

The strobe/day and red/night system is generally used in highly populated areas, which require red incandescent lights at night.

Owners of towers from 200' to 500' can forego painting with this system.

For more information, contact **Jeffrey Crooks at 608-833-3977,** or circle **Reader Service 71.**

Audio level control

FM Systems' ALM672 Audio Level Master maintains a constant audio volume level for input which may vary over a 30 dB range.

The ALM672's average program level input is −20 to +8 dBm, with peak level of 10 dB above the average and common mode supression of 40 dB or better. Average program output is 0, +4 or +8 dBm, with peak level 10 dB above the average level.

Dual-banded to prevent pumping and gated to prevent noise breathing, the ALM672 has program dependent control and phase-and gain-locked stereo left and right channels.

For more information, contact **Frank McClatchie at 714-979-3355,** or circle **Reader Service 79.**

Compact ¼" tape recorder

Otari's new MX-55-N compact ¼" tape recorder features a transport with DC quartz PLL capstan motor, controllable from an external synchronizer.

Options include transport remote control, autolocators, and a voice editing module which allows dialogue editing at twice original speed.

For more information, contact **John Carey at 415-592-8311,** or circle **Reader Service 77.**

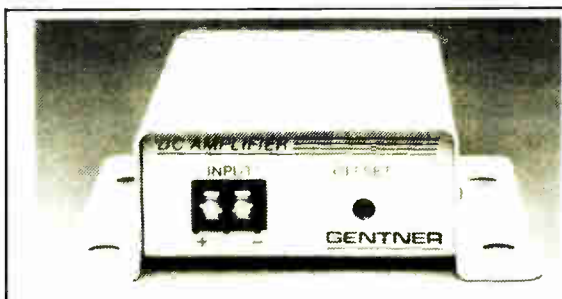
25 Hz tone processor

Zercom Corporation's new 25 Hz Tone Processor is available both in the standard unbalanced audio version or with optional active balanced inputs and outputs for a slightly higher price.

The tone processor was originally intended as an automation interface for reel-to-reel music playback decks without 25 Hz switching tone detectors and filters.

However, the Zercom tone processor can also be used on satellite networks for station signaling.

For additional information, contact **Jeff Zernov at 218-765-3151,** or circle **Reader Service 74.**



Remote control interface

Gentner RF Products has introduced a DC amplifier and antenna monitor interface for its VRC-1000 remote control unit.

The DC amp provides DC isolation for floating sample voltage, and isolates analog signals to 1000 VDC above ground. Either unity or 10X gain is provided.

With the antenna interface, monitor outputs, phase angle reading, loop current, etc. are provided continously to the VRC-1000 for limit checking and automatic logging.

For more information, contact **Kelli Maag at 801-268-1117,** or circle **Reader Service 73.**

SCA generator

BTC's new Model 1000 SCA Generator operates at carrier frequencies of 67 kHz and 92 kHz simultaneously, with an audio input level range of 0 dBm to 10 dBm.

The carrier stability of the Model 1000 is ±400 Hz, with modulation capability of 7.5 kHz. Frequency response of the SCA generator is ±1 dB, from 50 Hz to 7500 Hz. Distortion is kept at 0.1% or less.

Although the unit comes with 150 μS preemphasis standard, it is also available with 50 or 75μS preemphasis.

Optional mute and compressor modules are also available.

For more information contact **Bob German at 303-641-5503,** or circle **Reader Service 78.**

Subscription/Reader Service Forms

Radio World

February 15, 1988 Issue Use until May 15, 1988

FREE Subscription/Renewal Form

I would like to receive or continue receiving Radio World FREE each month. YES NO

Signature _____ Date _____

Please print and include all information

Name _____ Title _____

Company/Station _____

Address _____

City _____ State _____ ZIP _____

Business Telephone ( ) _____

Please circle only one entry for each category:

I. Type of Firm

A. Commercial AM station
B. Commercial FM station
C. Educational FM station
D. Combination AM/FM station
E. Network/group owner
F. Recording studio
G. TV station/teleprod facility
H. Consultant/ind engineer
I. Mfg, distributor or dealer
J. Other _____

II. Job Function

A. Ownership
B. General management
C. Engineering
D. Programming/production
E. News operations
F. Other (specify) _____

III. Purchasing Authority

1. Recommend 2. Specify 3. Approve

Reader Service

Please first fill out contact information at left. Then check each advertisement for corresponding number and circle below. NOTE: Circle no more than 10 numbers, otherwise card will not be processed.

001	021	041	061	081
002	022	042	062	082
003	023	043	063	083
004	024	044	064	084
005	025	045	065	085
006	026	046	066	086
007	027	047	067	087
008	028	048	068	088
009	029	049	069	089
010	030	050	070	090
011	031	051	071	091
012	032	052	072	092
013	033	053	073	093
014	034	054	074	094
015	035	055	075	095
016	036	056	076	096
017	037	057	077	097
018	038	058	078	098
019	039	059	079	099
020	040	060	080	100

Sales Call Service

Please have a salesperson contact me about these items (list numbers):

_____ _____ _____ _____

Clip & Mail to: Radio World, PO Box 1214, Falls Church VA 22041

Circle Reader Service 6 on Page 22

BUYERS GUIDE

Automation Equipment

Beta Key to Schafer Digital

by Paul Schafer, Pres
Schafer Int'l/Schafer Digital

La Jolla CA ... When I developed the first broadcast automation system 30 years ago, we played music on Seeburgs and everything else on reel-to-reel tape. We set switches to program the sequence of events and silence signalled the end of an event.

We got a bit fancier and chose a 25 Hz tone to indicate the end of an event. We achieved some degree of random access with what we called a "spotter"—a reel-to-reel recorder that cycled at high speed to locate a particular spot.

We've come a long way!

Technology Update

At the Radio '87 convention in Anaheim, I was proud to introduce the new Schafer Digital System, a system which stores everything a radio station will broadcast, and allows complete random access.

Digital is a buzz word these days. It's important to know that the "digital" I'm talking about is 16 bit, 44.1 kHz sampling frequency (not the 8 bit format employed in the 8mm audio on home systems).

I went to Japan to investigate 8mm and received a valuable indoctrination convincing me that rather than 8mm or VHS, the true EIAJ standard recording audio on the Sony Beta cassette gives us the best of the best.

I am impressed with CD quality, but in developing my system I felt the need to advance beyond a "Seeburg" philosophy to play CDs on the air. I felt it was important to be able to store everything a radio station broadcasts and provide total random access.

Hence the birth of the Schafer Digital System.

The Schafer Digital System stores the entire music library on Beta cassettes.

One or two cassettes store all of the commercials, IDs and other short events. The cassettes are automatically downloaded to a hard disk to provide instant access. Thus events may be played in any desired order, back to back.

The basis of the Schafer Digital System is the EIAJ standard format. Audio is recorded on a Beta cassette with the use of a digital processor. In the case of a digital recording such as a CD, the copy can be made digital to digital, actually "cloning" the original.

The L830 cassette allows five hours of digital recording on the "video" track and five hours on the hi-fi (FM) track, for a total of 10 hours of stereo per cassette.

The L750 cassette, which employs full thickness tape, allows four and a half hours on each for a total of nine hours of stereo.

In addition, there is a control track on one edge of the tape and a linear track on the other edge on which we record a SMPTE timecode track. This allows us to cue to within 1/30 of a second of any address on any cassette.

There are eight VCRs in the basic Schafer Digital System, providing storage capability of up to 80 hours of stereo. The system may be expanded to up to 32 VCRs plus four or eight external sources.

Schafer Digital Automation System

The instant access "spot" system utilizes only one of the external inputs.

Remaining external inputs may be used for network, announcer, cartridge or any other audio sources. All are controllable from the on-the-air computer.

The instant access spot system incorporates one or more VCRs, each capable of storing four hours of stereo. The on-the-air computer loaded with the schedule of spots automatically down-loads from the VCRs to the hard disk in advance of air time.

The computer airs the events from the hard disk, which stores 30 minutes.

The system keeps far enough ahead so a cassette can be removed to permit new material to be recorded at any time during the broadcast day.

The Schafer Digital production station incorporates an editing VCR. Commercials, IDs, music cassettes and other events which will be aired from the system may be recorded and edited.

The computer used in conjunction with the production station accommo-

(continued on page 26)

KKDL Run by Di-trol

by Wayne Edwards, Op Dir
KKDL-FM

Detroit Lakes MN ... When our automation system's electronic brain became unreliable some 18 months ago, our management asked for a low-cost replacement which could deliver walk-away operation.

User Report

We've enjoyed great results with both satellite and tape-delivered music services with the Di-trol System from Innovative Automation.

Our engineer, Richard Tyner, and I were able to use the Di-trol's programming versatility and hardware flexibility to deliver error-free programming.

Di-trol uses an Apple IIe personal computer system and an audio interface with 23 inputs. The system can provide random-access cart selection for up to four carousels with 24 trays each. A monitor, double-disk drive and printer are standard.

Centered around a satellite music network, we used four random-access carousels, two carousels in sequential-play mode, four singleplay cart machines, three reel-to-reel decks, two studios, two Marti receivers and the EBS signal tone generator.

The software has four key areas for operations: Program Log, Exact Time Table, Manual Operations and Carousel Directory.

The system has 7-day programming capacity (1440 events/day in program logs; 192 events/day in exact time tables), with automatic loading of new logs at midnight for continuous operation.

The re-booting characteristics of the computer became a useful function for us immediately.

Although the program log displays event steps as hours and minutes, this is just a labelling procedure without any real time association—unless tied to the exact time table, or in power-down/up sequences.

When re-booting, the software resumes operations at the program step most closely associated with real time. With satellite as our basis of programming, I set up program logs so a re-boot would bring us up in step.

This was a welcome function for the power outages and brown-outs caused by storms, but also became a quick, easy

(continued on page 29)

BUYERS GUIDE INDEX

User Reports:

Also articles from Paul Schafer on the new Schafer Digital System, Nick Solberg on Concept Production's CAPS I, and David Collins on MEI's Digisound.

BUYERS GUIDE

Trends in Station Automation

by **Marlene Petska Lane**

Falls Church VA ... The concept of automation has undergone a radical change in recent years, thanks in large part to digital technology and the manufacturers who have incorporated it into their systems.

No longer is automation simply a money-saving device for stations operating on the edge of profitability. Now it has become a means of achieving greater control and walk away capability.

"There has never been a time up to now that you could have your entire music and commercial library in a system and program the order in which those things will occur on the air," says Paul Schafer, president of Schafer Digital.

Schafer was one of the early pioneers of automation for radio stations, and recently introduced his digital automation system using Beta consumer video.

Unfortunately for station operators, however, manufacturers have not settled on which digital format or formats will become standard. In addition to Schafer's there are systems using R-DAT, 8mm, hard disk and all or some of these. The choices can be difficult.

Those using music syndicators may find decision making even tougher. The media chosen by the syndicators may limit broadcasters in their choice of system suppliers.

"Not only are stations going to have to choose the kind of music they want, they're going to have to choose a technology at the same time," says Tom Ransom, director of marketing and sales for IGM Communications. IGM's Instacart carousel automation became an industry standard early on.

Each manufacturer has its own idea about what will happen in the digital automation market.

Concept Productions is putting stock in R-DAT for automation. At Radio '87 the company showed its prototype CAPS I Computer Assisted Programming System using 10 R-DAT transports for music, voice, PSAs, commercials and other pre-recorded material. A basic system will cost $24,000.

Systemation President Steve Bellinger believes 8mm will win out over the other formats by the simple process of elimination.

"Hard disk systems and CDs are expensive, so all the broadcasters are going to run for R-DAT," says Bellinger. "But when they find out it's going to cost them $2000 to store 30 songs, where $1200 will store 300 songs on 8mm, they'll change their minds," he says.

Bellinger says he doesn't think the 8 bit, 32 kHz sampling rate of 8mm is a problem.

Industry Roundup

"Why get into an argument about a 44 to 48 kHz sampling rate when you can't get it through your FM transmitter anyway—and if you could, try and squeeze it through the receivers," says Bellinger.

However, Bellinger says that Systemation's X-7D automation system can "support anything in the interest of those who believe they should do something else." The X-7D controller with two terminals costs $12,500. Each 8mm deck costs about $2000.

Paul Schafer, "father" of the first automation system in 1956, believes Beta videocassette is the only suitable digital format for automation.

Schafer Digital's system, shown at Radio '87 and now being delivered to two stations, employs Sony VCRs and Beta videocassettes, with a hard disk system for random accessing short events. A complete system using eight VCRs costs $29,990.

"We had to go 16 bit, with the standard 44.1 or 48 kHz sampling for true digital quality and the ability to clone the original," says Schafer.

Schafer says he ruled out the use of 8mm and R-DAT early on in his development of a new system. He maintains that 8mm could not provide the quality he wanted. And although R-DAT quality is as good as Beta, he felt the two-hour cassette capacity limited it for his system.

"I wanted to have the entire library accessible so any song could be selected," says Schafer.

Yet other companies are bypassing digital tape formats altogether, electing in-

(continued on page 28)

BUYERS GUIDE

CKCB's Digital Solution: X-7D

by Wayne Bjorgan, Exec VP
CKCB/CKBB

Collingwood Ontario ... When you have a small AM radio station in a market of 15,000 that's been operating out of a "hole-in-the-wall" since its inception, and circumstances demand a new building and new equipment, solutions are very limited if you wish to maintain a marginally profitable operation.

Enter Systemation X-7D, the homegrown brainchild of Steve Bellinger of WDZ/WDZQ in Decatur, Illinois.

CKCB is a 1 kW operation in a small town on the shores of Georgian Bay, about 80 miles northwest of Toronto.

Since first signing on in 1965, the station had been operating out of a storefront location downtown with functional, but recently obsolete equipment.

New equipment was an absolute necessity, and the lease on the premises was nearing expiration.

Faced with construction of a new building and purchases of all new equipment, to say we had a problem on our hands would have been a serious understatement.

A chance meeting between one of our principals and Steve Bellinger at the NAB show proved to be our salvation.

User Report

We did go ahead with the new building, designed with Systemation's computer-driven random access cassette operation in mind.

Included in the package are six Sony EV-S700U 8mm digital cassette recorder/playback units for our entire music library. Each cassette is capable of storing up to 10 hours of music, digitally recorded in stereo.

All other program sources are on analog audio cassette decks.

Presently, we operate about 30% of our broadcast week with the system in automatic mode; the remainder of the time we run on live assist, or network.

CKCB employs a program/news staff of four—small by Canadian standards. With Systemation, the staff can easily handle our programming commitments.

The main benefits of the system, in our applications, include economy of equipment purchase. It costs about half of what it would had we used traditional gear. Also, there is increased productivity and community involvement because of the use of automatic programming.

The space our new building required was minimal with the X-7D. Our master control is less than 50 square feet and contains a small console, Systemation keyboard, monitor and joy stick (for live assist operating) microphone, telephone and weather station.

There is not a turntable, tape deck or cartridge deck to be seen.

The quality of our digital music is much superior to our former analog music, even to an untrained ear. Quality control is much improved because all programming, whether automatic or live is pre-selected and keyed into the computer.

Our announcers are more creative because they're not spending valuable time looking up, seeking out and cueing up.

Remotes, one of our best sources of revenue, are handled simply by carrying a remote portable computer keyboard and screen to location, patching it into a land-line and dialing up Systemation back at the station.

No longer do we have the need for an operator back at the studios. We cut our manpower costs in half.

We have been operating our new station for less than six months, and we're sure the list of benefits will continue to grow as we expand our use of Systemation.

Editor's note: Wayne Bjorgan, who has been in broadcasting for more than 25 years, is also executive VP of CKCB's parent station CKBB in Barrie, Ontario.

For more information on the X-7D, call Steve Bellinger at Systemation: 217-423-9744.

System 7000 Shines

by Robert I. Wein, Pres/GM
WTSX/WDLC

Port Jervis NY ... Our decision to separate our two stations' programming in mid 1984 using the Schafer 7000 Level 2 automation system was one of the best business decisions that could have been made in our market.

Since that time we've been very happy with the system. It handles a complex adult contemporary music format with ease and flair. It allows us to impart a local flavor to the extent that we receive telephone calls for our DJs.

One of the features we especially appreciate is the ease of making programming changes within the system. You can use CD or digital audio source equipment with enhanced software programming installed in the system's firmware.

Operation failures are displayed both on the control and the video terminal. Editing irregularities are displayed as questions on the VDT until corrected.

The diagnostic system gives us the ability to locate and display the source of the system's irregularities.

Because the Schafer 7000 is a modular, mainframe design, it is easy to maintain. Most problems can be fixed quickly by replacing one of the plug-in boards.

The support service from Schafer has been exceptional. During the rare times when there have been technical problems, we have received extensive and immediate aid both on the telephone and with spare parts.

It is comforting to know that our problems and priorities are considered by Bob Dix and his staff as theirs, too.

User Report

The Schafer 7000 automation system gives the user editing and programming flexibility through Schafer's long range plug-in expandability, keyboard integrated real time and event scheduling commands in clear English.

The 7000 series of systems can program a live source, CD, digital sound reproduction, satellite, reel-to-reel and random access multicart.

We combine the 7000 with two audio files to provide versatility and immediate access for local programming, including remotes and up-to-the-minute emergency information.

Editor's note: Robert Wein started in radio at the age of 15 and boasts 30 years in the business. He took over the family operation of WTSX/WDLC two years ago.

For more information about the Schafer 7000, contact Bob Dix at 703-783-2000. The author may be reached at 914-856-5185.

BUYERS GUIDE

Automating with Schafer Digital

(continued from page 23)
dates data base storage to allow preparation and editing of the music playlist and the commercial schedule.

Music library and playlist data may be input from a service. Data may be input from a traffic and accounting system.

The simplest system has a single computer. It allows inputting by floppy disk, the commercial schedule from a traffic and accounting system and the music playlist from a syndicator.

Limited last minute deletions and changes can be made by the operator/DJ.

A countdown clock on the screen shows how many seconds to the end of the on-the-air event. When the system is in pause and the command is given to resume programming, the clock shows the number of seconds until start of programming.

From the command to resume, a countdown of 12 seconds will be shown if the next event is music direct from a VCR. Events on the hard disk begin instantly.

In normal, automatic operation there is no dead air or waiting. The computer initiates the dead roll anticipating the start time of the next event. A two second fade/overlap following a musical selection is normal.

The fade in and fade out time is adjustable, but normally set for 0.2 seconds fade in and 2 seconds fade out.

A song which fades will show playing time to the beginning of the fade. A song which ends in a crescendo will show playing time to the end of the cresendo. The next event begins at the time indicated as the end of playing time of the preceding event, thus allowing overlap as desired.

Music libraries designed for the Schafer Digital System will be available from music syndicators. Playlists will be available from music syndicators and companies specializing in playlists.

A playlist can be created or modified by the program director of the radio station on the computer in the production station.

The commercial schedule can be handled by the system in several ways. It may be input directly into the system from a traffic and accounting system. Or the computer in the production station may be used to combine the schedule from a traffic and accounting system with the music playlist.

Another option is to use the computer in the production station to create the commercial schedule.

The combined schedule may be reviewed and edited before passing it along to the on-the-air computer via a floppy disk or optionally, by direct connection.

The system is flexible in its application to fill the needs of any type of radio station operation. Music playlists and commercial schedules may be programmed for days or weeks in advance.

The Schafer Digital System computer has been designed to avoid programming conflicts. For example, in the case of scheduling music the computer will not allow a song to be scheduled if it cannot be cued in time.

It will not allow a song to be programmed following a song on the same cassette.

Because the system can take up to five minutes to locate a particular song, it will not allow a song to be programmed from the same cassette as the two previous songs, and will not allow a combination of two songs with a total playing time of less than five minutes.

Variations from these parameters may be programmed should they prove restrictive for a given format. Given the normal procedure of placing music of a similar type on the same cassette and the fact that a system has eight or 16 VCRs, the limitation should not prove restrictive.

Syndicators and playlist suppliers providing playlists for use with the Schafer Digital System will utilize a software program to avoid programming conflicts.

A simple system for an all-talk format or for a station which takes programming from a satellite music network would incorporate a stand-alone spot system.

Editor's note: For more information, contact the author at 619-456-8000.

System 100 Delivers

by Curtis Durst, GM/Owner WKLP/WQZK

(Editor's note: Absolute Broadcast Automation principal Jack Mullen II is part owner of WKLP/WQZK, where this User Report originated.)

Keyser WV . . . My partners and I once said, "We'll never automate; automated stations sound automated." That was before the System 100 Real Time Automation.

System 100 is promoted by Absolute Broadcast Automation as total radio station automation. I believe the results are consistent with the claim.

User Report

After purchasing a poorly equipped AM/FM combo, we decided that a greater profit could result from separate programming of the stations. We quickly realized that our market situation would not economically justify two professional sounding air staffs.

In addition our operating capital was depleted by the equipment needs of the FM station. We decided to consider automation.

System 100 permitted us to take advantage of a small group of talented, hardworking announcers who would be "live" on the FM station and "cut talk tape" on the automated AM station.

We obtained the full business software package so we could print commercial logs for the FM and produce the real time schedule of events used by the AM.

The use of a computerized traffic system alone saved hours of manual log preparation each day. We also replaced the accountant with the A/R, A/P, billing and general ledger programs.

The powerful program automation of the System 100 allowed us to duplicate the live operation we had originally planned to implement.

Since space is limited, I'll confine my discussion of details to the scheduling software responsible for the natural live sound produced by System 100.

The result of the scheduling process is a comprehensive sequence of events including music, spots, talk and news, as well as the exact time each event will air.

Schedule software

The schedule is printed on paper and loaded to the automation system for use on the day for which the schedule was prepared. The printed copy can then be used to record the so-called "real-time talk," which consists of specific talk segments recorded and aired at the designated time and location in the schedule.

To generate this sequence of events the

(continued on page 28)

BUYERS GUIDE

Touchstone Lends WFIL a Hand

by Russ Mundschenk, CE
WFIL/WEAZ

Philadelphia PA ... Find a fully operator-interactive control system that can provide automated satellite program control, and run multi-CD players and future digital audio storage devices as well as traditional sources.

Have it automatically select pre-programmed mix-minus feeds for sports network origination.

Have it be capable of providing the live-assist announcer with what he needs when he needs it.

Also, make it fit in a tiny temporary studio and have it working in 30 days.

Finding such a system was the task we set out to accomplish to completely modernize the soon-to-be acquired WFIL-AM. All available control systems were evaluated.

Media Touch Systems of Salem, NH turned up as the only feasible candidate.

Media Touch had just begun marketing a touchscreen-PC based controller that they had been testing at all-news WEEI in Boston for more a year.

A satellite programmed/live assist music format is different in many ways, but Media Touch assured us the new software could be written and the system on line within our restricted timeframe.

User Report

We gave Media Touch the nod. A month of sleepless nights later, the system was operational in time for ownership change.

With the Media Touch Touchstone system, a 19" color video computer monitor with attached touchscreen replaces the traditional console.

The screen layout resembles a scrolled program log with each current event near the top of the screen in an "actives" pile. Next to each event three different "touch boxes" allow the operator to control its current status.

Other boxes allow for instant source access and system configuration changes.

The operator can also access a theoretically unlimited number of additional spreadsheet-like screens to look at the log, choose songs from a data base or bring up live copy.

The capacitive touchscreen interfaces via RS-232 to an IBM compatible PC that controls studio peripherals such as audio and mechanical switchers.

This PC is then Novell-networked to a File-Server PC that continually updates the computer with log information. The File-Server then network interfaces to a number of work stations that allow for manual input of data or changes in system configuration.

The traffic work station is connected to the station's IBM system 36 Columbine traffic computer for automatic program log downloading.

Studio audio switching is centralized to three Ramco, Inc. RS-1616 audio switcher mixers configured for 48 in and 16 out. The computer selects the appropriate audio routing for the on air source by its log designation or touchscreen selection.

An RS-232 controlled mechanical switcher provides 16 command channels to start cart decks, reel-to-reel decks and other sources that are not RS-232 compatible.

The status of these and other units as well as satellite receiver commands are fed back to the computer via a similar tally interface.

During live-assist times, preprogrammed cuts are called up from two Audiometrics multi-CD players loaded with identical syndicated libraries.

As with any pioneering system of this complexity, it was not without its problems. Most of these were software related and quickly corrected by Media Touch via modem.

No large hardware problems have crept up in the eight months the system has been operational. We believe this is due in part to the use of uninterruptible power supply AC isolation and optoisolator control isolation.

Should a failure occur, it is a fairly simple matter to swap PCs. All the units have the current control program available from the network or in their local drives.

A fully interactive computer system such as this one will dominate the broadcast industry in years to come.

The advent of digital audio storage coupled with other types of computerized random source selection and the programming needs of today's highly structured formats will make similar systems a necessity in the future.

Editor's note: Russ Mundschenk has been CE of independent station WEAZ for more than four years and WFIL since it was acquired in April, 1987.

For more information on Media Touch's Touchstone, contact John Connell at 603-893-5104. The author may be reached at 215-664-5666.

BUYERS GUIDE

ABA 100 Makes Control Easy

(continued from page 26)
scheduling software takes information from the spot order files, the music library files and the format masterlogs.

This method of pre-producing the schedule of events is novel since it eliminates the manual, "punch-in" of program sequences and permits live sounding talk to be generated.

In other words, say goodbye to the time announce schemes of the past! All music is scheduled in advance using the music management portions of the scheduling software. Thus programming techniques are handled automatically.

Some of the music management features include song recognition by categories such as current, recurrent, add, oldie and gold. If jingles are used, the software automatically matches the jingle tempo with the tempo of the upcoming song.

Parameters such as flow, artist and song separation, hot clock requirements and others which are user definable determine what songs are scheduled. If station IDs are to be aired over the intro of a song then "intro length matching" of the song is accomplished.

Many other similar considerations are possible so that most format requirements can be satisfied.

After a schedule is produced, the process of recording talk for a typical six hour show is completed in about 20 minutes. System 100 permits talks to air out of the end of a song and over the intro of the next song.

It is therefore possible to have music mixed under a talk segment in a manner analogous to a live music talk mix.

Walk-away time is user set and varies according to talk tape and music rotation requirements. Our typical walk-away time is six hours, after which we change talk tapes. Days of walk-away time are possible.

Our system records newscasts from two networks and airs them each on a delayed basis. Local news is recorded to cart for access by the system five times a day.

The system also airs Paul Harvey news and ABC sportscasts live during the day. The backtiming is automatically taken care of during scheduling and no operator assistance is needed.

The system features computer assisted music and commercial recording. The software is fault tolerant and the on-line prompting makes input of information very easy.

Remote control of the system and legal transmitter remote control is possible with the addition of some soon-to-be-available hardware and software, according to the company.

System 100 can also control satellite programming services and other special configuration situations.

Our future plans include automating our other stations utilizing digital audio tape (DAT) players as the source for music and spots.

Our evaluation of the System 100 is good. Our only negative comment concerns the incomplete documentation, which is supposed to be finished soon.

The hardware and software are reliable. Our experience with the system spans more than two years with only minor problems.

Thanks to System 100 we have a professional and consistent sounding AM radio station with little more cost than operating the FM alone.

System 100 has changed my I'll-never-automate attitude.

Editor's note: Curtis Durst is part owner of the Starcast Systems Inc. group of stations.

For more information on Absolute Broadcast's System 100, contact Jack Mullen at 301-786-4661. The author may be reached at 304-788-1662.

Formats Vary in Digital Automation

(continued from page 24)
stead to develop hard disk storage systems. One such company is Microprobe Electronics.

"We wanted to get away from using any tape because with it you don't have instant access and you get all the inherent problems of moving tape," says Dave Collins, MEI president.

MEI's Digisound is a mass digital storage unit that allows instant access to tracks. Each disk drive has 280 Mb of capacity, which provides about 30 minutes of stereo audio.

The system may be expanded to six drives. A complete entry level system costs about $30,000; the largest system sells for about $60,000.

Collins says that automation system manufacturers have not yet achieved total walk away capability; they must "redo" their software to utilize the two-way digital communication possible between a station and a satellite syndicator.

"Although the digital audio storage units are in place now," says Collins, "the automation brains need updated software to capitalize on the new generation of intelligent interactive source equipment like (MEI's) Digisound."

Despite the current disagreement as to which digital formats will succeed in the automation marketplace, manufacturers say that any move towards digital is a quantum leap for radio.

"You're getting better audio quality—whatever way you're getting it," says Ransom.

And, say manufacturers, using the new random access, walk away systems may even help turn around the current decline in radio listenership.

❑ Industry Tidbits ❑

New Directions ... Test equipment manufacturer **John Fluke Mfg. Co.** is now responsible for selling, supporting and servicing all **Philips** test and measurement instruments in North America.

A new company, **Redwood Marketing** in Nashville, TN has acquired North and South American marketing rights for the **GENELEC line of self-powered professional studio monitor systems.** Redwood will offer sales, service and support for the line, and has already supplied several systems to **Minnesota Public Radio and The World Theater in St. Paul.**

Manufacturing and sales rights have also been given to **Zercom Corporation** from **M.W. Persons** for its 25 Hz Tone Processor.

Those needing **RCA broadcast equipment spare parts** should know that market support has been transferred from RCA to **GE Support Services** in Mt. Laurel, NJ.

❑❑❑

People ... In line with **Gentner Electronics Corporation's** new Audio Products Division, company president Russell Gentner announced a major restructuring of the corporation's management.

Personnel changes include **Elaine Jones**, formerly marketing manager. She is now **director of marketing and sales for sound and teleconferencing**. Also former sales manager **Gary Crowder** has been appointed **director of marketing and sales for broadcast audio** ...

Walt Rice, who was with **Harris Corporation** for 17 years and was most recently its west coast district sales manager has become **Continental's** new **manager of radio sales**. He replaces **Vern Collins** who, as most know, recently retired.

Harris is now looking for a new west coast salesman. Interested parties can call **Ron Frillman** at 217-222-8200.

John Kenyon, who was General Sales Manager for Pacific Recorders & Engineering is back in the microphone business. Kenyon, who was with H.M. Electronics before going to PR&E has accepted a position with **Sennheiser** ... replacing Kenyon is **Anders Madsen,** who was formerly Tascam's advertising manager...

Nick Solberg, most recently Concept Productions' systems division director, has accepted a position with **Media Touch** ...

ADC Telecommunications has named **Richard Lawrence** its new **broadcast—west account manager** ... and **Denon America** has appointed **Laura Tyson** its new **product manager** for its professional broadcast line.

Concept Productions is looking for an assembly, test and service representative. Contact Dick Wagner at 916-782-7754 if you're interested ...

If you have industry/equipment news to report, send it to **Radio World Buyers Guide,** *5827 Columbia Pike, Ste 310, Falls Church VA 22041.*

BUYERS GUIDE

Di-trol Affordable, Dependable

(continued from page 23)

way for an inexperienced operator to correct those occasional unexpected problems that affect automated programming.

The computer writes to disk after each programming step and alarm situation for about five seconds.

During this time, the system may not detect an end-of-message tone. Our problem was with five-second maximum length image liners.

We solved that beautifully by connecting the liner deck's audio into a summing point. We modified the deck so an auxiliary tone laid over the entire liner sent the audio out, on line.

This prevented anyone from placing a wrong cart and having it air over network.

To start the deck, we connected a line carrying the satellite function tone for liners to an interface connected to the deck's remote start. The interface utilized latching relays triggered by two separate momentary pulses from the automation.

At the start of our local commercial breaks, we shut the tone line off, then turned it on immediately after the last commercial played. If we ran long locally, the tone to the deck would never get through. Correctly-timed breaks allowed the liner to play in the five-second window the network allowed.

Legal IDs were handled in a similarly.

Other pulse commands from the computer were used to trigger interfaces to turn our transmitter plate on and off remotely, automatically record closed-circuit feeds and trigger the placing of an auxiliary tone on carts used to record programs off-satellite.

The more we allowed the satellite personnel to control our equipment and the Di-trol to handle scheduled tasks, the better we sounded.

When new management decided to go to a tape service, we were planning to extend the automation even further, using relays and computer commands to change liners automatically with network announcer shift changes, and external timers to step out of remote broadcasts within our local breaks.

I'm not sure total walk-away radio is possible, but we were very close.

During installation, the main difficulty was the conversion of our carousels for binary code data, as we were pioneering the conversion for our brand of equipment.

Di-trol designer Don Prentice provided outstanding support.

The versatility of Di-trol can't be overstated. For example we found the system's switching to be a bit slow when we didn't take an optional break and instead went directly back to the satellite source.

That was easily modified in the internal circuitry of the interface. A better solution would be to use a second receiver at another input, with the same network.

Actual use has revealed some irritations, but no major problems. Static electricity discharges, which would cause stepping at wrong times, were handled with static mats and spray.

Transients will cause the system to pulse ahead through the silent sense circuitry. Our most frequent source of transients came with the passage of the leading edge of a storm front, so we'd just switch the silent sense off until the storm was settled in.

If the commercial load is heavy, printer output of the previous day's (or days') logs is slow. Sometimes the system will back out of that print function.

We addressed that by printing out portions of the actual log the same day.

There are two software changes we'd like to see.

First, we'd like the ability to change software labelling of audio sources locally. The current labelling is pre-set and inaccessible. We have device listings in our printouts that don't match with the actual equipment.

The second change would be a synchronization of an exact time update with the intended program step. This would help keep programming in step.

If our programming gets out of step for some reason and goes undetected long enough, stepping problems may occur when the logs go from AM to PM and vice versa.

Experienced and imaginative engineers and programmers can really make use of Di-trol's capacities and versatility.

The system gets my endorsement because it answered our needs without requiring much monitoring. That's the kind of dependability you need from an automated system.

Editor's note: Wayne Edwards has nine years of broadcasting experience under his belt, and has held positions in "everything from news to programming."

For more information on the Di-trol System, contact Don Prentice at Innovative: 505-891-0501. The author may be reached at 218-847-5624.

BE 16x Trouble-Free

by Glen Hopkins, CE
WDBR/WTAX

Springfield IL ... WDBR replaced its aging, troublesome automation system in late 1982 with the Broadcast Electronics Control 16x. Since then, we have used a format that combines live radio with the control of an automated station.

User Report

We do mostly live-assist with our system. Our morning and afternoon DJs operate it just as if they were on cart, although all material is fed through the automation system as a source.

One of the best features of the Control 16x system is source substitution. If we lose a bearing in a tape motor or have to change heads on a tape machine, this feature allows us to tell the system to use a different source without our having to reprogram it.

The Control 16x also has an alarm system so we can catch mistakes before they occur.

If a source is not ready, the Control 16x will let us know by flashing "Next-Not-Ready" on a monitor screen. There is also a panel on the system with 12 lights connected to slave lights that can be seen in all parts of the building.

If a source is still not ready when the system goes to play it, the Control 16x will skip over it, so we never have a problem with "dead air."

We have had a minimum of problems with our system. Fail-safe measures include a battery to back up the memory in case of a power failure. We also have the system memory stored on cartridge so we can reload it if needed.

The strong RF field caused by our AM and FM towers' close promixmity to our building has not affected our Control 16x.

Some of the audio sources going into the system had RF on them and we had to get that off, but the digital part of the system was never affected by it.

We maintain that the system can run our programming better than any live operator. If you listen to us and can tell that we're automated, then *we're* doing something wrong, not the system.

Glen Hopkins is a consultant for Sage Broadcasting's 17 stations.

For more information on the Control 16x, contact Jan Vance at BE: 217-224-9600. The author may be reached at 217-753-5400.

BUYERS GUIDE

CAPS 1 Weds Computers, R-DAT

by Nick Solberg, Systems Div Dir
Concept Productions

Roseville CA ... Concept Production's CAPS 1 Computer Assisted Programming System is the first of a new family of system controllers to take advantage of new developments in software, PC hardware and digital audio tape. The first two systems are scheduled to be delivered this month.

Ten R-DAT transports are used with CAPS 1 for music, voice tracks, PSAs, commercials, time shift of news and other pre-recorded audio normally associated with a live-assist, partial or full time automation systems.

All ten R-DAT transports are capable of full random access under direct control of the CAPS 1 computer/audio switcher using a serial interface developed by Concept.

The CAPS 1 system mounts in one 70" equipment rack. This rack contains the system audio monitor panel with VU meters, internal monitor speakers and a stereo, 20 W per channel monitor amplifier for external speakers.

The system computer/ten channel audio switcher and ten R-DAT transports also mount within the rack.

External to the rack are the system video monitor, keyboard and optional printer. Additional video monitors and special studio keyboards are available as options for live studio operation.

The CAPS 1 computer, a PC/XT clone with 640K of RAM, one 3½" and one 5¼" disk drive, contains the system audio switcher. The switcher consists of five dual source input control cards and one output control card.

Technology — Update

Each input card controls two R-DAT transports, providing audio switching, AFSK (logging data) tone detection and serial remote control for each transport. The output card contains the system program amplifiers and the necesssary tone encoders for recording DAT tapes.

Audio switching is solid state. Digital audio faders are used for control of audio levels.

Each multilevel input board and the system output board were developed to take advantage of ASIC (Application Specific Integrated Circuits) with multiple microprocessors, EPROMS and low noise linear ICs.

The CAPS 1 system software, developed in house by Concept, makes extensive use of menus and windows with single letter or cursor selection of data for control of system programming.

Typical system programming by event numbers or by entering multiple commands has been eliminated with this system.

Commands made simple

All commands available for a specific operation are displayed for the operator and, as necessary, "help" data is displayed. A system command is selected with the cursor keys or by entering a single letter on the keyboard.

A number of operations are also selected using special function keys on the system keyboard. Each of these special keys is labelled.

Extensive use of automatic operations is provided.

For example, scheduling of music and voice tracks for a specific day is accomplished by selecting the "Schedule Day" function from the main system menu, entering the "Day Name" to the schedule, placing the Concept music schedule disk in a disk drive and pressing the enter key.

The system then schedules the correct music rotations with voice tracks, source assignments and EOM data for each selection.

Commercials are scheduled by using a commercial disk generated by an external billing and traffic system or by entering a copy number.

The system selects, from a data base created when the commercial was recorded, all data necessary to play the selected commercial, including the source and location, logging data and EOM placement.

Provision for real-time functions such as time shifting, delay recording network news or time corrections for over-programmed music are included for each day schedule.

After-the-fact data

The system stores five full day schedules and also provides after-the-fact log data, including actual air time and reports of events that did not run on air.

Each event to play is displayed with a full description on the monitor. The system data base contains the necessary source and location of each selection for random access control of the R-DAT transports. The operator or programmer is not required to program or enter this information.

The system is capable of full live assist operation. The studio operator may use events as they are displayed, one event at a time, move them around or even enter data for new events.

At all times the operator has a full display of the system status and a full description of the events on the system monitor.

Commercial recording may be accomplished at the main system or on an optional record center which consists of an R-DAT transport and another PC.

The system stores the EOM time as entered by the operator and also makes a back-up DAT tape.

The Concept CAPS 1 and DAT music formats offer ease of programming, R-DAT transports and digital audio control.

Editor's note: For more information, contact Dick Wagner at Concept: 916-782-7754.

MEI Offers Flexibility

by David E. Collins, Pres
Microprobe Electronics Inc./MEI

Lake Forest IL ... A new age has arrived. Not with a bang but, like most meaningful changes, slowly and steadily. In this case I'm referring to the age of mass digital audio storage.

MEI's Digisound, a mass digital audio storage unit, was designed to replace mechanical multiple cartridge equipment. Digisound offers instant access to thousands of sound tracks. Monaural and stereo spots may be intermixed.

Technology — Update

The sound is sampled 32,000 times a second. Each sample of 16 bits is stored on a Winchester hard disk drive.

Because Digisound is a linear system, nothing is discarded or compressed. This technique provides a full 15 kHz frequency response and 0.009% THD at +18 dBm.

Digisound can support several drives of different types and capacities. The most cost effective drive at this time is a 280 Mb unit which provides 60 minutes of monaural recording time.

Digisound will automatically begin recording "on audio" so that the resulting spots are tightly cued, thus barring

(continued on next page)

Consultants

BUYERS GUIDE

Digisound Allows Instant Access

(continued from previous page)
human error or the possibility of "wow."

In addition, Digisound may be instructed to time (to 1/10 of a second accuracy) and automatically terminate any recording. Program elements will be of precisely known lengths.

This precise control of recording times makes Digisound ideally suited to satellite formats, and is also useful for remote sports broadcasts.

Satellite "liners" are more easily handled using digital storage. It is effortless to change or customize a few sound tracks rather than re-record all the rotating cuts on a cartridge.

Walk-a-way time is another plus for a station using a satellite format and Digisound.

KLCI's (Boise, ID) system operates unattended from 6 PM Friday until 6 AM Sunday when local tapes are played.

This is important to keep in mind when justifying the cost of a system which might lease for $600 to $900 per month.

Digisound's input ports may be changed (under software control) to respond to a BCD code from any automation controller capable of addressing an instant-start device.

Digisound, because of its large storage capacity and the fact that older automation "brains" are limited to 99 trays per port, becomes four sources to the host automation controller.

Sources 1, 2, 3 and 4 are converted to A, B, C, and D on the Digisound CRT. The operator programs the automation controller as he or she always has.

The preferred method of communicating with Digisound is serial through your computer, using a RS-232-C link.

Once this serial link is established, Digisound's entire command set is accessible. It becomes an interactive, intelligent piece of source equipment, capable of responding to commands and answering queries regarding its sound inventory.

Under computer control it can record, delete, interchange, list, play, copy, change text and perform other useful functions.

All the day's commercials, jingles, PSAs and special features stored in Digisound may be listed on a printer for reference.

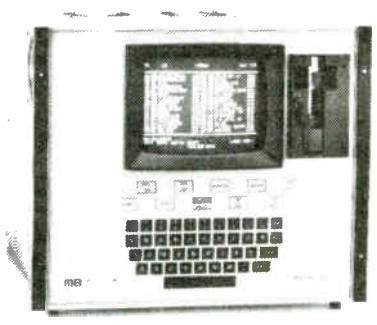
Listed are the track number, four-digit house number, description, length and whether it is a mono or stereo track.

When a track is aired the printer will list the date and time along with the text description.

Digisound, being a software based recording and playback system, opens the door to many interesting possibilities for manipulating the station's inventory.

Digisound can be easily tailored to fit any radio station's changing day-to-day operations.

Editor's note: For more information, contact the author at MEI: 312-816-6690.



MEI's Digisound

BUYERS BRIEFS

MW Persons' Programmer 3A Live Assist Controller is an alternative for stations that may not need the program control offered by full automation.

Sources which can be used with the controller include reel-to-reel decks, cart machines, cassette decks and carousels.

The controller memory stores information on which song is to be played next. The operator sets the memory by touching one of four push buttons which then lights along with the common start push button.

The selected deck starts when the common start button is pushed.

A minutes and seconds digital timer resets to zero and starts counting up each time a deck is started.

Stereo audio controls for each input allow the operator to adjust the level of every source independently.

The Programmer has stereo program audio outputs along with a cue output. Program audio can be easily strapped to monaural at AM stations.

The Programmer 3A will do an automation type segue from the source that is running on the air to the next preselected source in memory. An auto sequence option allows it to go through three or four sources continuously in a fixed sequence until interrupted by an operator.

For more information contact MW Persons at 218-829-1326, or circle Reader Service 67.

Circle Reader Service 21 on Page 22

The DYNAMAX® family of cartridge machines

New models, good looking, great listening

Thirty years of experience is working for you. In 1954, Fidelipac invented the endless loop tape cartridge, and we've been in the business ever since. We've focused our experience to develop a complete line of innovative, state-of-the-art cartridge machines.

CTR100 Series

The ultimate cartridge machine. You can intermix standard, high output, mono, stereo, matrix and discrete format cartridges using our Cartscan™ system. Even warn a jock to read live tags or automatically turn on external functions. Create special effects with Vary Speed. Time carts with ease, even in fast forward, with our real time digital clock. Other features include DC servo motor. Blackout status display. Splice finder. On-board diagnostics. SMPTE time code compatibility. Phase correcting matrix system. Optional Maxtrax® format. And audio you'd never expect from a cart machine.

CTR10 Series

Our idea of basic utility. 3 cue tones. Automatic fast forward. Audio search. Audio switcher and mixer. 1 kHz defeat. Constant current recording. Low voltage 2-inch air damped solenoid. Ball-bearing self aligning pressure roller. Azimuth independent head bridge assembly. Superb audio.

CTR30 Series

A 3-Deck that records. The recording system is standard, and the complete unit is priced below most play-only 3-decks. The CTR30 Series offers 3 cue tones, audio switcher and mixer, and a constant current recording system for the cleanest audio you'll ever put on a cartridge.

ESD10 Eraser/Splice Detector

Cleanest erasure ever! Dual constant current precision erase heads. No heat generating, tape stretching degaussing coils. Continuous duty operation. Reliable, adjustment-free, patented splice finding.

All you'll ever need

The inventor of the tape cartridge has invented a complete family of cartridge machines. Let our experience work for you. For more information, contact Fidelipac or your authorized DYNAMAX distributor.

DYNAMAX®
BROADCAST PRODUCTS BY FIDELIPAC®

Fidelipac Corporation ☐ P.O. Box 808 ☐ Moorestown, NJ 08057 U.S.A. ☐ 609-235-3900 ☐ TELEX: 710-897-0254 ☐ Toll Free 800-HOT TAPE

DYNAMAX products are designed and manufactured in the U.S.A.

Circle Reader Service 16 on Page 22