Radio World®

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FCC-FAA Turf Battle Brews

by Charles Taylor

Washington DC A quiet battle has been smoldering between the Federal Aviation Administration (FAA) and the FCC over which agency has the final say in spectrum allotments.

The tug-of-war, which has been brewing for several years, stands to have an even greater impact in the wake of Docket 80-90 allocations and it leaves station applicants stranded in the middle wondering where to turn.

The problem surfaced recently when a new FM in Waunakee, WI submitted a tower application that was denied hands down by the FAA.

The agency, which must approve the safety of station towers against hazards to air traffic before the FCC will approve an allotment, objected to both the height of the tower and possible intermodulation interference.

The station's engineering consultant, Ralph Evans of Evans Associates, was not pleased when he learned of the denial.

Evans accused the FAA of using criteria in judging the tower's potential safety that were "not realistic and (that did) not represent real world conditions," including use of a computer program that he said brought "suppositions that are questionable at best."

Frustration not unique

His frustration with the FAA is not unique. According to John Chevalier, president of Aviation Systems, several hundred disagreements have arisen between broadcast stations and the FAA in the past couple years over the agency's methods of tower safety approval.

In addition, the FCC reported that it received more than 100 letters on the topic in the last 15 months involving new or modifying FM stations.

An FAA official responded that the number of actual appeals is minimal when put into perspective: The agency's nine US regional offices annually process between 27,000 and 36,000 prospective applications—inclusive of all types of tower construction.

"That's a very small number referred to Washington, and if we're wrong, we correct it. We've overturned decisions on numerous occasions," stressed Jerry Markey, manager of the FAA's spectrum engineering division.

But the underlying conflict appears to center on which agency has the ultimate control, with the FAA using its jurisdiction over air space and the FCC its overseeing of the spectrum as respective "weapons" in the battle.

"We're encountering a certain amount of inter-turf agency battle between the two, both claiming domain over interfer-

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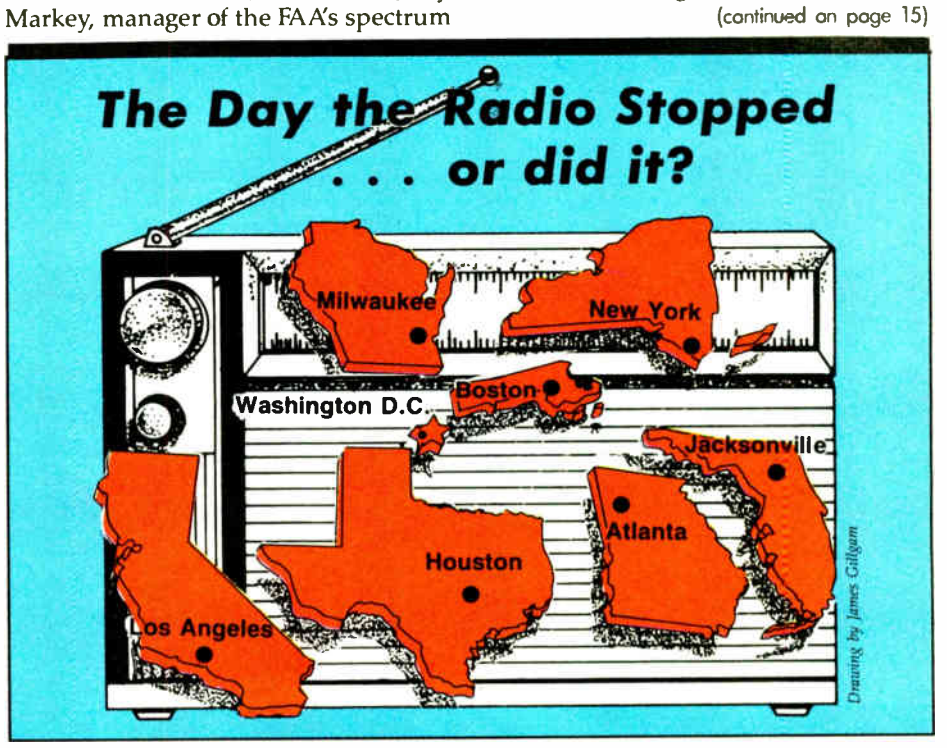

Transmitter Watch By Sat

by John Gatski

Avon CO A new company has begun offering stations the chance to have their transmitters monitored remotely—by satellite.

If Standard Broadcast Service succeeds in drawing radio stations to its unique service, the company maintains that owners will have a less expensive option to consider for transmitter monitoring requirements.

The company is promoting its National Supervisory Network (NSN) to sample, monitor, control and record conditions of transmitters, automation systems and EBS systems via satellite.

"It's like having someone sitting in your studio. We will be able to monitor anything the station wants," Standard Broadcast Service President Bill Sepmeier said.

Sepmeier expects clients to be using the service by mid-July.

"We have had a tremendous amount of interest, but it takes time to convince people about such a new service," he said.

The service, according to Sepmeier, can lower power during nighttime operation, log EBS tests, record logs and offer data services.

If a station authorizes NSN control functions, the service could restart a transmitter, correct an alarm or even conduct an EBS test without the station engineer ever being called.

Satellite monitoring

The service will use telemetry units that can provide RS-232 or compatible digital data output, such as telephone dial-up remote units now on the market. Unlike conventional phone remote control, NSN's transmitter status information and control commands will be relayed by satellite.

With NSN service, automated and satellite radio station management "can

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by Charles Taylor

Washington DC It was supposed to be the sound that wasn't heard across America.

But instead, the Radio Advertising Bureau/NAB's cooperative new promotional campaign for radio that included 30 seconds of dead air drew inconsistent and often reluctant participation in the nation's top radio markets.

Radio stations across the US were asked to air a two-minute spot simultaneously at 7:42 AM on 26 May that asked listeners to imagine "Radio: What Would Life Be Without It," then followed with 30 seconds of silence to exemplify the concept.

In various markets surveyed, the promo's presence was scattered across the dial. Some stations missed the 7:42 mark—deliberately or otherwise—while others substituted custom spots that excluded the dead air. One station even sold the 30-second gap to an advertiser at what was claimed to be premium price.

At least one member of the NAB Radio Board of Directors even declined to play the promo, questioning the use of dead air. Thomas Kushak, president and GM of WMAY-AM and WNNS-FM in Springfield, IL, said his market's radio

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News Briefs

Commissioner Slots

Washington DC Word is that the White House will nominate the NTIA's Alfred Sikes for chairman of the FCC, with Sherrie Marshall, a partner in the DC law firm of Wiley, Rein & Fielding, and Illinois Commerce Commissioner Andrew Barrett slated to fill two other positions on the Commission.

A spokesperson in the White House office of presidential personnel said candidates are undergoing FBI security checks, all that is waiting before nominations go to the Senate.

Sikes declined to comment on his expected nomination, but added, "I'm pleased to be considered."

Sikes is a lawyer and former owner of radio stations, the last of which he sold in January 1986, in Missouri and Colorado.

Marshall, also considered for chairman, has close White House ties most recently in the efforts on behalf of John Tower for defense secretary.

This will not be the end to who's in and out at the FCC, however, Commissioner Patricia Diaz Dennis's term is up in June. Reports said her reappointment is uncertain at this time.

More Show Hours

Washington DC The NAB Exhibitors Advisory Committee has recommended that exhibit hours for the 1990 convention in Atlanta be extended for one hour on each of the first two days.

Exhibits and Associate Membership Director Rick Dobson confirmed that staff would consider extending hours from the usual 6 PM closing to 7 PM. Initial thoughts, he explained, were to extend hours by two, but that was nixed because it might interfere with after-hours suites.

Exhibitors expect attendance to be "dramatically" higher in Atlanta, he said, because of its east coast location and high concentration of broadcasters and with easy flight connections into Atlanta. Attendance at this year's convention in Las Vegas reached an unexpected 50,000.

Dobson also noted the committee discussed improving exhibitor guest registration. That registration was a nightmare this year in Las Vegas on the first day with long, long, long lines.

Chinese Rely on VOA

Washington DC Voice of America became the only source of "trustworthy" news for many Chinese during the student riots and resulting massacre, but the government jammed many of the broadcasts.

Chinese language reports as of 5 June were jammed on all frequencies, except 1143 kHz mediumwave that provided coverage to the southeastern coastal areas, VOA reported. VOA said English language versions were not affected.

Jamming began 22 May on three of its five frequencies used to transmit Mandarin Chinese.

The jamming was noted by VOA monitors in Hong Kong and Islamabad and the FCC confirmed that the culprit signal originated in South China.

The significance of the VOA broadcasts to the Chinese was noted by callers who said the signals were poor but getting through. Callers also said they wanted more broadcasts than just the morning and evening reports.

VOA added two hours of additional reports and resumed Cantonese versions. At one point, reports included 11 hours of daily Mandarin and a half-hour of Cantonese.

Radio Ways

Washington DC Washington Post critic Tom Shales said it best. Television was really radio for live coverage from Beijing of the turmoil there as the Chinese government denied access to satellite uplink.

Reporters relied on the power of words to describe the student massacre 4 June in accounts telephoned to the US. The first images out of Beijing were still photos, while the networks waited for video that was flown to Tokyo and Hong Kong for transmission.

Radio reports also had to be called in by cellular telephone.

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AM Stereo Results In

by Alan Carter

Tokyo JAPAN An analysis of five AM stereo systems conducted here as the government moves toward selecting a standard found no significant differences except for the dual mono/stereo capacity of the Harris system.

Findings from the study, conducted by the Broadcast Technology Association (BTA) of Japan, were forwarded to a special subcommittee of the Telecommunications Technology Council of the Ministry of Post and Telecommunications where a decision on a standard will be made.

The BTA conducted theoretical evaluation on five systems but only performed in-house and field tests on the ISB system developed by Leonard Kahn, Motorola's C-QUAM and the Magnavox system. BTA also evaluated systems developed by Harris and Belar.

The US market is interested in the Japanese decision because that country is at the center of receiver production.

There is no sanctioned standard in the US because of the FCC's so called "marketplace decision" but other countries, including Canada, Brazil and Australia have chosen C-QUAM as an AM stereo standard due primarily to market forces and not because of any differences in technical quality.

The BTA study, which has been ongoing for the past two and a half years, backs up the premise that there is little technical difference among the five original standards.

At Motorola, which lists installation at 500 stations in the US and a total of 700 worldwide, Modulation System Laboratory Manager Frank Hilbert, who oversees AM stereo development, praised BTA's work.

Hilbert maintained that the BTA tests were under "average modest modulation" circumstances. But under more stress test conditions, C-QUAM would be "more robust," he said.

"This study ought to lay to rest Kahn's claim that he has a superior system," Hilbert said.

Kahn, who reports 100 US stations using ISB although others claim the number is significantly less, declined the opportunity to comment on the BTA study results.

Fears of litigation by any of the standards' proponents during the standard setting process have apparently not been a problem for the BTA. BTA Executive Managing Director Tamotsu Ohmura said the association has had "friendly" discussions with both Kahn and Motorola.

It is primarily the threat of such legal action which has kept the US broadcast organizations or agencies from choosing a single standard.

As for selecting a standard for Japan, Ohmura said a special subcommittee is studying the BTA report and a conclusion could be expected during the first half of 1990.

The study by BTA, which was not charged with making a recommendation, evaluated reception characteristics including frequency, distortion, SNR and separation.

The study also examined relationship to channel plan; capacity for dual stereo/monaural reception; stereo properties, including distortion/frequency, amplitude/frequency, SNR and modulation frequencies; and the effect of transmitter impedance characteristics.

A final area tested was synchronous broadcast characteristics, including distortion, electromagnetic field strength, separation and phase.

For information from BTA, contact the organization by FAX at 03-503-2533. Contact Frank Hilbert at 312-576-4889 or Leonard Kahn at 516-222-2221.

Blackout Hits FCC, CBS, NPR

Washington DC A fire 5 June here that destroyed underground electrical cables affecting the communication corridor—including CBS, National Public Radio and the FCC—sent people scrambling as a seven-block area of the city was shutdown.

The CBS Radio bureau and NPR went to back-up generators, working with no computers, no lights and no air conditioning. The FCC sent employees home for the day.

Power was off more than 24 hours throughout the area and only partial power was available the second day.

Because the power outage occurred in the middle of the night, NPR had an emergency generator in place before it was supposed to start transmitting. Service was not interrupted, according to spokesperson Cate Cowan. She praised distribution, technical and program engineers for doing the impossible.

NPR functioned off a 125 kW diesel generator when power was out and kept it on standby while under partial power.

"We've really become so dependent on electricity," Cowan said. "That's why they call us the electronic media."

Down the street at CBS Radio, Producer Evelyn Thomas said staff jimmy-rigged set-ups to feed reports to New York. But, sometimes, it worked; sometimes it didn't.

"You walk in and say what can I do—nothing works," Thomas said.

During the height of the ordeal, CBS Radio Washington was out of business for 40 minutes when emergency power went down. On the second day with only partial power, the network used generators to supplement what was available.

Putting the Clip On Clipping?

by Judith Gross

Falls Church VA Notice things getting a little **out of hand** in the way of loudness these days on FM? Not the loudness so much as the distortion caused by the gizmos that get you to that point.

Yeah, **composite clipping** is still a concern, years after the whole brouhaha over it in the early '80s.

Can't be sure that it is, in fact, clipping that's being used, since it's all **very hush-hush** at most stations. But according to the LA newspapers, **Pirate Radio**, the Scott Shannon and **Westwood One** hype of **KQLZ** we told you about a few issues back, shot up from Number 14 to Number 3 according to Birch.

The station is **very big** with the teen crowd, as the demos from age 12 on up show. Is there something special about the **ears of adolescents** that makes that kind of audible distortion to the signal, well, attractive?

'Course, I'm one to talk . . . I had my share in the mid-'60s with **transistorized AM** all but glued to my ear all summer long. Talk about your basic screeching. To this day, I'm convinced that the **WMCA good guys** were born with a heavy dose of compression in their vocal chords.

Anyway, overheard at the **NRSC meeting** at the CES in the Windy City was the fact that some **NYC stations** are putting more than one clipper together in series.

Got news for them, though. You know those **blending circuits** in FM radios these days? The ones that send the signal **back to mono** when the stereo separation goes below a certain point (even though the stereo pilot light stays lit)? A couple of engineers have reported to me that heavy clipping sends those radios into mono almost **instantly**.

Since these stations are hurting nobody but themselves (no increase in interference to neighbors, generally) it isn't likely that the **FCC** would do anything to regulate such things.

But the NRSC is looking at it. A report by **Chuck Adams of CRL** has already suggested a "composite mask," similar in concept to AM's NRSC RF-mask. Hey, bet that'd go over **real big** with the nation's PDs, huh? Anybody want to ask the $15-million-dollar-man, **Mr. Shannon** himself, if he'd go for it?

Now in the midst of all this comes a new wrinkle from **Modulation Science's Eric Small**. He's found a way to get a little more loudness without further damage to the signal. His new gadget, **ModMinder**, has been tried on such stations as the Big Apple's **WNSR** with some pretty nifty results.

It all centers on **measuring modulation**, which there hasn't really been a foolproof way to accomplish. Eric's new mod monitor actually gives a station a **dB or two more** to play with, depending on the format.

Take a look at this issue's *Buyers Guide* to get the straight skinny from Eric.

Not that the NRSC has abandoned **AM topics**, mind you. They're still trying to get those new radios to market. Now the big question seems to be **how wide** will wideband be for AM?

Let me tell you that there is a decided **resistance** to anything beyond **7.5 kHz** on the part of receiver manufacturers who have been brave enough to venture an opinion.

In fact, it's beginning to look as if 7.5K is going to be a **major struggle**.

Then there's the **certification mark**. Discussion is focusing on what specs it should include, and the **preliminary recommendation** to the committee is not all that happy: No Stereo. No Expanded Band. No Continuous Tuning. Yes to NRSC, but only wide to 7.5K.

Wait a minute here . . . I thought we were trying to *help* AM. Let's say for argument's sake we go along with the recommendations. We get an **AM certification** mark that guarantees us NRSC in a radio with a dual setting: wide to 7.5K and narrow (for night) maybe to 5. And it can be **mono** and still be certified.

OK, now you go tell the **US consumer** that you've improved AM. You say "Listen to 7.5K mono AM instead of 15K stereo FM." Right.

Those who even know what the heck you're taking about when you start to throw kilohertz at them will be savvy enough to remember that when they bought their CD and latest stereo gear at **Crazy Eddie's** or **Maniac Mike's** it was specked at 20 kHz. And you want them to turn to AM. Sure.

I don't mean to be completely negative, here. I think **there is a way** to help AM, technically. NRSC is a start, but we gotta have it **as wide as we can**, with some way to narrow it for night interference. How about variable, tunable bandwidth?

And hey, let's stop this nonsense, OK? It's *got* to be **stereo**. It's silly to think it could be anything but. We live in a **stereo world**. Doesn't matter what some NAB-commissioned study said about listeners being confused by the term "AM stereo." We got the airwaves. Let's un-confuse 'em by **educating** them.

Once we get radios that sound better than telephone sets, the rest is up to the **stations themselves**. Once again I'm afraid it comes down to the "P" word: **Programming.** 'Nough said.

What of the mysterious **super-duper radio** that the NAB is keeping shrouded in secrecy ever since its, uh, shall we say, premature debut last fall? I hear it's undergone yet another **name change**.

It went from the "super" to "ultimate" to "Sequerra" (after its designer) and now finally to simply "**the NAB radio**." Catchy, huh? Anyway, seems the NAB has a letter of intent from a receiver manufacturer interested in it.

I'd like to tell you more about the design but the **NAB** for some cloak-and-dagger reason won't let us near the thing, even without a camera. Hope we get to find out more about it before it gets near one of those **Ollie North-type shredders**. This *is* Washington, after all.

Emerson Radio threw one heck of a party for the second annual **Radio Hall of Fame Awards** in the Big Apple last month. Everybody's favorite cousin (Brucie, of course) was emcee and some NYC radio folks did the honors with the presentations.

It was kind of a thrill to see the daughters of **Jack Benny and Orson Welles**, both stunning blondes, accept for their famous fathers.

The technical achievement award went to **Lee De Forest** for inventing the tube technology which helped propel the then new medium of radio into popularity.

In 1908, De Forest broadcast a phonograph record concert from the **Eiffel Tower**, which was received as far away as 500 miles.

Joan Benny (far left), Beatrice Welles (4th left), Calvert De Forest (5th), Mel Allen (3rd right) and Don Imus (far right) et al with Awards.

His nephew, **Calvert De Forest**, whose face is mucho familiar to David Letterman TV fans, accepted the award for his uncle.

Awards also went to sportscaster **Mel Allen**, newscaster **Lowell Thomas, Fibber McGee & Molly, The Goldbergs, The Shadow, Larry King** and the original radio bad boy, **Don Imus**.

OK, so the speeches got a little long and there was a tad too much nostalgia. It was still quite **a party**. And who knows if it will be even bigger next time around? Yes, of course . . . **The Shadow knows** . . .

■ ■ ■

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 1989 edition* **Radio World** *mug.*

READERS FORUM

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Members-only exemptions?

Dear **RW**:

" . . . divided we fell." Friday May 26th . . . 7:42 AM (local) . . . What an experience dialing up and down the band hearing silence where stations were just moments ago.

KMOX: (quiet) . . . my competitor: (quiet) . . . Hey, why don't I tune in some of the Springfield, IL stations?

Music? Birthday Clubs? What's this? You mean to tell me that the two stations owned by the NAB Executive Board member for the entire state of Illinois can't afford 30 seconds of silence—for his own promotion? The NAB/RAB expected the rest of us to go along; was there a members-only exemption?

Truthfully, all the Springfield FMs ignored the RAB/NAB stunt. After all, this was not "We Are the World." Maybe the new "What would life be without it" campaign isn't red hot . . . maybe it's a little too subtle to be "seen"—let the bickering begin!

The negative press over this fiasco is just beginning and will continue until "united we stand."

Robert D. Baxter, GM
WTIM-AM/WTJY-FM
Taylorville, IL

A-1 is a good idea

Dear **RW**:

I can sympathize with Al Campagnone . . . the broadcaster in Delaware experiencing a signal erosion on his AM operation.

While we enjoy a good daytime signal with 5000 watts on 1590 KC, I feel our allotted 27 watts post-sunset is a joke. Even the 500 watts pre-sunrise power has been much less effective in recent years.

I agree with Richard Arsenault, credited as the originator of the FM "Class A-1" idea, that a low power FM simulcast service would greatly help standalone AM daytimers.

This station has been operated by my family for over 30 years, and I have 19 years invested in full-service local radio. And while I must admit that I would prefer to sell ads for an AM *and* FM stations, the most pleasure would come from providing our faithful listeners with a station they could count on, 24 hours a day.

(Do any of you daytimers get tired of "Why can't I pick your station up before 7:30 in the morning?)

Let's turn around the decline of AM. It has been my observation that, particularly in small towns, the local AM daytimer is providing a valuable community service. We deserve to survive!

Write the NAB, your state association and the FCC in support of an FM Calss A-1 for standalone AM daytimers! It *has* to be the most cost-effective answer I've heard.

Rich Gwyn, GM
WQCH-AM
Lafayette, GA

Lessons of history

Dear **RW**:

The article on the FM "Loudness Wars" (10 May **RW**) in Los Angeles was interesting. But it troubles me to see history repeat itself and to find that we didn't learn anything from our mistakes on the AM band.

Wasn't it the loudness wars of the late '70s and early '80s that started the mass exodus to FM? Listeners were willing to put up with narrowband, mono AM receivers as long as you gave them clean audio and good programming.

But thanks in part to the "we've got to be loud to compete" theory, listeners took to FM in droves. What's going to happen when FM listeners start getting tired of the same loudness artifacts they heard on AM, only this time in stereo? Where will they go?

Well, AM broadcasters . . . this could be your second chance!

Fine-tune your audio, install a C-QUAM stereo exciter, put NRSC on line too! Get your audio and transmitter plants in tip-top shape. And take yet another look at your programming.

And by the time you're done "tooling up," maybe the receiver manufacturers will have some low-cost, AM stereo, NRSC, wideband radios out in the marketplace. And who knows? Maybe history will again repeat itself.

Only this time, they'll be coming back to AM for all the same reasons they originally left for FM.

Stu Tell, Technician
KGLO/KNIQ
Mason City, IA

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Airwaves Versus Airspace

The controversy between the FCC and the FAA over who has the final say in station allocations threatens to set back the growth of the industry.

New FMs, especially those under docket 80-90 allotments, appear to be caught in a "Catch-22" resulting from a long-standing turf battle between the two agencies.

Understandably the FAA needs to take stringent actions to ensure the safety of air traffic. New stations cannot be allowed to hamper navigation frequencies or radio communications with undue interference.

But radio service to underserved communities, especially in times of natural or manmade disaster, is equally as important. And indications are that the computer programs being used by the FAA may in fact overestimate a station's interference potential.

If there are technical solutions to this conflict, both agencies should be pursuing them with all expediency. At the very least, the two should be sitting down and trying to reach some compromise in the interest of new stations and the communities they hope to serve.

The NAB also should take an active role in trying to get the matter resolved on behalf of station applicants who are given allotments by the FCC only to have their antenna construction denied by the FAA.

If a mutual agreement cannot be worked out between the two government agencies a legal option—such as a class action suit or the involvement of the Justice Department—may need to be pursued by station consultants.

Each government agency should realize that its action is tied to the other and remember its mandate to act in the public interest.

If apsiring stations become the innocent victims of a power battle, it will be the public—not just the radio industry—that will be the ultimate loser.

—**RW**

A Rock and a Hard Place

GUEST EDITORIAL

by Dale Ganske

Eau Claire WI Once again we broadcasters seem to be caught between two governmental agencies who don't appear to be consulting each other or considering the effects their decisions (or lack thereof) are having on us and our communities.

I'm referring to the FCC and FAA, regarding proposed tower sites for new FM allocations.

With the advent of the 80-90 dockets and FM "drop-ins" the FCC has designated more "restricted" areas where applicants may locate their tower. The problems with these restricted areas are that they are (according to the FAA's determination) too close to an existing airport, or may cause too much IM interference. These areas are being flatly rejected.

Our choice as applicants is to reduce the tower height to such a ridiculous degree that the signal would barely cover a neighborhood, much less the proposed city of license. A second choice is to move the tower site far enough away (which is outside the FCC's restricted area) to meet the FAA requirements.

Obviously we can't do both. Yet we are expected to comply with both agencies and are given no help or suggestions as to how this might be done.

On our own, we've spent thousands on engineers and attorneys; talked with our congressmen, Senators, the FCC, FAA, NAB, even "airspace consultants." We get nothing but polite "lip service" from the government. No ideas, no help, no possible solutions—not without dumping another bundle of money on the dilemma.

The solution, it seems, must revert to the originators of these allocations. Rather than allocating new FMs, opening windows and clinging to our filing fees, is it possible for the FCC to determine beforehand if in fact these proposed frequencies will comply with the FAA? If not, why go to all the time and expense to open a channel that the FAA says can't be built?

It's a no-win, no-help, "throw money at the problem" situation. This lack of concern and foresight, bogged down in government bureaucracy and paperwork, only delays a community's right to a broadcast facility.

When blatant errors such as this are recognized, let's move swiftly to correct them and get on with business. We're not interested in fault and blame here; we're interested in solving a problem. Any suggestions?

■ ■ ■

Dale Ganske is the GM of WISM-AM. He can be reached by writing to WISM Radio, 1819 Mitchell Ave., Eau Claire, WI 54701, or by phoning 715-836-9476.

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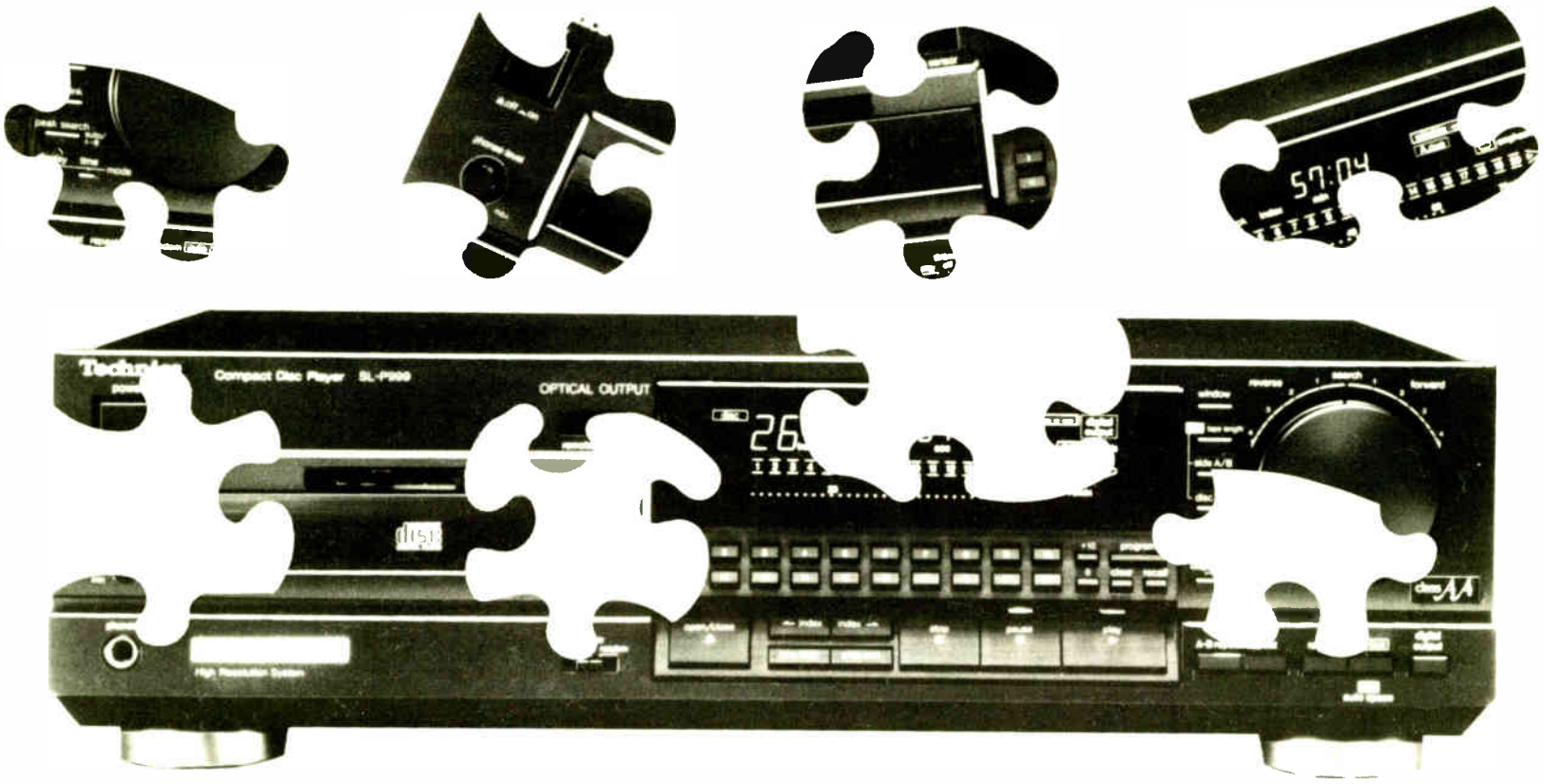
Technics

When this one was put together. . .



the plan was features, "broadcast-ability" and price.

THEY DID IT!

The SL-P999 with auto cue, indexing and digital as well as analog outputs, features two D-A converters per channel and 20-bit resolution. The price? Technics lists all of this at only $549.00. Allied's price is even better.

ATLANTA, GA CHICAGO, IL DALLAS, TX
LOS ANGELES, CA RICHMOND, IN

800-622-0022

ALLIED
Broadcast Equipment
— A HARRIS COMPANY

Circle 81 On Reader Service Card

Radio Ad Meets with Resistance

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association decided as a whole not to play the spot.

"There was not unanimous agreement that the 30 seconds of silence was in the best interest of everyone in this market and we agreed that if we couldn't agree to do it collectively, then we would pass (on the promotion)," Kushak said.

"As a member of the NAB board, I enthusiastically supported this joint effort with RAB, the funding, the choice of agency, the market testing; however, I think NAB recognized that this was a voluntary effort and quite honestly, I'm serving two associations: NAB and as a vital link in our local association."

Kushak said his station and others in the market are enthusiastic about airing custom and follow-up promotions.

RAB and NAB, are claiming that about 80% of the nation's 10,000 commercial radio stations participated in the campaign kickoff. They estimated, translating the percentage into audience, that 135 million listeners were exposed to the spot. NAB explained that it derived the percentage from a survey of 40 or 50 radio group owners, a spokesperson said.

The organization remains undaunted by criticism of the campaign. "We were trying to stress that radio could unite for a common cause to promote its own importance, setting competition aside for 30 seconds," an NAB spokesperson said.

The success of the campaign, which is supposed to last throughout the year, is still undetermined. But the groups plan a fall series of print ads in consumer and trade publications, as well as radio ads.

Meanwhile, the nation's radio marketplace had its own opinion of the campaign, which in some cases addressed more relevantly what life would have been like without the RAB/NAB promotion.

Following the Leader in DC

—RW Special Report

About half of the stations in the nation's capital followed RAB/NAB's lead by playing the campaign kickoff, though a number weren't satisfied with the actual promotion.

"I thought the overall effect for the average man and woman on the street was rather forgettable," said classic rock WCXR-FM PD Andy Beaubien.

Most objectionable were the 30 seconds of silence, which some said opened the door for listeners to search for alternatives.

"Withholding something of value from the consumer we didn't think was the best way to make the point," said Michael Douglass, VP and GM of WASH-FM, the only DC top 10 station not to play the spot. "It's not the consumer to whom we want to indicate what life would be like without radio. It's the advertising community. Why punish the consumer if you're trying to make a point with the advertisers?"

30 seconds of dead air . . .

David Chadwick, PD at WGAY-FM, the market's number-one rated station, added, "Thirty seconds of dead air gives people a reason to tune out. If everybody participates, then you accomplish your purpose of bringing it to everyone's attention, but if only a few participate then people may tune the dial thinking they've lost the signal and may not come back to you."

The beautiful music station was prompted to run the spot at the request of owner Greater Media.

Country formatted WMZQ-FM, like most of the eight stations owned by Viacom, played a role in the campaign, but customized the promo with a 105-second spot using testimonials from local listeners.

"It really wasn't us thumbing our nose at NAB as much as it was trying to do something that fit the personality of the station and that would accomplish the same goal," PD Gary McCartie said.

Will it play in Peoria?

—Bill Knight
The Journal-Star

The idea for 30 seconds of radio silence fell on deaf ears here at WXCL-AM/WKQA-FM in this Illinois town, where GM Bob Burch refused to participate in the campaign kickoff. Instead, he sold an ad.

"This type of project has been done in single markets, and I've never noticed a positive, measurable result . . . ," Burch said.

Of the 16 stations in the Peoria market, those on the air at 7:42 AM included WXCL-AM/WKQA-FM, public station WCBU-FM, and two Christian stations, WPEO-AM and WCIC-FM. But perennial ratings leaders such as WWCT-FM and WKZW-FM participated in the half-minute of silence.

The market's overwhelming participation didn't bother Burch, he said. It amused him.

"I'm an opportunist, I admit it," he said. "It was a one-time opportunity to be the only radio station on the air, and I sold a commercial to a special client for the highest price ever paid for a spot in Peoria radio history."

Burch refused to identify the client, the message, or the price, but said, "The client was thrilled to death. We had a nice laugh about it."

Other area broadcasters weren't amused.

"Some people will take advantage of anything," said talk-radio WTAZ-FM Program Manager Richard Parker. "We decided we'd rather help the industry show itself as important to people rather than a way to make a fast buck."

Joking in Jacksonville

—Dan Macdonald
The Florida Times-Union

Like it or not—with the "nots" letting listeners know with mocking banter—about half of the market's top-ranked stations here went along with the kickoff.

"This is stupid," said WCRJ-FM morning announcer Robbie Rose just before the spot began.

The Arf (Mike Areford) of WFYV-FM's Morning Flakes contemplated what his life would be without radio and found that he'd be unable to make child support payments.

Of the market's top-ranked stations, WQIK-AM/WQIK-FM, WAIV-FM, WCRJ-

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Satellite Monitoring

(continued from page 1)

now legally lock the doors and walk away" during off-peak hours, Sepmeier said.

Sepmeier said he developed the system initially for automated stations, but he said stations that are not automated have expressed interest, too.

Based on company estimates, a station could save as much as $23,769 annually, based on a minimum wage operator on duty 24 hours a day, 365 days a year.

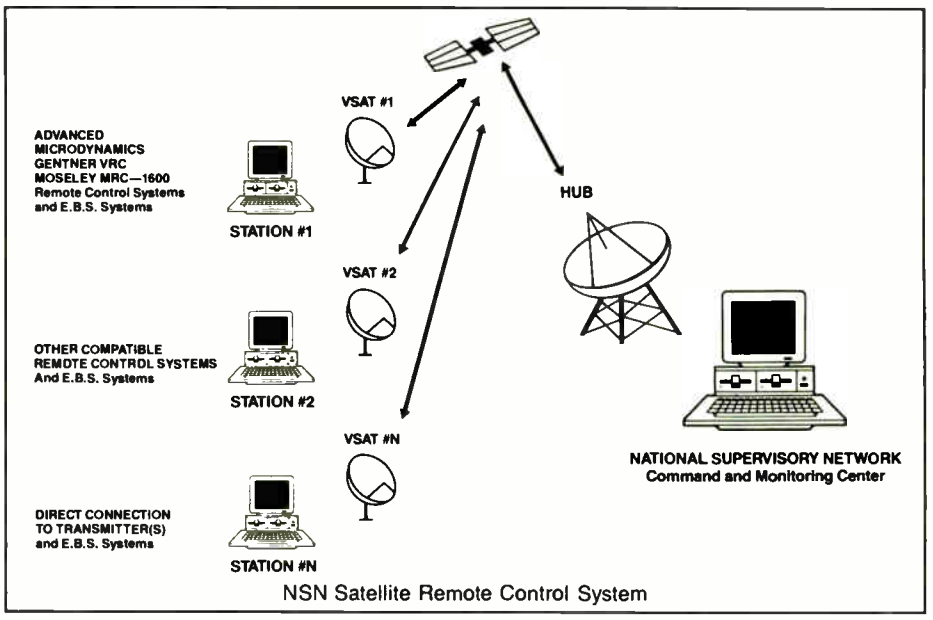
According to the estimate, 24-hour operator monitoring of broadcast functions costs a station about $33,369 annually at minimum wage, but the NSN would cost $9600 annually.

Burk Technology (formerly Microdynamics) President Peter Burk, whose company manufacturers one of the dial-up systems NSN would be capable of using, said the NSN system is an idea whose time has come.

"I fully support what they are doing," he said. "It's another option the operator has in order to cut costs."

He said there are still some areas that NSN's advanced technology cannot monitor or control, such as a malfunctioning tape machine, but he added that the service could benefit hundreds of stations.

Sepmeier said it is true that NSN could not splice a tape together, but if an automated station has a Format Sentry system, NSN could re-program around the tape break to avoid dead air.



NSN Satellite Remote Control System

The concept of off-premise control and monitor is not new. Moody Broadcasting offers an option of limited service via remote dial up to its affiliates. It also can shut down a station's transmitter via a data channel on its satellite's stereo subcarrier.

According to Moody Broadcasting Affiliates Development Administrator David Woodworth, the network also offers the service to a limited number of non-affiliate stations.

Control from Colorado

According to Sepmeier, the NSN will monitor client stations from its command and monitoring center, called the "Hub," in Avon, CO. The network ideally could handle as many stations as signed up for the service—radio or TV.

There will be one trained engineer for every ten stations, Sepmeier said.

Monitor and control will be maintained via the VSAT network, which means stations that don't have VSAT will need a dish. The NSN purchased space on the SATCOM K-1 satellite, which communicates with the ground on the Ku band.

NSN will provide most of the necessary equipment, including the six foot dish, IBM-AT compatible computer, display, software/hardware links, printer and installation at no additional charge.

The system requires some type of remote capability hardware. It is compatible with most current computerized remote control systems in use such as Microdynamics, Gentner and Moseley and, Sepmeier said, it soon will be compatible with Potomac, Marti and Hallikainen & Friends equipment.

Sepmeier pointed out that most co-located (studio and transmitter) stations don't use remote monitoring. But NSN will help assist the station in upgrading the provided computer to accommodate remote capability for "a reasonable fee."

NSN's monitoring and control options will be customized to each station, based on how the chief engineer sets up the computer equipment, Sepmeier said.

30 minute status checks

The monitoring service will include the capability to access 30 minute logs and alarm logs at any time, and can be printed out by the station engineer.

In addition to the logs, local stations will have display and print capability of NSN's data services, including FCC files and weather information.

If a problem occurs, NSN engineers

(continued on page 26)

Antenna Project Nears Launch

by John Gatski

Washington DC Barring further delays, the NAB was to begin construction of its long-awaited anti-skywave antenna 26 June for performance testing starting in August.

The antenna, designed to reduce AM nighttime skywave interference, will be on a site northeast of Washington, owned by Howard University. L and R Communications of Laurel, MD, is the contractor.

Behind schedule

Construction is several months behind due to a significant portion of the project's time, which has stretched into its fourth year, spent securing permits from state and county agencies, according to NAB Staff Engineer Kelly Williams.

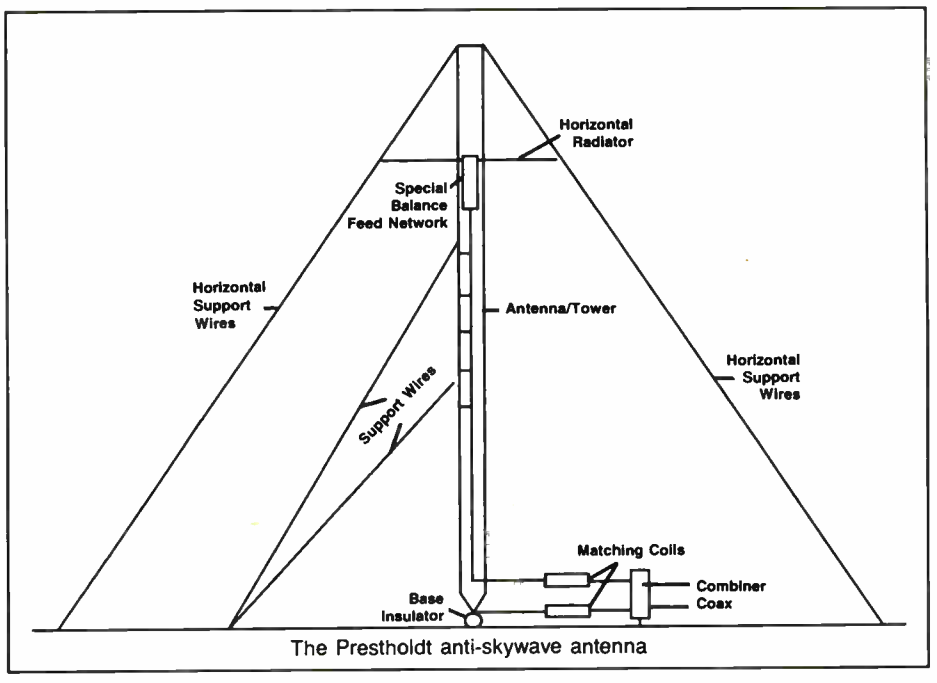
Williams said construction will take about eight days from the time the foundation is poured to completion of the tower.

The 190° base-fed vertical antenna tower was designed by Ogden Prestholdt and manufactured by L and R Communications. The 295' tower and antenna is designed to suppress skywave in one single direction by directing the energy of the skywave into the groundwave signal.

Directional null

"We are creating a very deep signal null in one direction," Williams said. "If we can point that null in the skywave pattern, hopefully, that will allow a station (that causes skywave problems) to operate without interference (even at higher power levels)."

Williams noted that the anti-skywave antenna will not be a "magic solution" for total elimination of the skywave, but could, if the test is successful, eliminate a station's problem nighttime skywave signal that causes the most interference to other stations.



The Prestholdt anti-skywave antenna

The test structure will feature a main vertical radiator with a horizontal radiator about three-quarters of the way to the top, using a balance-fed network specially designed by Prestholdt. The horizontal radiator can be turned to the direction in which skywave presents the most problem.

Volunteer monitors

For the performance tests, the NAB will use volunteers to monitor the signal at various locations near the transmitter and from more distant locations, Williams said.

The FCC authorized a 1660 kHz test transmitter (KA2XXB) for 5 kW, but the NAB will use about 400 W most of the time, Williams said. The transmitter will be housed in a small trailer adjacent to the antenna.

"Our intent is to transmit at night to people at remote sites and then tune the antenna to the anti-skywave mode," Williams explained.

He said there will be mobile units located 10 to 15 miles from the transmitter taking field strength and other readings to determine the design's effectiveness.

A monitor also will be located in Norfolk, VA, to determine the antenna's effectiveness in reducing skywave over longer distances, Williams noted.

The test will involve the test station receiving a skywave signal and then tuning the antenna to the anti-skywave mode to see if the signal disappears.

Prior to the performance testing, the NAB will conduct specifications and tuning tests of the antenna.

Williams noted that during the set-up phase, the NAB also will test a newly-designed, four-wire elevated ground system, which could save a station on the cost of the normal 120 wire ground system used on many AM antennas.

The ground system was designed by engineers Al Christman and Roger Radcliff.

When the anti-skywave project is complete, Williams said the project will total about $100,000.

For more information, contact Kelly Williams at 202-429-5346.

FCC OKs Filing of Dial Hop Petition

by Charles Taylor

Westland MI The FCC said it will allow daytimer WNZK-AM here to apply for a waiver that would authorize the station to broadcast on 690 kHz with increased power during the day and switch to 680 kHz at night.

The unusual move, which has not occurred since 1950, originally was rejected by the Commission when the station petitioned to change its facilities from daytime-only to unlimited time, increasing daytime power from 1 kW to 5 kW, and operating at 2.5 kW on the adjacent 680 kHz at night. Such a change would violate FCC rules, the Commission said.

WNZK, which provides an "ethnic" format with programming in 24 languages, resubmitted its request for exception, arguing that it provided a unique foreign language program to minorities in the Detroit area.

The station also explained it could not operate full time at 690 kHz because of severe protection problems toward CBF radio in Montreal. It could not move full time to 680 kHz because of interference that would result with CFTR radio in Toronto.

Birach Broadcasting Corporation, licensee of the station, found that at night CFTR employs a different antenna directional pattern that would allow a nighttime operation on 680 without interference in the Detroit area.

The FCC responded that "granting Birach's waiver request would not undermine the policies underlying its allocation plan," particularly policies that underlie its decision to restrict AMs to a single channel.

Daytime operation on 690 kHz and nighttime operation on 680 kHz would "enable WNZK, as a full-time station, to provide better service," the Commission said.

The station now is subject to normal FCC administrative procedure in applying for the allocation, according to Kathleen Levitz, an FCC staff attorney.

"It's a function of whether petitions to deny are filed, whether somebody comes in and decides to file a competing application for that frequency," she said.

The Commission added that if similar requests were triggered by this waiver, it would examine whether it should relax its policies against split frequency operation. So far, however, it's too early to tell if Birach's request is a one-time situation, Levitz said.

"It's hard to answer the question right now, because I really don't have a feel for whether Birach is just a corporation that chose to come in and ask, where others decided that the request wouldn't be granted so they didn't try," she said.

For more information, contact Kathleen Levitz at the FCC, 202-254-3394.

NAB Radio Due By '90

by Alan Carter

Washington DC A consumer model of the NAB "ultimate radio" could be coming off the assembly line by the middle of 1990, according to NAB Science and Technology VP Michael Rau.

The NAB has a letter of intent from a manufacturer to build the NAB radio, Rau confirmed. He declined to identify the manufacturer because the contract is under negotiations.

Also not settled are the specifications for the radio, originally designed for NAB by Richard Sequerra. Rau said those points are part of the negotiations.

"This is a negotiation process," he said. "I'm not sure NAB is going to get everything it wants. But NAB is asking for as much as we can get."

As designed by Sequerra, technical features include AM stereo, the NRSC preemphasis standard and FMX for FM stereo extension.

The design has C-QUAM AM stereo on a board replaceable with multisystem boards that allow for reception of multimode stereo or Kahn ISB stereo reception only. The multisystem boards use a chip developed by Sanyo, available as a sample but never put into general production.

The price of the radio to the consumer has not been determined, Rau said, because the manufacturer does not know production costs yet.

Rau said NAB would recoup the money it paid to Sequerra to design the radio from the manufacturer. He declined to release final figures, referring to previous numbers NAB quoted.

NAB initially paid $25,000 for the design of the radio, which was completed on time. NAB was to have paid Sequerra another $25,000 for three working prototypes but delays put that figure into question. Final negotiations with Sequerra were not made public.

The end product was a single prototype with replaceable board, not finished until earlier this year after a somewhat disastrous attempt to introduce the receiver last fall during Radio '88.

For information on the radio, contact NAB Science and Technology at 202-429-5346.

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Circle 51 On Reader Service Card

AMs Simulcast TV News at Six

by Charles Taylor

Charlotte NC Getting home from work in time for the 6 o'clock news is an almost laughable concept for many of the nearly 20,000 Floyd County, SC, residents battling gridlock in the afternoon commute from nearby Charlotte.

But now, as long as they're equipped with an AM radio, commuters can at least listen to what they'd otherwise miss, thanks to an unusual cooperative formed by WSOC-TV in Charlotte in which the station's 6 PM local news is simulcast throughout most of its 22-county ADI on 17 AM stations.

"The prestige of having an eyewitness newscast on was very attractive to us," said Bill Rice, operations manager at WRHI in Rock Hill, SC. "We looked at it as another resource to provide information to the listeners."

Outdo competition

The idea was launched 1 May to outdo competitor WBTV, which began simulcasting its 6 o'clock news over sister radio station, WBTV-AM, in July 1988.

"We also own a radio station, WSOC-AM, and looked for a way to do the same thing, only better," said Alan Batten, director of advertising and promotions for WSOC-TV.

Within three months, the TV station contacted AM stations in each of the 22 counties in its ADI and arranged with one in each of 17 counties to simulcast its 6 PM news, forming a mini-news network.

The TV station was exclusive to AM because management figured it unlikely that an FM would surrender an hour of choice time for news, Batten said. "Also, because AMs have to try harder, they're probably better tuned into the community. More AM stations have news staffs than do FMs because they have to provide that local service."

The AM stations had little to lose from the arrangement: For each station, WSOC-TV provided a television sound tuner (modified to receive only WSOC's signal), an isolation transformer requiring a simple hook-in to the radio station's board and a 10" black and white TV monitor for visual cues.

WSOC-TV also allowed each station to fill the 14½-minute commercial window during the hour as it wished, thus gaining the stations the potential for additional ad revenue.

"So many of the programs we run are bartered, where we get part of the advertising along with the program's sponsors," said Rice at WRHI. "This is set up where we get all the breaks to do with what we want, so we have the flexibility either to sell it or do local news capsules. We're doing both."

Another simulcaster, WIRC-AM in Hickory, NC, already has sold about eight of the available 14½ minutes of ad time and uses the remainder to promote its programming and giveaways.

"Six o'clock has become the information hour for the world. We were airing our regular (country) programming with a five-minute newscast," said GM Maynard Taylor. "We decided it was at least worth a try to gain listenership during that hour."

To promote the show throughout its ADI, WSOC-TV provided custom promotion spots to each station, in which the news anchors used station's call letters.

Few TV adaptations

For the TV news team, few adaptations were required to make the broadcast relevant to its new audio-only audience, according to Batten.

"When somebody very important is being shown on the screen, where we used to use just a font identifier, we now have the reporters identify them as part of the feed," he said. "And where we have telephone numbers on the screen, we will read the numbers aloud. Other than that, there's been very little adaptation."

The cooperative has been received "phenomenally well by listeners and advertisers," according to Batten, but it also prompts inherent advantages for the TV station.

"We're obviously able to get our product into the potential universe of people who may not have sampled it before," Batten said. "If somebody is a dedicated watcher of somebody else, but is a dedicated listener to one of the radio stations that we're on, they will hear either the program itself or the promotion of the program."

And Batten points out one additional advantage for him: "We don't usually get out of here until after 6. When somebody used to say, 'Did you see what was on the news last night,' I used to have to say, 'No, I was on my way home.' Now at least I can hear what's going in the news."

For more information, contact Alan Batten at 704-335-4999.

SBE Show Faces Critics

by John Gatski

Kansas City MO The success of future SBE national shows may hinge on how well radio and TV broadcasters make the trip to the 1989 convention in Kansas City, according to some show exhibitors.

SBE convention organizers said this year's show marking the 25th anniversary of the society will be better attended because of Kansas City's central location which, they said, is more accessible from the east coast than Denver was last year.

The Denver show had only 2,200 registered attendees including exhibitors and the total included more than 900 registrants for the Rocky Mountain Video Expo held jointly with SBE.

The 1989 show is 5-8 October at Kansas City's Bartle Hall and is scheduled for Cincinnati, Minneapolis, Nashville and St. Louis over the next few years.

Several manufacturers and vendors, however, are not so sure about the long-term success of the SBE national show and are taking a wait-and-see attitude.

Scaling back

Circuit Research Labs (CRL) TV/Radio Marketing Manager Bill Ammons said his company is planning to return to SBE, but with a smaller booth than in 1988.

"We're cautious this year. We've cut back to a 10×10 booth. It's a wait-and-see thing with us," he said.

Ammons said Kansas City is likely to be better than Denver and that future shows in Nashville and Cincinnati could be more successful because of their proximity to the east coast where the largest preponderance of engineers are located.

Some companies, however, declined to give the SBE fall show the benefit of the doubt.

Eric Small, engineering VP at Modulation Sciences, said company officials decided not to attend SBE this year because of last year's poor attendance and because of the "nickel and dim-ing attitude" of organizers. He also complained of scheduling the convention to concur with Yom Kippur, the holiest Jewish holiday.

"I was just unhappy with the way it was done," Small said.

Small said he is convinced the show is not succeeding as a national show.

"I think that moving it to Kansas City is ample evidence it is not happening. It is a super regional show, but it is not a national show," he said.

Small said he is planning to put most of his energy into NAB's Radio '89 show in New Orleans.

Don't write off SBE

Other companies, however, said they are not yet ready to write off SBE as a national show, which is now in its fourth year.

"We do think the show is worthwhile," Bradley Broadcast National Sales Manager Neil Glassman said. "I don't think this year will make it or break it. I think it is too early to tell. We just haven't given it enough time."

Glassman said his company will be at SBE and Radio '89, but it will not have booths. Company reps will float between its suppliers' booths.

Due to the number of national and regional shows in the fall, Bradley does not have enough people to cover all the shows with a booth, he said.

Pacific Recorders & Engineering Corp. Sales Manager Anders Madsen said the SBE show plays a role for engineers and manufacturers, and he hopes it succeeds. PR&E will have booths at SBE and Radio '89.

A temporary lull?

"We felt there is a need to have a national (SBE) show," Madsen said. "It's unfortunate that it had to have that little lull in Denver. Being in Kansas City, it might have a chance."

From an engineering standpoint, he said the SBE show is "purer and more focused" than the fall NAB radio show.

Show management firm Eddie Barker and Associates and the SBE are confident the 1989 convention and future shows will do well.

Responding to the criticism of last year's attendance, Barker said it is not valid to compare floor traffic to larger shows like NAB where there are a lot of people, but many of them have little to do with making station purchases.

"You get very qualified attendance, but you don't get 45,000 people in the aisles (at SBE)," Barker said. "We feel very, very good about this show."

He said the 1989 show will have a strong number of exhibitors including Abekas, Utah Scientific, Grass Valley, Tektronix and the Harris Corp.

SBE sessions coordinator John Battison said there will be 35

(continued on page 26)

FCC and FAA Skirmish

(continued from page 1)

ence," said Ralph Justus, director of engineering for regulatory and international affairs at the NAB.

"The FAA is claiming that national air space is theirs and they're going to protect it, by God. The FCC is saying, 'Excuse me, but spectrum management as far as it affects other users of the spectrum is ours.' "

Markey acknowledged the entanglement but said there is more at stake than radio service. "All we're saying is that we have an industry called aviation, and that if radio signals penetrate our avionic boxes and create problems, then we have every right to declare hazard to aviation," Markey said.

But, he added, "The FCC says, 'Hey, that's our business,' and we say, 'No, sorry, it's not,' so that's where the battle lines are going."

Conflict born in 1983

The conflict ballooned in 1983 when the FAA decided to expand its role in aviation protection by unilaterally developing new methods of analyzing potential interference from broadcasters, according to John Reiser, an electronics engineer with the FCC's engineering policy branch. Previously, the FAA concentrated on physical obstruction tower criteria.

The FAA said it has always considered interference; however, the new methods became essential as the issue became more prominent over the last decade.

"For years, we just used regular good engineering sense," Markey said. "But FM stations in the early days weren't as high powered and they've put more of them in. The FAA is doing the same thing. We're putting more and more localizers in around the country.

"Now the problem starts showing up because of our growth and their growth. We were on a collision course."

In order to soften the FAA's increasing interest in interference, the Commission proposed through docket 85-108 in 1985 to adopt guidelines for preventing FM interference over aeronautical airwaves. The docket, however, was tabled without action a year later.

Then last year the conflicts heated up when a computer program developed at Ohio State University was implemented by the FAA to more precisely determine interference potential from FCC radio license applications.

Officials at the FCC and NAB argue that it is clearly ineffective, thus leading to unnecessary time and financial burdens on broadcasters.

The NAB conducted one study of the 10 most heavily populated US airports and applied the FAA's interference analysis model to existing FMs in the area. According to Justus, "We found that the FAA's prediction methodology was grossly inaccurate."

A paper presented at the 1989 NAB convention by William Suffa with consultant Jules Cohen and Associates added fuel, claiming that the present computer model is "severely flawed in its representation of intermodulation interference. . . . The net result is that the program overstates the interference which will actually occur."

Markey said allegations that the computer program doesn't work are "baloney. I'll fight that one until I die."

One of the groups' primary complaints against the FAA program involves an additional 12 dB that is added into a station's power level when being computed for potential interference.

"You'd end up getting two Class A stations 60 or 70 miles apart supposedly causing severe interference," Reiser said.

On one hand, Markey admitted to past errors: "We admit that we've made mistakes, but there's not a case where something is appealed to Washington, that we haven't corrected it."

But he also defended the 12 dB factor as an important element in determining the safest possible conditions for aircraft, especially in an emergency situation.

"The FCC asks why we have to protect out 35 degrees (of a normal flight or landing pattern) and why we have to protect down to 'this' altitude. Well, we say that's none of your business why we have to protect that," he said.

"Airplanes get into trouble or they go off course—that's when they need a legitimate signal. That's when they really need all the accuracy right down to the Nth degree. And we don't need FM broadcasters interfering with them."

No easy resolution

Attempts at resolving the differences between broadcasters, broadcasting groups and the FAA, according to most of the sources, have resulted in frustration.

"The FAA at the moment is really unwilling to meet with anyone on the subject, which is part of the problem. I can speculate that it may have something to do with the fact that they (think) they know what's right and that's that," said Suffa, of Jules Cohen and Associates.

Markey, however, disagreed: "We've worked it and we're working it better every day. It's not the disaster that everyone turns it out to be. I talk to (FCC) people a couple times a month and we work with them. I think we're making progress."

The FCC claimed it has thus far tread lightly in its dealings with the issue: "Theoretically, we normally don't get involved in it because the stations really are not an applicant yet. Someone interested will frequently file with the FAA before they file with the FCC," Reiser said.

However, the Commission is participating in an international forum to establish standards that will be acceptable worldwide, he said. "It would have a great deal of influence because US planes flying into foreign countries would be afforded the same protection level that we afford foreign planes flying into the United States."

Justus recommended that the FAA return to its original emphasis of tower obstruction analysis.

"Spectrum management is really the domain of the FCC, not the FAA. If the FAA believes they have an interference problem, their best course of action is to seek recourse through FCC procedures," he said. "We recognize they have an obligation to protect national air space, but there's a competing demand here for electromagnetic spectrum usage."

Markey, however, maintained, "In the business that the FCC serves—the broadcast industry—it's their job to be the guardian and to be sure they get a square deal. That's fine. Our job is to make sure aviation gets a square deal and certainly we're going to cross swords somewhere."

For information, contact Jerry Markey at the FAA, 202-267-9710; John Reiser at the FCC, 202-632-9660; and Ralph Justus at NAB, 202-429-5341.

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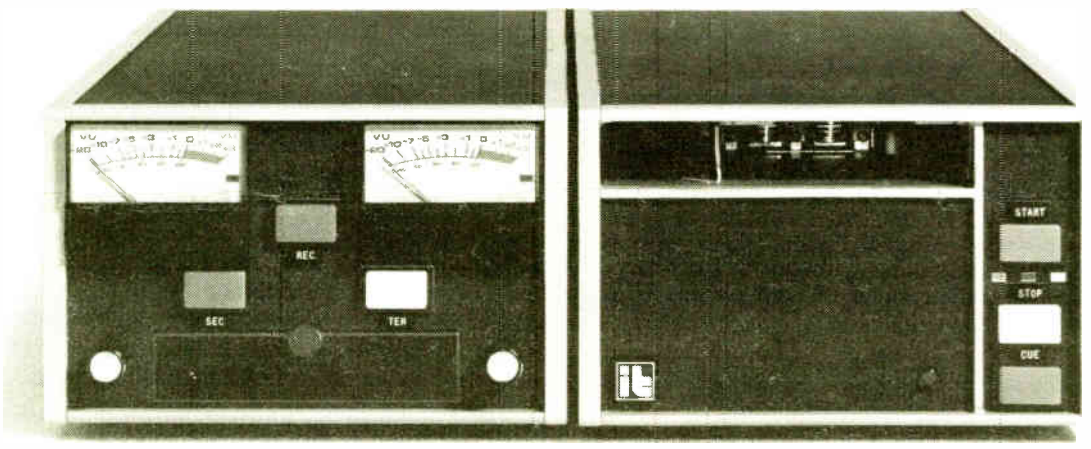

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Ad Campaign Responses Vary

(continued from page 7)

FM, WFYV-FM and WOKV-AM took part. WAPE-FM, WEJZ-FM and WIVY-FM did not.

WAIV-FM Program Director Dave Dillion said owner EZ Communications made the station participate. "I don't think 30 seconds is a commitment," he said. "Thirty seconds is an irritant."

At the number-one ranked WAPE-AM/FM, where listenership is one out of three, GM Mark Schwartz agreed, calling the move counterproductive and WEJZ-FM GM Jim Jerrels said the promo was irresponsible in asking stations to go silent.

WQIK-AM/FM Program Director Jack Evans had a similar sentiment. "We ... fight to keep people listening to our station's music, commercials and promotional content; then we turn it off for 30 seconds. I, along with many programmers around the country, am very much against it."

Participating stations argued that 30 seconds wasn't a long time and that it would spark listeners to ponder radio's role in their lives.

"It dictates to the universe just how wonderful the radio medium is and how informative it is to people," said Yulee Commander, president and GM of WFYV, where owner Metroplex Communications of Cleveland committed to the promo companywide.

Mixed bag in Beantown

—Susan Bickelhaupt
The Boston Globe

Not every station here was crazy about the idea of dead air during drive time.

The result was some regular programming, some silence and some staggered silence. Not all stations' clocks are in precise sync, and those with talk show formats work with delays from seven to 10 seconds.

A scan of the dial at 7:42 AM found silent stations in the minority.

Mike Morin, DJ on rock'n'roll WCGY-FM chose perhaps the most novel way to "exploit the silence of the other stations," as he put it. He blasted a John Phillip Sousa march in the background while the DJ screamed the station's call letters over and over.

"I figured it was a great way to get new listeners from people who were just scanning their radio if all the others went silent," he said. "I just couldn't believe that a broadcast association would ask dues-paying members to do this during drive time on the busiest morning of the week."

WBZ-AM's Dave Maynard acted as if 30 seconds was an eternity. When it was over, he gasped, "Wow, that was a long time. I felt like I should be doing something, a time check, an ID or something."

"I don't think 30 seconds is a commitment" ... "Thirty seconds is an irritant."

WBZ Promotions Director Frank Murtagh said the length of the promo had an impact, if not on listeners, then on people at the station. "If there's just two seconds of dead air, everyone starts jumping up from their desks to see what's wrong," he said.

"Playing" in Milwaukee

—Michael Zahn
Milwaukee Journal

All major radio stations here participated in the kickoff except "Classic Hits" WKLH-FM, which saw no point to the piece. But not all stations took the promotion seriously.

Listeners to top-rated FM, Top-40 WKTI, heard this byplay between morning men Bob Reitman and Gene Mueller during the dead air:

Producer: OK guys, the mics are off.

Mueller (sounding under considerable stress): How much time?

Reitman: We've got about 28 seconds left, I think.

Mueller: I think I've got time.

There is the sound of a zipper followed by sound of urinating.

Mueller: How much time, buddy?

Reitman: You've got about 10 seconds left. They've got to put the mics back on, hurry up!

Mueller: All right.

Sound of zipper, followed by resumption of regular programming.

The Milwaukee Area Radio Stations (MARS), the local radio promotional group, strongly endorsed the industry promotion. Said MARS Executive Director Andy Friedrich to the DJ's bit, "We have such class in this business. What can I say?"

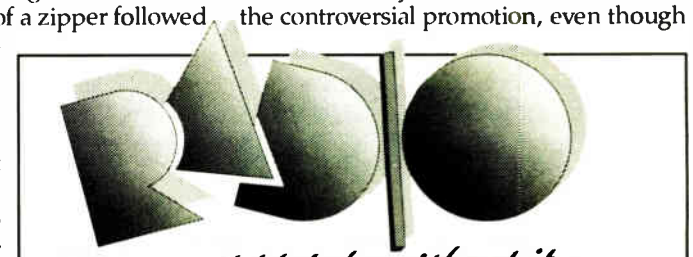
Interestingly, considering all the hoopla, some radio people forgot that May 26 was The Big Day.

WLUM-FM VP/GM Stephen Sinicropi admitted he was stumped. "I was taking a shower, and all of a sudden I heard my radio go off and I went crazy. I was running for the telephone to find out what happened when the radio went back on and I suddenly remembered."

Los Angeles resistance

—Paul Dileski
Freelance writer

Almost every radio station here aired the controversial promotion, even though there was concerted resistance.



Catchy graphics for the joint NAB-RAB campaign

Top-rated KPWR-FM and KIIS-FM ran the spot as did the new kid on the block, KQLZ-FM Pirate Radio. Speculation was the stations wouldn't go along with the stunt, and though they did, it was not without comment—some during the would-be silence.

KIIS's Rick Dees interjected the sound of an elderly person saying such things as, " ... there's nothing going on," and then moments later starting to cry, at which time Dees came back on the air—

(continued on page 26)

Chart for a Smart Cart Starter

by Bill Higgs

Louisville KY Modern high-end cart machines are marvelous things. I recently had occasion to use three of them in an automation display and found myself with a healthy respect for the little microprocessor.

This little chunk of smart "sand" is amazing—set the DIP switches the right way and the machine can do almost anything.

BOTTOMLINE BROADCASTER

How nice, I thought. It will detect bad carts; bias, equalize, probably toilet train itself and prevent double plays.

The jocks at my station can detect bad carts (and throw them at things), yank the cart when it recues and don't have to worry about bias and technical things.

Unfortunately, what they can't seem to do is play the right cart to begin with.

Here is the all-too-familiar scenario. The jock plays four seconds of a commercial, then notes that the log calls for a PSA instead. He frantically pokes for the stop button on the deck (he started it from the remote on the console) and hits the tone by mistake.

Meanwhile, the other side of his brain manages to find out which of the three slots holds the right cart and it is back to the console to start it out.

What is needed is an "I-didn't-mean-to-push-the-button" button. Several of the new triple-deckers have a feature which kills audio from the other two slots when a start button or remote start is pressed.

Easy to add

As it turns out, the feature can be added to standard machines with the addition of four chips, six inexpensive transistors, and three relays. What's more, it is done in CMOS, so it can be run off the deck power supply.

This feature works equally well with triple decks or three individual machines and can be built for under $15. The only extra requirement is that the machine(s) be equipped with EOM tones.

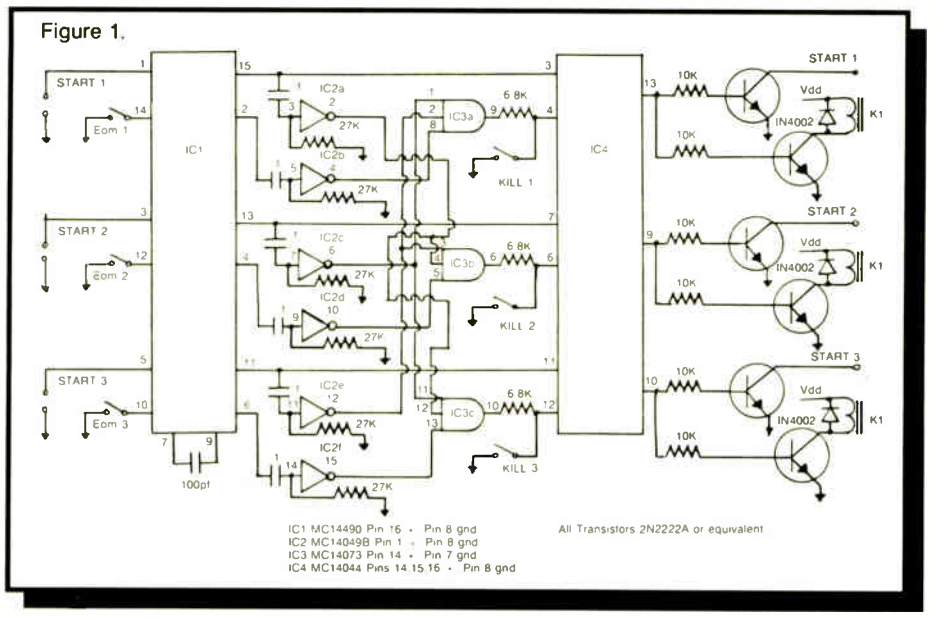
Operation is simple. The remote start button starts the machine as usual, including switching in audio. The next start button to be pressed will start the next slot and the *release* of the button will drop the audio of the previous slot.

Audio is also dropped at the *end* of the cart's cue tone, so if only one cart is played, audio will be disconnected properly at the end of the spot. The cart will continue to run and recue.

If an improper cart is started, a quick "punch" of one of the other remote start buttons will start a second cart and kill audio on the wrong one. The cart miscued will recycle to the cue point.

If desired, carts can be cued with the fader up and the key on, as long as the remote button has not been pressed. If it is necessary to stop both the audio and the cart run, the "kill" button can be used. Neat, huh?

Figure 1.



A simple circuit

The circuit looks complex at first, but really isn't. The heart of the unit is the Motorola MC14490, called a "Hex Debouncer" which translates the pushbutton and relay contact closures into clean, logical signals.

The problem with mechanical switches and relays is that they "bounce." In other words, when activated, they may actually open and close several times over a period of several milliseconds before reaching their final on or off position. For digital logic, a millisecond is plenty of time for glitches and other nasty things to go awry.

The MC14490 contains six individual circuits to clean up this switching garbage and allows us to use buttons and relays as logic inputs. Three of the circuits have as their inputs the console's *momentary* remote start closures and three are controlled by the decks' EOM relays.

The logic outputs of the MC14490 control the "set" and reset" inputs of a 4044 quad latch. The "set" inputs are controlled directly by the remote starts and

(continued on page 29)

New Rules Aim to Help AMs

by Steve Crowley

Washington DC The FCC's AM rules have favored the creation of as many AM stations as possible—there are now approximately 4900. They have been created, though, at the cost of increased interference on the band.

Because of the long history of AM broadcasting and the different sets of allocation standards that have been used, many stations are now on the air that would not be permitted under present-day criteria. They had interference rights "grandfathered" when tighter rules were adopted.

Now, new rules are being proposed that would encourage interference reduction efforts between AM stations. This would be done by facilitating contraction, rather than expansion, of AM service when it would benefit the service as a whole.

Interference and public interest

The proposed rules appear in a Notice of Proposed Rule Making in Mass Media Docket No. 89-46, where the Commission says that even though an AM station reducing power or going off the air would result in a marginal loss of service to an area, the net gain in interference-free service from other stations may better serve the public interest.

CONSULTANT'S CORNER

There is nothing in today's rules to prevent a station from working out an arrangement with an interfering facility to have its pattern modified or even to go off the air. It is permissible to pay costs or other considerations.

There are, however, several incentives to not do this. For one, present rules prohibit the filing of contingent applications—applications that depend upon the approval of another application.

These have not generally been permitted because of the Commission's belief that they are speculative and restrict superior proposals by third parties.

The refusal to accept contingent applications means that facility modifications cannot be coordinated—between stations or with the Commission.

As part of the proposed rules, the Commission would start accepting contingent applications where the changes will result in a reduction in interference or otherwise permit an improvement in interference-free service.

Risk of competing applications

Another disincentive to cooperative efforts in interference reduction is the treatment of AM power increases as a major change, making the licensee subject to competing applications.

If a competing application is filed, the licensee can always withdraw its application and continue operation with the existing facilities. An opportunity to reduce interference and provide improved coverage, however, has been lost.

The Commission is proposing that applicants filing contingent applications, where one or more is seeking a power increase, will not be subject to competing applications with respect to opportunities created by the contingency.

The public will still have full opportunity to comment on the proposal, but the fact that greater service might be provided by an alternative modification by a third party will not be considered.

Practically, power increase proposals taking advantage of the proposed contingent application rule will mostly involve daytime operation. At night, if a station reduces its interfering signal or goes off the air, the nighttime interference levels will be recalculated and all stations will be required to comply with the new RSS values.

As mentioned above, today a station receiving interference could buy the offending station and turn it off. Unfortunately, FCC rules grandfather the radiation and protection rights of stations for one year while they accept applications for a replacement station.

This means that a new station need not comply with current technical criteria and interference may be caused anew to the affected station.

Under the proposed rules, new replacement facilities will not be permitted to cause prohibited overlap of daytime contours of remaining stations. Also, nighttime proposals must provide protection based upon the recalculated interference.

Not only will this protect a station from a recurrence of the interference, but the decreased coverage caused by the elimination of grandfathered radiation and interference rights will make a replacement facility less appealing to a prospective applicant—the facility may never return

(continued on page 29)

Moving Into Main Street Digs

by Dee McVicker

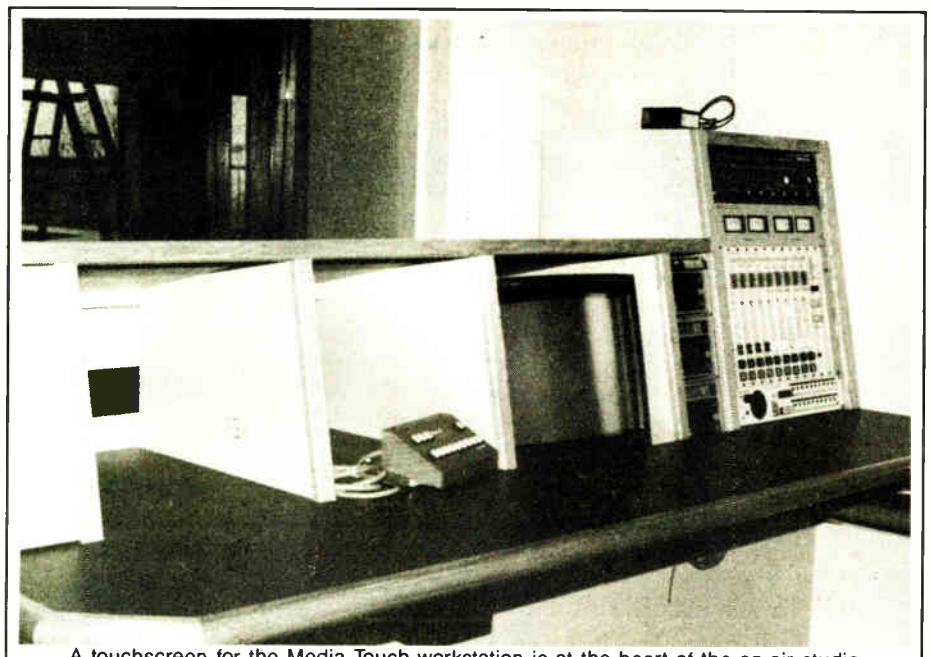
Tempe AZ WEEI-AM, avid RW readers will recall, piloted the Media Touch system some three years ago and proved the success of computerization in the broadcast studio.

For those who would ask what new audio worlds the Boston station has embarked on since that Media Touch launch, CE Larry Vidoli would probably have to answer "529 Main Street."

Then Vidoli would likely mention the new computer software, the new computer workstation, the new digital switchers . . . and, if asked, the other new broadcasting wares that he purchased recently for WEEI's new facility on Main Street.

Still the innovator he was three years ago, Vidoli has managed to change addresses in high-tech style.

This change came about because of a lack of expansion capability in the station's previous facility—an unheard-of limitation for a station with a mission similar to that of the "USS Enterprise."



A touchscreen for the Media Touch workstation is at the heart of the on-air studio.

The project, a 70% turnkey setup according to Vidoli, had its requisite share of new facility challenges. Vidoli was happy to report, however, that few of the problems were computer-related. Instead, he found himself preoccupied with a more static opponent: new studio furniture.

"I think I measured the on-air studio about 16 times!" confided Vidoli. As it turned out, 15 of his 16 measurements were unnecessary. The new studio furniture, designed by Vidoli and custom made by Design Fabricators in Rhode Island, fit into place on the first try.

Of course, there were other concerns to which Vidoli gave equal time. The new facility was a historical building that needed an architect's attention.

Every Wednesday for four months, Vidoli met with architects to discuss changes in the building's structure. The other days of the week Vidoli thought about how he was going to move operations into the new structure that was getting closer and closer to completion.

The studio which carries Boston Celtics games was set up first.

The Celtics challenge

Because WEEI is an all-news station and (just as important to some) the flagship station for the Boston Celtics, Vidoli wanted to bring the newsroom, the Celtics studio and the master control room up to 100% efficiency as soon as possible. That, he said, was his biggest challenge.

The Celtics studio was set up two days before radio operations began from the new facility.

Equipped with a new Wheatstone SP-6 console, Delta cart machines, Otari MX5050 recorders, Technics turntable, the Ramco RS-1616 routing switcher, Tascam 122 cassette players, and a Telemix telephone hybrid system; the studio was almost ready for on-air satellite service. The only missing component was its slave Media Touch system.

Tied directly into the station's Media Touch computer network, the slave system in the Celtics studio allows independent logging of the station's satellite service without the benefit of the system's other functions. Full-function Media Touch workstations can be found in the main on-air and alternate on-air studios.

A change of menu

Vidoli, by now a pro with the likes of computers and having a ready repertoire of diagnostic tools, began upgrading Media Touch computer operations.

He purchased a new generation Media Touch to replace the station's pilot system, and moved the 3-year-old Media Touch hardware to the alternate on-air studio. He also increased computer speed to 12 MHz in the older workstation, so that there was a common computer base from one studio to the next.

Except for a few software changes, the new generation workstation is similar to the Media Touch that piloted the technology several years ago.

A new Sony Trinitron touch-screen monitor for on-air logging, and a new Televideo monitor for displaying commercial copy were purchased to dupli-

(continued on page 35)

FACILITIES SHOWCASE

WE'VE MADE DEAD AIR A DEAD ISSUE.

There are worse things in radio than dead air. But not many.

And if your CD players aren't built to resist tracking errors, you could find yourself listening to some very embarrassing silence.

Not with the new CD-701 from Tascam. Its unique disc clamping system is a technological triumph that virtually eliminates disc vibration. So you never hear the awful hush that means a tracking error has occurred.

What you do hear is the finest sounding CD unit you can buy, with the same proprietary "ZD Circuitry" praised by two of Japan's top audio magazines* for eliminating low-level digital distortion.

Then there's the optional RC-701 Remote Control with Auto Cue so you can cue to the music instead of the track (for even less dead air). Or you can add the Ram Buffer for true, instantaneous startup.

And with four times oversampling and 16-bit D/A converters in an extra-rugged chassis, the CD-701 is superbly designed for the broadcast environment.

Can a CD player really deliver this kind of performance, track after track, disc after disc? Only if it's a Tascam.

Contact us or visit your Tascam dealer for more information about the CD-701. And take the sounds of silence off your playlist.

TASCAM

Radio Technology Component Grand Prix '88, CD Division, *Stereo Sound* Component of the Year (1988) & Best Buy (1988)

Circle 49 On Reader Service Card

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Want proof? Let Allied send you three FREE Fidelipac cobalt-formula Dynamax cartridges for your own evaluation. To get your free 70-second, 2.5-minute and 3.5-minute Dynamax carts, just send your request on your station's letterhead to: Allied Dynamax Offer, Dept. db, P.O. Box 1487, Richmond, IN 47375. Offer subject to change without notice.

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Circle 89 On Reader Service Card

Basics of Database Marketing

by John M. Cummuta

Downer's Grove IL During the past few months I've been exploring marketing concepts and tools for the engineer who is selling his services to the marketplace, rather than working as an in-house technician.

Last time we covered the ingredients in successful sales letters, so in this issue we'll talk about how to use those letters as effective sales-makers and client-keepers.

What we're talking about here is called Direct Marketing. You're dealing directly with the client or prospect, as opposed to mass marketing where you're sending an identical message out to the masses, with no control or awareness of who gets it

ENGINEERING MANAGER

and who doesn't. With direct marketing your message can be more precise and relevant, because you know exactly who it is going to.

An offshoot of direct marketing is database marketing. With database marketing, you can be exact in your approach to each client or prospect, because you can reference and incorporate specific information about each person or business in the body of the letter itself.

First things first

Before we get into the intricacies of how database marketing works, you need to understand what's at stake. Let's break the uses of this communications system down into the two categories I mentioned above: sales-makers and client-keepers.

Contemporary research indicates that over 80% of the sales made in this country are closed on or after the fifth call on the prospect. In other words, the average prospects say, "No" four times before they say, "Yes."

That means persistence is the key to sales success. Yet continuing to make personal sales calls on each prospect could take all your time, leaving you none to service the clients you already have. The answer: database marketing. Let a personal computer do the communications work for you.

On the client-keeping side of the ledger, the database concept can also shine. Each customer relationship is much like a marriage and statistics show that more than half of the couples in America don't make it.

Why? In most cases it's a communications breakdown. Again, you can let the machine do the talking with your clients in a database system—and they'll each think you sat down and wrote them a personal letter each month.

What's a database?

The telephone book is a database. The *Broadcasting Yearbook* is a database. Any system for collecting and displaying the same categories of information, on a variety of persons, places or things, is a database.

In terms of database marketing, we're talking about a PC-based system in which you record all the pertinent categories of information you'll need on each client and (as best you can) on each prospect.

These categories could include such things as station call letters, address, phone number, frequency, power, transmitter type, antenna system type, number of studios, staff engineers (Y/N), due date for a proof and any other information that would be useful to you.

While you could keep all your files about customers and prospects on paper, and write the letters manually, a personal computer could do it in a fraction of the time with better results.

If you happen to be familiar with computers, you could use your own database software to track your prospects and clients. And you could use your own word processor to write the letters. You could even mail merge each letter to each sorted category of clients or prospects, if you want to take the time to set up the necessary files.

But if you'd like it all to happen automatically, with the touch of a few keys, you want to get what is called sales and marketing management software.

These packages are integrated database/word processor systems, specifically designed for this communications purpose.

(continued on page 30)

Understanding Transistor Specs

This is the sixth installment of a 12-part series titled Introduction to Active Devices. *Readers who have registered with Northern Virginia Community College can receive continuing education credits from the college upon successful completion of an examination administered at the end of this series. To register, contact the Director of Continuing Education, Annandale Campus, 8333 Little River Turnpike, Annandale, VA 22003, or call 703-323-3159. The fee for the course is $20.*

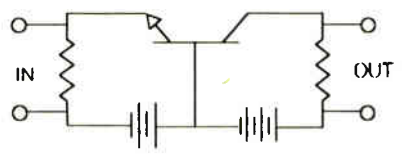
by Ed Montgomery

Part VI of XII

Annandale VA Transistors vary in their ability to switch or amplify because of manufacturers' design requirements. When purchased, all transistors come with operating limits and parameters. It is useful to know what these terms mean.

Technical terms such as "alpha" and "beta" are found on information sheets accompanying transistors. These terms are important in understanding transistor operation.

Figure 1.



Alpha (α) illustrates the current gain a transistor is capable of giving, when the base is grounded and the input signal is placed on the emitter (see Figure 1). The output will be taken off the collector.

The small variation of signal on the base will create a large current change on the collector. Equation 1 is the formula used to determine alpha.

Often a manufacturer will give an alpha value for a particular transistor as its minimum expected value. Alpha is also known as the forward current transfer ratio or H_{FB}. Upper case letters would indicate DC characteristics; lower case letters indicate AC characteristics of the device.

Equation 1.

$$\alpha = \frac{\Delta I_C \text{ (the change in collector current)}}{\Delta I_E \text{ (the change in emitter current)}}$$

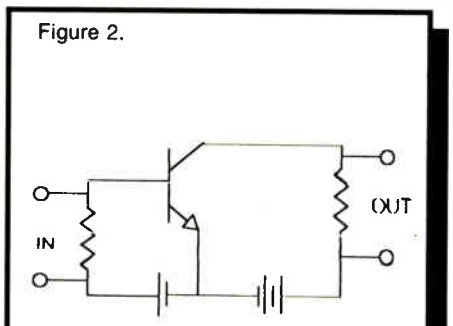
Equation 2.

$$\beta = \frac{\alpha}{1-\alpha}$$

Beta (β) is a measurement of the current gain of a transistor when the emitter is grounded (see Figure 2). The input is placed on the base and the output is taken off the collector. Equation 2 is the formula used to determine beta.

Beta is the measurement of the transistor's amplification ability. It is also known as the forward current transfer ratio, as is alpha. To distinguish between a transistor with the base grounded and one where the emitter is grounded, beta is known as H_{FE}. Once again, upper case letters indicate DC characteristics and lower case illustrate AC characteristics.

Figure 2.



Leakage currents

Leakage currents, or the reverse currents required to make the transistor operate, are also published by the manufacturer. This data is necessary to determine how a device will operate in certain situations. It is also useful to know these numbers when checking a transistor to determine if it is good or bad.

Collector-to-base leakage current is known as I_{CBO}. This is the current made up of minority carriers flowing across the collector-base junction when it is reverse-biased and the emitter is disconnected.

Another leakage current is I_{CEO}. This is the reverse current between the emitter and the collector with the base disconnected from the circuit.

If a multimeter is used to check the I_{CBO} and I_{CEO}, use the ohms function and reverse-bias the junction. Silicon trasnistors have very low leakage currents—the ohmmeter should show infinite resistance. Germanium transistors have a higher leakage current and the meter will show something less than infinity.

Transistor checkers have a function to test for alpha, beta and leakage currents while newer digital multimeters often have a function to test transistor and diode junctions built in.

Gain bandwidth of frequency range is indicated by the term f_T. This is an indication of the spectrum in which the transistor can effectively work. V_{CE} is the voltage across the junction that will drive the device into maximum current conduction or saturation. Further forward biasing of the emitter base junction will not result in greater collector current flow.

Replacing transistors

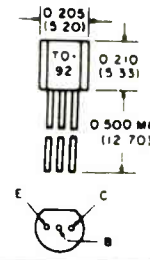
An example of a transistor's characteristics is illustrated in Figure 3. This information is often needed when replacement of a transistor is required. Often, part numbers of the manufacturer's exact replacement are not available. Substitute transistors can be used as long as they are based on the same technology originally used in the circuit.

Figure 3.

123AP

NPN Si Transistor

P_T	1.2 W
I_C	0.8 A
V_{CBO}	75 V
V_{CEO}	40 V
V_{EBO}	6 V
h_{FE}	200 Min.
f_T	300 MHz



One can measure circuit voltages to gain some idea of which characteristics a replacement transistor should have. V_{CBO}, V_{CEO} and V_{EBO} are the voltages present at various locations around the junction. These are usually maximum ratings and are helpful in replacing a transistor when the exact device is no longer available.

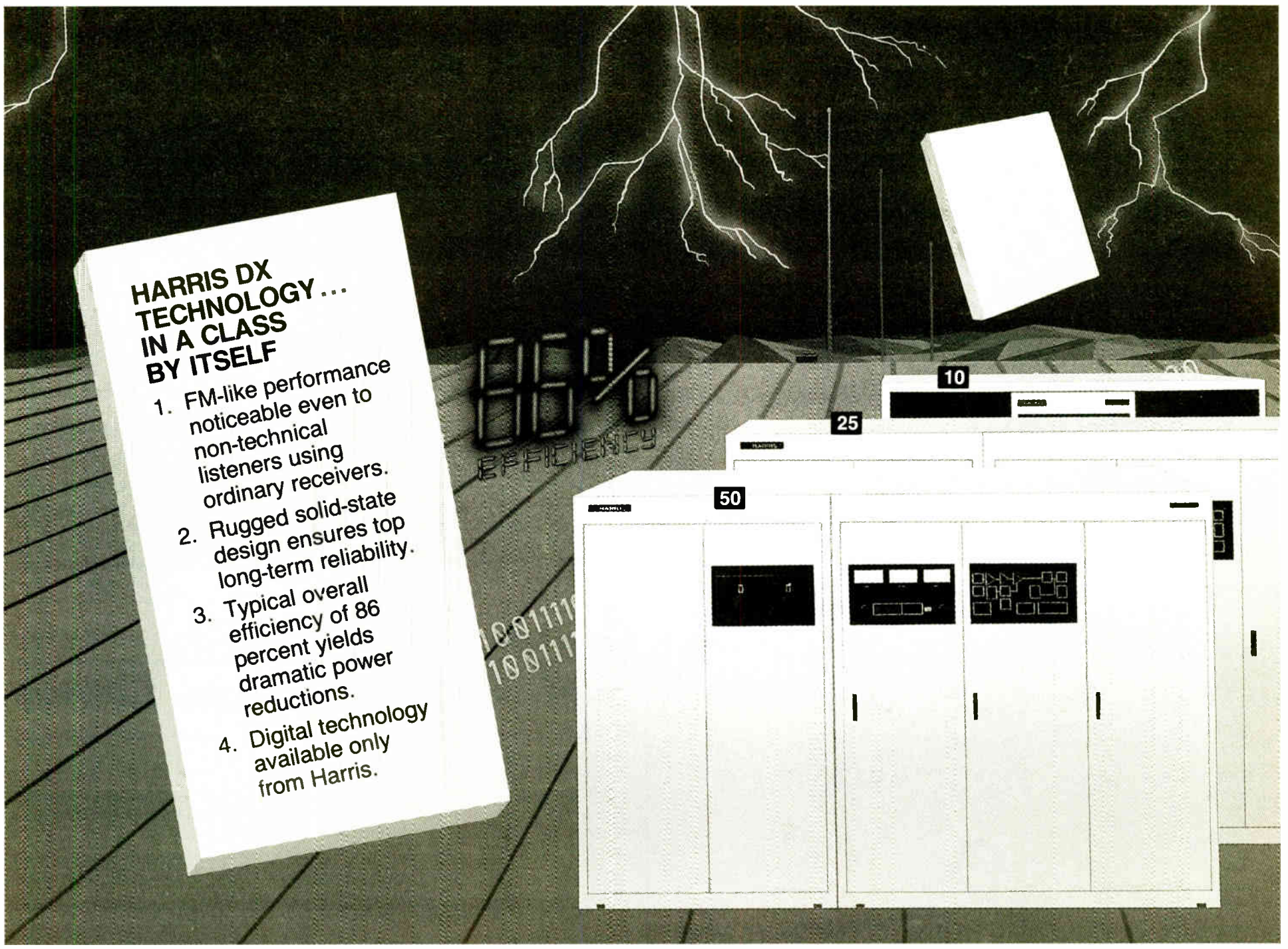
When making measurements across the junctions of a transistor within the circuit, it is easier to take a voltage reading than to break the circuit open and take a current reading. Thus, manufacturers publish junction voltages rather than junction currents.

Transistor checkers are convenient devices for determining whether a transistor is capable of switching or amplifying. Remember that the checker is making general tests of the device—just because it indicates that the transistor is good does not mean the device will work

(continued on page 30)

Harris DX Series AM Transmitters

PROVEN DIGITAL TECHNOLOGY DELIVERS UNEQUALLED PERFORMANCE, RELIABILITY AND EFFICIENCY



If you believe all transmitters are alike, you owe it to yourself to examine Harris' DX Series of patented, digitally-modulated solid-state transmitters, available in 10, 25* and 50 kW models.

They deliver FM-like sound. They're ruggedly reliable. And they're so efficient they will practically pay for themselves.

Your station's audio performance will improve, even on the fringe. Broadcasters worldwide note that DX transmitters improve sound so dramatically, even non-technical listeners with ordinary receivers comment. Designed to provide superior square wave response, 140% peak capability and audio performance virtually free from overshoot, tilt or ringing, DX transmitters sound so crisp and clear you may think you are listening to FM!

You'll also appreciate top reliability. DX transmitters feature a redundant and highly modular design, use conservatively-rated components, and include such standards as lightning protection, power line fluctuation safeguards and VSWR fold-back. The result is a transmitter that will provide years of dependable service.

What's more, Harris DX transmitters are so efficient they will substantially reduce your power bill. Compare the DX Series' typical overall efficiency of 86 percent to competitive efficiencies of 50 to 73 percent, and you'll find a Harris DX transmitter can lower your transmitter power bill by as much as one-third.

We invite you to learn what users worldwide have discovered about Harris DX Series transmitters. For more information about the DX-10, 25U or 50, or to discuss even higher power requirements, please write: Harris Broadcast Division, Marketing Department, P.O. Box 4290, Quincy, IL U.S.A. 62305-4290, or contact us at:

*The Harris DX-25U is upgradable to a DX-50.

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1-800-4-HARRIS
Extension 3019
International FAX
217/224-2764

HARRIS

Circle 54 On Reader Service Card

Lukewarm Participation in Ad

(continued from page 17)
after the spot—saying "Don't worry, we're still here."

KPWR DJ Jay Thomas, after allowing the dead air, said with a sneer in his voice, the only thing he learned from the spot was, if radio sounded like that he couldn't pay his rent. He then asked, "Who thought of this great promotion where you heard only silence for 30 seconds?"

Meanwhile, Scott Shannon at Pirate Radio turned the bit into a promotion for the station, saying sardonically, "If we don't go from worst to first, this is what we'll sound like." Then came the dead air. He forshadowed the event at 7:10 AM, when he announced to listeners they would hear something in a half-hour they had never heard on the station before.

Although most stations ran the campaign, many didn't run it at the slotted time. Some ran it a minute earlier, some a minute later.

Ho-hum in Houston

—Louis B. Parks
Houston Chronicle

Response to the 30 seconds of silence in this Texas community was apparent indifference from most listeners and only partial cooperation from stations.

Although a majority of stations took part, at least nine of the top-rated ignored the silence or did an alternative promotion that did not include going off the air.

"I feel we had a fairly mediocre output here, and it's a shame, but it can't be helped," Houston Association of Radio Broadcasters (HARB) President John Dew said. "Everybody has their own idea (of) what they want to do with their radio station. It's very competitive (here)."

Stations not participating represented about 40% of listeners at that time, Dew said. "It diluted (the effort) a great deal," he said.

Two major stations that did not take part were KIKK and KILT, Houston's top-10 country stations. Both created their own spots to acknowledge the importance of radio.

KPRC and KTRH, high-rated AM news stations, declined to join in. On the other hand, KMJQ, the city's perennial number one, with an urban contemporary format, was enthusiastic about the silence. KLAT, the highest-rated Spanish station, used a Spanish-language introduction to the silence. One rock station reportedly played James Earl Jones' spot, but inserted the sound of a heartbeat into the silence instead.

Atlanta wasn't burning

—L. Eric Elie
The Atlanta Journal-Constitution

Radio didn't exactly grind to a screeching halt here despite the campaign.

Although most of the city's stations observed the 30 seconds of silence, a couple of the top stations went ahead with their usual formats.

Atlanta's number one WSB-FM, an adult contemporary station, had no comment on its decision to not participate, according to spokeswoman Maria Taylor. WSB is owned by Atlanta-based Cox Enterprises.

WZGC-FM GM David Meszaros was not quite so reticent. Owned by Washington-based Cook Inlet Radio Partners, it had a choice and opted out.

"We . . . felt that it was too inside and too self-serving," Meszaros said. "We just wanted to focus on the product for the listeners. It's not like we don't support the effort, but I think to the regular listener out there, it was insignificant."

However, the majority of Atlanta's commercial stations did broadcast the spot.

"I understand there was a good deal of griping about having to do 30 seconds of dead air," said WFOX-FM GM Eddie Esserman. "But that's probably the best way to promote yourself in a one-shot deal like that.

"I can't believe that people would be so selfish as to not participate. I think that this is a great industry and you just need to give something back every now and then."

Satellites Mind Stations

(continued from page 8)
can choose from a variety of solutions the engineer has set up in the NSN installation, according to Sepmeier.

Sepmeier offered a possible station scenario that NSN could handle.

"Say station X in Indiana goes off the air. We (engineers at the Hub) are going to get a primary-one alarm. We will automatically get an on-screen status," he explained.

Sepmeier said the engineer will have immediate access to the station engineer's procedural instructions.

Because NSN is linked to national weather information, including lightning strikes, the NSN engineer could determine whether the transmitter was struck by lightning or whether the problem resulted from a more common power spike.

If restart procedures were authorized, the NSN engineer would try to restart the transmitter.

"If we can't get it restarted, we'll call the engineer for further instructions or to provide the engineer with comprehensible data . . . relating to the problem at hand," Sepmeier said.

Despite recent concern about the legality of remote control of transmitters, Sepmeier said his system is completely legal and FCC officials have been kept up to date on the network's development.

NSN was developed because of problems setting up a legal, reliable off-premise control system, he noted.

Because of the responsibility of so many stations, the Hub will have a battery and generator backup systems in case of a power failure and remote dial-up backup in case of satellite problems.

For information about NSN, contact Bill Sepmeier at 1-800-345-VSAT, Peter Burk at 508-433-8877 or David Woodworth at 312-329-4433.

SBE Criticized on Show

(continued from page 14)
papers presented this year including an all-day antenna program.

SBE's philanthropic arm, the Ennes Foundation, will sponsor an all-day seminar of workshops conducted by manufacturers the day before the show opens.

For the first time, a spouses program is scheduled, which SBE said was heavily requested.

Combining shows?

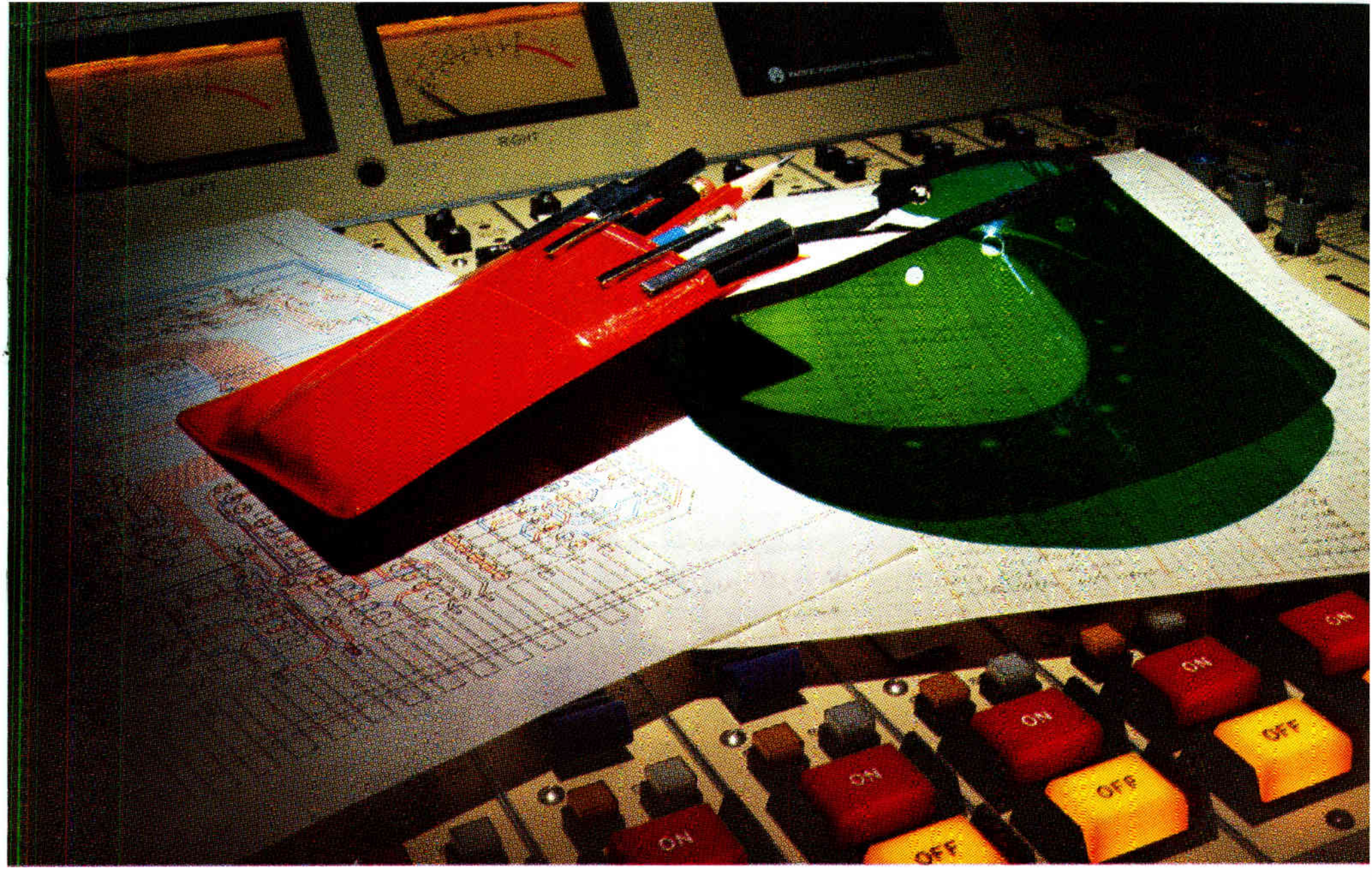
After last year's low turnout, there was some discussion that SBE may combine resources of its fall show with NAB's Radio '89 show to create a "super" radio show, heavy in engineering and programming.

NAB Science and Technology VP Michael Rau said there has not been any discussion on either side since last year. "I'm not sure whose court the ball is in at this point," Rau said. "It still is a viable proposal."

SBE President Jack McKain said SBE is not actively considering a collaborative effort with NAB in the next few years, but it is an option to consider for the future.

"We are keeping it on hold," he said. "It could be possible, but it has not gone into any development stages with NAB."

For information, contact Neil Glassman at 301-948-0650, Eric Small at 718-625-7333, Anders Madsen at 619-438-3911, Eddie Barker at 214-631-1278, Michael Rau at 202-429-5339 and Jack McKain at 505-292-4528.



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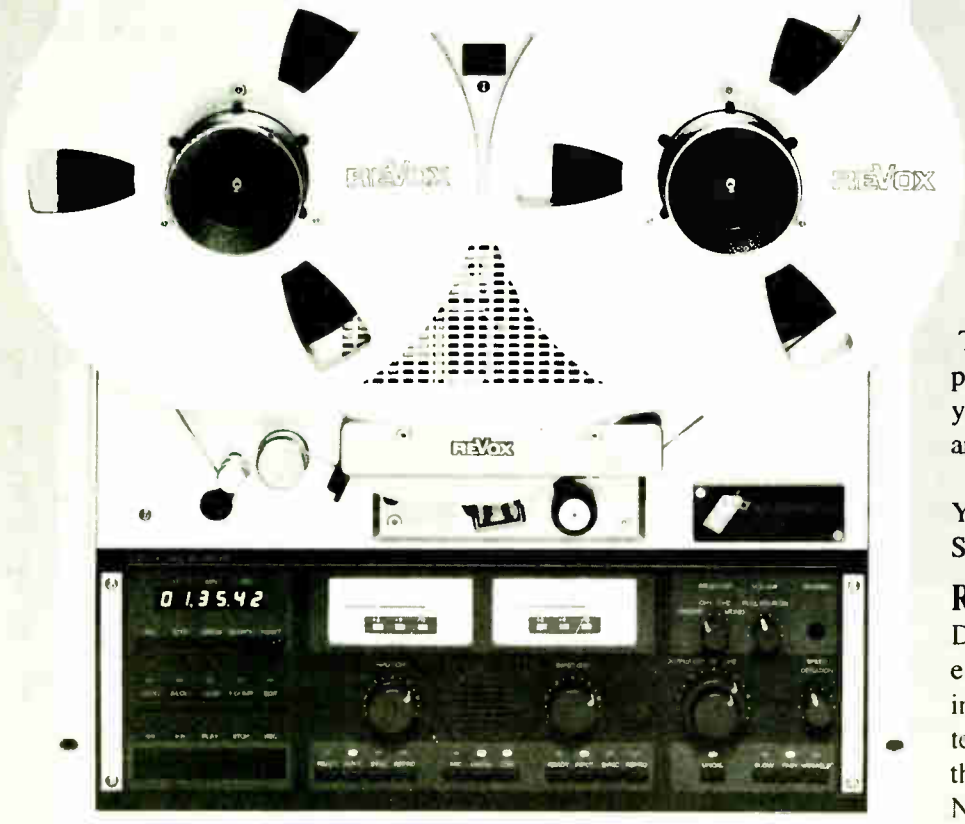

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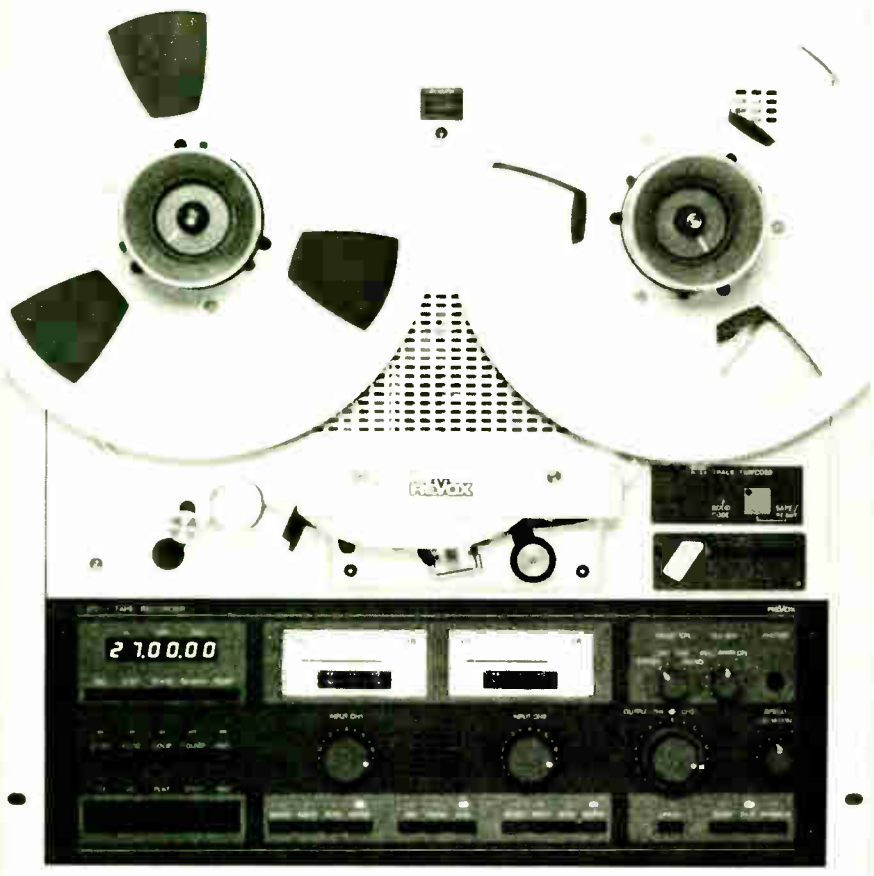

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Circle 38 On Reader Service Card

Aim Is To Help AM

(continued from page 19)

in any form, and remaining stations can then increase their coverage into areas that were once precluded by the interfering station.

Local service appraised

Whenever a station reduces its coverage or leaves the air, there is a concern about local service. The Commission is considering the establishment of a service floor, or minimum level of service that must be maintained following any facility changes.

Comment is being sought on what an appropriate service floor should be—for example, that at least two or three services remain. Furthermore, in any facility reduction proposal, coverage with the principal city contours must be maintained.

Perhaps there should be no service floor—many stations that might leave the air as a result of any new rules are now barely surviving and do not have the resources to provide the level of service envisioned when the Commission authorized their construction.

The marketplace could then be left to decide which stations will go off the air, and which will be able to benefit from lessened interference and improved coverage. The Commission notes, however, that it may be precluded as a legal matter from allowing the creation of any "white" or "grey" areas—that is, areas with no service or with one service.

Not all interference is objectionable. A station may want to increase power in order to increase signal strength to populated areas near the transmitter site, enabling the station to better overcome electrical noise and building attenuation.

A consequence may be the creation of new received interference within the newly expanded service contour, but this interference will occur in areas not already served by the station—no one previously served will receive interference. Unfortunately, this is now only possible under very limited circumstances.

If a station deems interference it is now receiving to be objectionable, these proposed rules will make it easier and more economical to take action to reduce interference. Ultimately, fewer stations with more power, along with other AM improvement efforts, may enable AM to once again fully exploit its only advantage over FM—greater propagation.

■ ■ ■

Steve Crowley is a registered professional engineer with the consulting firm of du Treil, Lundin & Rackley, Inc. He can be reached at 202-223-6700.

Starter

(continued from page 18)

turn on a transistor connected to the deck's remote start input. The operation also closes a DPST relay through which the machine's balanced audio feeds. Don't forget the 1N4002 diodes across the coil.

The "reset" input is controlled through an AND gate (here used as a negative-logic or gate) driven from 4049s used as trailing edge detectors. Audio and the maintained start are opened when the circuit senses either the release of another remote start button or the end of the EOM tone. By sensing the trailing edge, overlap audio is accommodated.

Transistor type not critical

The type of transistors used is not critical—2N2222As are usually just fine. Most solid state machines have current control inputs, and the 2N2222A is good through at least 24 volts.

Relays are the builder's choice, although I am partial to reed relays in DIP packages. They are very dependable, and mount easily on perfboard. I have seen these available as surplus for as little as two dollars apiece. The voltage of the relay coil should match the voltage of the cart machine.

The circuit will work just fine on anything from 5 to 15 volts. I would recommend that you ground the circuit at the machine(s) and float the remote start buttons at the console.

Note that this circuit requires momentary contact remotes. Most consoles have these available, either alone or by moving a jumper.

One final word: The circuit is designed to work with machines which require the pulling of a positive voltage to ground to start. If you have one of the older units, such as Sparta, which operates on a *negative* voltage with respect to ground, you will have to use an opto-isolator or relay to start the machine.

■ ■ ■

Bill Higgs is on the engineering staff of WHAS-TV, was CE for WXLN/WFIA 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 812-945-9414.

Self-Marketing With a Database

(continued from page 23)

There are a number of such programs available, ranging from around a hundred dollars to several thousand dollars, with complexities relative to price.

The important thing is that these systems have been developed specifically to do what I have been describing—automatically merging information you've stored on each prospect and client into letters you've already written to those categories of recipient.

On the sales-making side, let's say you've written a dynamite introduction letter that incorporates little bits of information on the station itself.

For instance, you might say, " . . . and I have experience working on _____ antenna systems like yours." When writing the letter, you would include a designator where I've placed the blank line.

Filling the blanks

That designator would tell the system what database information to put in that space. You would, of course, use the designator that identifies the field in your database where you've stored the type of antenna system for each of your prospects.

When the computer prints out the letters it just drops the proper system name into each individual letter. The same could be done with transmitters, automation systems or any other category of equipment you wish to put into your database.

The computer would also automatically address each letter, pulling the relevant information from the name, address, station manager, salutation and other pertinent fields for each station.

You can be extremely creative in developing a letter that unobtrusively uses specific information from the database to "individualize" each communication to each prospect or client.

Notice that I said, "individualize" rather than "personalize." Personalizing a letter is the technique of dropping the person's name down into the text a few times. In and of itself, personalizing is not bad. But it has been overused.

Just read over one of those sweepstakes letters you get from Ed McMahon. When you run across your name every other sentence it begins to call attention to itself and from that moment it is a negative element rather than the positive one it was meant to be.

A stronger effect

It's much stronger to have the computer drop in other individualized information as well. That makes the statement that your letter is too "station-specific" to be a form letter.

Plus, you can schedule the letters to go out at pre-determined intervals, or you could have five different prospect letters and send a different one to your prospects each month until they become clients.

A recent Harvard Business Review article stated that, "By automating the sales and marketing functions, companies have increased sales anywhere from 10% to more than 30%, and investment returns have often exceeded 100%.

" . . . They perform selling tasks with greater economy and impact. They know their customers better and can tailor their sales communications to supply just the right amount of sales stimulus at just the right time. Overall, they craft and control their marketing programs more intelligently. In the long run, the competitive barriers they establish may change the nature of marketing in their industries."

Isn't that the advantage you want?

■ ■ ■

John Cummuta is president of Advanced Marketing Concepts, Inc., a broadcast management and marketing consulting firm, and a regular **RW** *columnist. He can be reached at 312-969-4400.*

Reading a Transistor

(continued from page 24)

within the circuit.

Much time can be lost trying to make a transistor function because the checker indicates it is good. Often, when time for trouble-shooting is considered in the cost of the repair, it is much cheaper simply to replace the transistor.

Review

At this point in the series, you should be able to do the following:

- Identify diode types: rectifiers, zeners and LEDs;
- Identify voltages that will forward-bias and reverse-bias a PN junction;
- Identify full-wave and half-wave rectifiers;
- Provide the proper diode arrangement for a bridge rectifier;
- Create a schematic diagram for diodes and junction transistors; and
- Give the proper biasing for the emitter, base and collector to make a junction transistor operate.

■ ■ ■

Ed Montgomery currently is an electronics teacher at Thomas A. Edison High School in Fairfax County, VA. He has taught broadcast engineering at Northern Virginia Community College and has worked as a broadcast engineer for several radio stations.

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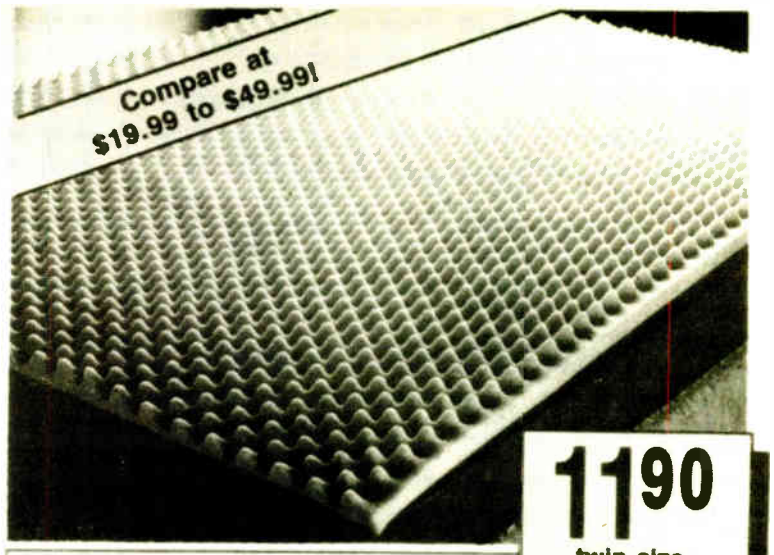

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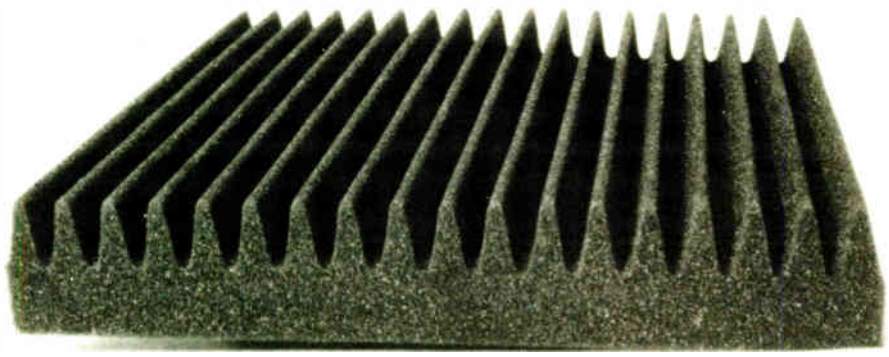

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WPXC	WRKZ	WSJC	KMBS	KRZI	WWAM	WCBA	WLEN
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KTAP	KSDB	WMGG	KALP	KCDZ	KDRI	KSEZ	KRIO
WRAI	WMOU	WKNX	WLVH	WWCH	KCON	WIVK	WUMS
WHLB	WRHD	KRKZ	KSTG	WTOT	KGIL	WMNI	KRKT
WBRN	KMPL	KCVS	WOMA	WHMT	KLZC	KSNO	WSEB
KRJT	WOXD	KUGR	WKKE	WSHU	KTVH	KEDA	WCOA
KHLC	WKBK	KRUM	WRMN	WEOS	KSLU	KMNS	KEYV
WAVV	WCXL	WARV	KPCO	WOXY	KWLC	KDFX	WYNN
KDMO	KSPQ	WRBB	KCIB	KTTK	KORQ	KBHT	WZOO
WCTD	KRLV	WJMX	KRGK	KATJ	WJKL	KVOY	WCMC
WCSY	WCTZ	KRVM	WBEL	WTCS	WMRY	KALW	KJUL
WCVL	WGHQ	WCRO	WUOM	WBPM	WRJN	KPAY	WSAN
WESU	WGTY	WAVD	KALM	WMQU	KZOK	KSUG	WHOB
KMLE	KNEZ	WEZO	WGNU	WWAV	WDKT	KZIQ	KOSE
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KULY							WBHL
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Airforce Creates Music Beds

by Ty Ford

Baltimore MD This month's *Producer's File* continues the intimate inspection of production music libraries with a look at *The New Production Music Library* from Airforce Broadcast Services, Inc. of Toronto, Canada.

The collection currently consists of 14 CDs and a three ring binder. Airforce has divided the library into slow, medium and up tempo, random length, new age, country, international and comedy categories. Expect more CDs as they become available.

PRODUCER'S FILE

There are no theme length beds, all 30 and 60 seconds. Note that the chart shows the number of different compositions. Almost every :60 bed has a :30, which doubles the number of cuts listed. There are also a number of alternate versions with added instruments which further increase the count.

A time check of the cuts proved that you'll have to fade the ring out to get out by :29.5 and :59.5 for critical TV spot use. In a few cases the last note hit was past :29.5 or :59.5. On those cuts, the ring out made the piece too long.

The only other problem I had with the package was with CD #1. Cue to music was tight enough that I sometimes had to manually back-off the auto cue, a minor annoyance.

One other thing about these spots. Just because Airforce's beds are no longer than :60 doesn't mean this package can't be used for non-broadcast/industrial narrations.

Most longer form productions use at least several pieces of music. If your individual segments don't run longer than :60 this package will work. If you need longer pieces you can always lengthen or loop parts.

Random length tools

The random length pieces are musical stingers, pads, effects and fanfares ranging from :02 to :30. These are handy if you have a sampler, multitrack or multicart production set-up and no synthesizer. It's the perfect musical tool kit for non-players.

The efforts of producers Mort Ross and Richard Loth to create an overall consistency for the package are audible. Many of the tracks appear to have been played by the same musicians. As a rule there is a very consistent quality to the package.

There are, however, a few cuts on each CD that are obviously "coming from somewhere else." Were it not for them, the package might be too "samey" sounding.

Funky arrangements

Relative to some of the other packages I've reviewed, and due to the "slap bass" technique and "grooved" percussion tracks, the Airforce library leans a little to the "funky" side in arrangements and licks.

The "slap bass" is so consistent throughout the package that it leads me to suspect that it's being fired from a sequencer. If you've been ripping off Stanley Clarke for beds in the past, you'll like this package.

As you listen to any production music package it's important to be aware of how prominent melody and other elements of the music are.

Although there's room for personal taste, remember that music that's too dramatic or strong can overpower the copy. The Airforce package delivers feeling without getting in the way of the copy.

If you're used to the idea of having similar kinds of music on the same disc, this package will take some getting used to. Not only do all the discs cover a broad range of styles, discs #8-#14 are programmed with a variety of tempos as well as parts of the random length library.

In order to get the most out of this or any library you really have to commit some listening time up-front and on a continuing basis. If you don't, you'll lose touch. I find it helpful to randomly dub production music CDs to cassette so I can listen to them in the car while on my way to a session.

I also stick one in the studio CD player while setting up for a session. This can be especially helpful when working in a studio you haven't worked in before.

Due to variances in room and monitor response, you can screw yourself to the wall by attempting to EQ everything to "your own reality" only to find that "reality" doesn't exist in that studio.

The deal

According to Airforce's Richard Loth, this non-exclusive library comes with a three-year lease. The first shipment consists of the 14 CDs reviewed in this article and your choice of one of the three CD sound effects series from *Sound Ideas*.

Series 1000, a combination of analog and digital works, consists of 28 CDs. Series 2000, all digitally recorded, consists of 22 CDs. Series 3000 contains over 200 ambiences, each over four minutes.

In addition to the first 14 Airforce CDs, the three-year lease includes 15 additional CDs to be shipped to you over a period of 30 months. That's a total of 29 CDs and a sound effects library for three years.

For top-ten markets the going rate is $9000 for three years. The figure scales down in increments to $4500 for markets below 100.

Airforce is also planning station promo packages for specific formats. Numbering around 600 tracks including variations, AOR, CHR and AC stations will receive market exclusive use by 1 July.

By the end of the summer they also expect to have a two-CD Christmas library with around 40 commercial length cuts plus random length elements for a $195 buyout.

They are also working on a soon-to-be-named laser effects package with over 350 random tracks (650 if you count alternate versions). The package will consist of loopable beds, plus 20 :60 and :30 tracks in a variety of keys, with extensive catalog and suggestions on how to assemble the different parts to get custom tracks.

Call Richard Loth at Airforce for more information at 416-961-2541.

■ ■ ■

Ty Ford, audio production consultant and voice talent can be reached at 301-889-6201 or by MCI Mail #347-6635.

Airforce Broadcast Services Production Music Library

Disc # Name	Total Time	# of Themes	Arrangement	Use	Comments
Disc #1 Slow Tempo	56	32	contemporary combo with very little synth	TV/Radio/AV/Film	Soft AC, some extra versions with added instruments, "light & lively" beautiful music style with the exception of two slow rock anthems.
Disc #2 Slow Tempo	56	31	contemporary "pop" combo with more synth than #1, some strings	TV/Radio/AV/Film	AC, More edge and mood and dynamics than #1
Disc #3 Medium Tempo	58	30	contemporary pop and rock combo with synth accents, some "horn added" versions	TV/Radio/AV/Film	Brighter and funkier than #1 and #2.
Disc #4 Medium Tempo	72	40	contemporary pop, funk and rock combo with synth accents	TV/Radio/AV/Film	Lots of these sound like TV/Film themes. I can almost see the scene cuts and the credits rolling. Includes a mix of acoustic and synth percussion and a small collection of synth percussion pieces.
Disc #5 Up Tempo	67	32	techno-funk, pop, rock, jazz combo with a blend of synth	Radio/AV/Film	A good cross section of different styles.
Disc #6 Up Tempo	57	32	techno-funk, pop, rock, jazz combo with a blend of synth	TV/Radio/AV/Film	A good cross section of different styles.
Disc #7 Random Length	24	96	Various	TV/Radio/AV/Film	Fanfares, drum rolls, stingers, glissandos, arpeggios, pads, sustainers and other production elements from :02 to :46.
Disc #8 Medium & Up Tempo & Random Length	52	54	AC, soft rock combo	TV/Radio/AV/Film	Note, cuts 17-46 are random length music elements as on #7. Great pads for CHR talk-overs.
Disc #9 Medium Tempo, Random, Comedy	38	47	Various	TV/Radio/AV/Film	Cuts 1-8 are music :60s and :30s, 8-39 are musical effects, cuts 40-47 are electronic comedy music beds.
Disc #10 Slow, Medium, Uptempo and Random	53	53	Various combo configurations	TV/Radio/AV/Film	A good collection of stingers, bridges, video logo drops, etc.
Disc #11	35	48	Medium, Random, Electronic New Age	TV/Radio/AV/Film	Cuts 1-8 are synth/sampler based beds, cuts 9-40 are musical and human sound effects.
Disc #12	59	63	International, Comedy, Country, Rock, Funk; Various combo	TV/Radio/AV/Film	1-8 are electronic facsimiles of international themes, 9-39 are human, human-made animal and electronic SFX, 40-47 are acoustic/electric country, 48-57 primo AOR chunky "rockman" flavored beds, 58-63 more hot funk.
Disc #13	52	32	Solo, New Age, Light & Lively, Rock; Sequencer driven combo	TV/Radio/AV/Film	1-8 Guitar, harpsichord, piano, organ, synth brass, synth harmonica w/synth swamp sounds, celeste solos, 9-16 synth new age, 17-24 "light & lively" synth, 25-32 rock.
Disc #14	65	40	Jazz, Funk, New Age, Easy, Mixed Bag	Sequencer driven combo	1-16 jazz/funk, 17-23 new age, 24-40 easy & mixed bag.

Any of these problems sound familiar? Get to know Modulation Sciences' composite baseband solutions.

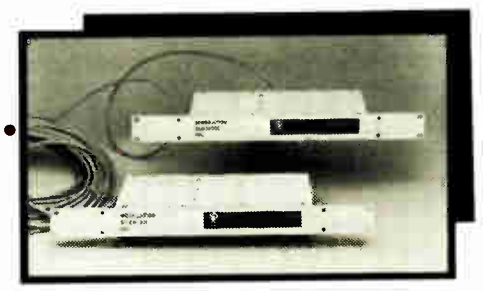
Problems

- Transmitter noise, heat, RF field interference and physical location make the transmitter room a poor place to locate the stereo generator and audio processing. Necessary and critical adjustments are inconvenient at best; nearly impossible at worst!
- Lossy, expensive, hard-to-install 950 mHz semi-rigid coax is often impractical to run from the studio to the STL antenna on the roof.
- Fire codes won't let you run PVC jacketed coax through the ceiling, except in very expensive metal conduits.
- Long composite runs at the transmitter or studio pick up ground loop hum.

- You need to drive multiple exciters without composite level changes and switching or relay hassles.
- The station has two stereo generators and two transmitters. You want a simple way to matrix-switch them without requiring complex backloading.
- It's a pain to use your spectrum analyzer and other test gear to make composite measurements because of the hassles of interrupting the air feed to connect them.

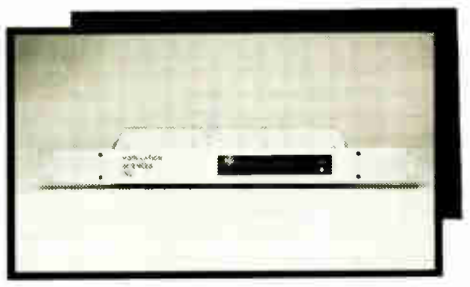
- The PD, the CE and the GM all want to monitor and measure the station's quality. But buying three modulation monitors is out of the question.
- Keeping tabs on the competition's signal quality is important, but it's inconvenient and expensive to do.
- Lots of boxes use composite baseband—the STL, stereo and SCA generators and more. You need an easy, economical way to test their performance, and directly measure composite baseband signals.
- The station has an old modulation monitor gathering dust. You don't trust the readings, but can't it still be useful?

Solutions



Modulation Sciences' CLD-2501/2 Composite Driver/Receiver

- Lets you put your stereo generators and audio processing where they belong—at the studio.
- Supports up to 3000 ft. (or two miles, on special order) of flexible, inexpensive, twinax cable – standard or PTFE-jacketed for plenum runs.
- Fully balanced against hum and noise pickup.
- 100 dB of immunity to ground-loop related noise and hum.
- Exceptional stereo separation and SNR performance.
- One driver can supply two independent receivers (each up to 3000 feet away in different directions) with composite stereo baseband audio and all SCA's.
- Works with 78 ohm twinax (Belden 9463) twinax for indoor service and 150 ohm twinax (Belden 9182) for outside or direct burial.



Modulation Sciences' CLD-2504 Composite Distribution Amplifier

- Makes distribution of composite baseband signals as easy as distributing audio.
- 1 composite input, 4 composite outputs.
- Unity gain with >50 dB isolation between outputs.
- High impedance 50Ω input, low impedance outputs.
- BNC connectors on input and all outputs.
- Basic performance specs similar to Composite Line Driver.

Modulation Sciences' FM ModMinder™

- Provides all essential measurement functions of a high-quality modulation monitor when fed by any composite baseband audio source.
- Works with any wideband source of demodulated FM—even consumer tuners or stereo receivers.
- Displays total modulation percentage, overmodulation peaks, stereo & SCA subcarrier status, subcarrier injection level, allowable increase in modulation—all for about half the cost of a modulation monitor.
- If you have an old modulation monitor—even one that reads unreliably—that oldie's demodulator section can drive ModMinder. You get unbeatable accuracy at a $3000 savings over the cost of a new modulation monitor.
- Plug-in cards adapt ModMinder to measure SCA subcarriers on non-standard frequencies.

Whether you have these audio distribution or measurement problems, or some unique puzzles of your own, Modulation Sciences has the convenient, cost-effective composite tools to help you solve them. Any further questions? Of course—so call 800-826-2603 Toll-Free for complete information and specifications on Modulation Sciences' Composite Problem Solvers.

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WEEI-AM Upgrades

(continued from page 20)

cate the Media Touch workstation already in service.

"The most important change," said Vidoli, "is that (the new Media Touch software) put all the commercial copy in alphabetical order. And, we now have a back-up file server on line."

The console that Vidoli elected to purchase for the main on-air studio is the Wheatstone A-20, a nine channel unit that Vidoli rack mounted off to the side of the Media Touch workstation.

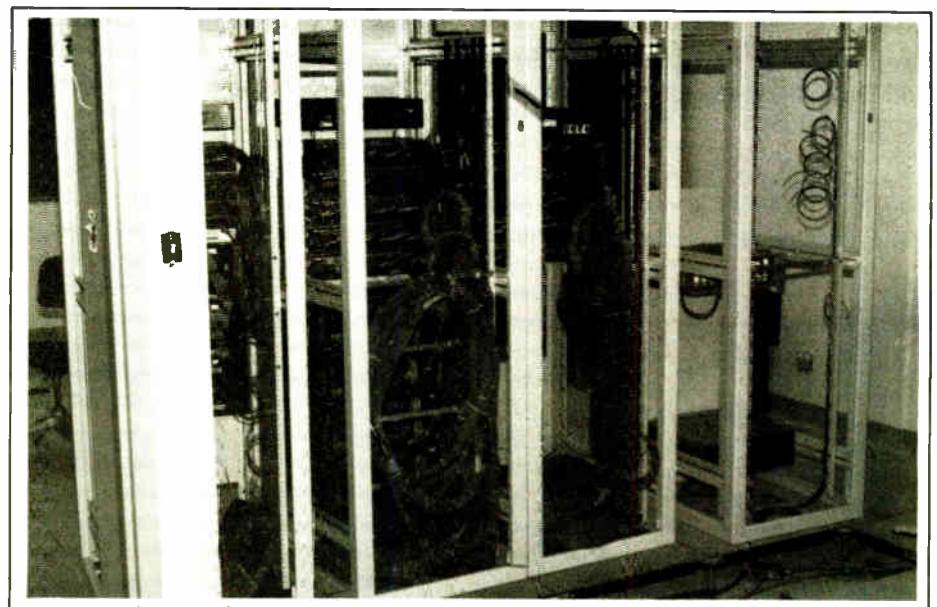
Of the rack mountable consoles available on the market, Vidoli elected to go with the Wheatstone because it provided him with the nine channels he needed.

"The audio that comes out of the Media Touch goes through the Wheatstone, to give our anchors a source of control," informed Vidoli, adding that the console is used primarily for level control. "We also have a digital routing switcher which is another source of audio they can bring into the console."

Pulling the switch

While the Media Touch workstations have a Ramco 64×16 digital switcher directing them, studio consoles have a Ramco 48×16 digital switcher directing their source material.

The 64×16, according to Vidoli, "will literally switch any one of the 64 inputs to any one of the 16 outputs, individually or all together, depending on how you want to program Media Touch to do this." All the lines are addressed by RS-232 connectors, which the system can couple as stereo feeds and/or address as single line feeds for monaural.



A maze of electronics comprise "an engineer's master control room."

As a stereo-ready AM station with an all-news format, this switching capability allows WEEI to label the feeds stereo or monaural according to the source. "Obviously," said Vidoli, "the audio coming in from, say, the State House will never be stereo. But the beauty of this switcher is that you can have stereo or mono, simply by the way you program it."

For the manual studios, the 48×16 Ramcos serve as a switching network that is equally capable. "I have this digital switcher in studios, recording stations, newsrooms, recording booths; so that at 16 different locations in the station, I can access any one of 48 possible audio sources."

For the anchor, added Vidoli, "this allows him access to any one of 48 inputs to feed directly into his control center." The digital switching networks also provide direct feeds to and from the station's five studios.

With the exception of the alternate on-air studio, which acquired an Auditronics 212 console that was previously servicing a production studio, the Media Touch studios were equipped with all new equipment. Vidoli re-equipped the on-air and alternate on-air studios with five new ITC/3M Delta cart machines, new Gentner IC-20 Intercoms, Rane HC 6 headphone amplifiers and the Crown D-75 power amplifiers for the speakers.

He also equipped the main on-air studio with the Telemix telephone hybrid system and equipped the alternate on-air with the new Tascam 122 cassette player, two Otari MX5050B Mark IIIs, and a Technics turntable.

The new master control room was also brought up to what Vidoli likes to think of as "an engineer's master control room." This was accomplished with jack fields that Vidoli configured for the maze of computer and mechanical activity at the station. The Media Touch system, reminded Vidoli, is just one computer network that the master control room keeps track of.

"Our entire news room is an electronic newsroom," explained Vidoli. Previously a nine workstation newsroom, the move brought in nine additional workstations for news production and actualities. Traffic and billing at the station are also computer automated.

The question begs to be asked: Does WEEI-AM have an MIS (manager of information systems) on staff? No, said Vidoli, but he wouldn't rule out the possibility that they need one.

■ ■ ■

Dee McVicker is a free-lance writer and regular contributor to **RW**. *To inquire about her writing service, call 602-899-8916.*

Putting Your PC to Work at the Station

by Thomas L. Vernon

Harrisburg PA You did it! You convinced the GM that life at the station simply couldn't go on without a Macintosh II and a low cost digitizer so the production and news people could get into hard disk editing. You also got your entire Rolodex on HyperCard and can access important phone numbers and addresses in nanoseconds. Now what?

Maybe when you sold the GM on the idea of purchasing a computer for hard disk editing you made some vague promises like, "It can do lots of other useful things around the station, too." Now you have to deliver.

Diving in

A good jumping off point might be developing a HyperCard application to drill new operators on broadcast fundamentals, since there's usually never enough time to bring beginners up to speed. It will get you started on learning HyperTalk, and get the boss off your back, too. You don't need advanced degrees in instructional technology or computer science, just a little time and patience.

To create such materials we will use exercises like true/false, fill-in-the-blank and multiple choice. Each question will be on a separate card and the user will navigate by clicking on left/right arrows or using the keypad.

Figure 1 shows a typical true/false question. One field is used for the question, there are buttons for true and false and a box to tell students if they selected the correct answer.

Single script

Scriptwriting can be simplified by having one script for both true and false and pasting it in each button. The finished version might be as shown in Script 1.

SCRIPT 1.

```
on mouseUp
  If the target contains "TRUE" then
    answer "You got that one right"
  else
    answer "No, no, no!"
  end if
end mouseUp
```

SCRIPT 2.

```
on mouseUp
  If the target contains "TRUE" then
       answer "You got that one right"
  else
       answer "No, here's the right choice"
       show card field "ANSWER"
  end if
end mouseUp
```

The same structure and HyperTalk script can be used for multiple choice questions. Here each choice has its own field and transparent button over the answer.

Name the button of the correct answer "true" and buttons over remaining answers "false." A multiple choice question is illustrated in Figure 2.

It's a simple matter to show users the correct answer if they select the wrong one. Just add to the script as shown in Script 2.

STATION SKETCHES

may be a button labeled "verify answers," which is written as in Script 3.

Sometimes novice stackware developers get carried away with all of the painting/graphics capabilities of HyperCard. Too often this leads to visually cluttered screens that are hard to decipher.

SCRIPT 3.

```
on mouseUp
  put empty into AllRight
  if card field 1<>"5000 watts" then
       answer "Slot 1 incorrect"
       put "X" into AllRight
  end if
  if card field 2<>"1510 kHz" then
       answer "Slot 2 incorrect"
       put "X" into All Right
  end if
  if card field 3<>"WYXX means music!" then
       answer "Slot 3 correct"
     put "X" into AllRight
  end if
  if card field 4<>"Under the chairmat in production" then
       answer "Slot 4 incorrect"
       put "X" into AllRight
  end if
  if Allright<>"X" then
       answer "You didn't make any mistakes!"
  end if
end mouseUp
```

Fill-in-the-blank questions are a little trickier. These usually involve a series of fields. There are locked transparent text fields and unlocked blank fields with rectangles into which users type their answers. Students move from blank to blank by pressing the tab key. There

When creating new cards, the "less is more" axiom is usually appropriate. Screens should be of a simple design that let the users find buttons easily.

Another common problem with stacks is the lack of navigational aids. Without these, users can easily become lost and frustrated.

A complex program may contain a map screen. This would use highlighted text or check boxes to indicate sections the learner has completed. Such a screen would be available in the introductory section and also accessible by a "map" button on the cards.

Simpler programs may just have an outline menu with topics and sub-topics. Again, completed sections would be highlighted so the user knows where he's been. Such a card establishes a reference point to which the user can always return, check his progress and link to anywhere else.

You are here

Within a section, it's a good idea to inform the user which topic he's in, which card, and how many are left. This may be easily accomplished by putting the in-

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Hypercard Training

Figure 1. Clocking on either the TRUE or FALSE buttons reveals a window with the correct answer. Note the navigation aids in the lower left corner.

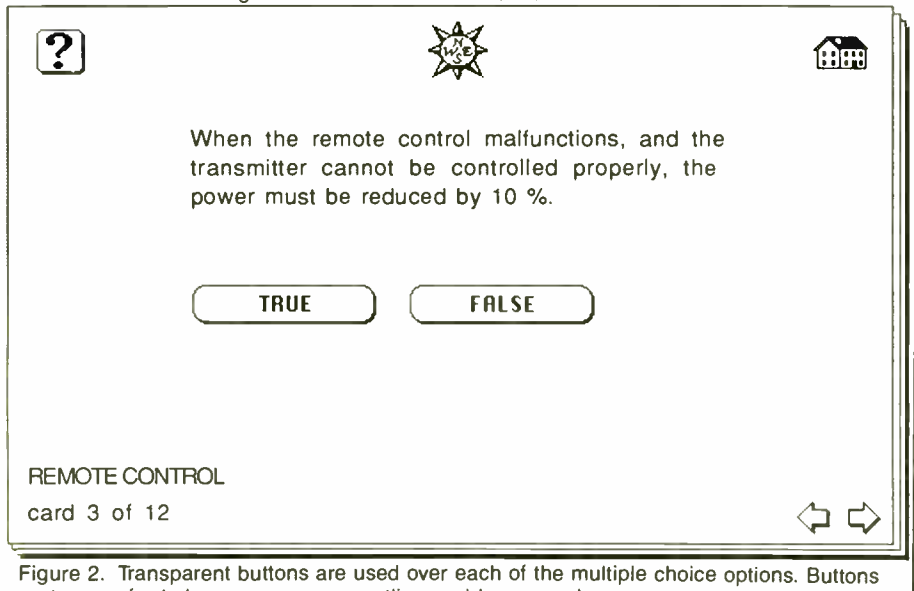
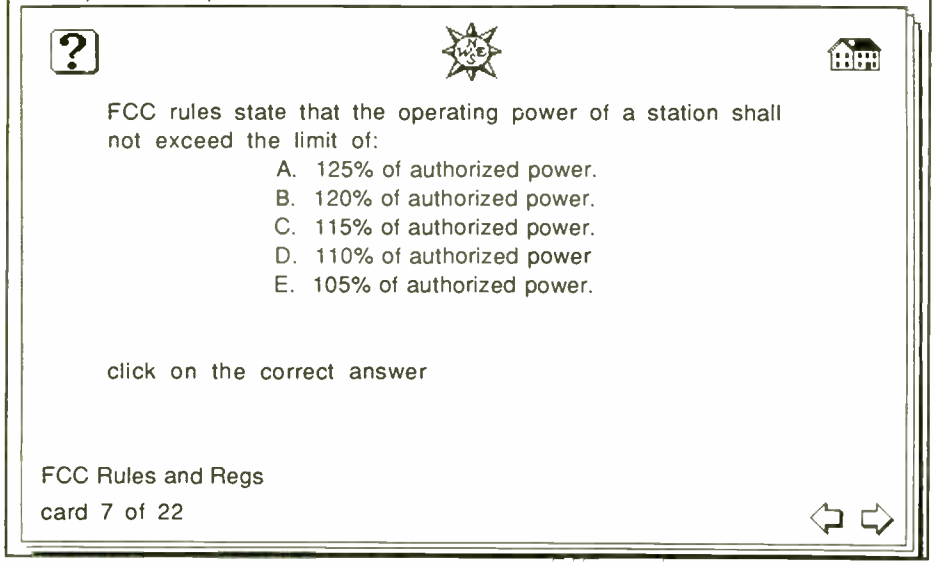


Figure 2. Transparent buttons are used over each of the multiple choice options. Buttons on top are for help menus, course outline and home card.



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formation in a small box in the upper right corner, i.e., "TRANSMITTERS card 3 of 17."

You'll need suc essential buttons as right arrow for move forward, left arrow for move back, question mark for the help stack, house for return to the home card. Remember that the function of these buttons may not be intuitively clear to the novice user, so be sure to explain their purpose in the introduction.

If you're not close to a metropolitan area, you may find that you're the only person you know developing HyperCard applications. This often leads to feelings of isolation and intense frustration.

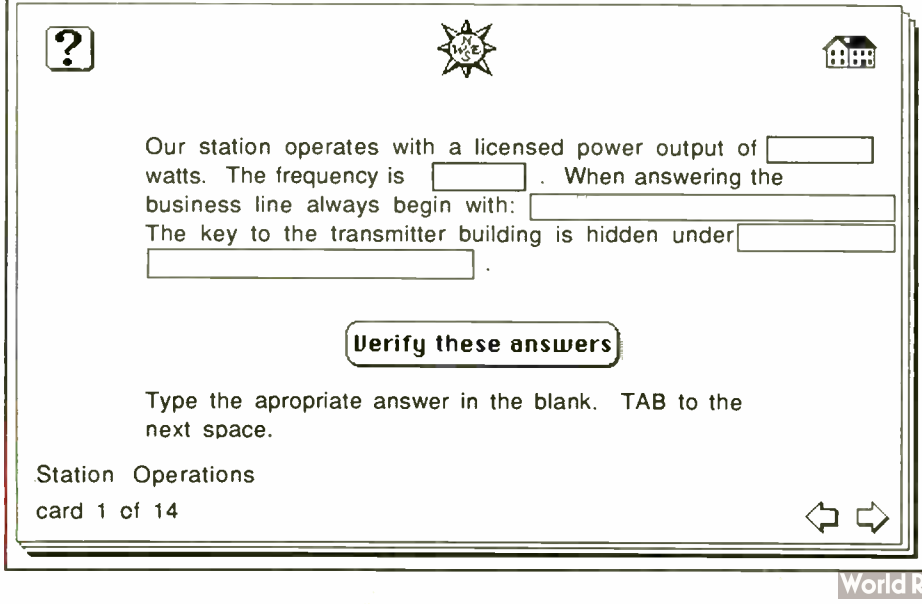
A good solution to this problem is joining the Boston Computer Society. Through membership you'll be able to receive two BCS newsletters. Both the Macintosh user group's Active Window and the Hypermedia group newsletter contain articles and information on HyperCard.

There's also a public domain software library, a bulletin board, and opportunities to network with other developers. For more information, contact: Boston Computer Society, One Center Plaza, Boston MA 02108, 617-367-8080.

■ ■ ■

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

Figure 3. Fill-in-the-blank questions can be created in minutes using Hypercard. A script for the correct answer is shown on the previous page.



If you're not taking CDs direct to air, you're losing an audio edge your competition is probably using.

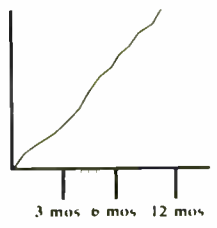
CDs have delivered the promise of faultless audio. They've also delivered a maintenance nightmare.

With any other CD player, consumer or pro, everyone who plays CDs at your station has to touch the discs. *If* everybody wears white gloves, there's less chance for a disc to be contaminated with body oils, chewing gum, and cigarette smoke.

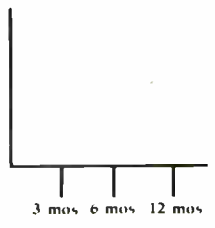
Let's eliminate the contaminants completely. Let's keep the disc in its *original* condition.

Unlike every other CD player, the Denon DN-950FA uses cartridges which permanently secure discs in their pristine, original condition.

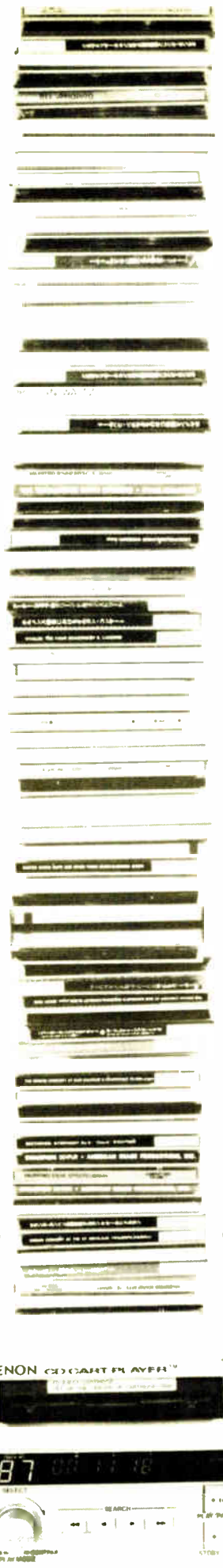
Your CD library is no small investment. Since music is such an important part of your operation, consider the cost of entire-library replacement. Although in reality, this would take place over a period of time, the expense would be a capital expenditure if all had to be replaced at once.



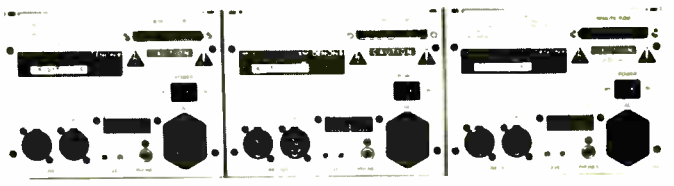
Simulated number of on-air embarrassments without CD cartridge protection against contaminants



Simulated number of on-air embarrassments WITH Denon CD Cart Player CD protection against contaminants



The Denon DN-950FA system totally eliminates the risk of handling. NO wear, NO tear, NO skipping, NO on-air glitches, NO embarrassment.



Mono-stereo selector, easy access, simple interface of remote functions and professional levels and impedances are indicative of the attention to professional detail.

Denon's CD Cart Player® is easy to interface, because it's built to the needs of your radio station. Remote control, end-of-message warning (which may be remoted to the alarm of your choice), quick cue and review, 3-pin XLRs... does this sound like a *broadcast* device?

What about quality? A 3-beam pickup and meticulously designed D to A filters provide sonic accuracy which has resulted in Denon's replacing other pro machines throughout the industry.

Two units can be easily mounted in the optional rack mount assembly. The total Denon approach is "professional."

You can *win* with the Denon DN-950FA system. CDs are surpassing black vinyl in consumer sales. CDs *will* be a part of your musical programming, if not already.

And last, but definitely not least, the Denon DN-950FA makes playing CDs as easy as playing a cart. AND, *no other CD player can do that.*

ALLIED and DENON introduce several thousand audible improvements to the CD player.

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Radio World
BUYERS GUIDE
Program Audio Processing

Phoenix Rises at WOBT-AM

by Richard E. Hencley, GM and Lloyd C. Vollmar, CE WOBT-AM

Rhinelander WI There are no magic solutions for AM today. It is a combination of quality programming, professional attitude and a clean sound, stereo or mono that wins and keeps listeners on a long term basis.

Many AM stations maintain an AM attitude such as: "Oh well, we don't sound as good as FM, therefore we're inferior."

To compete with FM these days, you need an FM attitude: "We sound as good or better than FM, therefore we are superior." It is a great thought.

But how do you do it? Your quality programming and professional attitude are only as valuable as the extent to which your listeners hear them.

Processor makes a difference

In many stations, the missing link is a good audio processor. Combined with your programming and attitude, the three together become a hit. Our ace in the hole is the Phoenix processor from Gentner Electronics.

The Phoenix has our entire staff grinning from ear to ear and listeners are wondering if there is a new station in town. From a non-technical perspective, it has added 20% to our coverage area and made us the cleanest, brightest, clearest sounding station on the dial. To most people, that is indeed the bottom line.

But wait a minute: technically, the Phoenix, with its built-in Gentner Audio Prism, goes a lot further.

First of all, the Phoenix is a digital processor. This means that rather than experiencing the constant expansion and compression common among analog compressors, the Phoenix can do "nothing," or, in other words, "maintain present gain."

This greatly cuts down on listener fatigue, lessening that "busy" sound of increasing and decreasing gain. The Phoenix can be programmed to expand only when necessary.

USER REPORT

Digital processing benefits

So while the Phoenix maintains an equal or higher modulation level, its Audio Prism processor will make only one third to one half as many AGC voltage reversals as would an analog processor.

The Phoenix has made WOBT-AM get up and dance.

The benefits of the Phoenix continue, having greatly improved our sound density (a difference that was noticed immediately) as well as a offering a dynamic range that compliments digital programming sources such as music on compact disc.

The Phoenix is completely digitally controlled and all of its controls are mounted on the front panel. It is very user-friendly.

WOBT was at one point contemplating going stereo but found that with the Phoenix, we were able to offer an AM sound rivalling that of FM without having to go stereo. And, too, we knew that with the Phoenix and an additional Audio Prism we had the option of converting to stereo anytime in the future.

The Phoenix processor, from Gentner

The Phoenix also adheres to the NRSC standard, solving the problem of how to maintain mandatory compliance. You will also find its internal pink noise generator extremely useful, especially during initial set-up, which is made simple with an easy-to-read and understand manual.

Quick set-up

The manual gives starting points and good suggestions for all formats and various types of equipment used in conjuction with the Phoenix.

The Phoenix unit itself is completely self-contained in a single 1¾" rack height enclosure and will operate in severely hostile electrical environments.

Featuring RFI filtering and three part lightning protection on all conductors, complete set-up of the Phoenix takes just a few minutes and requires no test equipment other than a simple VOM.

The Phoenix' front panel LED indicators offer a wealth of information and are arranged in typical bar graph fashion. Color coding displays expansion and compression.

"Hot Box" reactions

The Phoenix from Gentner Electronics has delivered on every claim it has made. With the term "hot box" being thrown around by so many processor manufacturers, the Phoenix has shown that it sets the standards and does for AM what Orban did for FM.

The day after we installed the Phoenix, our phones lit up with comments like "I don't know what you did, but

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BUYERS GUIDE INDEX

Processing for Better or Worse

An Appraisal of the Current State of the Radio Audio Chain

by Robert Orban

San Francisco CA It is 1989, and the FM processing revolution is long over. Quiet evolution (did I say *quiet*?) is the order of the day.

The loudness wars continue. The tools with which we wage them are somewhat more refined than they were five years ago, but audio artillery has seen few breakthoughs.

Stereo spatial enhancement now adds a bit of spice to the audio stew when used tastefully. When used abusively, such enhancement can make vocalists sound like they are singing at the bottom of a well.

Refinements in multiband limiter design wrest a bit more brightness and cleanliness from the limitations presented by the FM preemphasis curve.

And still, bizarre as it might seem, the option to process conservatively still exists. Fortunately, a few programmers, managers and engineers who care about music have taken advantage of the evolutionary improvements in processors to better follow this path.

The deregulation and subsequent rise of SCAs has prompted processor manufacturers to introduce technology that more effectively protects the SCA part of the stereo baseband from interference caused by the stereo subchannel.

GUEST OVERVIEW

They developed this technology without compromising loudness, sometimes even *improving* it slightly (as in the case of our own product).

However, anyone determined to trash the SCA region can still buy composite clippers that will do this with surgical effectiveness. In this respect, nothing in FM processing has changed.

The issue of composite clipping (which was hot about eight years ago) has been re-opened by the NRSC's FM Subcommittee.

Composite clipping destructive

I predict that the committee will observe, as its predecessors did, that composite clipping degrades stereo separation and pilot protection, interferes with SCAs and causes audible distortion on the center-channel voice (in particular).

The committee will opine that the baseband harmonics introduced by composite clipping do not appear to significantly increase interference to other stations. They will thus conclude that composite clipping is, almost entirely, a form of self-abuse.

The subcommittee will then write an earnest report which right-thinking engineers will present to theirhearing-damaged program directors (who have spent too many years under headphones driven by 60 W amplifiers).

Ultimately, though, few minds will be changed. The programmers who are offended by the distortion caused by composite clipping will have long since removed it from the air.

Meanwhile, those who prefer "loudness at any cost" (or who simply can no longer hear distortion) will tell the engineers to take their theories and file them in their pocket protectors.

And what of digital processing? The press presented this as the Wave Of The Future, the Next Big Thing and the Savior Of Us All.

It was no surprise . . . that once the "digital stars" disappeared from peoples' eyes, they realized that it takes more than simply digitizing the audio to make miracles happen . . .

No threat to analog

While a few digital audio processors have appeared on the market, they have not yet posed the slightest threat to the best analog technology.

It was no surprise, then, that once the "digital stars" disappeared from peoples' eyes, they realized that it takes more than simply digitizing the audio to make miracles happen (indeed, the most difficult part of the exercise is deciding *what to do with all of those digits once you have them).*

In the movie *The Graduate* from the 1960s, Dustin Hoffman's character was told that the future was "plastics." Heading into the 1990s, the future is no longer plastics, it is *algorithms*—the mathematics applied by DSP chips to the unprocessed digits to turn them into competitively-processed digits.

Digital improvements modest

There are a few things that are easy to do in digital but very hard to achieve in analog (such as making delay lines and phase-linear multiband crossovers).

Unfortunately, these things are virtually irrelevant to the art of making competitively loud broadcast audio processing (although they are much more useful when one is striving for "purist" quality).

Conversely, many things presently done easily in analog are much harder to do with equivalent quality in digital. (Simple clipping is a good example.)

For this reason, I predict that good algorithms will take much longer than expected to be crafted (lateness is virtually an iron law in software development) and that any improvements over the best of today's analog "competitively-processed" audio will ultimately be quite modest.

Instead, the true advantage of digital for some stations will be improved control—the ability to instantly reconfigure the audio processor in software for different day parts or program material.

Our own 787 programmable mic processor, for example, does this, using digital control of analog circuitry to "tune" a compressor, fully-parametric

(continued on page 48)

DDP-8 Delivers Digital Quality

by Chris Hicks, CE
WDIZ-FM

Longwood FL Let me preface this article by stating that I have long believed that a properly designed multiband on-air processor can achieve the best possible sound without encouraging many of the ills now plaguing FM.

Many years ago I experimented with several analog multiband processing schemes, but found that due to the limitations of analog filtering, the desired end result seemed to elude me.

When I found out that Valley International had developed a multiband, multifunction dynamics processor operating entirely within the digital domain

USER REPORT

and using digital FIR (Finite Impulse Response) filters, I was intrigued with the possibilities.

I wasted no time in obtaining a unit and its companion A-to-D/D-to-A interface.

Trying it out

The unit is the Valley International DDP-8 digital dynamics processor. (Mine is the eight-band version.)

When the unit initially arrived, I took it along with a CD player and a set of my best headphones and locked myself in my office for a few hours of experimenting and listening.

The DDP-8 is a menu-driven system that can be adjusted from its system controller card. An LCD display on this card shows the various modes and parameters, which may be varied from a single front panel knob.

Four pushbutton switches allow you to step quickly through the set-up parameters or to recall a particular set-up. The user manual provides an operational "map" to allow the user to find his position on the menu tree, given the prompt shown on the LCD.

Admittedly, this unit is more complex to set up than the industry "favorites," but this is a new era of sophisticated signal processing. Capability and flexibility are beyond our wildest dreams. Given the end results that can be obtained, the few hours spent educating oneself are a small trade-off.

Effective parameters

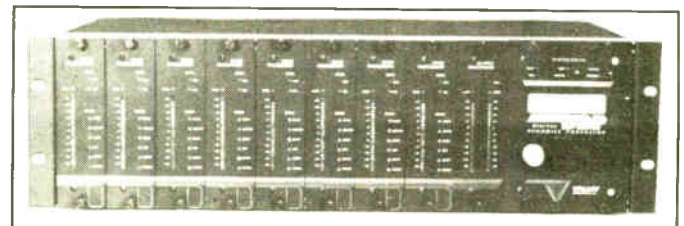
A practicing, audio-conscious broadcast engineer can do just about anything imaginable with one of these units. While space does not permit me to elaborate on particular set-ups, I can report that most of the parameters I tried work very well.

In fact, it is so easy to change modes and parameters while on-line and on-air that 1 AM to 5 AM had become my favorite time of day for a few months.

Audio from our console is fed directly to the DDP-8 analog interface and then into the DDP-8. The output from the DDP-8 goes back into the analog interface and then from the output of the analog interface into an OPTIMOD-FM S100A/1, through a set of Aphex throughput cards in slots 3 and 4.

Then the OPTIMOD does the rest.

Perhaps the best thing about the DDP-8 is that it is so incredibly flexible. Its speed and "glitchless" performance allow you to make changes in operating parameters while it is on-air.



Valley International's DDP-8 digital processor

The DDP-8 is certainly the most powerful performer in the DDP line from a competitive standpoint. But, having experimented with both the 5-band and 3-band configurations, I can confidently state that they are not weak boxes.

We all know and understand that there are other key decision-makers and "movers and shakers" who have to be pleased with a station's sound, not the least of whom are its clients and audience. The DDP-8 got high marks from our VIPs, as shown from a sampling of their comments.

Music Director Lee Randall called it: "Three dimensional! It actually has depth!"

Program Director Rad Messick said, "After installing the DDP-8, my radio station opened up a whole new dimension of sound quality I have never heard on FM! You can tell the CDs are better! Our stereo separation was greatly enhanced. The apparent dynamic range was increased along with an increase in loudness!

"For the first time ever, I was able to enjoy three hours of uninterrupted listening on an audiophile stereo system without my ears ringing from distortion and bad compression."

Station Manager Ralph Salierno observed, "A few of our clients have mentioned they noticed WDIZ sounds clearer and fuller now. That never happened before . . . so the digital processor must be enough of an improvement to be noticed and appreciated by non-technical types."

System can instruct

The DDP-8 is a fine example of how a multiband processor is supposed to sound. Engineers will actually sharpen their ears once they have one of these units.

As a matter of fact, the DDP-8 is an almost educational audio device. The things I have learned from the research

(continued on page 48)

More Loudness—Less Processing

by Eric Small, VP Eng
Modulation Sciences, Inc.

Brooklyn NY With ModMinder, an FM station can increase loudness, reduce processing or do some of both.

Surprise: the ModMinder is *not* a new processor, but rather a method of measuring modulation that provides a unique approach to peak modulation measurement.

ModMinder can use any stereo modulation monitor for its front end—only a source of composite baseband is needed. It can even be driven by a quality FM tuner, within the limits of the tuner's bandwidth.

The principle behind ModMinder's operation can be found in the history of the FCC treatment of FM modulation.

Before deregulation

Before the deregulation of modulation monitors in 1983, the rules said that in order to get type approval, a modulation monitor had to peak flash if ten consecutive cycles of 10 kHz exceeded 100%—a response time of just less than 1000 microseconds (1 millisecond).

In the Automatic Transmitters System (ATS) Rules of the same era, the maximum number of overmodulation events permitted per minute was ten.

In order to make the one-minute count concept valid, it was also specified that after each event of overmodulation, no new occurrences would be counted for five milliseconds.

This period is often called the "standoff time." While the ATS modulation rules were never formally applied to non-ATS operation, they were generally regarded as a statement of policy that applied to any FM operation.

The concept of the ModMinder evolved from problems with the measurement of modulation in BTSC stereo television. With many television stereo generator/monitor combinations, overmodulation seemed almost continuous.

Stereo TV mod problems

Stereo television differs from FM stereo radio in that the modulation must be set exactly to the reference level of the dbx L-R noise reduction encoder. It cannot be adjusted arbitrarily without greatly reducing the system's stereo separation.

Because modulation level could no longer be "tweaked" to fit the modulation monitor (as had always been the case in FM radio), differences in modulation monitor characteristics became much more apparent in stereo television than in FM.

In the course of trying to resolve the television aural modulation problems, several FM radio modulation monitors were obtained and their peak flasher performance characterized.

We discovered just how fast most peak flashers responded. Once the television aural peak flasher was slowed down to just meet the FCC specification of ten cycles at 10 kHz, most of the television overmodulation problems vanished.

Effect on FM modulation

We became curious as to what effect the almost one millisecond response time would have on typical FM stereo modulation.

A modulation monitor with a one millisecond response time was prototyped and tested using off-air signals. The prototype monitor and a conventional modulation monitor were connected to a high quality FM tuner.

By tuning to various stations it was possible to determine how great an advantage ModMinder would provide over a conventional modulation monitor.

The results were impressive. On some stations the ModMinder indicated as much as 5 dB below the standard modulation monitor. This was because the ModMinder was ignoring the brief (less than one millisecond) spikes that have no impact on occupied bandwidth.

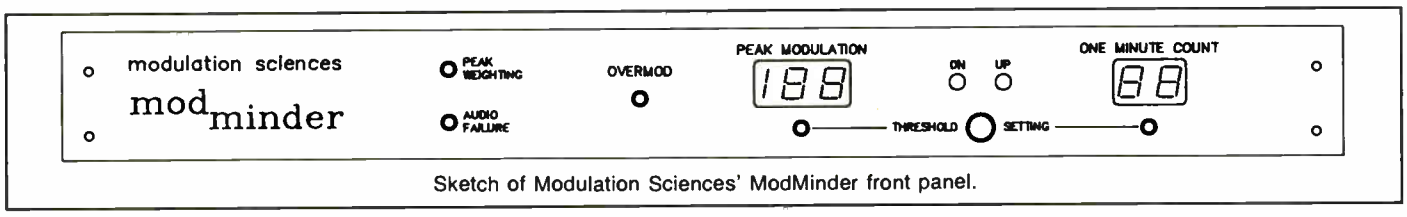
It is interesting to consider that much of the complexity of modern processing comes from controlling these brief transients. If the peaks can be ignored, average modulation can be raised until it is only the real peaks that trigger the flasher.

Test results

A moderate to heavily-processed station such as WNSR in New York showed an improvement of almost 2 dB by merely adjusting total modulation using the ModMinder.

For a lightly processed station such as WNCN, the difference was almost 5 dB. Very heavily processed stations, such as WPLJ or Z-100, showed less than 1 dB of change.

Conventional monitors provide little information of value about modulation by real program material. The peak flasher, always the mainstay of dynamic measurements, has been shown to be misleading because of its excessively fast response time.



Sketch of Modulation Sciences' ModMinder front panel.

And the moving pointer meter is unreliable for anything but sine waves, because its ballistics are so different from the peak flasher. ModMinder provides, in addition to its unique peak flasher, a digital readout of the highest peak during the previous second.

This display makes setting up total modulation a snap. Another set of digital displays shows the number of overmodulation occurrences taking place in a rolling one minute interval.

The rolling minute

By "rolling minute" we mean a window one minute wide moving in time continuously. That is, *not* a counter that accumulates overmodulation counts for one minute and is then reset. A rolling minute counter adds each overmodulation event to its total, while at the same time subtracting each event as it becomes one minute old.

In addition, a "smart" silence-sense alarm provides an indication of loss of modulation.

ModMinder is more accurate than other monitors. Measuring circuitry of most monitors is specified to ±5%, an accuracy no greater than that demanded by the pre-1983 Rules. ModMinder delivers better than ±1% accuracy over a wide temperature range.

Another element in the "real world" accuracy of modulation measurement is where the monitor is located. Measurements made off-air are notoriously inaccurate, often indicating much higher peaks than when measured at the transmitter.

Remote operation

The obvious solution is to measure the modulation at the transmitter and bring the readings back to the studio via some kind of remote control. The problem is that few modulation monitors are set up to interface with a remote control.

ModMinder, however, is designed for remote operation in several modes. The peak flasher closes a relay when its user-set threshold is exceeded. The silence-sense operates a relay. And a maximum number of overmodulation occurrences per minute can be set and a relay will close when that count is exceeded.

The one second peak hold indicator drives a digital/analog converter, so a 0 to 2.5 V signal, scaled to peak modulation, is available. This is especially use-

(continued on page 52)

SPECIAL REPORT

Vigilante Does FM Justice

by Gerry Turro, CE
WNEW-FM

New York NY The Vigilante FM multiband limiter, from Cutting Edge Technologies of Cleveland, is a neatly packaged single rack unit audio processor that not only enhances an audio chain, but could mean the difference between winning or losing the loudness war in your market.

USER REPORT

The Vigilante is a three-band limiter designed to work as the "loudness" processor in your audio chain. When used with a multiband pre-processor, the Vigilante is capable of achieving additional loudness *without* the added fatigue that normally increases when processing for loudness.

The Vigilante offers the loud, full, competitive sound that all programmers are looking for, yet leaves an open, natural transparency that allows the benefits of quality audio to remain.

Full documentation

The unit comes complete with full documentation that supports the installation, operation and suggested "starting points" for the user.

A number of selectable operating parameters make this processor a valuable tool. Incorporated into the unit are user selectable attack and release time constant controls for each of the three audio bands.

A drive control sets the amount of limiting to the three bands, along with EQ controls for the low and high bands. Cross-over points are also user selectable.

The low band can be positioned at either 100 Hz or 160 Hz. The high band can be set at 4.5 kHz or 6 kHz. A bar graph indicates the amount of limiting that the unit is performing.

Probably the most unique features of this unit are its limiting threshold controls. These are 10-turn dial pots with built-in numbered settings. They are user adjustable, and in using these to set limiting threshold levels much more flexibility is achieved because of their precise range.

Numbered settings helpful

Repeatable settings are much easier to achieve due to the numbered settings of the controls. If a change is made to the operation of the limiter and the previous setting is more desired, then you can return to the *exact* point where you were in the operation!

The Vigilante uses XLR connectors for input and output connections. Both input and output are electronically balanced, with an optional unbalanced setting that is switch-selectable for the output. Input level can be set for −10 dB or +4 dB.

Building loudness is not the only benefit provided by the Vigilante. Utilizing unique processing concepts developed by Cutting Edge Technologies, the Vigilante actually "opens up" the perceived sound of a radio station.

Two areas that appear to be enhanced are both the low and high frequencies.

The Vigilante processes the high frequency content in a unique manner. Instead of "wrapping" a limiter section around the preemphasis curve and using this for high frequency limiting, this unit varies the threshold levels between the mid and high band to allow the proper amount of limiting to be performed along the preemphasis curve.

This yields a superior sounding high end. What was noticed in using this unit was what appeared to be more high end, but without the added density to the high end; a very open and natural sound!

The low frequencies are improved due to the lower cross-over point on this unit. Only the "real" low end spectrum is processed in the low band; the deep, rich fundamentals of the low end. This is especially good for contemporary format radio stations trying to achieve that low end "punch."

During on-the-air auditioning of the Vigilante, a noticeable increase in loudness was present and yet there was not an increase in processing artifacts.

Sound clear of ill effects

What was missing was that heavy, fatiguing, density normally associated with loudness processing. The audio content was able to achieve both loudness and quality together, not

(continued on page 51)

Upgrading AM with NRSC-1

by William L. Ammons
Radio Products Marketing Mgr.
CRL Systems

Part I of II

Tempe AZ Converting your station to the NRSC-1 standard may be the best way to upgrade your signal quality.

In many cases the coverage area of the station is increased, with increased fidelity and reduced interference. Converting is easy and does not require a major reworking of the station. In some cases the conversion takes about an hour.

While converting your audio processing to the NRSC-1 standard will not guarantee that you are in full compliance with the NRSC-2 RF mask, employing NRSC-1 processing, with a properly designed and maintained RF plant, will in many cases yield full RF mask compliance.

In any audio processing system the NRSC-1 compliance is done around the final peak limiting section of the processing.

To help with your plans to convert to the NRSC-1 standard, let's discuss many of the common questions that are brought to our attention.

Two main methods can be used to convert to the NRSC standard. The first is to buy retrofit equipment—supplied either by the manufacturer of your peak limiter (modulation controller) or by an aftermarket retrofit.

The second method is to purchase new audio processing that includes NRSC compliant filtering and preemphasis.

Of the two options, adding a retrofit unit to your current peak limiter may be the least expensive method to comply with the standard. Most retrofits will be in the $500 to $800 range.

If the manufacturer of your current peak limiter offers a full retrofit kit (preemphasis and low-pass filtering), buying it for your unit would make the most sense.

If the manufacturer of your unit does not support the full NRSC standard (or is no longer in business), several aftermarket retrofit units have been introduced.

True compliance

For true compliance with the NRSC standard, the retrofit unit must offer separate preemphasis and low-pass filter paths. Also, the low-pass filter section of the retrofit unit must be phase-compensated and overshoot-corrected for maximum modulation control.

SPECIAL REPORT

Non-overshoot corrected filters can rob as much as 6 dB (or 50%) of peak modulation control from your station!

The NRSC-1 preemphasis curve boosts audio by 10 dB at 10 kHz. The proper place to insert preemphasis is directly preceding the multiband peak limiter circuitry.

Inserting preemphasis anywhere else in the signal path will render it either ineffective or cause excessive pumping and compression action to take place. In most cases the existing peak limiter will be able to handle the added preemphasis.

The main exception is with some older wideband limiter designs. Preemphasis causes some of these to compress excessively, which often causes a muddy or "pumped" sound. This results in the generation of excessive IMD and is a cause of the out-of-band "spitting" sounds often heard.

Buying a new peak limiter

The other method of conversion to the NRSC-1 standard is to buy a new compliant peak limiter. In any audio processing system the NRSC-1 compliance is done around the final peak limiting section of the processing. Preceding AGC and compression circuits have nothing to do with the NRSC-1 standard.

For example, assume you own a multiple unit system with AGC action in one unit, multiband compression in another and the peak limiter in the last unit.

To comply with the NRSC-1 standard, you would only need to replace the final peak limiter. If the AGC and multiband compressor units are in good working order, there is no need to replace them.

Advances improve audio

One of the advantages of buying a new NRSC-1 compliant peak limiter is that the circuitry has seen great advances in the last few years. Limiter designs are cleaner and much more accurate than in units designed more than three or four years ago.

(continued on page 48)

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Aphex Type III Defines Sound

by John Miller, CE
KLON-FM

Long Beach CA Aphex Systems has been developing its Aural Exciters since 1975 and it has produced several versions with different features and sounds.

The latest, Model 250, Type III, is the third generation of this processor. It incorporates a number of improvements and offers several applications that are very handy for the broadcaster.

USER REPORT

KLON-FM is a public station serving Southern California with a mixture of jazz, news, information and blues. Because of this format, it is not necessary for our station to be incredibly loud. Subsequently, all processing controls are set on the conservative side.

Evaluation method

For this evaluation, we used an Aphex Compellor and an Aphex Dominator, set up for FM broadcast use (15 kHz low pass filters and preemphasis included). The Aural Exciter was inserted between the two, so that there was some AGC before it, but there was a "brick wall" of protection before the stereo generator.

When switching the Type III in and out after set-up, the differences were subtle. But certain effects were very apparent. There was more high end definition, clarity and ambient information.

The low end also had more punch and snap. Certain tunes appeared to have more presence and prominence than without the Type III.

Structurally, all of the unit's audio inputs and outputs are XLR 3-pin connectors. The connections are actively balanced, so care must be taken if unbalanced operation is needed. The input impedance is high and the output impedance low, as is standard with most modern audio electronics.

Aphex Aural Exciter® Type III

A 602 ohm, 1% termination resistor can be switched in for each channel, providing input termination if required. The operating level is also switchable to either −10 dBm or +4 dBm. Both are switchable from the rear panel. A remote control connector is provided for remote bypassing of the Aural Exciter.

Several Aphex products, including this one, utilize a relay in the audio path which has two functions. One is for bypassing the electronics completely when desired.

The second function is that if power is lost on just this one piece of equipment, then audio will still pass through. The relay can be controlled from a front panel switch or remotely.

Audio follows two paths through the exciter: the main audio path and the processing side-chain, where the aural excitement is generated. The main path is very transparent, utilizing high grade components.

The processed side-chain is then summed back with the main audio. This ratio of main audio to processed audio is adjusted with the Type III's MIX control.

A solo control allows you to hear only what is being created by the side-chain, a very useful tool in setting up the unit.

Noise reduction

Two different noise reduction systems come with this model. With the object being to prevent the process from creating additional noise, the noise reduction threshold is continuously adjustable. (The "A" mode is best for complex program material, such as one would feed to a transmitter.)

Also, a newly added spectral phase refractor significantly restores bass clarity.

A number of other front panel controls affect the produced sound. These are well explained in the manual. While there are many effects possible with the provided adjustments, there are also several suggested set-up diagrams and descriptions in the manual to get you started.

Many other applications suit this processor, including use in recording and radio production studios, as well as for video and film.

The tune, peaking, null fill, harmonics and timbre controls can create many diverse sounds (including some sounds that are not so desirable, if care is not exercised).

Indeed, in a production situation, the Aural Exciter can be a very creative, powerful tool. The processor can be used to restore clarity and add intelligibility, as well as enhance some element of a mix.

The Type III can also be used to enhance the quality of phone line feeds, either with equalized circuits and line extenders (Comrex or Gentner, for example), or direct feeds from a phone.

■ ■ ■

Editor's note: John Miller may be reached at: 213-985-5566.

For more information on the Aphex aural exciter Type III, contact Marvin Caesar at Aphex: 818-767-2929, or circle Reader Service 97.

How to Convert to NRSC

(continued from page 44)

Modern filter topology, combined with advanced patented clipper designs, can dramatically improve modulation density while allowing precise negative peak control.

Also, newer multiband limiter designs have faster control action and are specifically designed to handle dynamic preemphasized audio with ease. The cost of a new tri-band limiter is not that much more than an NRSC-1 retrofit. A modern tri-band limiter costs about $1700.

A few words should be said about stereo AM processing. Some stations are using two older mono processors, or have an older stereo unit which is not supported and have inquired about converting them to the NRSC-1 standard.

Since the predominant AM stereo system is a matrix system, the audio program material should also be processed in matrix form (L+R, L−R).

If the stereo program material is not processed matrix form, and some type of added mono gain support is used in the L+R channel, your mono signal will suffer.

Good proc adds density

A well designed matrix processor can add 6 dB of modulation density to your mono signal. Total stereo separation is dependent on the phase and amplitude matching of low-pass filtering in both the L+R and L−R channels.

Properly designed retrofit units are typically very close to one another with regard to phase and amplitude response, but will most likely degrade maximal stereo separation.

■ ■ ■

Turn to next month's Buyers Guide for part II of this article, which will include tips on system transmission, integration of NRSC-1 and some signs to watch for during the process.

William Ammons may be reached at: 602-438-0888.

Valley DDP

(continued from page 41)

I have done with it are the meat and potatoes of processing.

In summary, if you suspect you know how to get the sound that nobody else can achieve, and that you just need to get your hands on the right box, then I suggest you get a DDP-8 . . . hopefully, before the guy across the street does.

And when you do get a DDP-8, do what I did. Lock yourself in your office and spend a few hours with the unit hooked up to a CD player and a set of your best headphones and/or monitors.

A couple of hours later, you will come out of there with a big smile on your face and a strong urge to get that box on the air.

■ ■ ■

Editor's note: Chris Hicks works as an audio consultant and may be reached at: 407-682-7676.

For more information about the DDP-8 digital dynamics processor, contact Norman Baker at Valley International: 615-383-4737, or circle Reader Service 98.

Processing

(continued from page 40)

equalizer, de-esser, noise gate and effects return for each individual talent.

What about FMX? How do audio processing and FMX relate? FMX is a *transmission* system and not an audio processing system. Its transmitter compressor and receiver expander are complementary and "invisible" to your listeners.

So to get the subjective "sound" you want on an FMX station, you can use the same audio processor that you use for conventional FM stereo transmission.

Looking into the crystal ball, is there any uncharted way to get your FM station louder, without degrading quality? The answer: a definite maybe.

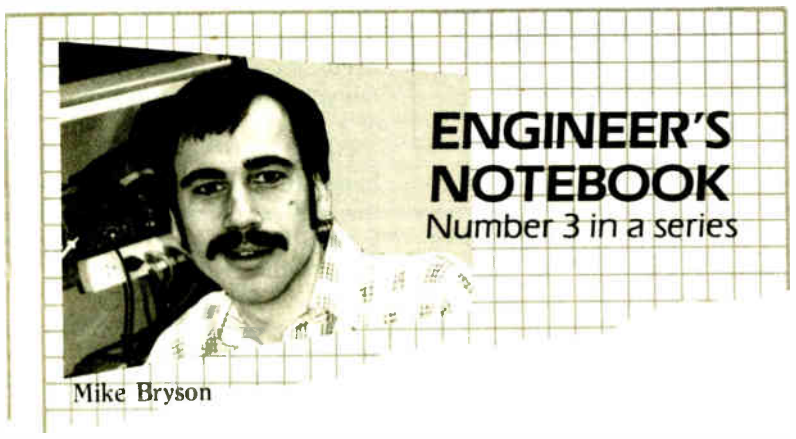
Greg Ogonowski (currently the CE at KTNQ-AM/KLVE-FM in Los Angeles CA), for example, has been studying the low-frequency transient response of the AFC loops in composite STLs and exciters, and has found that some of them perform very poorly.

And remember that "overshooting composite STL" that everyone says cannot overshoot because it uses phase linear filters? Well, it can overshoot.

The problem is not at the high-frequency end of the baseband—it is in the sub-sonic region, where the frequency response may show a huge peak (with resulting bounce and overshoot). Ogonowski is working on a cure for the problem: so watch this space.

■ ■ ■

Robert Orban is Chief Engineer at Orban Associates Inc., a division of AKG Acoustics.



ENGINEER'S NOTEBOOK
Number 3 in a series

Mike Bryson

Whatever happened to all of the 635A's?

Here's an amazing statistic for you . . .

Electro-Voice has sold over 147,000 635A dynamic omnidirectional microphones in the twenty years since they were introduced. That's over 54,000 pounds of microphones.

Now, there's certainly not that many broadcasting facilities around, so where the heck did all those mics end up?

Before we try and answer that question, however, we'd like to discuss why all those mics were purchased in the first place.

The 635A was designed for exacting professional radio and television broadcast applications. It's a proven design, with performance characteristics specifically tailored for hand-held field use.

Omnidirectional microphones like the 635A pick up sound from all directions, and are least sensitive to breath, wind and handling noise. The 635A has a "shaped response," with a slight rise in high-frequency response providing increased voice intelligibility. Its contoured low-frequency rolloff reduces handling and wind noise, as well as the pickup of very-low-frequency signals—such as "room rumble" or machine noise—that have nothing to do with the vocal message.

These features make the 635A the perfect microphone for general-purpose field work where it is important to capture ambient sound in the background with clear voice reproduction up front.

In fact, even the most inexperienced reporter can use the 635A and still obtain good quality audio. The mic is so reliable, you can literally pound nails with it without affecting its performance.

In other words, people buy the 635A because it's an industry standard . . . it's literally the most popular hand-held broadcast mic in the world.

The 635A is now available in a handy six-pack (without cables or stand clamps) for those who buy in quantity, and each mic comes with a two-year unconditional warranty.

So, where the heck did all those 635A's go? Well, it's one of the great broadcast mysteries of this century.

Who knows . . . maybe Geraldo will discover a vault full of them some day.

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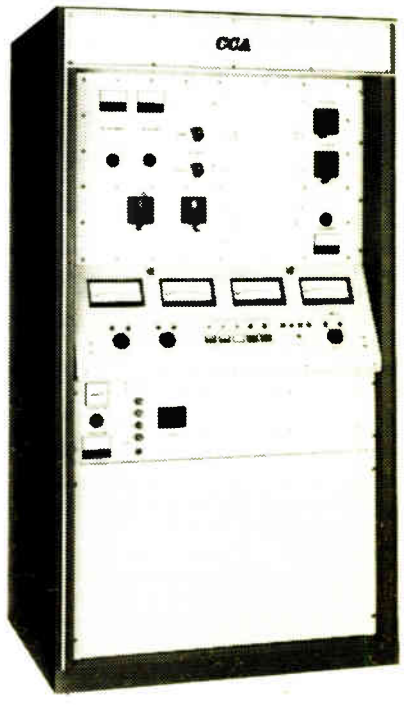

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Dorrough Maintains Integrity

by Ken Horton, Maintenance Eng KFAC-FM

Los Angeles CA The Dorrough 610A discriminate audio processor is a vastly "new and improved" version of the company's original 610 box.

We have been A/B testing a pair of the 610As for two months in our FM audio chain. (This chain is from our studios in Hollywood to our transmitter site on Mt. Wilson via T-1 digital telephone lines.)

In a test of any system, it is always a good to ask: "What are the criteria for evaluation?"

The first criteria is listening—it's the bottom line, the "proof in the pudding." Since we have a classical format, we are especially interested in extremely accurate reproduction of our program at the receiver—reproduction that is both transparent and dynamic, yet with an apparent loudness.

Second, interaction between our SCA channel and our main stereo channels could not be tolerated.

And third is the question of the unit's actual technical performance. Some very revealing but simple tests can be performed to evaluate this (see Figure 3).

There are so many boxes out there to choose from that it can get confusing trying to sort them out. What sets the 610A apart is its sound!

Dorrough's philosophy is that three-band processing in which minimum phase, gentle slope filters are incorporated is the only way to assure colorless limiting (see Figure 1).

Importance of phase integrity

The 610A is a tri-band limiter and special attention has been given to its phase integrity, under both static and dynamic conditions.

An important concept here is that the higher frequencies "ride" on the lower frequencies. One need only look at a scope to see that when you take away the low frequencies (150 Hz), the remaining higher frequencies "collapse" toward the base line.

Cutting off frequencies below 5 kHz causes another major collapse of the remaining information toward the base line: as frequencies increase, their amplitudes fall closer to the base line.

A common error, Dorrough says, is to use a sine wave generator to check performance. This does not work because the generator has constant amplitude over frequency, while music and speech get progressively lower in amplitude as frequency rises. This principle is illustrated in Figure 2.

After each of the three bands has been limited (if desired), they are summed together to achieve their original relative amplitudes.

Precise integrity

This is why we experienced precise integrity in the decay of sustained piano and organ passages, right down into noise, without a timbre change.

Most other multiband boxes sum for flat amplitude response at this point, which means that on a decay the higher frequencies fall progressively out of limiting and their relative levels are no longer proportionate, resulting in excessive noise and unnatural sound.

The 610A is a minimum signal path device incorporating single pole (6 dB/octave) band splitters and digitally controlled analog attenuators.

The attenuators are followed by a four band equalizer, which may be hard-wire bypassed when desired. The side chains utilize proprietary ROM look-up tables to set attack, release and limiting characteristics.

Figure 1.

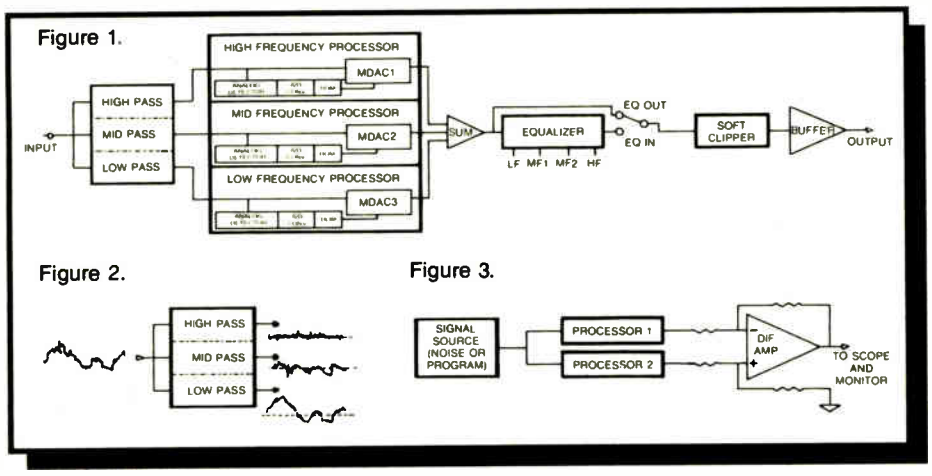

Figure 2.

Figure 3.

USER REPORT

A fast "soft" clipper is in place before the final output buffer amplifier to build power without degrading high frequency detail. Improvements in the 610A include higher speed, lower noise amplifiers, better ROM algorithms and simpler (more phase linear) filters.

Simple testing

Figure 3 shows a simple test set-up to check static and dynamic processor integrity. Two processors are required; one is operated below the limiting threshold while the second processor is operated as desired with processing activated.

All controls must be identically set up. When the outputs are summed out of phase with their amplitudes matched, the remaining artifacts may be observed and listened to, including frequency response discrepancies and intermodulation distortion products.

Included with each pair of 610As is the 80-B stereo generator. Balance compensation and pilot tone phase controls are brought out to the front panel to allow maximum separation under program conditions. All that is needed for calibration of the 80-B is an FM radio with mono mode capability and a balance control.

These 610As really sound good! And I believe they would be equally strong in any other format.

■ ■ ■

Ken Horton has worked in programming and technical installation for over 20 years with RKO, ABC, CBS, ARAMCO et al. He may be reached at: 213-466-9566.

For more information on the Dorrough 610A, contact Kay Dorrough at: 818-999-1132, or circle Reader Service 90.

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Circle 61 On Reader Service Card

Adding Zero Improves Optimod

Don Hobson, Eng Mgr
KJQY-FM

San Diego CA A lot of good products do not receive much publicity. One such product is the Orban ACC-22 FM filter card for the Optimod 8100A audio processor.

This product was originally developed by Bob Orban to filter program-induced "trash" above 61 kHz in order to provide a cleaner baseband region for subcarrier use.

Specifications *are* improved by about 25 dB, but real world conditions tend to negate much of this improvement.

Although crosstalk into the SCA channel is a problem, non-linearities in SCA transmission and reception actually mask most any audible improvement in baseband crosstalk over a stock Optimod.

Thoughts on the spectrum

To quote from Bob Orban: "As anyone who has tried to do spectrum analysis of an FM station off the air (from a receiving antenna) can attest, the slightest multipath generally puts the 'grass' or 'grunge' level at anywhere from about −50 to −60 dB in the higher baseband frequencies.

"I would think that any improvements in spectrum cleanliness below −70 dB or so fall into the category of not only diminishing but vanishing returns."

Orban goes on to say: "One would think, given the generally lousy off-air measurements that usually result, that FM could not work at all! So much for science . . . "

However, some other, very worthwhile and audible improvements to the main and stereo sub-channel are achieved with this filter card (often referred to as the "slot zero card" because of its location inside the Optimod).

One of my basic complaints with a stock Optimod is that it does not "like" unprocessed live microphones and brass instruments—especially trumpets.

Card replaces safety clippers

Their asymmetrical waveforms produce audible distortion when clipped. The ACC-22 replaces the safety clippers in the Optimod with two cascaded, fifth-order, overshoot-compensated lowpass filters.

Because there is no hard clipping by the safety clippers (which often must be set at a compromise anyway) no annoying distortion products or overshoot are generated. Improvements in stereo channel quality were also noticed when these filters were installed.

So if you would like an inexpensive (less than $600) way to improve the sound of your station, consider the slot zero card. It may be ordered as a factory-installed option on the Optimod 8100A/1 or as a field retrofit kit for existing Optimods 8100A and 8100A/1.

Careful installation and testing should take about two hours. Installation consists of adding a pre-wired connector to the rear rails and soldering the additional wires. Card #0 is installed in the signal path at the output of card #8/9 and the input to the stereo generator.

An audio oscillator and digital voltmeter are needed for proper alignment and the 38 kHz null should be checked.

You will probably notice a slight change in your sound character after installation of the zero card and you may want to make a slight adjustment to your other processor controls. Sometimes you wonder what a dozen more ICs will do in your audio path . . .

USER REPORT

But as those who work with FM audio processing know, it is somewhat of a miracle that the modulation needle can be sitting at 100% most of the time and the perception of the listener is that he is hearing high fidelity!

■ ■ ■

Editor's note: Don Hobson may be reached at: 619-238-1037.

For more information on the Orban ACC-22 FM filter card, contact David Roudebush at Orban: 800-227-4498, or circle Reader Service 91.

Vigilante

(continued from page 43)

sacrificing one for the other. This is why the Vigilante really shines.

In competitive listening on the dial, the Vigilante was noticeably louder than any other station. It was also the cleanest sound as well. There was an increase in the detail of the low end, presence and high frequencies. This seemed to help in generating that added "punch" to the overall sound.

It appeared as if this audio chain was performing with less processing, yet it was louder and cleaner sounding than anyone else on the dial!

Another interesting observation about this product was that in operating the Vigilante with its parameters set for a "softer" sound, it did not give up much in loudness, with regard to the loudness/quality tradeoff that exists with any audio processor.

This would make the Vigilante even a good choice for "lighter" formats such as adult contemporary, new age or country.

■ ■ ■

Gerry Turro is also president of Q Media Inc., radio consultants in the New Jersey/New York area. He may be reached at: 212-286-1027.

For more information on the Vigilante, call Frank Foti at Cutting Edge Technologies: 216-221-7626, or circle Reader Service 100.

ModMinder

(continued from page 42)
ful because the reading is only updated once each second, so even the slowest sampling remote control can accurately follow the modulation.

A "fast" DC voltage for driving a conventional moving pointer meter is also provided. This is useful for a local meter or if the remote control has a fast enough sampling rate.

Special ballistics

The electronically generated ballistics make it easy to determine peak modulation as well as dynamic range. Because all the indications generated by ModMinder follow the same ballistic, they all agree for both sine wave and program modulation.

A second remote option is provided digitally, supporting a slave modulation monitor panel. Using any data link of 1200 bits/second or faster, the entire front panel of ModMinder plus a moving pointer meter can be duplicated at any location—across the street or across the country.

No calibration of the remote system is required, since, unlike analog remote systems, the digital data provided by ModMinder is absolute.

If a two-way circuit such as a dial phone line is used, the control functions of the front panel as well as its indications are duplicated.

If only a one-way circuit is used, such as an SCA channel, the settings as they were left at the master unit are used, but all of the indications of the front panel are available.

In this age of deregulation, sometimes it is difficult to decide what is and is not legal. We despaired of getting an answer about the ModMinder's legality from the FCC, so we decided to do what any smart broadcaster would do—ask an FCC lawyer.

Lawyer says yes

What we got was a clear yes. Called an "Opinion of Counsel," it is the way lawyers put themselves on the line. It carries weight with the FCC, the courts and other lawyers. We will gladly provide copies of this letter for you or your attorney to peruse.

ModMinder has two modes of operation: FCC and Quasi. All of the previous discussion has dealt with FCC mode. FCC mode is the one that complies with section 73.332(f)(3) of the rules prior to the deregulation of 1983 and is the subject of the Opinion of Counsel.

Quasi mode is less specific; its response time is user-defined. The FCC Rules currently in force do not specify any response time; in fact, the Report and Order that deregulated modulation monitors anticipated new standards, although no guidelines were provided.

In order to provide a rational basis for choosing a suitable response time, Modulation Sciences will embark on a research program to correlate various peak flash response times with occupied bandwidth.

What it all means

The results of this research will be published *in full* as it progresses. It is anticipated that the information obtained

(continued on page 54)

Phoenix

(continued from page 39)
keep doing it" and "Did you increase your power?"

What did we want when it came time to choose an audio processor? Simple. Maximum modulation along with a clean, non-fatiguing sound.

The Phoenix has made WOBT-AM get up and dance. Our listeners are getting the necessities they require of any radio station, AM or FM. They are getting quality programming, a professional attitude and audio quality matching that of any other station.

There are many managers and engineers who will give their testimonials to the success of the Phoenix. You can compare all you want, and there is no doubt that you will come to the same conclusion. Your AM will never sound better than it does with the "hottest box" in the industry.

■ ■ ■

Editor's note: Messrs. Hencley and Vollmar may be reached at: 715-362-6140.

For more information, contact Gary Crowder at Gentner: 801-972-7200, or circle Reader Service 96.

Clean Composite with DBE-1000

by Brian Emery, Eng Spvsr
WMMS-FM

Cleveland OH The Somich Engineering DBE-1000 Dynamic Baseband Enhancer is a compact (one rack unit) device that is inserted in the composite path at the transmitter just before the exciter.

The front panel has two 10-turn dial pots and three LEDs. The dial pots make it very convenient to experiment with various settings while allowing quick and easy return to your reference point.

USER REPORT

Two of the LEDs indicate that the power supply is working properly and the third one lights red at the beginning of processing.

Five set-up adjustments are under the hood: a 10-turn pot to calibrate the red LED turn on, a pilot on-off switch to adjust the pilot null and three 10-turn pots—one for pilot null (not a routine adjustment) and two to adjust pilot level and phase.

Good first impression

Ordinarily, one would not assume that a clipper would contribute to the sound of a station except in a negative way. However, the first aural impression made by the DBE-1000 was an apparent increase in low frequency EQ and improved low end clarity.

We had to reduce our thump EQ by half when using the DBE-1000. The net result on the air is a better, tighter low end with less distortion—a desirable result for us!

The composite signal is fed through an input BNC connector and RF filter, buffered by a unity gain follower and notched at 19 kHz to remove the pilot signal. The composite, minus the pilot, is fed to the process stage through the front panel drive pot.

The processor is "black boxed" and consists of two hybrid barrier-diode arrays connected in a proprietary fashion. Two precision voltage references and associated buffer amplifiers and support circuitry round out the black box.

The output of the processor is fed through the front panel drive pot (10-turn) to a combining amplifier.

Filter recovers pilot

The composite is also fed to a 19 kHz bandpass filter before the pilot notch. The output of this filter is pure pilot, the filter being down in excess of 50 dB at 15 kHz and 23 kHz.

Somich Engineering's DBE-1000 Dynamic Baseband Enhancer

This recovered pilot is amplified and fed through an adjustable all-pass network to provide some adjustable phase shift.

The output of this network is also connected to the combining amplifier. The output of the combining amplifier is fed to an output stage and out of the box.

A convenient feature of the DBE-1000 is that the pilot injection level does not change when you adjust drive or modulation. This characteristic and the 10-turn dial pots, make it easy to experiment for the best settings without having to readjust the pilot injection each time.

Only the internal trim pot sets pilot gain through the box. Of course, you can also adjust injection at your stereo generator.

Sample fed to comparator

A sample of the audio, before processing, is precision rectified and fed to one input of a comparator, whose other input is the +15 VDC supply through a 100 kHz 10-turn pot. The comparator drives the front panel's process LED.

The power supply is a conventional, regulated bi-polar supply which is monitored by the two front-panel LEDs. The power transformer can be strapped for 220 V operation.

The DBE-1000 is easy to install, but it must be fine-tuned to your system. Fine-tuning takes less than five minutes and should probably be repeated annually.

The DBE-1000 is inserted at the transmitter, just before the exciter. The Drive (input) pot is adjusted so that the unit is operating below the threshold of processing (red LED off). The output level is adjusted with the modulation (output) pot to a convenient point.

Checks run via scope

A scope is connected to a convenient composite monitor point after the DBE-1000. This can be the output of the DBE-1000 itself or a spigot on your mod monitor or exciter. One kHz, one channel only is fed through your stereo generator with the pilot turned off.

Separation can be checked on the scope by adjusting the stereo generator L-R (separation) control for a flat baseline. (Normally only a very small adjustment is necessary, if at all.)

The stereo generator is then fed with a 1 kHz tone L-R (Optimod 8100 in the sub-to-main crosstalk position) and the DBE-1000 is adjusted for perfect pilot phase (arrowheads lined up vertically). A final 10-turn control sets the pilot gain through the processor, which is normally adjusted to unity.

With the recommended "fine tuning," there will be no loss of separation when the unit is on line.

Once the DBE-1000 is fine-tuned to your chain, it is only a matter of advancing the drive control until the process LED lights on peaks, and setting the modulation control for legal modulation. Any further changes in drive level are made by ear, using your reference monitor.

The heart of the DBE-1000 is its proprietary processing module. It provides absolute peak control and reduces clipping distortion. Its transparency enhances low material and provides a clar-

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Loudness

(continued from page 52)

will enable a station to make a rational selection of peak response times.

Tests at WNSR were a spectacular success. A moderately-heavily processed station, WNSR uses an Optimod 8100 with an XT chassis. The increase in modulation by changing from their current model modulation monitor to the ModMinder was 1.7 dB.

WNSR also maintains a second air chain of an 8100 without the XT chassis. For these tests it was set for very light processing.

We found that when this gently processed air chain was switched in and set using ModMinder, *no loss in loudness* resulted, as compared with the much more heavily processed chain set up using the original modulation monitor.

ModMinder holds the promise of combining maximum loudness with greatest quality. For the first time it will be possible to eliminate excessive processing without giving up any loudness.

Stations that have suffered a competitive loss because they refused to "nail the processing to the wall" can now maintain maximum loudness without overprocessing.

And heavily processed stations now have an alternative which will still further enhance their competitive position without additional squashing and squeezing.

■ ■ ■

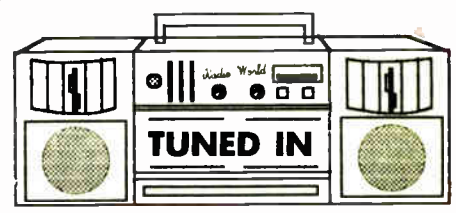
For more information on the ModMinder, contact the author at: 800-826-2603, or circle Reader Service 99.

People . . . Lawrence Behr Associates, Inc. has announced that George B. Grills, PE, has joined the broadcast and telecommunications consulting firm as Vice President of Consulting Services.

Meanwhile, Chris Fichera, with a strong recording studio background and experience in professional audio equipment sales, has joined **Klark-Teknik** in the position of DDA Product Sales Representative. He will be responsible for the company's DDA studio consoles.

Prize winner . . . Bext, Inc. wishes to congratulate Bill Ruck of KFOG in San Francisco, whose name was drawn as the winner of that company's raffling off of its new front panel programmable Tex 20 20 W exciter. The raffle was held on the closing day of NAB '89.

New Reps . . . Aphex Systems Ltd. has appointed two new manufacturer representative companies. Pembroke Pines FL-based **World**



Wide Electronics will now handle Aphex sales responsibility for Florida and Puerto Rico.

Essential Marketing of St. Joseph MO has been named to represent Aphex in Kansas, Missouri, Montana and Iowa.

New facilities . . . Tower Network Services, a Dallas TX-based tower and antenna construction and maintenance company, has opened a new division office in Atlanta, GA.

The office will serve the company's radio and television customers in the southeast region of the country. The Atlanta division office will be run by Manager Tom Bull. The Tower Network Services Atlanta division telephone number is: 404-699- 2620; Fax number: 404-699-2634.

DBE-1000 Improves Lows

(continued from page 53)

ity not usually associated with baseband processors.

Out of the box, the DBE-1000 will not degrade your separation more than 2 dB. With the recommended "fine tuning," there will be no loss of separation when the unit is on line.

The pilot is never clipped in the DBE-1000 at any level of processing. It is removed and fed to the side chain to be re-inserted after processing.

(You will notice some pilot bounce at heavy processing levels due to clipping products mixing with the pilot. But this slight pilot modulation has not been a problem on any receiver.)

The processing trade-off

All audio processing equipment degrades fidelity to some degree in return for loudness, consistency and absolute peak control. It is the price of this compromise that determines which processing devices wind up in our chains.

The DBE-1000 gives WMMS increased loudness and absolute peak control, with the added benefit of a cleaner and more clear low end to our signal. It is better than anything we have tried before.

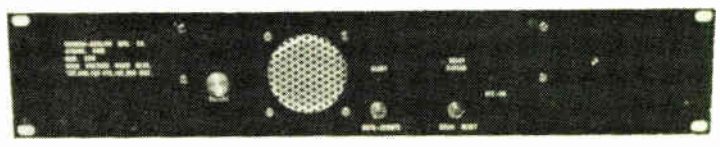
Clean composite processing, such as is provided by the DBE-1000, can buy you at least 1 dB of loudness over using no composite processor. Its unique sound would also make the DBE-1000 my processor of choice for non-rock formats, where only absolute peak control is necessary.

This box will give you a modulation brick wall, with an absolute minimum of artifacts. And at stations where it is necessary to "turn it up," the DBE-1000 can be run flat out, offering a more competitive sound than is possible with any other processor.

■ ■ ■

Brian Emery may be reached at: 216-781-9667.

For more information on the DBE-1000, contact Jim Somich at Somich Engineering: 216-526-4561, or circle Reader Service 93.



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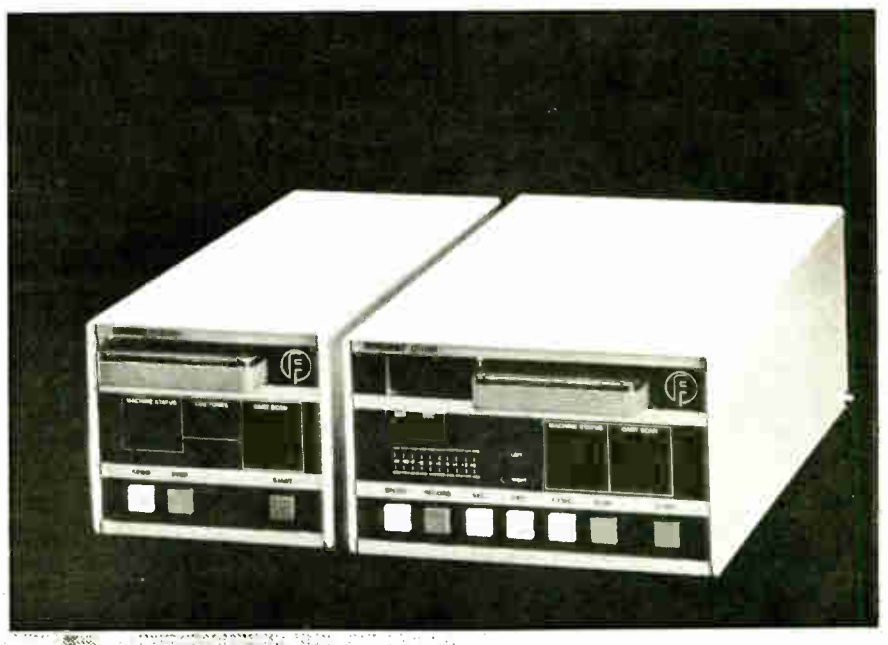

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