

NEWS BRIEFS

Digital Planet Attracts New Carriers

CARSON, Calif. Two additional cable companies are going to carry Digital Planet, a national digital audio cable service.

According to Digital Planet, National Cable TV Cooperative (NTCTV) and Triax Communications are the latest affiliates to

offer the service. NCTC is the industry's oldest cable purchasing cooperative, representing more than two million subscribers.

Tuner Developed for Digital Cable Radio

HATBORO, Pa. Jerrold Communications has announced the development of an 800 MHz

digital audio tuner for its Digital Cable Radio service.

The tuner allows "unlimited number of digital audio channels" and enables a number of them to be carried below channel 2 (50-54 MHz). The tuner is said not to disturb the video channel capacity of a home cable system.

Satcom Goes East

WASHINGTON Many radio stations will have to reorient their network receive dishes this month with the relocation

of Satcom C1.

The satellite was to be moved eastward by two degrees to 137 degrees west during the week of July 15-23. Satcom C1 handles most of the major radio networks including CBS, ABC, Mutual, NBC, and Unistar.

For recorded updates on the satellite move, contact GE Americom: 800-526-4214.

Complaints Result in Pirate Radio Shutdown

LOS ANGELES A Venice, California, "pirate" radio station recently was shut down by the

FCC.

Operator Tom Reveille was fined \$1,000 for operation of "Radio Free Venice" following the FCC's Los Angeles bureau investigation that located the illegal broadcast operation.

According to the FCC, the station interfered with numerous Venice residents' reception of legitimate television and radio broadcasts.

New NAB Radio Board Leaders Named

WASHINGTON Richard Novik, president of WKIP-AM/FM and WRNQ-FM in Poughkeepsie, N.Y., has been elected president of the NAB's Radio Board of Directors for a one-year term.

Novik succeeds David Hicks, president and CEO of Hicks Broadcasting.

In other action, the Radio Board elected Richard Harris as vice-president of the Radio Board. Harris is the former chairman of Group W Radio and current owner of WSP-AM in Sarasota, Fla.

VOA Back on Air in Germany

WASHINGTON The Voice of America has resumed broadcasting in Germany following a 30-year absence.

The new service began July 4 with production and broadcast of the "U.S. Report," a 30-minute news magazine program. The program airs daily at 7:30 a.m., on frequency 1197 kW (medium-wave).

Although begun in 1940 during World War II, the VOA ceased broadcasting to Germany in 1960 because of a decline in short-wave listening.

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Algorithm Bake-Off Delayed

by Judith Gross

OTTAWA A six-member team representing U.S. broadcasters and manufacturers of digital source coding—or compression—systems has successfully gotten CCIR compression algorithm tests postponed to allow participants more time to prepare.

The six, who included representatives from Dolby, Scientific-Atlanta, Aware Inc. and two independent engineering consultants, were headed by Greg Urbiel of CBS, who participated in last summer's ISO compression tests. They met here in an international CCIR forum in late June to discuss procedures.

The CCIR tests, which aim to go beyond the ISO compression "shoot-out," were slated to take place in November and December in Canada. But the U.S. delegation and others agreed that the timetable was unrealistic and postponed the test schedule into early next year.

The U.S. team was not as successful, however, in obtaining support to allow system proponents to come up with less than the full technical disclosure that CCIR's standard-setting procedures require.

Levels of quality

Urbiel reported that the tests will consider several aspects of putting audio through compression algorithms, including one of vital concern to broad-

casters: "chaining" or "tandeming" audio through several generations of compression, which the ISO tests did not consider.

Two levels of quality will be considered, defined by applications. The first is "emission," which involves sending audio directly to the end user or receiver, such as during DAB transmission.

The second category is "transmission" and is divided into two sub-categories. The first is "contribution"—which includes audio sent to production studios for additional editing. That category is to be tested for 18-bit resolution.

The second sub-category is "distribution"—including audio sent to affiliates for re-broadcast, and will be tested for 16-bit resolution. The idea is that the more stages of production (and compression) the audio undergoes, the greater the likelihood of a breakdown, and the more robustness, or resolution, required.

According to Urbiel, six source coding systems have been submitted for the emission portion of the testing. They are ISO Layer II (MUSICAM); Dolby's AC-2; one from Aware Inc.; ASPEC-T (AT&T); Scientific-Atlanta's SEDAT; and one from NHK.

For transmission, a total of nine algorithms have been submitted. For both contribution and distribution are: ISO Layer II (MUSICAM); Dolby AC-2; Aware Inc.; ASPEC-T; SEDAT; NHK;

and a German ASPEC. A Swiss algorithm, SB80 PCM, has been submitted for distribution tests only and another AT&T developed scheme, Nyffler (also a CCIR 724 recommendation), has been submitted for contribution only.

Test timetable

Originally, participants were to have submitted their equipment by the end of September so tests could start before the end of the year.

Under the modified timetable, documentation is due at the beginning of September and will be approved during a CCIR meeting scheduled during the AES convention at the beginning of October in New York.

Hardware is due the first two weeks in November and the test sequence will be decided at a CCIR meeting in Geneva, November and December. The tests will take place in Canada, January 6 through the end of February.

Also at the October meeting, the group has agreed to discuss procedures for training listeners for the subjective listening part of the tests, Urbiel said. He said another important consideration, that of "weighting," will be decided at that meeting as well.

Compression system proponents usually want to see the features in which

their algorithm excel given added weight during the evaluation; therefore, each participant will have an opportunity to submit a "weighted" Xlist of features for consideration by the entire group. Urbiel said a final list of features will be drawn from that list.

Full disclosure questioned

The one sticking point that remains, Urbiel explained, is the question of full disclosure. CCIR procedures mandate enough technical disclosure of systems being tested to allow a third party to build the system.

Dolby, among other companies, fears revealing proprietary information to competing companies. In preparation meetings in early June, Dolby representatives were successful in getting other U.S. members to agree to press for less than full disclosure for the tests.

But Urbiel said that other CCIR delegates were not as sympathetic to the U.S. concerns. He noted that Neil Gilchrist of the BBC said a British compression company, apt-X, had decided not to participate in the CCIR tests because of full disclosure.

The other delegates understood his comments to be a subtle way of saying that any manufacturer who objected to CCIR procedures could simply choose not to become involved.

Urbiel said the U.S. participants are trying to obtain the exact wording of the full disclosure policy to determine how much of a problem it poses.

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Look Who's Talking, Part III

by Judith Gross

FALLS CHURCH, Va. Do you talk to your radio?

Yeah, I do, too. All the time. I tell it when I hate that song and why the Mets should have won and what Congress can do with its pay raise.

But does your radio talk back?

Well, if you say "yes," either you're



ready for the rubber room or you're ahead of the wave of the future. And the future is interactive.

It seems the listening and viewing public may finally be tired of the lethargy of couch potato life. It used to be enough to have your entertainment spoon-fed to you; to let some PD or network guru choose how you want to spend your time.

But our minutes are too valuable these days. Why should I spend a half hour listening to music I can't even understand and then waste another hour shopping at the store when I can accomplish both tasks at once, while I'm driving to work, and let the PD know this Vanilla Ice release ain't cuttin' it at the same time?

Two companies have come up with interactive systems in the last few weeks. One is for radio and one for TV, but the TV system has radio possibilities, too.

The TV service is for at home use and is the brainchild of TV Answer out of Reston, Va. It takes the shopping channel one step further, you might say. They're waiting for spectrum approval.

The radio service was shown by Gary

Noreen of RadioSat and is for cars. What's nifty about it is how you can control it by talking to it. And it talks back to you. Say you want to tune your station to classical? No problem.

You simply say "Classical"—no yelling necessary—and bingo, there you have your basic Mozart or Vivaldi.

OK, you liked it enough to buy the CD? When the cut is over the talent tells you how to order, you say (in that incredibly sultry voice), "Order," and in a few weeks you're the proud owner of a brand new classical CD and a few dollars poorer on the credit card.

Now, you're probably saying, "Oh, sure. We've got to be one of RadioSat's special service providers up on the bird to take advantage of this. That's the gimmick." Wrong, satellite face.

Gary says once RadioSat gets its direct-to-car satellite service up and running, targeted for 1994, and once the AM-FM-satellite receiver is in the car, any radio station that can be received can offer a shop-from-your-car or other interactive service.

So, go ahead. Get ready to poll the listeners on that catchy Sinead O'Connor single you wanted your station to be the first to break. And when you hear that interactive reaction you'll know exactly what to do. Wonder how the voice-activated feature responds to a razzberry, á la Flatbush?

I spent a recent weekend at the beach—Ocean City, Md., to be precise—and it was all work. Honest. Maryland, Delaware and D.C. broadcasters were having their annual confab. And some congrats are in order.

Cook Inlet D of E, (and RW technical advisor and friend) Tom McGinley was honored as Engineer of the Year. And Radio Systems' Dan Braverman was handed the Manufacturer of the Year award. Good wishes and another round of strawberry daquiris for all.

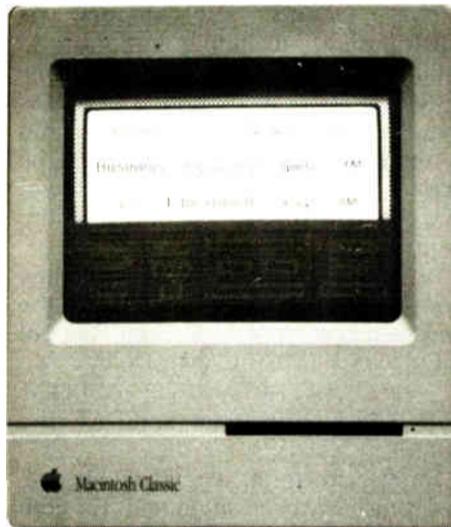
You might have thought the WARC L-band issue has had its moment in the sun, but as Yogi used to say about baseball, "It ain't over 'til it's

over."

Now it seems lots of various interests are having numerous little backroom chats trying to convince NTIA and the military to part with a wee bit of spectrum for DAB.

Don't know if they'll be successful, or when, but don't hold your breath. It is entirely conceivable that the U.S. may go to WARC without a specific amount of L-band for DAB.

Then, we may get there and wow with other countries. Or we may



Talk to me, baby.

come back from WARC without a specific terrestrial DAB allocation. If so, it'll be up to the FCC and broadcasters and whomever else to hammer it all out here.

Sounds time-consuming? It might be. Experts are guessing years.

Speaking of DAB, I just gotta say a few things. First, I gotta hand it to those who have braved a barrage of (figurative) tomato-throwing and gotten out front with their viewpoints all for the sake of the industry's future.

Two names spring immediately to mind. Alan Box, chairman of the NAB's DAB Task Force is one. Dignity in the face of raging emotional argument is

a fine attribute and Alan has maintained his and been a straight-shooter from the start.

Then, turning to the loyal opposition, there's Randy Odeneal. You have to admire someone with enough guts to buck the Old Boy network and who fights to get the more apathetic among us thinking about some important, if controversial, issues.

Now, to add to the tomato-throwing, I haven't heard too many positive things about the NAB's Las Vegas Eureka demo since April. At worst, there's the whole can of worms about comparing apples to watermelons with the inequalities in the analog and the digital signals.

Then, the way it was staged (and I do mean staged), a lot of folks with no experience in DAB came away with the impression that it isn't such a big deal. The conclusion a lot of them are drawing is: "DAB, who needs it? What's all the hype? Why bother?"

Now, I was up in Toronto about a year ago for the Canadian Eureka demo and I'm no golden ears, but I came away impressed. But I have to agree that the Las Vegas dog-and-pony show left a lot to be desired.

Let's face it, I don't think it had to take \$50 million and countless man-hours of precision engineering from all over the world to create something that prompts people to shake their heads and say, "What's the big deal?"

I'd like to see another DAB demo, both Eureka and in-band and anything else that's out there. And this time let's wow 'em, huh? But don't count on the San Francisco Radio Show. There may be less DAB there than we originally thought.

Oh well, we can always talk about DAB. And then we'll hand out the kazooos.

Heard a juicy tidbit? Spill your guts to Earwaves by faxing JG at 703-998-2966 or writing to P.O. Box 1214, Falls Church VA 22041.

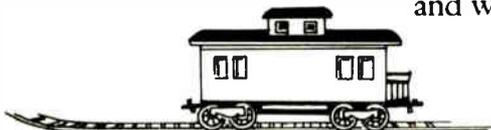


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World Radio History

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AM is not dead

Dear RW,

I've read my last "AM is Dead" article that I want to see or hear about for a while, the latest being that from Sidney Marshall of WDME (now FM only) of Dover-Foxcroft, Maine. (RW, June 12, 1991)

Some of us read other trade publications, and we see the same "AM is Dead" there, too. However, I can say from reading, knowing people in the industry, and operating an AM stand-alone (daytime at that), AM is *not* dead. It may be hurting in some places, but it is far from dead. Many times, it is due to lack of management or ownership commitment.

Let's start with the top 10 markets in the U.S. In an article a few issues back, a major trade publication printed the Arbitron ratings for those largest markets in this country. Fully five out of 10, or 50 percent of the top 10 markets, have an AM station in first place. San Francisco has an AM in first place and another AM in second place. I guess those weird folks in San Francisco haven't heard yet that nobody listens to AM.

How about Chicago? Well, WGN is doing quite well, again in first place. OK, so there are a few exceptions in the top 10 markets; outside those areas, nobody listens to AM. Then let's explain the legendary KDKA-Pittsburgh; WTIC, Hartford; WCCO, Minneapolis; KMOX, St. Louis... I can keep going, but what is the point—these must be flukes, because "AM is Dead"!

OK, so there are exceptions in the larger markets—maybe down to number 100 or so. The rest of the country is listening to FM, and the AMs below market 100 (like Dover-Foxcroft) are mailing their licenses in to Washington so fast the FCC has to hire extra people just to open the mail.

Wrong again! We operate a daytime AM in an unrated, non-metro market with a 100,000 watt FM and a 50,000 watt FM licensed to the same community, or next town over, and a plethora of stations from Sarasota an Fort Myers spilling in (both close enough to place city grade signals over our community), plus a Class A from 20 miles away, and a full-time AM, and we operate at a profit. Most broadcasters would consider our area "over-radioed."

But that's not the only surprise. In our county Arbitron report, we are the top station: 12+ in average quarter hour share, for the past two years. By the way, we only signed on in 1986... most of those other guys have been here forever!

Why would Rick Buckley shell out \$25.5 million to buy WOR (AM) in New York? That would seem to be an outrageous amount of money to sink into a medium that is dead, or at the very least, about to die. Having known Rick for some years, he appears to be quite sane, as well as extremely successful.

Now let's cut the "AM is Dead" crap and figure out why some AMs are having trouble, and deal with the problem instead of acting like a bunch of Chicken Littles.

First, the guy in Dover-Foxcroft, Maine, didn't have a clue as to what his AM billing (or AM listenership) was because he admitted he was 90 percent simulcast. I guess if you are willing to assume the FM was carrying the load, you might as well sign the AM off. Since the station was simulcast, no attempt was being made to find another audience and sell advertising to it.

I imagine there must be some other stations that get into that town... which one is the most popular? What do people want that the FM format can't give them? Find out and go for it. Since WDME-FM is mono, I have to assume it must be mostly talk because certainly no one is going to really win a major music audience on FM today with mono. Sidney, I'm not picking on you personally, but your mindset is at the root of your problem.

AM today normally has to be programmed as a niche format in all but the largest markets, where the full-service guys can afford to operate. But even in small markets, there are pockets

AM stereo has a new champion in Congress, whose efforts may finally force the FCC to take an official stand on the technology.

South Dakota Senator Larry Pressler recently introduced a bill that would require the FCC to select an AM stereo standard within 180 days of approval of the legislation.

Pressler's reasoning for proposing the bill is simple: For his constituents, the AM band is a vital link with the world beyond their farms, and improved sound quality in AM is still significant to them.

While that point is not lost on FCC Chairman Al Sikes, his off-the-cuff remarks about AM stereo have shown that he feels an FCC-approved standard is unnecessary.

According to Sikes—who as administrator of the National Telecommunications and Information Administration decreed that AM stereo already had a "de facto" standard—manufacturers and broadcasters have stated their preference for one of the two competing systems.

Embracing AM Stereo

True, most of those broadcasters willing to go out on a limb to support a new technology have chosen Motorola's C-QUAM over Kahn's ISB system. But those pioneers represent a mere handful of the total number of AM broadcasters.

The remaining stations are not fence-sitting because they see no benefit in AM stereo. To the contrary, many more would probably adopt the technology if they were certain that the direction they chose was federally mandated.

The fact is, implementing an AM stereo system is a costly proposition for broadcasters who are already suffering from declining revenues; without a standard, the financial risk may seem too great.

As for receiver manufacturers, it is true that a few companies have introduced AM stereo radios, most of which decode only the C-QUAM system. But these firms will not spend the promotional dollars needed to launch an effective marketing campaign for a technology that still has a vocal competitor on the sidelines.

Broadcasters are still interested in AM stereo. But it will take more than a minority to make AM stereo a success, and the majority are looking to the FCC for an official statement.

It's time the U.S. joined the ranks of the other nations that have backed a single standard. AM stereo may not save the band, but without a national standard, broadcasters are seeing a potential enhancement of the AM service slip through their fingers.

—RW

that can be served *and* sold.

My local AM competitor sells blocks of time to some local businesses and lets them do talk shows on computers, automotive repair, health services, etc. They also do a good local politically-oriented talk show, and the show host goes out on the street and sells the daylight hours out of it. She has some sponsors on the air I'd like to have (please don't tell her I said that—it's a matter of pride). The station is the sister of a 50,000 watt FM station, but does not sell in combo (or worse yet, bonus FM advertisers on the AM station). Those that do that have already told everyone what the AM is worth.

I've told the management over there I'm glad they're trying to do something with the AM—it gives our community another reason to tune into AM where they might also happen to hear our station, if they didn't know about it already.

A few hints—get yourself a morning personality who will also hit the streets and sell. This has worked extremely well for us for three years. Hold down the operating costs (we are on Unistar AM Only satellite except for our morning show, but still do lots of local promotions).

In most cases in smaller markets, getting revenue par with the FM guys is tough, so we have to try to do more with less. News, community information, free remotes at charity events, the list goes on and on. And be active in your community; that is a must—and you will find that those worthless AM stations that people are turning off can be the pride of a community and profitable.

Last, try to keep your on-air sound as technically good as you can. We broadcast in stereo. That may sound expensive, but I bought a C-QUAM system from \$5,500 from a station who

abandoned it, including a CRL stereo processor. It sounds great on my car radio... and several listeners have commented favorably. In fact, I have bought lots of good used equipment, most of it through RW's classifieds. Look around for bargains. We are quite unprocessed, clean and dynamic. I believe that adults appreciate that sound.

In summary, if you guys out there spent as much time and energy improving and working hard at your AM stations as you do trying to convince everyone that "AM is Dead"... or is it a conspiracy by FM broadcasters for what AM did to them from the 1920s to the 1980s?

Hal Kneller, President/GM/CE

WKII-AM

Port Charlotte/Punta Gorda, Fla.

Multiband? No thanks

Dear RW,

Multiband audio processing is one of the worst things that ever happened to radio—both AM and FM. Why should every song sound the same? Whose brilliant idea was it to make it so?

In the recording, drums, guitar, strings, woodwinds, and horns are at different levels. That's the way the artist and recording engineer created the music. When played on the radio, it all sounds the same. When the public listens to the same music on tape or CD, it doesn't all sound the same.

No wonder radio keeps losing listeners. Multiband processing destroys the audio by eliminating the dynamics that make each recording unique.

No, thank you. I will take state-of-the-art wideband processing any day. My ears don't like multiband processing. Never have, never will.

Randy Johnston
Fresno, Calif.

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800-336-3045, Fax: 703-998-2966
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Next Issue
Radio World
August 7, 1991

Eureka Negotiations Begin

by Judith Gross

WASHINGTON NAB executives already have had one meeting with Eureka 147's designated negotiator and intend to meet throughout the summer in the U.S. and Europe to hammer out a licensing/royalty agreement for Eureka 147 DAB.

NAB is pursuing the agreement at the same time its Radio Board said it wants to encourage the development of other systems. The NAB, however, intends to stand firm on its 11-point DAB plan.

NAB Senior VP of Science & Technology Michael Rau confirmed that a

preliminary meeting with Thomson attorney Thierry Seuer took place before the extended deadline on Eureka's letter of intent, which was July 1.

NAB CEO Eddie Fritts and Executive VP of Operations John Abel both cautioned that the July 1 deadline was "not etched in stone" and that Eureka partners were flexible about future meetings.

Rau said the result of the first meeting was that a "handful of other meetings" has been set up to take place throughout the summer, some in Washington D.C. and others in European locations.

At its semi-annual meeting in mid-

June, the NAB Radio Board unanimously reaffirmed the association's policies on DAB, including the 11-point plan approved by the board in January.

Newly-elected Radio Board Chairman Dick Novik said the reaffirmation took place after a lengthy DAB discussion in which NAB staff and DAB Task Force Chairman Alan Box brought board members up to date on DAB developments.

FCC WARC position

The discussion included an update on the FCC's WARC position, which recommended "some" spectrum for DAB in both the L-band (1500 MHz) and S-band

(2300 MHz) region without specifying how much. The NAB has estimated that some 60 MHz of L-band is needed to accommodate every existing radio station on the Eureka 147 system.

The discussion also included some debate over controversies brought to light by DAB Task Force member Randy Odeneal (who is not a board member) and highlighted by some group owners' letters to the FCC expressing disagreement with NAB's DAB policies.

But after the unanimous vote of confidence by Radio Board members, Novik and others were reluctant to discuss any divisiveness that had surfaced. "We're more concerned with the public relations aspects, with how the trade press has been portraying it," Novik said.

L-band tests this fall

Box also said the DAB Task Force still intends to go ahead with L-band tests of Eureka 147 and that the tests will most likely take place this fall after the NAB's Radio '91 convention in San Francisco.

NAB confirmed that a possible demonstration of Eureka equipment (not at L-band) during the show may have to be scrapped because Eureka equipment is committed to a large electronics show in Berlin just days before the San Francisco gathering.

"We're continuing to talk with Eureka partners to see what's possible; right now there's about a 30 percent chance we'll have their equipment for the show," Rau explained.

In addition to its support for the NAB's DAB policies, the board also said it will "continue to encourage the development of in-band systems," according to Fritts and Novik.

When asked whether such encouragement represents a conflict with NAB's endorsement and intentions to pursue licensing of Eureka 147, Fritts, Novik and Box all said they saw no conflict.

AfriSpace Approved

(continued from page 1)

also is being eyed by several other proposed digital services, including the NAB-backed Eureka 147 system. Many of these digital audio prospects are aware that the U.S. government may not part with the L-band, which would force them to seek other frequencies such as S-band.

AfriSpace's programming will include news, music, public service, education and World Health Organization news to the large, mostly third-world continent.

The satellite uplink facilities and some programming origination will be housed in the U.S. and then beamed to the satellite. Programmers from within Africa also will be able to beam programming to their listeners via the AfriSpace satellite.

AfriSpace officials said signals will be received on special solar-powered DBS receivers, costing about \$100. The company announced that financial partner MARCOR has signed a letter of intent with U.S.-based Techsonic Industries and Korean-based Lucky Goldstar to produce the "Starman" receivers by 1993.

MARCOR also is a financial partner in Satellite CD Radio, a commercial digital radio service proposed for the U.S.

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RDS Makes Inroads in Europe

by Dietmar Kopitz

GENEVA Since the inception of the Radio Data System (RDS) in the early 1980s, the majority of Europe's FM networks have been equipped with the 57 kHz subcarrier.

To date, approximately 100 different receivers—mainly car radios—from all over the world are on the European market.

Earlier this year, CENELEC, the official European standards body in the electrical sector, issued the final version of the Radio Data System (RDS) standard. The first specifications were published in March 1984 after being developed by members of the European Broadcasting Union (EBU).

The CCIR recommended the RDS system during its Geneva conference in 1986. While broadcasters in Europe prepared for implementing RDS, the EBU introduced the system to the consumer electronics industry. In the summer of 1987, both broadcasters and manufacturers were ready to implement RDS.

Making radio easier

Why is RDS so popular? The system's objective is to offer listeners simplified tuning. This has become an important objective for broadcasters since the choice of programs that can be received in the same area is often confusing. With an RDS radio, listeners can see the label of their program, composed of up to eight alphanumeric symbols.

Call letters or station slogans are displayed in the same area that the frequency is shown on conventional radios. Some recent receiver models also search for "program formats" such as rock, news, sports and classical. A program choice stored under a preset key on the radio will not necessarily come up on the frequency where it was last received.

In a network, if the car is driven to another area, the radio will automatically find the frequency giving the best recep-

tion quality. Or, if the same program is not available any longer, a reasonable alternative is selected. The alternative is chosen by the broadcasters who input the RDS signal codes.

Many of the original RDS radios that were expensive are now more affordable, and new cars in Europe are equipped with RDS radios. Since the early days of RDS where only the five basic tuning functions of RDS were used, a host of other features were added or are soon to be added. These include radio text, clock/date, radio paging, alert signals and traffic message channels, just to give a few examples.

New feature

Another RDS feature gaining increasing popularity is EON, or enhanced information on other networks. Second and third generation RDS car radios will be released this summer in Europe with the new EON function. Manufacturers including Grundig, Panasonic, JVC, Alpine, Philips and Blaupunkt will offer RDS radios with the EON function.

RDS radios equipped with EON can be used for cross-referenced services. For example, European broadcasters such as the BCC, that operate several program services, but only one with traffic news, can make their service accessible to listeners tuned to another program.

If the listener chooses the RDS radio and traffic announcement mode, the music received from one network will be interrupted, and the traffic news from the local radio station will be output instead. In the earlier RDS radios, a similar function was available for cassette or CD listening.

In the last few years, many countries outside Europe have started to experiment with RDS, and some have implemented the system. To expedite and encourage implementation, the EBU is coordinating a list of worldwide country codes that are necessary for the coding

label with other broadcasting unions. Once selected, these codes will be added later this year to the CCIR recommendation on RDS.

In the U.S., standardization work on RDS has started, and over-the-air demonstrations were held at the 1991 NAB convention in Las Vegas and the

Public Radio Conference in New Orleans. In Berlin this August, the IFA international radio and TV show will feature RDS.

•••

Dietmar Kopitz is chief engineer for the European Broadcasting Union and editor of the EBU RDS newsletter.

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DAB Entrepreneurs Await FCC Approval

RadioSat, Satellite CD Radio Applications, Filed with FCC Last May, Are Still Pending

by Judith Gross

WASHINGTON After more than a year of debate on DAB, two companies that filed the FCC applications that started the ball rolling are still waiting for approval from the Commission.

While the FCC has given the nod to satellite DAB firm AfriSpace to begin experimental operations into Africa, and also approved Ron Strother's first petition for UHF frequencies to test DAB, Satellite CD Radio and RadioSat applications, filed last May, are still pending.

Satellite CD Radio's Peter Dolan said he does not know when action on his petition to begin building a satellite will come. Satellite CD Radio also petitioned for approval to begin satellite broadcasts, but modified its original request several months ago.

Dolan speculated that Satellite CD Radio's request may be tied up in the controversy over L-band spectrum for DAB, which is still being hammered out between the FCC and the NTIA.

The Commission recently recom-

mended that the U.S. seek some L-band and some S-band spectrum for DAB, but whether any L-band will be reassigned from military flight test operations to broadcasters remains unsettled.

RadioSat, however, seems to be facing a different sort of controversy. Its application for a ground station to begin satellite broadcasts in the MSS band requires no new spectrum.

RadioSat President Gary Noreen

RadioSat's application may have bogged down in the legal controversy surrounding American Mobile Satellite Corporation (AMSC).

speculated that his application may have become bogged down in the legal controversy surrounding American Mobile Satellite Corporation (AMSC).

A federal appeals court has overturned the FCC's reasoning in setting up the satellite consortium, but industry consul-



RadioSat's Gary Noreen believes his service can be launched either on the AMSC satellite or a Canadian bird.

tants said the legalities should not affect the 1994 AMSC launch date.

Noreen's plans call for RadioSat to use

TV Marti Reprived

by Arthur Cole

WASHINGTON After a House subcommittee had earlier voted to cancel funding for the controversial TV Marti service, the full House Appropriations Committee voted last month to restore the service for another year.

The move returns \$14.1 million to the United States Information Agency's (USIA) TV service. TV Marti broadcasts news and entertainment to Cuba via a tethered balloon-mounted transmitter located 10,000 feet above the Florida Keys.

The House vote to restore funding came just as The United States Advisory Commission on Public Diplomacy, a bi-partisan commission of conservative presidential appointees, criticized TV Marti as ineffective and too costly.

Although the report, which covered a host of other USIA areas, did not recommend funding be cut, it nevertheless concluded that TV Marti was not cost efficient because of the limited availability of programming to Cubans.

"USIA spends a modest \$31 million annually for worldwide television operations and \$16 million for television broadcasting to Cuba," the report said. "The agency is unable to capitalize on public diplomacy opportunities due to this disproportionate allocation of television resources."

The report said TV Marti broadcasts were limited to the 3:30 a.m. to 6 a.m. time slot so as not to interfere with Cuban signals, and that successful Cuban government jamming has shielded most of the island from service. TV Marti has also prompted Cuba to jam Radio Marti's "influential" AM broadcasts, further hampering the flow of information to Cuba.

TV Marti and Radio Marti have long been criticized by the NAB, which sees the services as potential threats to U.S. broadcasters who would be susceptible to Cuban retaliatory interference.

"It makes little sense to fund a post-midnight program of news, 'I Love Lucy' reruns and old World Series games with federal money when no one can see it," NAB President Eddie Fritts said in a recent letter to Congress concerning TV Marti.

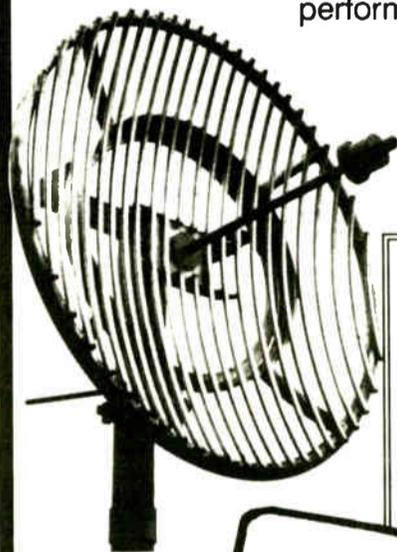
TV Marti also has been criticized for its unusual transmitter system, which has not been without problems. The service was hampered this spring when the balloon's anchoring cable snapped.

USIA spokesperson Beth Knisley said the agency had no comment on the TV Marti criticisms raised in the bi-partisan commission's report, but added, "We are pleased with the positive things that were said about Voice of America in general."

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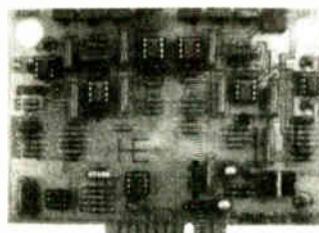
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Radio's Future Is Interactive

by Arthur Cole

WASHINGTON With the capability to order goods and services over the air currently shaping up as the next big advance in television technology, there is a substantial movement underway to bring that capability to radio as well.

A number of companies have proposed interactive television systems, which would enable viewers to order goods and services, do their banking, play along with game shows, and essentially chose what broadcast services they would like, rather than passively watching whatever is on the air.

At the FCC, attention is focused on recent comments submitted by several developers whose IVDS (Interactive Video Data Service) systems could be up and running by next year. Although most systems are currently geared toward television, some could be adapted to radio.

National Public Radio (NPR) is attempting to foster greater awareness of radio's potential for interactivity, according to NPR General Counsel Karen Christensen.

Why not radio?

"There is no reason why we couldn't have buttons on a radio receiver to make it interactive," she said. "People could record votes on town meeting issues or who knows what else."

"Interactivity has been raised in a video context. We want (the FCC) to be aware that interactive technology can be audio-only as well," Christensen said.

As with most new broadcast services appearing before the FCC, the major dilemma is how much spectrum should be awarded and where it should be located.

Currently, TV Answer, a Virginia-based outfit that started the ball rolling on interactivity by calling for a Notice of Proposed Rulemaking (NRPM) for IVDS, has asked for a one megahertz

spectrum allocation between 218-219 MHz. However, it appears that only a half-megahertz will be awarded—either at 218-218.5 MHz or 218.5-219 MHz.

Of the four proponents of video interactive systems that filed comments with the FCC, two said they could adapt their system to radio. Ironically, Radio Telecom and Technology Inc., of Perris, Calif., could not offer radio service because its system utilized TV's vertical blanking interval (the time gap between video scan lines) rather than additional spectrum for interactive transmission.

Interactive Systems Inc. of California, which modulates its data stream at a low level so as to be discernible from a video signal, also could not offer interactive audio, according to the company.

Video first

Spokesmen at the other two IVDS firms, TV Answer and Portel Services Network, said their systems can be tailored to radio. The companies, however, will focus their start-up efforts on video services.

"It seems that we could easily customize the system for radio," said Jack Johansen, president and CEO of Portel Services, who has developed an interactive system using phone lines and a specialized telephone receiver. "Right now, we envision three applications—fixed home service, a walk-around cord-

less unit and a cellular phone. So radio is certainly possible."

Sallie Olmsted, spokesperson for TV Answer, said that the system can also be adapted to radio, but the company is "very dedicated to video at this point."

"Visuals are very important in our system," she said. "We haven't pushed on the radio side."

One radio pioneer

With the sights of most IVDS proponents set on television, one group is gearing its interactive system for radio.

Gary Noreen, president of Radio Satellite Corp. (RadioSat), said his interactive car stereo unit will offer two-way data transfer to commuters.

The system will be outfitted with a voice-recognition device so a commuter can speak a sequence of words to send a short data transmission via satellite to RadioSat's planned earth station.

Like video interactive systems, the return data can contain purchases, information requests such as the latest travel advisories or updates on the financial markets, responses to listener polls, etc. Brief messages can also be forwarded home using RadioSat.

Noreen said the unit also can tie customers into the U.S. government's Global Positioning System, which will track a car's position in relation to nearby hazards such as tornados and chemical

spills. The car unit is then capable of warning the driver if a hazardous situation is nearby.

Planned for 1994

The units will be available in 1994, shortly after the launch of a Hughes satellite that will transmit the service. The cost is expected to be about \$200 more than a standard car receiver, Noreen said.

The amount of bandwidth RadioSat requires is "on the order of tens of kilohertz expanding to hundreds of kilohertz" depending on how many people sign on, Noreen said.

"Our bandwidth requirements are almost negligible," he said. "People will transmit rather infrequently, so we can get many users on a system very cost effectively."

At this point, Noreen said he is not aware of any competition to his planned service.



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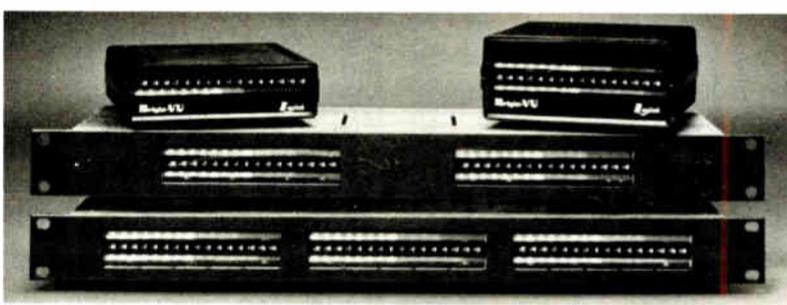
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New Bill Looks at AM Stereo

(continued from page 1)

are broadcasting in stereo.

Pressler put heavy emphasis on the FCC's decision to let an AM stereo standard emerge from the marketplace. "The inability of the market to decide between competing systems has left consumers, equipment producers and broadcasters in limbo," he said. "It is important for the FCC to prevent further confusion in this area by taking action now."

The senator stressed that rural states such as South Dakota have numerous AMs, and these stations stick with the

band because of its greater transmission distance.

"The thousands of farmers and ranchers in rural South Dakota, many of whom are without AM stereo, want to receive better quality sound. AM stereo is the solution because it can broadcast greater distances than FM stereo."

At a meeting with members of the press June 21, FCC Chairman Al Sikes disagreed with the notion that the lack of a standard has left AM stereo at a standstill in the U.S. He maintained that broadcasters and receiver manufacturers

have already demonstrated a preference for one system over the other.

Sikes said that if he had been on the Commission when AM stereo was first being considered, he "would have moved to set a standard," acknowledging that the FCC's inaction may have "set back the cause of AM stereo." However,

as well as continuing problems with electrical interference and a public perception that the band is inherently inferior to FM.

Some AM stations in Pressler's home state said even if a standard is selected, it may be a long time before they benefit from a move to stereo.

Acknowledging the better quality of AM stereo, Jim Lowe, GM at KSOO in Sioux Falls, South Dakota, tempered his optimism with economic reality. He said stations still have to purchase stereo equipment, taking a large bite out of a station that may be barely surviving.

The overall economic health of AMs is not as good as FM's, according to NAB



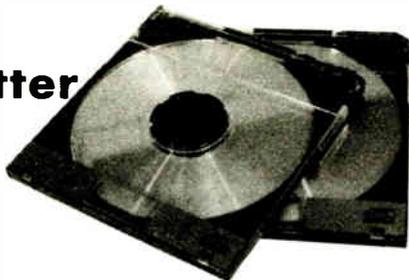
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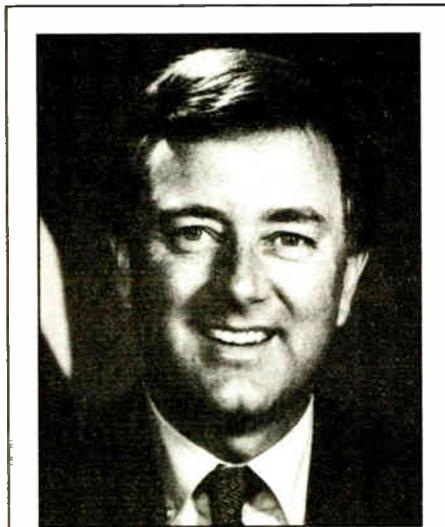
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"It is important for the FCC to prevent further confusion . . . by taking action now."

—Larry Pressler
(R-S.D.)

he added that reopening the issue "would be to raise a question where no question today exists."

Here we go again

The Pressler bill was introduced with little fanfare and discussion (the NAB declined to even comment on the matter). Legislation has been introduced in the past to require an AM stereo standard, but such bills have usually gotten lost among other, higher-profile legislation.

One bill, introduced by Rep. Matthew Rinaldo in 1989 would have required AM stereo in FM stereo-equipped receivers; but again, the bill did not specify which system should be the standard.

A spokesman for Rinaldo's office said the bill has not been resurrected in Congress because stereo is likely to be addressed in the FCC's pending AM improvement package.

The Commission's AM action will take into account a multitude of problems that AM has faced in recent years, not just lack of a stereo standard, according to the FCC.

Those problems include bandcrowding—which has led to narrower receiver bandwidths and poorer sound quality—



"(Reopening the issue) would be to raise a question where no question today exists."

—Al Sikes
(FCC)

surveys. Fewer of them turn a profit, and are therefore less likely than their FM counterparts to invest in new equipment immediately.

Lowe also pointed out that in rural, less affluent areas such as South Dakota, AM listeners are less likely to plunk down extra money for an AM stereo-equipped receiver or drive an expensive car that has one.

AM stereo equipment manufacturers, who were not overtly optimistic because similar legislation has been introduced before, said they would like to see the U.S. finally adopt a standard.

"We are the only country (that has taken a position on AM stereo) to take a free market approach, and we wonder why it has failed," Broadcast Electronics' Manager of Product Management Bill Harland said.

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USA Digital Hopes for In-Band Fit

by Steve Crowley

WASHINGTON Can DAB fit in the existing FM band? Six U.S. proponents think so: USA Digital, Kintel, Mercury Digital, LinCom Corp., Synetcom Digital and American Digital Radio.

Eventually we'll look in detail at all the in-band systems. We've already had many columns covering the out-of-band systems like Eureka 147 and Stanford Telecom—those designed to operate in an

exclusive allocation of spectrum—and I'll continue to write about those as developments warrant. But for this installment, we'll look at USA Digital.

There's no doubt that there are a number of ways to get digital audio signals into the FM band. But will they provide for a practical DAB service? There are many tough questions that researchers now are trying to answer.

Will coverage be equivalent to FM? How many channels can be squeezed in? Will re-

ceiver complexity be low enough to make the service economical? Will multipath resistance be as good as out-of-band systems? Does it need to be?

Attention at NAB

The in-band system getting the most attention at the NAB convention in Las Vegas was USA Digital, a consortium of Gannett Communications, Stanford Research Institute and Corporate Computer Systems. There also is input from CBS,

Group W and other broadcasters.

USA Digital says that its DAB system, "Project Acorn," will require no new spectrum. At the current stage of development, USA Digital is sure FM

CONSULTANTS CORNER

compatibility will be achieved. Research is ongoing into making a system that would work

in the AM band as well.

The system works by placing the DAB signal "beneath" the FM signal. It does this by combining the DAB signal with the FM exciter signal and sending the combined signal to the transmitter power amplifier. The DAB signal is kept at a much lower power than the FM signal, so the FM signal does not receive interference.

At the receiver, the main FM signal is canceled out and the lower-power digital signal is demodulated. The modulation scheme is called Coded Poly-Vector Digital Modulation (CPVDM).

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The advantages

According to its developers, Acorn DAB's advantages are no new spectrum requirements, minimal economic displacement for broadcasters, reduced risk of new terrestrial competition, reduced administrative responsibilities for the FCC, low implementation costs and fast implementation time.

The system has yet to be tested in a mobile environment. It is hoped that this will be accomplished in late 1991 or early 1992. The goal of USA Digital is to have the system implemented in 1994 or 1995.

What about AM stations? USA Digital is developing a system that it hopes can exist in the AM band as well. Because of the smaller bandwidth available to AM stations, the data rate and the audio quality of AM-band DAB would be lower than that of FM stations. The feasibility of practical implementation in the AM band is less certain.

USA Digital has come a long way in a few months. There's not much free spectrum that's suitable for a DAB service. As television is doing with HDTV, radio broadcasters may have to look at their own spectrum in order to implement a DAB service. Acorn DAB and other in-band proposals are a step in this direction.

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

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It's Hard to Believe Hard Disk Progress

Dear Alex,

Hot July here in Connecticut, right in the middle of a summer filled with plenty of personal and professional growth. I just picked up an A- in my acting class (college credit and an enhanced approach to commercial copy interpretation, to boot) and just began bluegrass fiddle lessons ... for the hell of it. Summer Fun in '91 for ole Al.

I'm also wading through stacks of technical brochures and the usual trades. Do I get mail? Heck, I've got piles.

I've also got diverticulitis, but that's another story ...

On the same day my June 12 RW got here, my June "Electronic Musician" magazine showed up. Once I finished with the Technology Breakthroughs pages in RW (and stopped drooling over the new generation of digital record and playback devices), a little voice in my head told me to seek out the Technology Page in EM—I beheld a sight I wasn't ready for.

Gary Hall profiled hard disk developments, especially one remarkable 60-Meg jobbie that was only five ounces with a platter about 2½ inches wide! The whole blasted drive was about the size of a Screts tin. On top of that, Alex, steal a fast look at your wrist watch ... that's the anticipated size of the generation of discs to follow.

Can you believe this? Only now am I perusing many of the spec sheets of contemporary audio storage devices, but already I find myself hungering for the speed, power and reduced size of these little buggers. In all honesty though, my home studio and station studios have a ways to go before digital recording technologies lock in in a major way, let alone with five-ounce drives.

Except for having a good time chain-sawing waveforms on the Korg DSS sampler and testing "How-Fast-Can-You-Fourier" on a friend's Fairlight, my two favorite digital audio playback systems continue to be my Syracuse "Burp Mug" and my "Final Word" keychain module.

Heading the list, my mug is rather charming, somewhat innocuous and extremely rude whenever jostled—unleashing a digitally sampled burp of garmongulous depth. Audio nut that I be, I popped the bottom to see what made my little toy do its legendary thang, but was disappointed to see the chip potted under a gob of epoxy (or was it Sankoru FG-84?), rendering

it invisible to my eye.

Now there's a plus side to digital audio playback technology. A man can drown in quicksand, but trap him under a blob of putty and he can still burp on command.

As for "The Final Word," you've seen this ... a little black box-n-button that ends arguments with a ripping "You're an %•&*, you \$*•%!." Fun, and only a little dangerous. If you ever get one, Al's Handy Survival Tips advises you

A man can drown in quicksand, but trap him under a blob of putty and he can still burp on command.

to never keep it in your pocket *button side out*. Recently, a kindly old gent held the station door open for me whilst I was maneuvering a heavy, awkward box of remote gear out to my car. I smiled and said "thanks," and a voice coming from my pants added, "... you \$%&• jerk!" when the box bumped my front pocket. Ooh, the look he gave me ...

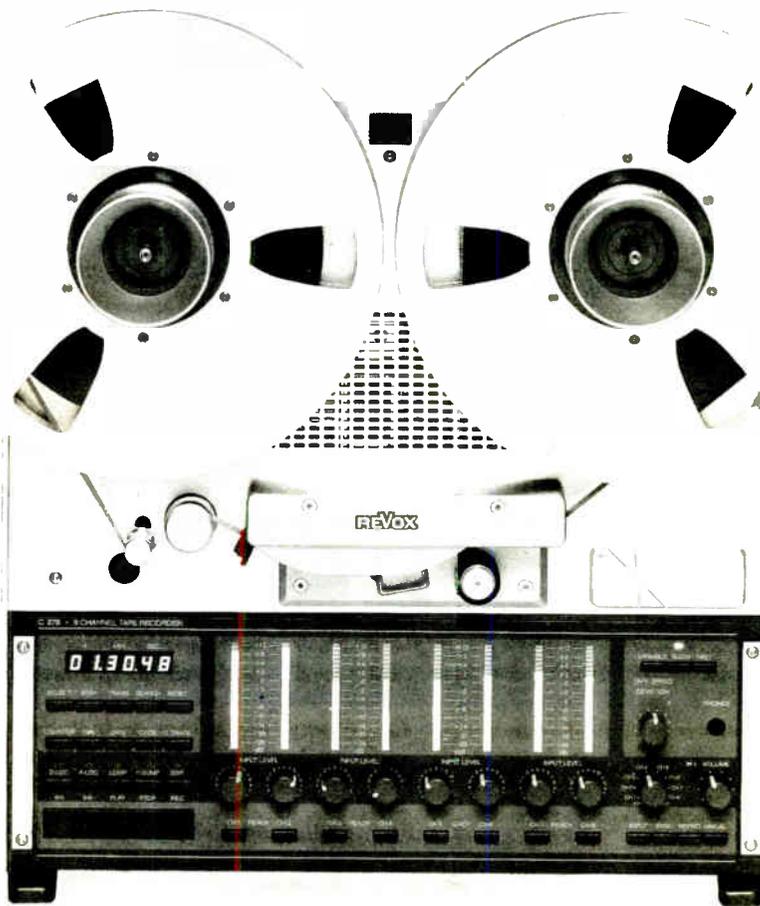
Over the next few months I hope to scare up a buddy at a station somewhere who's got one or two of the newest digital doodads so I can learn what they are—and aren't—capable of doing. Having the paperwork on them is fine, but things are happening too fast to fall behind even a little. I'll keep circling those numbers on Tiana Hickman's Reader Service cards for the literature and hope to sit down at a console real soon to watch the sparks fly or execute a little fancy cut and paste—it's the future and it got here before I missed it.

Look at it this way, Alex: Fate itself dictates my direction in my field. What do you get when you break up the word "Digital" into its component syllables? "Dig It, Al!" Well I do. More each day.

—Al

Al Peterson is WLAD/98Q's production manager and celebrates two years this month writing "From The Trenches." Tiana's heard him play the fiddle and suggests he continue working the day job.

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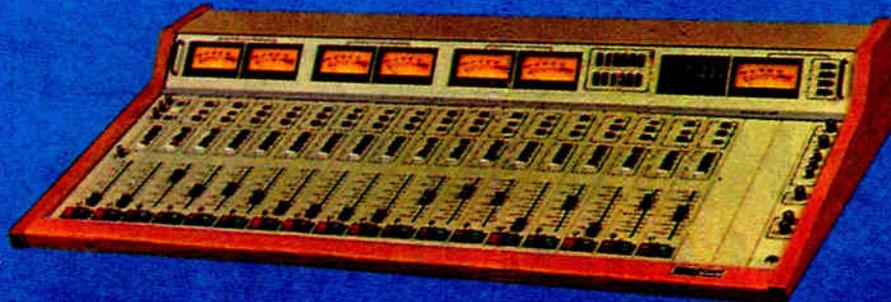
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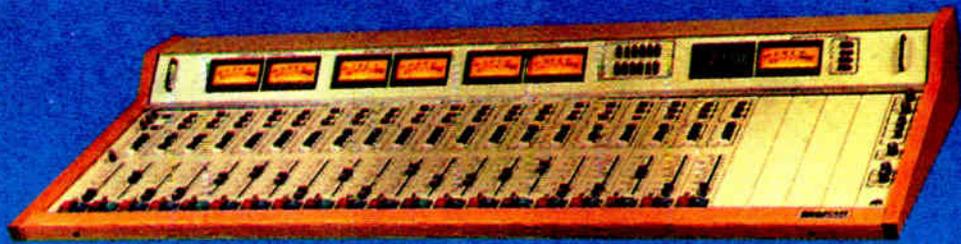
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World Radio History

Use HyperCard to Drill New Radio Operators

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. So now what?

Maybe when you sold the manager on the idea of 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. A good starting 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 going with HyperCard 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 with True/False, Fill in the Blank and Multiple Choice. Each question will be on a separate card and the user will navigate either by clicking on left/right arrows or using the keypad.

Typical true/false

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.

Script writing can be simplified by having one script for both True and False, and pasting it in each button. The finished script might look like Figure 3.

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. Label the button of the correct answer "True" and buttons over the remaining answers "False." A multiple choice question is illustrated in Figure 2.

STATION SKETCHES

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 may be a button labeled Verify Answers that compares this input with the right answers. A sample of this type of card is shown in Figure 4.

Sometimes novice stackware developers get carried away with all of the painting/graphic capabilities of HyperCard. Too often this leads to visually cluttered screens that are hard to decipher. When creating new cards, the "less is more" axiom usually is appropriate. Screens should be of a simple design that lets the user find buttons easily.

Another common problem with stacks is the lack of navigational aids. Without

Figure 1.

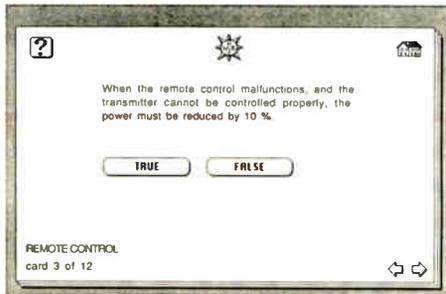


Figure 2.

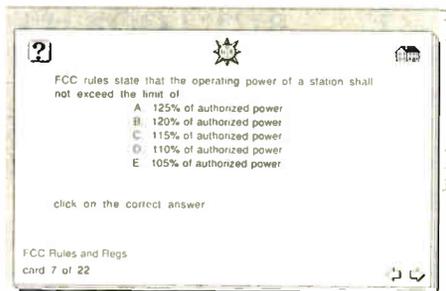
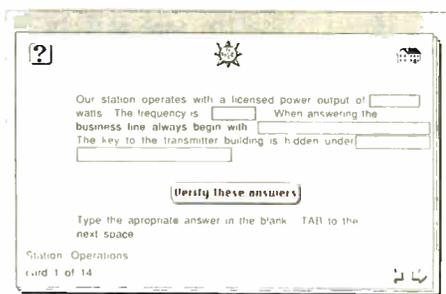


Figure 3.

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

Figure 4.



these, users can easily become lost and frustrated. A complex program should contain a map screen. This would use highlighted text or check boxes to indicate sections that the learner has completed. Such a screen would be available in the introductory section and also would be accessible by a Map button on the cards.

Highlighted

Simpler programs may just have an outline menu with topics and sub-topics. Again, completed sections would be highlighted so that 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.

Within a section, it's a good idea to inform the user which section he's in, which card and how many cards are left. This may be easily accomplished by putting the info in a small box in the upper right corner (i.e.: Transmitters card 3 of 17).

You'll need such essential buttons as Right Arrow for "move forward," Left Arrow for "move back," Question Mark for the "help" stack and a House for "return to the home card." Remember that the function of these buttons may not be intuitive to novice users, so be sure to explain their purpose in the introduction.

(continued on page 23)

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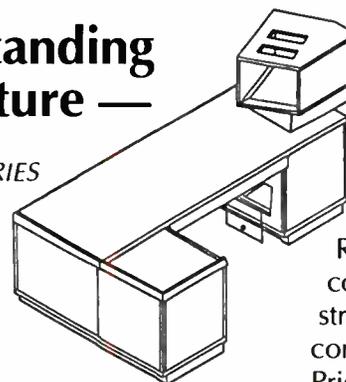
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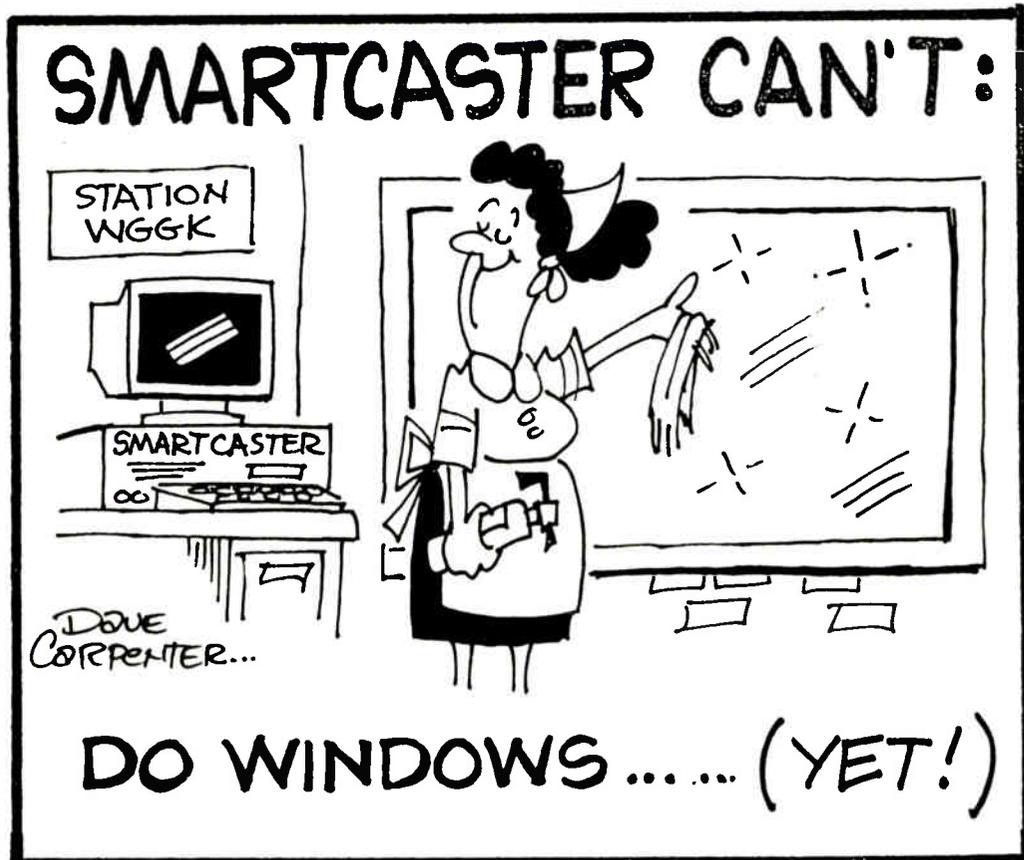
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WORKBENCH

Remote Possibilities

by John Bisset

FAIRFAX, Va. The installment of *Workbench* that focused on remotes brought some great comments. Thanks for your input.

WPHR CE Barry Thomas provided this tip if you are using several different types of RPU transmitters. Barry has the Marti RPT-2, RPT-15 and RPT-30 in his remote trucks.

On remotes, Barry usually feeds pre-mixed audio into the rear input connector of the Marti transmitter. Unfortunately, the DB-9F connector used on the back of each of these models is not wired the same. Wanting to eliminate this incompatibility and permit free exchange of the transmitters among all remote trucks, Barry found that the only difference was pin 2. The line input to the RPT-30 is balanced, using pins 2 and 3.

However, on the RPT-2 and RPT-15, the "aux" input is unbalanced and uses only pin 3 and ground. Since there was no need for the RF sample that shows up on pin 2, the trace was cut and pin 2 was grounded. The next step was to feed either unbalanced or transformer balanced audio. Now, each truck can be wired to accept any transmitter. Barry Thomas can be reached at WPHR in Cleveland, 216-348-0108.

★★★

If your Continental sales rep can arrange a Continental FM Transmitter School in your area, don't miss it. Though coordinated by the local sales rep, these are *not* sales-oriented. Instead, look for a full day of nuts and bolts, get-your-hands-dirty information on maintaining FM transmitters.

Continental's J. Fred Reilly presided over the session held here in Washington, D.C., and provided some interesting suggestions. One involved feedline. We've all seen the one or two loops of inductance placed between the output of an AM A.T.U. and the tower.

J. Fred suggested the same "lightning deterrent" for FM feed lines as they come down the tower and into the building (If this catches on, maybe the makers of rigid line will offer a "rigid loop" to be mounted at the base of the tower). Some of his other suggestions included such simple tips as not operating the transmitter blowers with the door open for very long.

I'd always thought the big concern was inadequate tube cooling. It turns out that without the back pressure that is present when the doors are closed, the blower will bite too much air. This can cause the impeller to blow apart or—at the very least—over-current the blower motor. If you're planning a new transmitter site, J. Fred Reilly's presentation is a must. For information, contact your local Continental sales rep, or circle Reader Service Number 25.

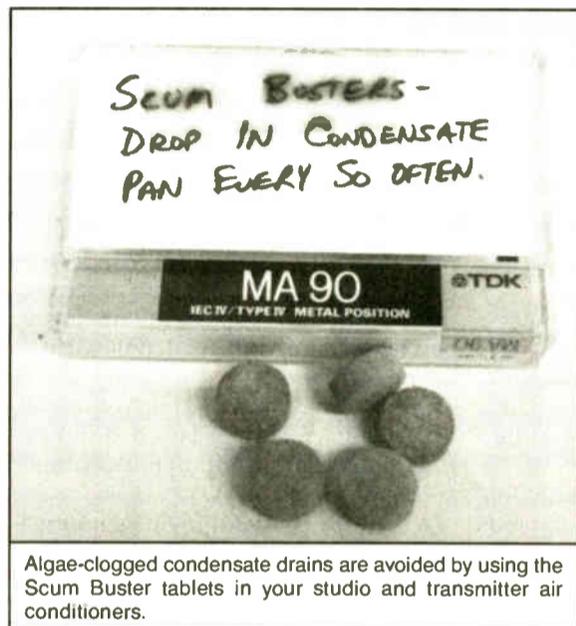
★★★

Anyone who has worked with the older all-tube 500 and 1 kW transmitters has probably heard the warning of not handling tubes with bare hands, due to transfer of oils onto the glass. Well, the idea transfers over to the higher power FMs too

and can actually be a diagnostic tool.

It seems that getting this human contaminant on the ceramic of the tube can cause discolorations. The discolorations may be misinterpreted as arc marks when tube change time comes around.

Next time you change tubes, pick up a cheap pair of cotton gloves and slip them on your hands first. When you remove the tube, you'll be surprised how clean and new it looks. And, if there are



Algae-clogged condensate drains are avoided by using the Scum Buster tablets in your studio and transmitter air conditioners.

any burn marks or discolorations, you'll know your hands didn't cause them.

Ever wish for a "portable" wall jack? You know, the kind that you could move three weeks after you installed it because an office is moved or the sales bullpen changes? Well, the Caddy Fastener people have the next best thing to a "portable wall jack" in their DSB Box mount.

Next time you need to run a new phone jack or computer cable, pick up these aluminum lifesavers.

Simply put, they permit the mounting of an electrical box into drywall up to 1 1/4 inches thick. All that's needed is a drywall saw. You cut the hole, insert the DSB, bend the flanged fingers and insert the box. Granted, these are not load rated, but they make for a clean installation.

Erico Products, the makers of Caddy Fasteners, will send you a sample so you can see how easy they are to use. For information, circle Reader Service Number 81. Erico products is located in Cleveland.

★★★

As we approach some of the hottest days of summer, thoughts may turn to that cool transmitter site. Before you get too comfortable pulling an afternoon of maintenance at the transmitter site, you might want to invest in some Scum Busters. Dropping a couple into the condensate pan will prevent algae buildup.

Over time, the algae can completely block a drain, leaving the condensate no other place to go than all over your transmitter building floor. Infinity Broadcasting CE Dan Ryson, here in Washington, D.C., is responsible for this tip—as well as the cassette

box used to store the tablets.

I used something similar to these a few years back after our studio air conditioner flooded our engineering storage closet. All you need is one such unforgettable—and sloppy—experience to impress upon you the importance of these tablets. The hardest part of this air conditioning maintenance is finding the Scum Busters.

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World Radio History

Since you'll only get blank stares from a hardware store or Hechinger/K-Mart, ask at an air conditioning service company. Your air conditioning service reps already may be treating your system with this or a similar product, so ask. Dan Ryson can be reached at WJFK-FM, 703-691-1900.

■■■

John Bisset, a principal with Multiphase Consulting, a contract engineering company, can be reached at 703-379-1665.

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DOS 5.0 Signals New Era for PCs

by Barry Mishkind

TUCSON, Ariz. On June 11th, Microsoft released one of the most anticipated computer programs in history. Literally millions of copies of MS-DOS 5.0 (or PC-DOS 5.0) were shipped to computer stores around the world.

DOS, or Disk Operating System, is rather like your car's transmission, which takes the energy from the engine and applies it to the wheels, using the right gear for a given purpose. DOS is the underlying series of programs that controls how your computer handles instructions. Each of the 50 million IBM and IBM-compatible computers in the world uses DOS to run other programs.

The first update to DOS by Microsoft since 1987, DOS 5.0 includes a large number of enhancements that will make life easier for everyone from power users down to the novice level. List priced at \$99, the DOS 5.0 upgrade is widely available at prices as low as \$39.

Should you upgrade your system to DOS 5.0?

First of all, DOS 5.0 is the first release of DOS to use less memory than before. If you frequently try to load programs, only to have them fail with an "out of memory" message, this will be worth the price of upgrade all by itself. All users from the lowliest 8088 PC on up will benefit from this.

Furthermore, for users of 80286 (also known as "AT" type), 80386 and 80486 machines, DOS 5.0 provides the ability to put large sections of DOS into upper memory. For example, with the DOS 5.0

memory manager, you can reclaim from 50K up to 120K of lower memory, freeing as much as 628K of the lower 640K for your programs.

Many of us accumulate a lot of drivers and TSR (Terminate and Stay Resident) programs—the ones popped up by "hot

KEYBOARD CONNECTION

keys." With the "Loadhigh" and "Devicehigh" commands, you may well be able to use some of those neat utilities, such as pop-up calendars or calculators that you couldn't spare memory for in the past.

DOS even contains some of these utilities ready for use. "Doskey" not only will capture and replay your previous commands, it allows you to create personal macros for use at any time.

"Undelete" and "Unformat" are two utilities DOS has needed for a long time. The first time you recover a file erased by mistake, or a wrongly formatted diskette, you'll feel you got your money's worth for the upgrade.

A couple of other notable enhancements are a "Mem" command to display free memory as well as where programs are loaded, and a much improved "Dir" command, which gives you a lot of display and sorting options.

If you use your computers mainly for DOS-based programs, such as traffic and billing, music or word processing programs, the DOS "Shell" will be of great in-

terest. The shell displays your files or a display of the directory tree structure, and facilitates file deleting, copying and moving.

Mouse-friendly, the shell allows task swapping via hot key, so you can, for example, stop work in one program to check a database and return to the exact spot you left the first program.

Part of the power of the shell is the "Edit" command, replacing the old "Edlin." Edit is a full screen editor that allows viewing and editing of text files, such as batch and configuration files. And DOS's QBasic™ interpreter replaces BASICA and GWBASIC with a reduced version of QuickBASIC.

There also are quite a few more enhancements from dealing with matters from supporting large hard drives to the "Help" facility. By typing "z/?" after a command, documentation is displayed to explain the command and how to use it.

Is DOS 5.0 a solid, reliable program? Some computer consultants will tell you never to buy any program with a version number ending in ".0," thinking that it will take some time to get rid of "bugs" and errors. DOS 5.0 is a significant change from the normal pattern because Microsoft used some 7,000 beta testers—the largest beta test in history. DOS 5.0 comes to market nearly perfect.

Even with the on-line Help command, there's much more you'll need to know to fine tune your computer. Assistance comes in several ways.

A software package providing information and help comes from Flambeaux Software. "DOS Help! 5.0" is a hypertext refer-

ence manual, which means it can react to the last thing you typed, providing context-sensitive help. Or, by following key words, you can locate tutorial help to understand how to get the most benefit from DOS 5.0.

If you'd rather have hard copy in your hands, the book shops will soon be full of texts trying to explain DOS 5.0 to users. Microsoft Press has published several books that stand above the crowd.

For example, the well-regarded "Running MS-DOS" by Van Wolverton has been updated to cover DOS 5.0 from basic concepts through customizing its advanced features.

For you BASIC programmers out there (and there are still a lot of us), QBasic brings freedom from line numbers and ease of editing. "Running QBasic" by Michael Halverson and David Rygmyr provides both fundamental and advanced programming techniques. They also show how to convert BASICA and GWBASIC programs to QBasic.

Also available are three Microsoft Quick Reference Guides. The topics are MS-DOS, Hard Disk Management and MS-DOS Batch Files. All under \$8 and updated for DOS 5.0, they provide quick answers to your most-asked questions.

Finally, let me correct a wrong impression that has brought many phone calls. When I mentioned "last call" on the free D&A program (RW, Feb. 20, 1991), some thought it was no longer available. It is available and will be to anyone sending a diskette and \$5; I just won't publish any more reminders.

■ ■ ■

Barry Mishkind is a consultant and contract engineer in Tucson. He can be reached at 602-296-3797; FidoNet 1:300/11; or on MCI Mail at 325-9883.

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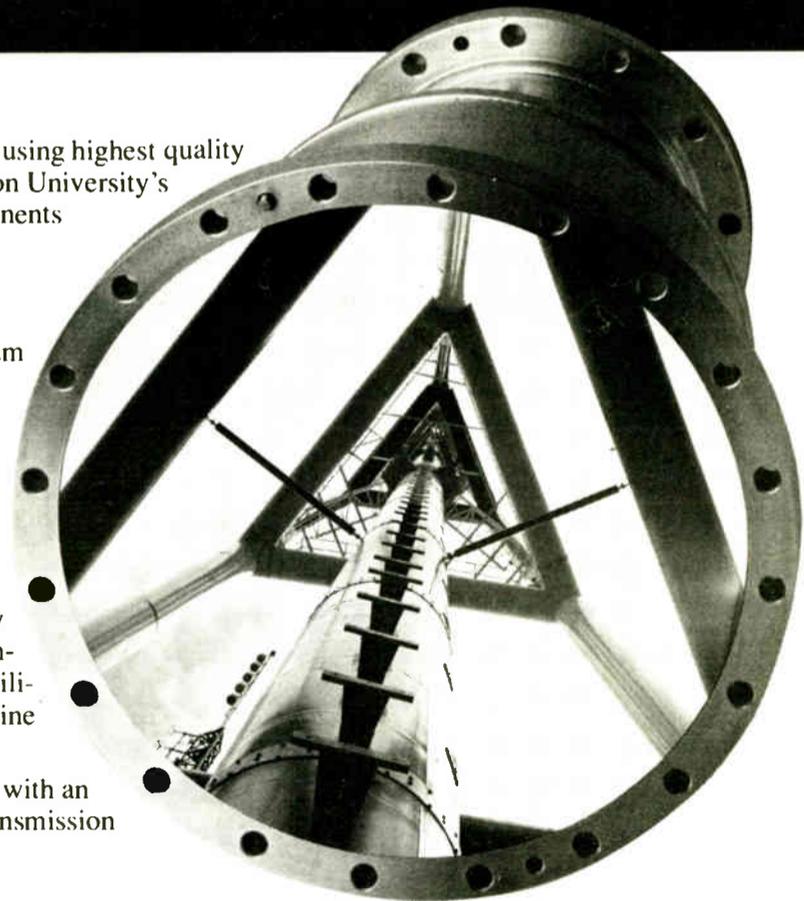
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World Radio History

Defining the Main Studio Rule

by Harry Cole

WASHINGTON Let's chat about the main studio rule. Or rather, about what's left in the main studio rule after deregulation. Or rather, about what the FCC is now saying was left in the main studio rule after deregulation.

Sound confusing? Welcome to communications regulation in the 1990s, where much of our effort, it appears, will be dedicated to trying to fill in the holes created by the 1980s' mad dash to deregulation.

Until four years ago, stations were, with very limited exceptions, required to locate their "main studios" in their communities of license. The rule containing that requirement did not explain what a main studio was, but the very next rule in the books required that at least 50 percent of the station's programming be originated from the main studio.

COLE'S LAW

As a result, to the extent that the term "main studio" had any generally accepted definition, it referred to where a station's day-to-day broadcast operations (i.e., its program origination) had to be located. And while nothing in the rules specifically addressed the question, licensees seemed content—possibly because of the obvious administrative sense it made—simply to locate *all* of their operations at the same place.

Bigger nearby communities

But some stations licensed to smaller communities preferred to associate themselves with bigger nearby communities. Because of that, they wished to put at least some of their operations in the bigger town. As more and more licensees explored that idea in the early to mid 1980s, they found an increasingly receptive Commission.

The result was a 1987 decision relaxing the "main studio" rule to permit location of the main studio anywhere in the station's city grade contour. But that same decision *deleted* the program origination rule, meaning that a station could originate less—and, conceivably, *none*—of its programming from the site dubbed "main studio." That left wide open the definition of exactly what the FCC expected a main studio to be.

A couple of petitions for reconsideration of the 1987 decision raised that very question. The FCC addressed those petitions in a 1988 "clarification," which asserted that the role of the main studio had not been "negated" by the elimination of the program origination requirement. Rather, the FCC said, a main studio must have "the capability adequately to meet (the licensee's) function of serving the needs and interests of the residents of the station's community of license."

Hmm, not much guidance there. But, the FCC continued, "to fulfill this function, a station must equip the main studio with production and transmission facilities that meet applicable standards, maintain continuous program transmission capability and maintain a meaningful management and staff presence."

OK, that at least tells us that the main studio must have studio equipment (not a big surprise) and must be interconnected with the station's transmission system so as to permit origination from the "main studio." But what is this "meaningful management and staff presence?"

In 1988, the Commission didn't bother to expand or expound on that point. Instead, it cited a 1986 opinion that did not address in any way what the Commission might have meant by the term "meaningful management and staff presence." Indeed, the only reference to staffing in that opinion appeared in con-

nection with a waiver of the program origination rule, and *not* the main studio rule, and made no distinction between management and staff.

Age of deregulation

Of course, this lack of definition did not seem to trouble too many people in 1988, perhaps because we were still in the enlightened age of deregulation, where the FCC was doing everything it could to make life easy for broadcasters.

Cut to June 1991. An FM in a small town in North Carolina is alleged to be operating its "main studio" in the bigger town down the road (about 50 miles

down the road, as it turns out).

The FCC inquires and finds that, sure enough, the station does indeed have a studio (which, not surprisingly, the station chooses to call the "main studio") in its small-town community of license.

Further, that main studio has the necessary equipment and transmission capabilities *and* it has a full-time office manager on site from 8 a.m. to 5 p.m. on weekdays *and* it has at least two other station employees, both residents of the community of license, who are present regularly (although not on a full-time basis) *and* the station's GM spends two hours at the "main studio" weekly.

The Commission's conclusion? This licensee is in violation of the main studio rule.

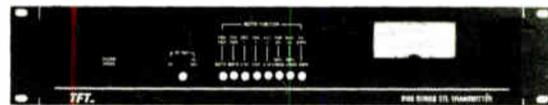
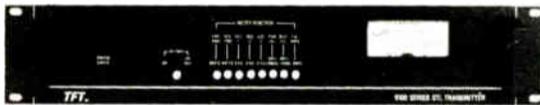
According to the FCC, a staffing situation (continued on page 21)

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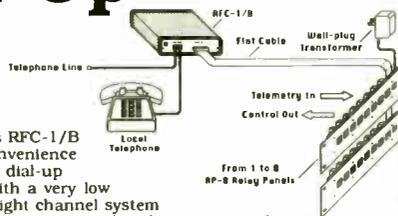
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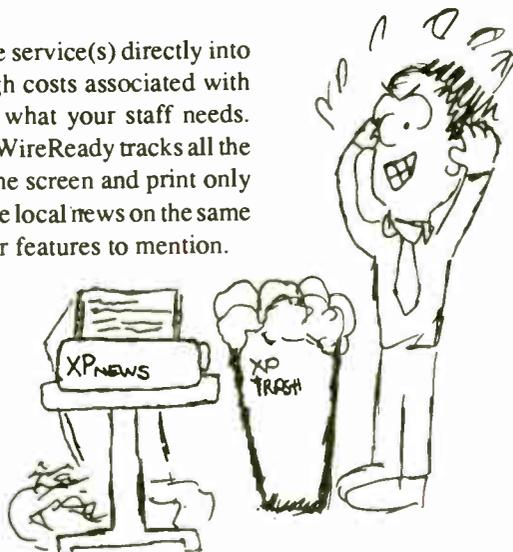
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Defining the Main Studio Rule

(continued from page 19)

like this "renders the Commission's concept of a main studio virtually meaningless." Rather, "a main studio must, at a minimum, maintain full-time managerial and full-time staff personnel."

Well, now we know. Or, more accurately, now we know more than we did. There still are some obvious questions, like how many staff personnel and which managerial personnel? Also, are there particular activities that have to be conducted at the "main studio," or can it be used for any station-related purpose?

A more fundamental question is raised by the FCC's decision. The licensee had argued that its management participates actively in civic affairs in

the community of license, and that that has served as a "functional equivalent of meaningful management presence at the studio." The Commission flatly rejected that claim.

What is the purpose?

But what, then, is the purpose of the "main studio" rule? The Commission has consistently said that the rule is intended to ensure a licensee's familiarity with the needs and interests of its community of license. If the licensee, through its management, is taking affirmative steps to ensure such familiarity, why are those steps "irrelevant" to the "main studio" rule, as the FCC now says?

Does the FCC mean that it is more important to have a certain number of

employees working at a particular site than it is to be sure that those employees are, in fact, in touch with the community?

This situation is aggravating. The Commission had a clear opportunity in 1988 to address precisely what it meant by a "main studio." It declined to do so, providing instead virtually no guidance at all. The current Commission now apparently recognizes the near total lack of standards, but it has not clarified the situation much. At best, the Commission has placed the industry on notice that the regulation/deregulation pendulum is swinging back toward regulation.

Licensees who may find themselves in potential violation of the "new" standard may take heart. It appears

that the North Carolina licensee has not been fined, but instead has merely been ordered to bring itself into compliance.

But that apparent forbearance by the FCC may not have been completely altruistic: The Commission may simply not have wanted to risk defending a fine in court, especially a fine for violation of a rule which is, on its face, absolutely silent with respect to the conduct for which the fine was issued.

In any event, the word is out: Your "main studio" should apparently have full-time management and staff personnel on site. If your operation doesn't jibe with that "standard," you may wish to take some corrective measures. (A call to your communications counsel might be a good first step.)

■ ■ ■

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

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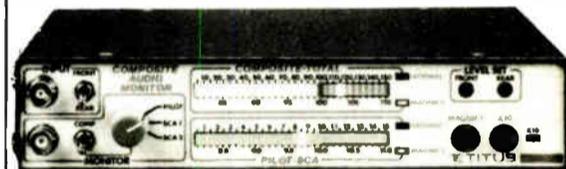
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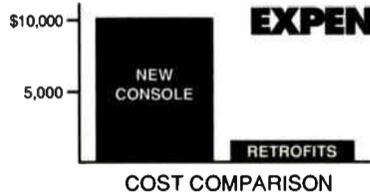
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Circle 121 On Reader Service Card

World Radio History

The Unique Selling Proposition

by John Cummuta

DOWNERS GROVE, Ill. Most entrepreneurs go into business because they're good at what they do. They've had success as employees and decide that they could keep more of the money if they owned the business, so they move out from under their employer's umbrella and strike out on their own.

In recent columns we've been looking at the realities facing one particular kind of entrepreneur: The broadcast engineer who offers his services to multiple stations as a free-lance or contract service provider.

It doesn't take most of these new business owners long to realize that there's more to running a successful business than just being good at broadcast electronics. Over the past few months we've examined many of the operational and financial realities of owning a business; last month we began focusing on what is probably the key component of any successful business: marketing.

Everything is marketing

There is virtually *no* part of your business that is not, in the final analysis, related to marketing. Obviously the quality of the service you provide (product quality) is a facet of marketing, but you may not have considered the way your car or truck looks through your client's window; or the cleanliness and orderliness of your invoices and statements; or the way your phone is answered; or the way you dress; or the way you collect overdue bills as being components of your marketing effort.

Anything that makes or has an impression on present or potential customers is marketing. But, before we organize everything in our business to present our positive and consistent message to our marketplace, we must decide exactly what that message is and how it will look to

prospects and customers.

As we discussed in our last column, the *only* perspective that matters is the customer's. If you think that what you have is a good value—but your prospects think it's not—they may be wrong, but *you* are the one who goes out of business. The essence of marketing is persuading the marketplace that you do indeed have some value for them, and that you have *more* value than that offered by their other options.

This is a critical point to successful marketing. No one *has* to do business with you, so you have to get them to *want* to do business with you. When you make them aware of their need for whatever you're

offering, your prospects' first instinct is to begin looking for options to your proposal. They want to make sure of two things:

ENGINEERING MANAGER

That they really need what you're offering, and that they can't find a better deal somewhere else. To succeed, your proposition needs to stand out from your prospects' other options.

This is where you need to develop a Unique Selling Proposition (USP). If you

don't have some kind of USP, you don't really deserve to succeed in business.

When I managed radio stations it always amazed me how many advertisers expected people to drive past their competition to get to their place of business—just because they asked them to in a commercial. It's like the people who put a facts-only ad in the Yellow Pages and sit back waiting for the phone to ring.

Reason for business

The fact of your being in business does not mean that you deserve business to come to you. You need to have a *reason*. That reason or advantage is your USP, and if you don't have one—create one.

You see USPs in effective TB commercials, when one car dealer extends the manufacturer's warranty or when a

(continued on page 25)

Using Your HyperCard

(continued from page 15)

For your premiere HyperCard development project, you'll want to start small. A 10-volume "Introduction to Broadcasting" might be a bit ambitious for your first effort. It's best to start with a manageable stack, finish it and go on to bigger things from there.

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. Here, the support of a Macintosh users group can be a real life saver.

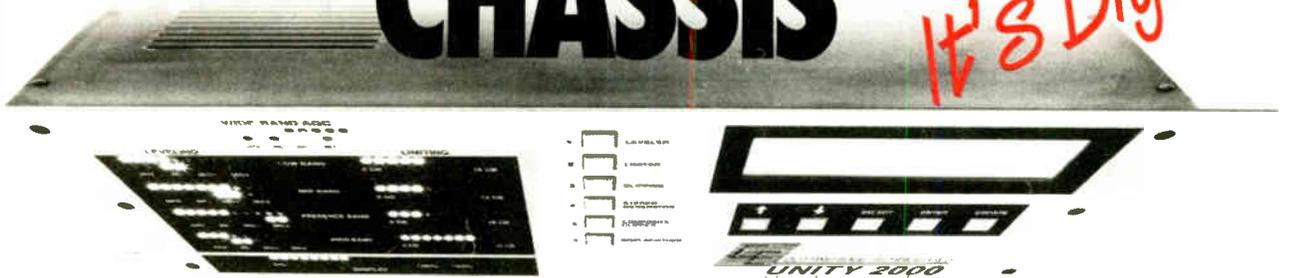
One of the largest Mac groups can be found in the Boston Computer Society. There's a very active HyperCard subculture there. For information, you can write: BCS Mac, 48 Grove St., Somerville, Mass. 02144; or phone: 617-625-7080.

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Tom Vernon divides his time among broadcast consulting, computers and instructional technology. He can be reached at 717-367-5595.

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Surf and Sound in Panama City

by Dee McVicker

PANAMA CITY, Fla. "Come spring break, it's all college kids," enthused Tom DiBacco, describing the migration of college students to Panama City Beach, Fla., during spring break. "This is the new spring break headquarters."

Near this sugar-white beachland is where DiBacco and his wife decided to purchase their first radio station, WRBA-FM. In the radio industry since age 13 and having worked his way up to GM of two stations, DiBacco was ready for the challenge of station ownership. WRBA-FM, located in Ar-

bitron's 212th market of Panama City, had the potential he was looking for.

Given the right format, reasoned DiBacco, the FM would appeal to the

FACILITIES SHOWCASE

visiting college students as well as other tourists, who hit the beaches in numbers as high as 2.5 million every year—a contrast to the county's local population of only 150,000.

But WRBA-FM needed some work be-

fore airing the kind of format DiBacco had in mind. "The station isn't old, it was built in 1987," he said. "But it was built with limited capacity."

That would change.

Unhooked from automation

DiBacco and his wife signed papers in December 1989, taking over ownership of the station under their company name, Styles Broadcasting. Soon after, WRBA-FM was unhooked from an automation machine and from a satellite service that had been piping in a "mellow" format.

Instead, DiBacco elected to air what he calls a hot adult contemporary (AC) format, which required not only a new library but a new studio and facility as well. His search for a suitable building for the station ended five months later when DiBacco found a 3,000-square-foot facility that had once been used by a real estate company. A single level, WRBA's new address on 23rd Street in Panama City would prove to need some renovation.

"It took a lot of work, being that this place had never been a radio station. But it was worth it," DiBacco said.

With offices for the sales and office staff already existing as remnants of the real estate company, DiBacco began the project by partitioning the studio complex into three studios—an on-air, a two-track production and a news studio.

Electing not to rely on external sound absorption panels, he accomplished soundproofing by insulating walls with heavy construction material. "We put all of our soundproofing material inside the walls and then carpeted them

for added absorption," he said.

The first station in the area to air its format completely from compact disc, according to DiBacco, WRBA-FM discarded the automation system for new Denon 950 CD players. This critical purchase, said DiBacco, was based on an important consideration. "The biggest problem with CDs is that they get handled and then they start to skip," he explained.

Listener contests

The three Denon CD players the station purchased for the on-air studio virtually eliminate this on-air embarrassment by using cartridge CDs that



The new on-air studio at WRBA-FM in Panama City, Fla.

protect discs from being handled. For WRBA's heavy commercial load, on-air announcers have access to five new Fidelipac CTR 100 Dynamax cart machines. A new Otari MX5050BII also is used in the air studio for listener contests.

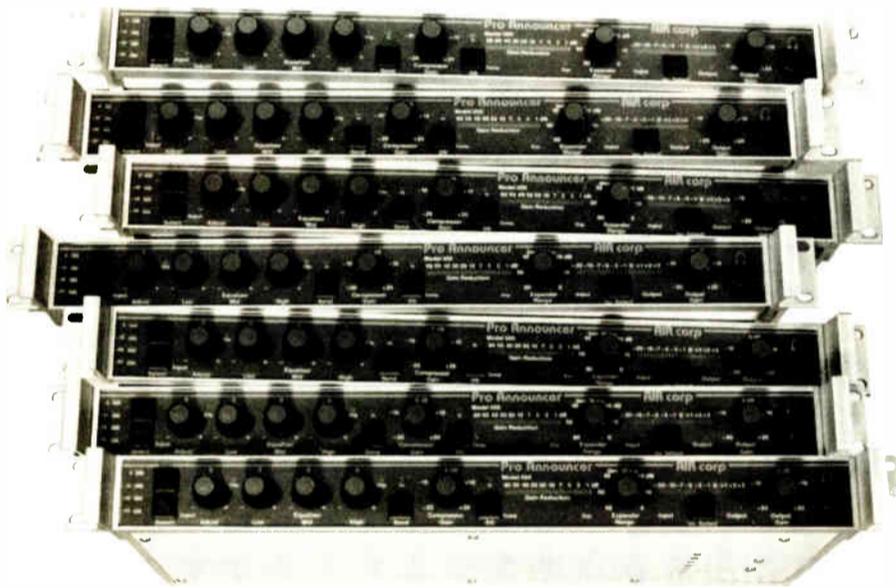
One of DiBacco's more critical studio decisions was selecting consoles for the station's new live programming. As an automated station, WRBA-FM had been using the Autogram IC-10 board for occasional live assist. Now with a live adult contemporary format, WRBA-FM would demand more of its on-air console in both durability and quality.

Although the Autogram had not been exposed to the kind of use an AC format demands, DiBacco was confident that it would hold up to heavy use. Instead of purchasing a new board, he decided to invest in module upgrades for the Autogram IC-10, a decision he

(continued on next page)

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World Radio History

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Circle 102 On Reader Service Card

Determine Your USP

(continued from page 23)

consumer electronics store throws in a free tripod and carrying case if you buy your camcorder at their store. These businesses are offering you clear advantages over their competition as reasons to pass by those competitors to come to them.

If the advantages of the extended warranty or the tripod and carrying case have value for you, they will influence the decision you make and the action you take.

You *must* give your prospective customers the same kind of clear advantages to do business with you. If you already feel you have such advantages to offer, consider whether you're making them clear to your marketplace.

Put it up front

One of the most common mistakes made by business owners who don't have much marketing experience is that they bury their USP in some dry, fact-filled brochure. If you have a distinct advantage (i.e., better rates, a guarantee, the most experience in your area, the most sophisticated test equipment, a special offer for new customers or whatever singles you out from the crowd), put it up front.

Make your USP your headline in any brochure, ad or letter communication with prospects and customers. Lead with your strength. And after you've captured their interest, you are in a much better position to bring the more

mundane facts into the conversation.

Remember the purpose of your USP: to hook your prospects or customers into believing that you offer exceptional value for their money. So always evaluate the power of any USP from the customer's perspective. You may think that your new whiz-bang analyzer is a hot item, but if your prospects and customers don't, it's meaningless.

This is where you must develop the skill of turning features into benefits. Your new test equipment is only a "feature" of your service until you show your prospect how it will benefit them. What they're looking for is more loudness, crispness, stability, bang for their buck (read audience share)—not simply the satisfaction of knowing that you used the new whiz-banger on their transmitter. Tell them about the benefits and use the features of the whiz-banger to validate your claims.

Well, that's it for this installment, but we're on the right track. In future columns we'll look at how to write good sales letters to station owners or managers, how to put together a winning brochure, how to construct a sales information package to send to prospects who respond to advertising or referrals and more.

Meanwhile, find your USP.

■ ■ ■

John Cummuta is president of Advanced Marketing Concepts, a broadcast management and marketing consulting firm. He can be reached at 708-969-4400.

Florida FM

(continued from previous page)
hasn't regretted.

The new two-track production studio also was outfitted with an upgraded Autogram IC-10 console, as well as two Otari Mark III recorders. Two new Sony CD players also were installed in the new studio.

The production staff also is taking advantage of new ITC 99B cart machines. Used for recording commercials, the 99Bs were selected because, as DiBacco explained, "we wanted to be careful of what we put on the air, to make sure everything was phased properly."

Like the two-track and air studios, WRBA's new news studio has an Autogram console. The six-channel Autogram AC-6A is surrounded by a Fidelipac record/playback cart machine, as well as a Fidelipac ESD10 Splice Finder/Eraser and Otari reel-to-reel.

DiBacco commented that the new format has been widely accepted by the market and WRBA is maintaining a full commercial log. Recently granted a power increase from 6 kW to 50 kW, WRBA soon will be undergoing renovation at its transmitter site.

■ ■ ■

Dee McVicker is a free-lance writer and regular contributor to RW.

If your satellite rates are skyhigh, Dolby digital audio can bring them down to earth.



Dolby AC-2 digital audio coding provides two channels of CD-quality audio at only 256 kbits/sec.

That means you need less bandwidth and less power than conventional analog and digital systems. Your satellite costs are lower, yet you get higher audio quality than with analog or more primitive digital systems.

Dolby DP500 Series encoders and decoders coupled with 256 kbits/sec digital modems.

Modem interface is via standard RS-422/449 connections. A 1200 bps RS-232 auxiliary channel incorporated in the data stream simplifies control operations. SCPC, band-edge, or digital video subcarrier systems can all benefit from

Dolby AC-2 combines Dolby's unique knowledge of psychoacoustics with advanced digital audio coding techniques. Frequency-domain signal processing in 24 "critical bands" confines quantization noise to narrow spectral regions, where it is masked by spectral components of the audio signal itself. Dolby AC-2 is the one digital compression scheme that combines significant data reduction with audio quality meeting the highest standards.

Dolby AC-2. For further information on the DP500, call us at 415-558-0200. That small step can lead to a big revelation, and a big savings.



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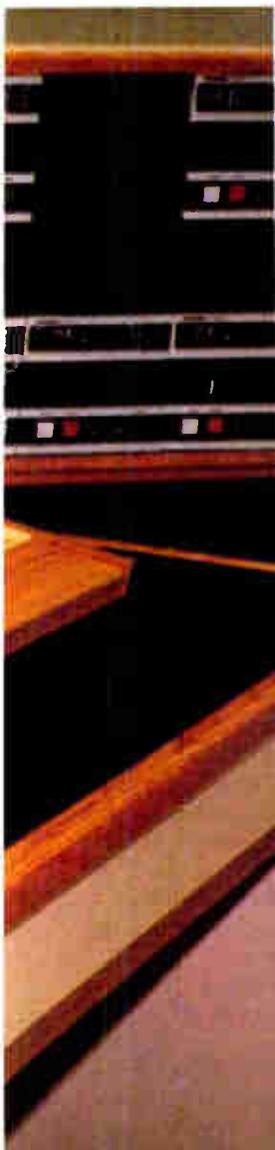


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 - Monitor DIM function during cue and talkback



NEW NEW NEW

Circle 126 On Reader Service Card

World Radio History

Build a Translator in Five Steps

by Howard L. Enstrom

MOUNT DORA, Fla. Issues and regulatory news about FM translators are regularly covered in RW, and my monthly column deals with technicalities, rules and practice.

This month I shall try to answer the question that readers have asked me about from time to time: How to get a translator somewhere. I have been asked to explain the why's of frequency searches, terrain and interference studies, coverage,

and rules and procedures.

In my own experience, I launched marketing of the first FCC type-accepted Jones equipment during the 1970s, after

LOWPOWER LOWDOWN

assisting the Tepco Corp. to add translators to its equipment production. My on-site role at the point of manufacturing came about because for years I'd been

a field engineer working out of the La Grange, Ill. office of engineering consultant Robert A. Jones.

His concept of downconversion/upconversion of a signal is embodied in all modern translators. Interest areas seem the same now, as in the beginning: What can a translator do, what about FCC rules, how does one get started?

Organize

I present now a departure from the usual translator tech-

nology and rules and offer a sort of digest of a guide explaining a five-step approach to building an FM translator station for your community, from idea to on-air.

If an FM translator does the best possible job of serving a particular area, then its role is more accurately described as "narrowcasting" rather than broadcasting (a word first heard from John La Tour, Power Du Pree Broadcasting).

Any size group can unite in purpose and give itself a name.

Each member is expected to shake some bushes and report useful information. An elected leader pronounces agreed-upon service objectives, and assigns tasks to all group members.

Incorporation may be discussed and acted upon in time, though such is not necessary from a licensee's standpoint. Ideas to promote and publicize a new community service ought to be discussed, making use of local news propagation resources.

Other discussion will be about use of existing or new sites and structures for the translator, outside and local technical assistance, financial, legal and procedural matters.

Get facts

Will the proposed primary station approve the plan and authorize rebroadcast in writing? Contact other translator groups and operators for experiences and recommendations. Obtain a copy of current, pertinent FCC rules. Survey community interest in the idea, including potential for financial support.

Would local announcements of 30 seconds per hour be useful? To what extent may the primary station legally assist? Ask to receive The Signal Source, a no-charge newsletter about FM translators published by my firm, FMTA.

Understand the legal coverage limits of the translator, and the importance of a translator's site location and characteristics.

Assemble cost estimates for publicity, promotion, frequency search, terrain study, engineering services, equipment, local installer's charges, tower leasing, insurance and possible travel costs to inspect other translator sites.

Decide

Decide about promotion and publicity approaches, system sophistication/service objectives, budget allowances, financial solicitation, collection, disbursement, banking and accounting of funds. Shall contributors be kept apprised of the project's progress?

Agree how the FCC applicant will be named, as an individual, general partnership, limited partnership, association, corporation or government authority.

Decide which professional and services to use for legal, engineering, equipment supply and terms of payment. Should the translator have facilities to make local announcements?

How will the translator be identified on the air? Decide about site leasing after consulting engineer's approval. In general, "nail down" cost estimates.

Commit

Start collecting and keeping receipts from pledge funds and contributions. File for a state charter of incorporation,

(continued on page 40)

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The Many Colors of Capital

by Ty Ford

BALTIMORE The year was 1970, the station was WNAV-AM/FM in Annapolis, Md.

It was the first station I worked for that had a full-time license, even though they chose to shut down at 1 a.m. To top it off, they had a production music library. Surely, this was the big time. I can still see the blue, green, purple and red sections of the Capitol Records Production Music Library.

The frayed edges of the jackets' spines and the cryptic hand-written notes on the covers were testament to the fact that the music within had been under-scoring and supporting local copy for some time. Now, more than 20 years later, it's somehow comforting for me to know that Ole George and Capitol Production Music is still in business.

Now that you've indulged me in my retrospective, let's move on and take a closer look at Capitol's library today. It still is divided by color and name: Red—Contemporary; Blue—High-Tech; Purple—Specialized; Green—Classical and Golden—Optional. All told, there are 50 CDs in the collection.

The lines

The Contemporary collection, or Red line, covers four different eras or feels. There is a reasonable amount of synthesizer use, but not on every cut. The early synth sounds and the arrangements used on the first eight CDs tend to give them a somewhat conservative feel. CDs #9 through #19 obviously have been produced more recently and reflect the advances in sampling and sound synthesis technology (note: these are part of the broadcast package).

The Blue line consists of 12 CDs, which contain a mix of acoustic and electronic styles that are consistent in quality with the Red collection without sounding too similar. They contain a mix of conservative and more adventurous material.

The Purple, or Specialized line, includes drama, comedy, travel, seasonal cuts, solo instruments and musical effects. The Green line contains the classical riffs and the Gold line is where you'll find vintage sounds.

It's important to note that some of the sampled sounds used in these libraries are so good that you probably won't even realize they're samples. The library also contains some pieces that combine older sound cues with newer arrangements in a very convincing fashion.

Although the newer "designer" sounds have a very high "ear candy" quotient, their main liability is that they can sound outdated very quickly. For this reason, many composers use extreme caution when using synthesized sounds, hoping to increase the shelf-life of their compositions. Capitol has done a good job of using these elements in moderation.

The exception to this rule occurs when a composer intentionally goes about to recreate a sound indicative of a certain era. David Carroll is marketing manager for the company. Carroll hinted that Capitol has such a project in the works, but made me promise

not to divulge the details. From what he told me, I think you're going to like it—a lot.

Relatively conservative

The first six CDs of the Red Contemporary collection contain between 20 and 24 themes each. CD #1 has 30-second outtakes for half of its 20 themes. CD #2 has 30-second and 10-second outtakes for eight of its 20 themes, and CD #3 has 10-second outtakes for five of its 25 themes.

All of the material on the first six CDs is relatively conservative by today's popular music standards. There's plenty of material there for those retail spots that just don't work with a crunch guitar and drums as big as God. This portion of the library also is good for industrial video and film clients.

At this point, it's worth mentioning that there are two ends of the production music spectrum. On one end, there is music scored specifically to be used in the background. On the other end exists music with such a high degree of virtuosity that it cannot be ignored.

If you're trying to get a lot of copy in and there's no time to let the music "have its way," it's actually much better to use a background track rather than one that competes with the copy for attention. Both the Contemporary and High-Tech collections span the entire spectrum.

A hidden benefit to both Red and Blue collections is that Capitol has gone out of its way to create alternate versions that sound nothing like the main theme, which means you get two different pieces of music for about 80 percent of the themes that have 30- and 60-second versions. Even though the 30-second versions are usually edits or minor reworkings of the main theme, the 60-second versions

are noticeably different.

In a few cases it's the other way around; the 60-second versions are similar to the themes and the 30-second versions differ. I'm talking different instrumentation, different tempo, different feel. In fact, most are so different

PRODUCER'S FILE

that you could use them both for beds under spots for competing clients without a problem.

That means, on a cost basis, that even though you're getting only 16 different themes per CD, the alternative or dramatized versions double the number of usable cuts to 32.

In the Red collection, with the exception of CD #10, which has 18 themes, CDs #9 through #18 each contain 16 themes. All but two of those have 30-second, 60-second and stingers of 10 seconds or less. Stylistically, this portion of the library sounds much more up to date and offers a mix of rock, funk, jazz, Euro, new age, even "industrial music" (in case you haven't been keeping up with the trends, "industrial music" uses sampled sounds of anything from heavy machinery to door slams as musical elements in a composition).

Stopwatch and a blade

If you produce TV spots, bring your stopwatch and a blade. Many of the 30- and 60-second beds run past 29.5 and 59.5 seconds. Like other libraries I've listened to, the results of editing a two-minute theme down to shorter versions sometimes means unusual changes in the composition.

Sometimes a piece just stops, without benefit of a good ending. I'd really

like to see producers make composers toe the line on these issues. Dumping the CD track to tape so you can chop it to end at 29.5 takes time and also means you're back in the analog domain (read: *tape hiss*). Requiring composers to construct their pieces to improve the flow of the shorter edits would greatly improve the impact of any library.

Capitol's Pro Plan Three is a \$3,000 annual blanket license that includes 50 CDs from all five groups, as well as additional CDs. Pro Plan Three-A, the "One-Stop Broadcast Package," is a \$2,000 annual blanket license that includes Blue CDs 3, 4, 6, 7, 8, 9, 10, 11 and 12; Red CDs 9 through 19; Purple CDs 3, 5, 8, 9, 10, and all additional releases. Capitol also offers Pro Plan Two, the \$1,500 mini-annual blanket that includes 20 CDs of your choice and all additional releases.

Capitol also offers the 50 CD library on a needle-drop basis for \$825 plus drop charges. Local and regional spot rates are \$75, "program rates" range from \$175 for up to five-minute productions to \$550 for productions up to 60 minutes.

If you're not sure you're doing enough business to make any of the blanket licenses pay for themselves, Capitol offers to put you on the needle-drop plan for three months. If it turns out it's more economical to go with a blanket, they'll apply the needle-drop fees to the cost of the blanket. David Carroll also mentioned that they also have "specials." Call him for more information at 800-421-4163.

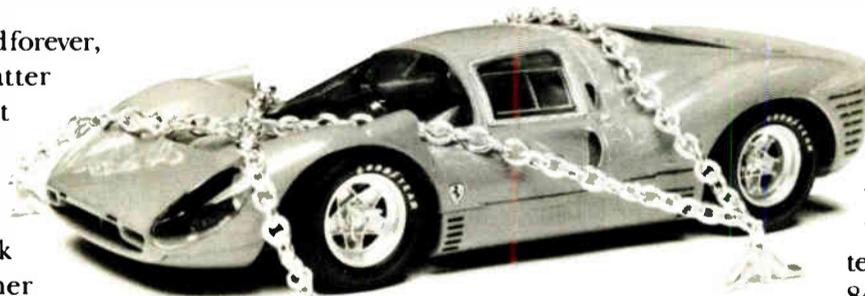
■ ■ ■

Production Consultant Ty Ford has been producing audio for more than 20 years. His studio beta tests a variety of broadcast and production equipment. He can be reached at 301-889-6201, or via MCI Mail 347-6635.

What happens when you buy a "high performance" product from a low performance company?

If electronics lasted forever, it wouldn't matter where you bought your next exciter, amplifier, STL, translator or transmitter. Track records of customer frustration would be of no concern as you simply chose the box which suited you.

Since failures not only occur, they usually take place at the worst possible time, it's a good idea to go into the purchase knowing exactly what the manufacturer will do if you need help. Will they handle your need themselves? Will they take action? Will they follow up to see if you're okay?



At BEXT, customer service is a way of life. We freely share our reference list so that those whose experience with other companies leads them to doubt our claim can hear what a difference BEXT has made in our customers' lives. Beside our service, you'll hear about the technical superiority and reliability that have made our products the growing choice of the engi-

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EXAMPLE #3

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AMPLIFIERS

Want to Sell

Phase Linear 400 stereo 400 W pwr amp, \$400. P Rebmann, WEZY, 1412 E Lime St, Lakeland FL 33801. 813-682-4191.

Dynakit SCA35 integrated amp/preamp, \$125; Shurwood S5000 stereo tube amp/preamp, \$125; Bogan DB130 mono integrated tube amp/preamp, \$75; all excel cond. W Kremer, Kremer Kraft, 301 SW 16th St, Ft Lauderdale FL 33315. 305/524-5652.

McIntosh MC-2500, black, fact sealed, \$3475; (2) MC-240, \$1075 ea; (3) MC-40, (2) MC-225, \$575 ea; Grand Integra M510, \$2975; (2) Spectral DMA50, \$1475 ea; Yamaha B-2 V-let, \$475; Luxman M4000, \$650/BO/trade. R Katz, Allegro Sound, 15015 Ventura Blvd, Sherman Oaks CA 91403. 213-859-5543.

Magnecorder amp & portable mixer; Ampex amp & spkr; call for prices. J Schramm, 205-826-0390.

Bozak CMA-150-2 rack mount pwr amp (4), 150/150 into 8, rebuilt, new PS condensers, smooth hi end for CRM bi-amp monitoring, no fans, excel cond, \$450 ea; BGW Systems 500D rack mount pwr amp, 450/450 into 4 ohms, rebuilt, new PS caps, call soon & will throw in spare amp module, \$500; (2) Hafler P500 VMOSFET pwr amp, 400/400 into 4 ohms, smooth sound, \$1000/pair, all FOB Miami. P Appleton Studios, 1000 NW 159 Dr, Miami FL 33169. 305-625-4435.

McIntosh MC-60 (2), 60 W mono pwr amp, tube type, \$800/pair. D Kronquist, D&D Prod, 7028 W 70th Ave, Armda CO 80003. 303-425-6851.

CBS Labs dual 1x8 audio DA, \$200. P Cibley, Cibley Music, 138 E 38 St, NY NY 10016. 212-986-2219.

Marti PGM-20 line amp, \$40. P Wells, KJQY San Diego, 619-238-1037.

McIntosh 250 pwr amp, excel cond, BO. Pinetucket Rcding, 205-826-0390.

Want to Buy

Denon POA8000 (2); Sansui B2301, BA5000, C2301. R Katz, Allegro Sound, 15015 Ventura Blvd, Sherman Oaks CA 91403. 213-859-5543.

McIntosh tube tuners, amps, preamps, tubes, working or not, literature, manuals. R Glenn, WJGR, 1718 Shannoa, Wimama FL 22598. 813-634-1940.

Scully '100' recorders, record/play amplifiers, 8, 16, 24 track heads. Sequoia Electronics, 1131 Virginia Ave, Campbell CA 95008. 408-866-8434.

AMPLIFIERS

Want to Sell

Phase Linear 400 stereo 400 W pwr amp, \$400. P Rebmann, WEZY, 1412 E Lime St, Lakeland FL 33801. 813-682-4191.

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McIntosh MC-2500, black, fact sealed, \$3475; (2) MC-240, \$1075 ea; (3) MC-40, (2) MC-225, \$575 ea; Grand Integra M510, \$2975; (2) Spectral DMA50, \$1475 ea; Yamaha B-2 V-let, \$475; Luxman M4000, \$650/BO/trade. R Katz, Allegro Sound, 15015 Ventura Blvd, Sherman Oaks CA 91403. 213-859-5543.

Magnecorder amp & portable mixer; Ampex amp & spkr; call for prices. J Schramm, 205-826-0390.

Bozak CMA-150-2 rack mount pwr amp (4), 150/150 into 8, rebuilt, new PS condensers, smooth hi end for CRM bi-amp monitoring, no fans, excel cond, \$450 ea; BGW Systems 500D rack mount pwr amp, 450/450 into 4 ohms, rebuilt, new PS caps, call soon & will throw in spare amp module, \$500; (2) Hafler P500 VMOSFET pwr amp, 400/400 into 4 ohms, smooth sound, \$1000/pair, all FOB Miami. P Appleton Studios, 1000 NW 159 Dr, Miami FL 33169. 305-625-4435.

McIntosh MC-60 (2), 60 W mono pwr amp, tube type, \$800/pair. D Kronquist, D&D Prod, 7028 W 70th Ave, Armda CO 80003. 303-425-6851.

CBS Labs dual 1x8 audio DA, \$200. P Cibley, Cibley Music, 138 E 38 St, NY NY 10016. 212-986-2219.

ANTENNAS & TOWERS

Want to Sell

Coaxial Cable, 1-5/8", gas fed, 280', (1) piece w/connectors, \$1400; Jampro 4-bay, 92.1 MHz, w/standard leg brackets, purchased new in Dec. 1989, BO. G O'Rear, WZEW, POB 2608, Mobile AL 36652. 205-432-0102.

Stainless G-17 galvanized unpainted tower (4), 196.5' ea, expandable to 300', w/base insulators & Phillystran guys, on ground, excel cond, new in '83, \$1000 ea. J Bisset, Multiphase, Falls Church VA. 703-379-1665.

EIA Flanges 3-1/8" rigid coax line, (20) 20' pieces, 50 ohm, stored indoors, \$200 ea; 3-1/8" rigid coax line w/Marmon type flanges (10) 20' lengths, \$180 ea. L Bruce, WBMX, 3 Fenway Plaza, Boston MA 02215. 617-236-6841.

Motorola 22' fiberglass 2-way antenna, \$200/trade for ham rig. J Schloss, KICD, 2600 N Hiway Blvd, Spencer IA 51301. 712-262-1240.

Vacuum CAP ATUs used in 4-tower 50 kW DA, as group or individually, BO; 50 kW 4-tower CSP phasor w/control panel & all vacuum capacitors, new in '83, BO. J Bisset, Multiphase, Falls Church VA. 703-379-1665.

ERI FML 3-bay tuned to 103.1 FM, 6 yrs old, \$2500. C Cooper, WOSM, 4720 Radio Rd, Ocean Springs MS 39564. 601-432-1032.

190' self-supporting tower, 150' to platform w/40' of 45G, BO. A Baron, 211 Front, Lynden WA 98264. 206-354-5252.

Gates/ERI FMA-9B 8-bay horiz on 94.5 MHz, complete, BO/trade on low pwr FM xmit. F Hollon, Rt 1 Box 72, Plymouth IL 62367. 217-392-2340.

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Andrew LDF5-50A 150' 7/8" w/(2) female 75AN fittings, \$440; 300' 1/2" Andrew LDF4-50, \$300; Cablewave 130' 1/2" foam, \$130; 60' 7/8" foam w/female 75AN, \$150; 170' Andrew FHJ4-50B 1/2" foam, \$170; 300' 1-5/8" Andrew HJ7-50A air dielectric w/(2) flanged fittings, \$2000. L Bawinkel, WJQJ/WJQK, 5658 143rd Ave, Holland MI 49423. 616-394-1260.

350' tower, 24' face, 7 yrs old, w/lights & beacon, gd cond, you disassemble & transport, \$10,000. C Shank, KSKU-FM, 106 N Main St, Hutchinson KS 67501. 316-665-5758.

Celwave ECFM-2, 2-bay educ, tuned to 94.5, \$600 incl shipping in US. J Aisip, KSCQ, Box 1528, Silver City NM 88002. 505-538-3396.

Shively 6810 1-bay 10 kW FM antenna w/radome, tuned to 92.7 MHz, excel cond, used 7 months, \$900. M Gollub, WMJS, POB 547, Prince Frederick MD 20178. 301-535-2201.

Rohn 55G, 310' lighting & guy wire, 4.5 yrs old, avail 9/91. B Williams, WBLG-FM, POB 900, Bowling Green KY 42102. 502-843-0107.

ERI G8CPS-6AC-3, (5) bays on 102.1 MHz, \$1600/bay. J Maples, WMYU-FM, 8419 Kingston Pike, Knoxville TN 37919. 615-693-1020.

1-5/8" coax, 425' gd cond, no leaks; 250' 100-pair phone line cable. K Grice, KMZE FM, 2728 Williams Ave Box D, Woodward OK 73801. 405-256-3692.

Hughes & Philips A-2 lighting system incl beacon, obstruction light, 350' conduit, wire & controls, \$2250. P Lierman, KSCP, 601 W Collins Dr, Casper WY 82601. 307-265-5414.

Xmission line parts selection, 3-1/8", new & used, coaxial switches, ELLs, bullets, couplers, over 200' of xmission line on spool, call for list. B Valerius, KCCZ TV-4, 1305 N Airport Rd, Cedar City UT 84720. 801-586-5938.

Dummy loads, FM oil cooled, several to choose from, 1, 2.5, 5 kW; Also 75 kW AM, 4 port motorized RF switch, 3-1/8", 76 port patch panel 3-1/8". Goodrich Ent, 11435 Manderson St, Omaha NE 68164. 402-493-1886.

Want to Buy

431' tower, 80/90' face, complete w/lights. J Aguilar, XEKMX, Avila Camacho 137, Guadalajara, Jalisco Mexico. 36-570-384.

FM TOWERS WANTED

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FM antenna, 10-bay, high pwr, 94.7. T Noordyk, WSHN, Box 190, Fremont MI 49412. 616-924-4700.

AUDIO PRODUCTION

Want to Sell

Tascam 10, 12x4x2 prod console w/add'l input modules, \$1100; Tascam series 70 4-trk 1/2" R-R, \$900. A Williams, CKCK/CKIT, 306-589-6200.

Shure SE30 gated mixer, \$185. G Wachter, KFYI, 631 N 1st Ave, Phoenix AZ 85003. 602-258-6161.

dbx 21 type II NR decoder, \$35. D Bailey, Rock Shoppe Prod, 3422 Beech St, Rowlett TX 75088. 214-475-9796.

Digital LED up timer (5), 2", self-pwr'd, \$5750 ea prepaid, UPS. D Peluso, KJUL FM, 2880 E Flamingo Rd Ste E, Las Vegas NV 89121. 702-732-2200.

Foretix 3180 stereo reverb, will trade for UREI 920-16 cooper time cube. J Roper, Imperial Sound, 383 N Studio St, Terre Haute IN 47803. 812-877-2663.

Valley Gate-X 4-chnl noise gate, like new, BO. J Claybrook, WERC/WMJJ, 530 Beacon Pkwy W, Birmingham AL 35279. 205-942-9600.

Eventide BD-932 stereo brdcast audio delay; Orban 245E stereo synthesizer; both excel cond, w/manual. H Ginsberg, WMEE/WQHK, 2915 Maples Rd, Ft Wayne IN 46816. 219-447-5511.

Lexicon Prime Time digital delay, (2) delay taps, w/EQ, VCO, hold & extended memory board, excel cond, \$300; Orban de-esser, 3 indepen chnls in 1 rack, gd cond, \$100. J Addie, WFMT, 303 E Wacker, Chicago IL 60601. 312-565-5033.

Sony PCM-501 ES digital audio processor. D Stortz, KFUO, 85 Founders Ln, St Louis MO 63105.

Valley People pwr'd rack w/(2) Grain Brain limiters & (2) Kepex expanders, \$1150/BO; (2) dbx 180, balanced. B Walker, Soundscapes, 501-661-1765.

Shure SE-30 3-input mixer/gated compressor, w/rack mounts, gd cond, \$150. J Addie, WFMT, 303 E Wacker, Chicago IL 60601. 312-565-5033.

Want to Buy

UREI BL-40 modulimeter manual & schematics, will pay postage & copy charges. P Hess, WPPJ, 134 Derwent Dr, Pittsburgh PA 15237. 412-366-1249.

dbx 941/942 Type II NR encode/decode module. R Burton, Audio Rents, 7237 Santa Monica Blvd, Hollywood CA 90046. 213-874-1000.

Vintage tube amps, preamps, EQs, compressors by Altec, Collins, Marantz, MacIntosh, RCA, WE, etc. W Kremer, Kremer Kraft, 301 SW 16th St, Ft Lauderdale FL 33315. 305-524-5652.

Ham radio operators looking for surplus audio processors, mixers & mics, as well as other inexpensive gear that could help bdcet engns play radio at home among enthusiasts for vintage AM. Please write w/offerings. WA3VJB, Box 73, West Friendship MD 21794-0073.

AUTOMATION EQUIP

Want to Sell

Schafer 8000 computer automation controller w/Leas-Siegler ADM-3A CRT terminal, logging printer, (2) blue Schafer racks, SMC Carousel, many parts, all manuals & documentation, can run 24 total sources, \$1200. G Gaskey, KWHO, 261 Main St, Weed CA 96094. 916-938-3828.

Format Sentry w/Commodore 64, \$2500; (2) IGM Go Cart 24, \$2000 ea; (3) Audicord S Series cart PB, \$500 ea; (4) Otari ARS-1000 reel reproducers, \$850 ea; reel sensor, \$100; (2) racks for above, \$300 ea; or complete 6-yr old system, \$11,000+shipping. B Toole, KGVQ, 127 N Higgins #107, Missoula MT 59802. 406-721-1290.

BE Control 16, 3,000 events w/(2) 42-tray & (1) 78-tray IGM 60 Cart IIs, (4) Scully playdecks if desired, (3) racks incl CRT, printer, spares, you ship, BO. D Brown, KVLE-FM, POB CC, Page AZ 86040. 303-641-3225.

Harris System 900, (5) Otari ARS-1000 R/R, (4) Go Cart 24-cart Carousels, (2) ITC Delta II PB carts, (2) Micropolis disk drives, system controller, (4) Audicord PB carts, Audicard R/PB cart, gd working cond, just removed from service, BO. J Bisset, Multiphase, Falls Church VA. 703-379-1665.

IGM 48-tray stereo instacarts (3), plus cables, on-air, \$4250 ea/\$12,000 all. T Hansen, 805-438-3221.

IGM Basic A control, separate cards, pwr supply reg 5 V at 30 amps, +- 15 V & 24 V, (2) IGM 42-tray go-carts, equip racks. D Gander, KDUZ/KKJR, Box 10, Hutchinson MN 55350. 612-587-2140.

SMC MSP 12, complete satellite/music auto system, dual cart PB, dual SMC 452 stereo cart Carousels, CRT, 2000-event memory, used 6 months, half price. D Carpenter, KKSJR, Box 699, St Cloud MN 56302. 612-253-9600.

Schaefer 903A automation system, re-built, (4) ITC 750 R-R, (2) Audiofile IIA, keyboard, printer, remote panel w/50' cable, BO. B Bolton, WCBH, Casey IL 62420. 217-932-4900.

SMC DP-2, (4) Carousels, (4) reel decks, new SMC Otari deck, all assoc equip, BO; SMC 450-800 nearly new Carousel, BO; SMC DT-4 card encoding data terminal w/CRT, BO. C Springer, KSEC, POB 890, Lamar CO 81052. 719-336-2206.

Want to Buy

Cetec 7000 Level 1 or 2 system left-end rack w/moon panel, card cages, pwr supply, doors, terminal w/CPU, SIO, RTC, RAM, ROM, PIO & VEL boards, min memory of 3680, universal source cards & more. D Williams, Lincoln Cnty Brdcasts, 1103 Utah Ave, Libby MT 59923. 406-293-6234.

BUSINESS OPPORTUNITIES

Want to Buy

Holding company seeks to acquire manufacturers, communications & leasing firms, turn-arounds our specialty, strict confidentiality. Acquisitions, 730 W Main, Louisville KY 40202.

Profitable LPTV group owner w/proven track record seeks debt, debt/equity or lease investment for major expansion, excel collateral. John, Republic Broadcasting, 502-568-4449.

CAMERAS (VIDEO)

Want to Buy

Early TV cameras for collection, studio & portable, also need tripods & camera heads. A Weiner, WREM, 14 Prospect Dr, Yonkers NY 10705. 914-423-6638.

GE PE-2S horiz color orthicon, manuals, lenses, pwr supply chassis in camera head; any B&W GE studio camera. B Gentry, KAZI-VY, 622 Plymouth Ave, Maltbydale NY 13211. 315-455-7257.

CART MACHINES

Want to Sell

ITC SP stereo 3-cue cart deck, gd cond, \$500. P Rebmann, WEZY, 1412 E Lime St, Lakeland FL 33801. 813-682-4191.

Sparta Century (3), w/parts machine & extra boards, \$300/all. B Mayben, WKXJ, POB 91, S Pittsburg TN 37380. 615-837-5544.

BE Spotmaster (2), stereo, primary, secondary, tertiary cue tones, auto fast forward, 1w hrs, excel cond: \$200 PS R/P, \$1600; \$200 PS play only, \$850; \$2250/both. L Wagner, ARN, POB 1788, Orlando FL 32802. 407-299-1299.

Sparta cart-delay machine, like new, \$500; Spotmaster 505, (2) R/P & (1) play only, gd cond, \$200 ea. R Meyers, Benchmark Comm, 4700 SW 75 Ave, Miami FL 33155. 305-264-5963.

ITC ESLIV, gd cond, you ship, \$500/BO. C Cullett, WGAN/WMGX, 200 High St, Portland ME 04101. 207-774-4561.

ITC 3D triple-play deck 1 cue, w/matched WRA record amp, rebuilt & updated pwr supply, heads, bearings, etc, free PR&E interface box if needed, \$2150 FOB Miami. P Appleton Studios, 1000 NW 159 Dr, Miami FL 33169. 305-625-4435.

Audicord 3-deck mono PB, Audicord mono R/P, mint cond; ITC R/P premium delay, mint cond; ITC R/P stereo w/tones; (5) stereo Audicord cart machines. J Phillips, WZOM, 408 1/2 Clinton, Defiance OH 43512. 419-782-8591.

ITC 99B stereo w/ELSA, \$2800. B Downs, KTSR, Box 3248, Bryan TX 77805. 409-846-1150.

Tepecaster 700P (2), (1) w/new motor, (1) w/new relay board, gd cond, \$250 ea. A Ishkanhan, 9723 Riggs Rd, Adelphi MD 20783. 301/439-7222.

ITC Premium series stereo R/P (2), mint cond. J Phillips, WZOM, 408 Clinton, Defiance OH 43512. 419-782-8591.

UMC 11-113 mono repro, 3 tones, \$325; (2) ABCO wire cart racks on floor stands, hold 500 carts, \$175 ea; set LEL alignment gauges for Ampro cart decks, \$15. P Wells, KJQY San Diego, 619-238-1037.

Telex 36 deck, uses NAB carts, rack mount, 4-trk mono, new in box, no electronics, \$150; Viking 500, 12 V NAB tape player, 4-trk stereo, w/PB amp, like new, \$50. E Davison, 135 N Illinois, Springfield IL 62702. 217-787-0800.

Gates Criterion I stereo P only, gd cond, \$75. E Reihl, 1715 Illinois Rd, Northbrook IL 60062. 708-272-7125.

ITC Delta Stereo PR99 stereo P (8), (1) 99-B R/P stereo, vgc, \$7000/all. D Solinske, WSUN, 877 Executive Cntr Dr W, St Pete FL 33702. 813-576-1073.

CASSETTE & REEL-TO-REEL RECORDERS

Want to Sell

Scully 270 (5), some aren't working, \$550/all. M Kestler, KAWZ FM, 208-733-3133.

Otari MX5050, older unit in excel cond, \$300+shipping. B Mayben, WKXJ, POB 91, S Pittsburg TN 37380. 615-837-5544.

Sony/MCI JH110 B/C 2 trk w/complete spare boards set, gd cond, \$2000. S Beverly, Flamingo Prod, 210 NE 57th St, Ft Lauderdale FL 33334. 305-771-2947.

Tascam 32 R-R/PB (2), w/remote control, in steel blue custom-designed racks, 1.5 yrs old, excel cond, \$1100 ea. G Livingston, WCCO/WQRT, Star Route, Salamanca NY 14779. 716-945-1515.

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2.5 kW FM	1978 CCA 2500R	1 kW AM	1974 Harris BC1H1
10 kW FM	1990 BE FM10B w/FX-50	1 kW AM	1976 RCA BTA 1S
10 kW FM	1975 RCA BTF 10ES1	5 kW AM	1980 McMartin BA5K
20 kW FM	1979 CCA FM20,000E	5 kW AM	1972 CCA AM5000D
20 kW FM	1973 RCA BTF 20E1	5 kW AM	1977 RCA BTA 5L
30 kW FM	1983 BE FM30	10 kW AM	1972 Harris BC10H
		10 kW AM	1972 RCA BTA 10U
		10 kW AM	1974 Collins 820E/F

CASSETTE . . . WTS

Nakamichi 1000-ZXL computer-controlled cassette deck, w/NR-100 Dolby C, rack mount w/rosewood case, low hrs, excel cond, \$1375/BO/trade. R Katz, Allegro Sound, 15015 Ventura Blvd, Sherman Oaks CA 91403. 213-859-5543.

Berliant Concertone Stereo 33 open reel deck (2), vintage; Dokorder 7" open reel. Ivan, WCUA, 301-984-1800.

dbx 105X 2-chnl type 1 NR, balanced I/O, 16 chnls avail, \$150/2 chnls. M Baykian, Research Kitchen, 6689 Orchard Lake Rd #151, W Bloomfield MI 43322. 313-737-0751.

Telex 300 R-R duplicator, cassette slave, rack cabinet, manuals, like new, all/parts, BO/trade. D Bobee, 685 S Roys Ave, Columbus OH 43204. 614-279-6163.

Audiotronics AV123-4TS 1/4 trk R-R duplicator; Ionicon RR-1(73M) FT; Ionicon RR-2(74M) 2 trk; all gd cond, \$200 ea. R Meyers, Benchmark Comm, 4700 SW 75 Ave, Miami FL 33155. 305-264-5963.

Ampex 350/351/400, compl machines plus heads, motors, transports, electronics, \$25-\$250/trade. J McLane, ODDCO, 115 W Gutierrez, Santa Barbara CA 93101. 805-963-3941.

Tascam DA-50 DAT rcrdr, \$1800. J Reans, Sunday Prod, 3301 3rd St, Moline IL 61265. 309-797-2510.

Otari 7308 1" 8 trk deck, 15/30 ips, lw hrs, excel cond, w/remote, \$4500; Ampex 612, stereo/mono, PB only, \$50. L Wagner, ARN, POB 1788, Orlando FL 32802. 407-299-1299.

Studer/Revox HS-77 Mk IV 2 trk, 15/75, highly-modified, ultra-analog audiophile mastering, excel cond, \$1375/BO/trade; HS-77 Mk IV FT mono, 10 hrs use, as new, \$475/BO/trade; port case for A77 w/mn spkrs & pwr amps, excel cond, \$375. R Katz, Allegro Sound, 15015 Ventura Blvd, Sherman Oaks CA 91403. 213-859-5543.

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Scully 280-B 2 trk stereo w/remote, \$300; Scully 280-B, 2 trk stereo w/remote, Servo cap, \$350; Scully 280, FT mono, \$200; all come w/Scully roll-around, maintenance records & manuals. A Williams, CKCK/CKIT, 306-569-6200.

Berliant Concertone tube stereo 1/2 trk, 2-speed, excel cond, \$500/BO; Tandberg 5-tube stereo rcrdr w/aux record amp, excel cond, \$250/BO. W Kremer, Kremer Kraft, 301 SW 16th St, Ft Lauderdale FL 33315. 305-524-5652.

Numerous recorders avail incl: UHER, vintage Edison tape w/rewriters, Avent w/Dolby, Norelco Square, Grunding, Webcor, Cylinder; Sony dupl, master/(3) slaves, hi-speed, excel cond; call for prices. J Schramm, 205-826-0390.

Scully 280-B, FT in Russlang cab, pwr supply prob, gd cond, w/manual, \$275; Pioneer FT-701 1/4" rcrdr (2), 7.5 & 3.75 ips, fair/gd cond w/manuals, \$100 ea. C Hendrix, WMNF, 1210 E Milking Blvd, Tampa FL 33603. 813-238-8001.

Scully 284-B 8-trk recorder, \$5000. H Sewell, Oakridge, 2001 Eilton Rd, Ft Worth TX 76117. 817-838-8001.

Ampex 601 1/4" tube-type, 1/2-trk in Samsonite luggage case, working, \$700/BO. T Heathwood, Heritage Radio Classics, POB 16, Boston MA 02167. 617-969-9966.

MCI JH-110B FT stereo for 14" reels, in metal rollaround cabinet, \$2075/trade for computer. P Wells, KJQY San Diego, 619-238-1037.

Ampex 600, 601, 602, (10) units, (2) for parts, BO. V Baker, POB 889, Blacksburg VA 24063. 703-552-4252.

Sony TC-650 1/4-trk stereo deck w/remote, gd cond, \$375. D Meyer, Meyer Prod, 7425 Sepulveda #33, Van Nuys CA 91405. 818-785-2324.

Otari ARS1000, new in box. J Phillips, WZOM, 408 Clinton, Defiance OH 43512. 419-782-8591.

Ampex 440-B stereo audio tape rcrdr, in Russlang console, excel cond, \$1500/BO; Studer C-37, tube stereo, never used, in Studer console, BO. R York, Jewel Records, 1594 Kinney Ave, Cincinnati OH 45231. 513-522-9336.

Scully 280B 2-trk stereo, \$1700; 4-trk 1/2" w/dbx NR, \$2750; FT w/tension control, \$1200; FT w/tension control & servo motor, \$1350; all excel cond & in Russlang consoles. J Addie, WFMT, 303 E Wacker, Chicago IL 60601. 312-565-5033.

Telex 6120 stereo cassette duplicator, 1x3, \$2500. Katherine, Linden Inc, 229 N Henry St, Alexandria VA 22314. 703-549-4424.

Want to Buy

Otari 5050 Series, FAX info to 203-634-1478. J Pescatello, WMMW-AM, 900 E Main St, Meriden CT 06450.

Ampex 351 rrding head stack, any cond. J Schloss, KICD, 2600 N Hiway Blvd, Spencer IA 51301. 712-262-1240.

Tascam/Teac 501 record/reproamp & 705 transport service info, schematics, will pay postage & copy charges. P Hess, WPPJ, 134 Derwent Dr, Pittsburgh PA 15237. 412-366-1249.

R-Rs & parts: Ranger Tone, Berliant, Ampex, etc, incl heads & manuals. M Zuccaro, Voice & Video, 5038 Ruffner Rd, San Diego CA 92111. 619-271-8294.

MCI/Sony capstan & reel motors, any cond., recdg heads, most mfgs, machines, new, used. Relapped then sold. Amp Services, 224 Datura St No 614, W Palm Beach FL 33401. 800-826-0601, in FL 305-659-4805.

Ampex ATR100 taperecorders for parts. Circuit cards, heads, motors, machine parts, or electronic parts. Call 818-907-5161.

CD's

Want to Sell

Sony CDK-006 CD juke boxes (2), interfaced to Sentry Systems FS-12C Format Sentry, w/spare interface, documentation, software, cabling, no computer, \$2500 ea; Format Sentry, \$2500; sell together or sep. R Sherman, WKBM, 32401 S Rt 53, Wilmington IL 60481. 815-476-5855.

Technics SL-P1200 brdct CD player, cue to music, cue wheel, oversampling D/A, excel cond, \$400. J Addie, WFMT, 303 E Wacker, Chicago IL 60601. 312-565-5033.

COMPUTERS

Want to Sell

Tallgrass TG3135 external 35 meg hard drive & 45 meg tape back-up, software, interface card, manuals, \$500. S Kozak, 351 Pinewood, Bay Village OH 44140. 216-871-5887.

Wang 2200 LVP-X, 32 meg internal hard drive, 8" floppy drive, (3) terminals, gd working cond. M Young, WJON/WWJQ, POB 220, St Cloud MN 56302. 612-251-4422.

Amiga 2500, 3 meg RAM, 40 meg hard, IBM Bridge Board, stereo mon, Super Gen brdct genlock, incl \$3000 of brdct software, mint cond, \$3800; Tamron Fotoconv, xtra lens, mint cond, \$1250; Whellit Cart w/smooth fluid head, excel cond, \$400. T Noordyk, WSHN, Box 190, Fremont MI 49412. 616-924-4700.

CONSOLES

Want to Sell

Opamp Labs 2008-4E, 20 input, 8 subs, stereo mix out, gd prod board, very clean, \$3500. L Wagner, ARN, POB 1788, Orlando FL 32802. 407-299-1299.

McCurdy 8500 custom 10 mixer dual stereo brdct console, \$4995. D Vernier, KUNI, U of N Iowa, Cedar Falls IA 50614. 319-273-6400.

JBL 7510 automated mic mixers, rack mount, (1) w/8 inputs, (1) w/12 inputs. S Kozak, 351 Pinewood, Bay Village OH 44140. 216-871-5887.

RCA BC19A stereo console, 4 chnls, no manual, needs work, \$350. W Nauman, WLWJ, 400 J Royal Commerce Rd, Royal Palm Beach FL 33411. 407-793-5555.

Arrakis 150SC stereo console (2), 6 mixing positions, 12 input, built-in mon amps, many other features, like new, \$1250 ea; (2) BE 4M50A mono consoles, 4 mixing pos, built-in cue & mon amps, like new, \$500 ea; Audio Technica Consolettes AM-500 stereo, 6 mixing pos, 9 input, other features. B Cook, 1412 S 21st St, Colorado Springs CO 80904. 719-594-9464.

BE boards (2), (5) stereo carts, R-R. J Phillips, WZOM, 408 1/2 Clinton, Defiance OH 43512. 419-782-8591.

Shure M-67 mixer (2), gd cond, \$100 ea. G Jablonski, WHMI, POB 887, Howell MI 48844. 517-546-0860.

BE 5S150 w/digital timer, well maintained. Ivan, WCUA, 301-984-1800.

2005 AD road board w/spares, 16-chnl, \$450 FOB Miami. P Appleson Studios, 1000 NW 159 Dr, Miami FL 33169. 305-625-4435.

Ramko DC 5MS 5 chnl stereo console, several remote inputs, working when removed, \$300. B Mayben, WKXJ, POB 91, S Pittsburg TN 37380. 615-837-5544.

Classic British Hellos 24/16/24, c. '70s, many updates/models w/full documentation, (9) separate pwr supply w/wood rack cab, mahogany desk, \$9500/BO/trade. R Katz, Allegro Sound, 15015 Ventura Blvd, Sherman Oaks CA 91403. 213-859-5543.

Sparta A-10B monaural console, mint cond, \$300; Ampex AG-350 monaural FT in console, gd cond, \$300; Crown 801 monaural FT portable w/matching spkr/amp, \$200. B Weiss, KLSI, 3101 Broadway #460, Kansas City MO 64111. 816-753-0933.

Audiotronics 200VC mic compressor modules (3), for 200 series consoles; Audiotronics 201PEQ mic equalization modules for 200 series consoles (2), w/personality plug-in modules, xtra plug-in incl; all work fine, gd cond, w/documentation. H Ginsberg, WMEE/WQHK, 2915 Maples Rd, Ft Wayne IN 46816. 219-447-5511.

Ramsa WR-8428 16x4x16x2, as new cond, \$7500/BO. F Baker, Sound Post, 7250 Thornapple River Dr, Caldonia MI 49316. 616-698-0866.

Ambassador mono 5 fader SSR console w/step attenuators, modules, pwr supply, new/accurate manual, needs work, \$450/BO+shipping. M McCarthy, McCarthy Radio Eng, 708-640-8965.

Shure M67 mixer & M675 production master w/line inputs & cue system, gd cond, \$200/set. S Kowalski, WXXL, 337 S Northlake Blvd #1067, Altamonte Springs FL 32701. 407-339-1067.

Pacific Recorders ABX-26 prewired complete prod room w/furniture by PRE, \$36,000; Pacific Recorders BMX18 prewired complete control room w/furniture by PRE, \$25,000; call for details. D Solinske, WSUN, 877 Executive Cntr Dr W, St Pete FL 33702. 813-576-1073.

RCA 6B6, tube-type, dual chnl, w/tubes & manuals, can be used in stereo, \$1000/BO. T Heathwood, Heritage Radio Classics, POB 16, Boston MA 02167. 617-969-9966.

Sony MX-20, 8 in/4 out mixing board, gd cond, no cover, \$425. D Meyer, Meyer Prod, 7425 Sepulveda #33, Van Nuys CA 91405. 818-785-2324.

Tapco Catalina C-12 mixer, 12x2x2, \$525; Foster 450 8-chnl mixer, \$650. Katherine, Linden Inc, 229 N Henry St, Alexandria VA 22314. 703-549-4424.

MCI/Sony JH110-C-8 8-trk 1" factory console w/Auto Locater III & manual, excel cond, \$2000, you ship. R Leonardi, Voices, 212-935-9820.

Want to Buy

Mono 8-12 fader, late working model console, prefer BE 8 or 10M150/200 or equiv. FAX specifications to MRE, 708-439-1464.

Stereo Gates or Harris console for rebuilding. J Schloss, KICD, 2600 N Hiway Blvd, Spencer IA 51301. 712-262-1240.

Langevin AM4A w/documents. J Gangwer, 942 32nd St, Richmond CA 94804. 415-644-2363.

Autogram AC-8A or Harris 80 8-chnl. J Aguilar, XEKMx, Avila Camacho 137, Guadalajara, Jalisco Mexico. 36-570-384.

Langevin AM4A w/documents. J Gangwer, 942 32nd St, Richmond CA 94804. 415-644-2363.

DISCO & SOUND EQUIPMENT

Want to Sell

Neumann PEV 3-band EQ, discrete transistor, xformers I/O, \$225/trade. J McLane, Odeco, 115 W Gutierrez, Santa Barbara CA 93101. 805-963-3941.

Studio Sound S-305 passive filter sets, matched pair, consec #, rack mount, very rare, \$275 ea. R Katz, Allegro Sound, 15015 Ventura Blvd, Sherman Oaks CA 91403. 213-859-5543.

Dukane 3A235 1/3 octave sound reinforcement syst EQ (2), \$250 ea; UREI 530 stereo octave EQ, \$250. S Kozak, 351 Pinewood, Bay Village OH 44140. 216-871-5887.

Denver recording studio for sale, 6000-sq-ft bldg, 25,000-sq-ft land, some equip, owner may carry, serious inq only. F Arthur, Arthur Prod, 6466 S Forest St, Littleton CO 80121. 303-220-0889.

Snake 16 phantom-pwr inputs w/xt ps, 250' Belden 19-pair cable w/mil connectors & stnss-steel strain reliefs, 10' Neumann XLR snake mals w/box or Belden snake, excel cond, \$775/BO/trade. R Katz, Allegro Sound, 15015 Ventura Blvd, Sherman Oaks CA 91403. 213-859-5543.

UREI electronic crossover w/API rack frame, (4) 518-L & (2) 518-H cards, w/Automated Processes pwr supply, \$300 FOB Miami. P Appleson Studios, 1000 NW 159 Dr, Miami FL 33169. 305-825-4435.

Dukane 100 W tube-type pwr amps; Altec-Lansing 9844 studio mon. J Phillips, WZOM, 408 1/2 Clinton, Defiance OH 43512. 419-782-8591.

Community Zoid mid-range enclosures, \$150 ea empty; Allen & Heath 24x9 mon board w/case, \$2200; (8) Community monitors, hold 12" & 1" compression driver, \$700; Crown DC-300A, \$450; Peavey MK4 24-chnl board, \$1500; Genie 24" super lifts for light trussing, \$1600/pair. B Wilson, 212 S Side Ave, Campbellsville KY 42718. 502-789-1505.

Peavey MB-1 mid-bass cabinets, \$600/pair; Peavey MB-2 mid-bass cabinets, \$300/pair; Peavey 4FH-2 bass cabinets, \$600/pair; Eastern Acoustic Works 2x15 bottoms w/JBLs, \$800/pair; Eastern Acoustic Works PA cabinets w/(2) 15", (1) 12" & (1) 2" compression drivers, \$1500 ea/(4) for \$5000. B Wilson, 212 S Side Ave, Campbellsville KY 42718. 502-789-1505.

Casio 510 stereo keyboard, gd cond, \$300; Fisher reverb, (2) amps w/(3) springs ea, \$125 ea; Echo Plate #2, 4-6", gd CF, \$500/trade. H Sewell, Oakridge, 2001 Eilton Rd, Ft Worth TX 76117. 817-838-8001.

FINANCIAL SERVICES

LEASING AVAILABLE ON USED TRANSMITTERS
AMERICAN BROADCAST FINANCIAL CORPORATION
414-482-2638

LIMITERS

Want to Sell

Valley 400 mic processor (3), never used, \$300 ea. W Bergman, WIZD-FM, POB 850, Plover WI 54467. 715-344-6050.

Harris Solid Statesman FM limiter, working, as is, no manual, \$100. C Hendrix, WMNF, 1210 E Milking Blvd, Tampa FL 33603. 813-236-8001.

Mod Sciences CP-803 composite clipper incl rack mount, excel cond, w/documentation; Orban Optimod 8100A/XT2 6-band limiter chassis, excel cond, w/manual; CBS Audimax 4450A stereo AGC, gd cond. H Ginsberg, WMEE/WQHK, 2915 Maples Rd, Ft Wayne IN 46816. 219-447-5511.

CRL SMP-900 AM stereo matrix processor, \$1000. M Young, WJON/WWJQ, POB 220, St Cloud MN 56302. 612-251-4422.

CBS Volumax 400 peak controller, \$150. L Wagner, ARN, POB 1788, Orlando FL 32802. 407-299-1299.

Optimod 8000A
\$1495 & UP
414-482-2638

RCA BA 43/46 & 45 audio processor, working when removed, w/rack mount chassis frame, \$65. J Cunningham, KEOR/KHCK, Rt 2 Box 113B, Stonewall OK 74871. 405-265-4496.

CBS Volumax 4110, w/manual, excel cond, \$150+shipping/trade for Ashley SC-50 compressor. S Mahaffey, Mahaf Prod, 3592 N Delsea Dr #12, Vineland NJ 08360. 609-692-3439.

CRL SGC-800 2-band stereo AGC w/Dynaflex; CRL SEC-800 4-band stereo comp/limiter; CRL SMP-900A AM stereo matrix processor; all equip brand new, incl manuals & custom modification instruction list & parts. Shannon, WENS, 7201 E Hillsborough Ave, Tampa FL 33610. 813-820-9100.

Gates Solid Statesman, \$275. P Wells, KJQY San Diego, 619-238-1037.

Howe Phase Chaser w/manual, \$600. B Downs, KTSR, Box 3248, Bryan TX 77805. 409-846-1150.

Orban 418A stereo limiter, excel cond, \$375. M Gollub, WMJS, POB 547, Prince Frederick MD 20178. 301-535-2201.

CRL FM-2, SEP-800 stereo 4-band compressor, SMP-800 stereo modulation processor, stereo prep processor, BO. C Springer, KSEC, POB 890, Lamar CO 81052. 719-336-2206.

CRL complete 3-piece AM processor, AM-4 APP40, SEC400A, PMC300A. G Knop, 803-497-0460.

Want to Buy

Ashley SC-50 in gd cond, need badly. S Mahaffey, Mahaf Prod, 3592 N Delsea Dr #12, Vineland NJ 08360. 609-692-3439.

Orban Optimod 9100A. J Aguilar, XEKMx, Avila Camacho 137, Guadalajara, Jalisco Mexico. 36-570-384.

EXR EXIV exciter, buy/trade. B Walker, Soundscapes, 501-661-1765.

Optimod 8000A, will pay cash, leave message at 703-276-0125.

MICROPHONES

Want to Sell

Crown PZM 30GPG (2), w/PX-18B pwr supplies, like new, \$400 both. B Weiss, KLSI, 3101 Broadway #460, Kansas City MO 64111. 816-753-0933.

Neumann U-87 (2), w/wind screen & shock mounts, \$1250 ea; Sennheiser MD 441U, w/case, \$200; all excel cond, like new. S Kowalski, WXXL, 337 S Northlake Blvd #1067, Altamonte Springs FL 32701. 407-339-1067.

Telefunken/Schoeps CM-61 tube mic, very rare, uses std 6AU6 plug-in tube, w/o cables/pwr supply, mint cond, \$975/BO. R Katz, Allegro Sound, 15015 Ventura Blvd, Sherman Oaks CA 91403. 213-859-5543.

Shure/Telex W1520/58 wireless hand-held w/SM58 mic (2), 177.8 & 193.8 MHz, brand new, \$500 ea; (4) Turner 253 desk page/2-way mics, brand new, \$35 ea; Turner +2 transistorized desk 2-way mic, little use, \$25. E Davison, 135 N Illinois, Springfield IL 62702. 217-787-0800.

Sony ECM-50 lavalier mic, \$50. P Cibley, Cibley Music, 138 E 38 St, NY NY 10016. 212-986-2219.

RCA/Altec/Telefunken: RCA 44-BX, 77-D, BK-5, KU3A 10,0001, SK-46, WE 639, Altec M-11 system, Altec M30 tube mic, Altec M49 & M50, (2) absolutely mint Telefunken U47's, will trade for other high quality mics & equipment. Tracy Eaves, 615-821-6099 (evenings).

Want to Buy

Telefunken/Schoeps CM-61 tube mic pwr supply & cable. R Katz, Allegro Sound, 15015 Ventura Blvd, Sherman Oaks CA 91403. 213-859-5543.

Altec, Normann, RCA, Sony, WE vintage mics. W Kremer, Kremer Kraft, 301 SW 16th St, Ft Lauderdale FL 33315. 305/524-5652.

EV or other dynamic shotgun mics in working order, no condenser mics. D Neiburg, POB 194, Laurel MD 20725. 301-490-3015.

MISCELLANEOUS

Want to Sell</

MISCELLANEOUS . . . WTS

Lead screw for Presto 6N cutter, 120 lines; Edital 1" block for splicing tape; Audiohead alignment tape 7.5-15 ips 1/4" tape; Dynakit PAS II pre-amp. Mr. Oliver, 212-874-7660 in afternoons.

Want to Buy

Early radar equip for collection. A Weiner, WREM, 14 Prospect Dr, Yonkers NY 10705. 914-423-6638.

Naval observatory clock, brown case, cream face, used by ABC radio & affiliates in the '40s/'50s, REI light flashes with reset. T Heathwood, Heritage Radio, POB 16, Boston MA 02167. 617-969-9966.

Jazz record collections, 10" LP/12" LP bebop, swing, dixie, highest prices paid. B Rose, Program Recdgs, 228 East 10th, Nyny 10003. 212-874-3060.

MONITORS

Want to Sell

Belar FMM-2 FMS stereo, SCM-2 SCA, RF amp. J Phillips, WZOM, 408 1/2 Clinton, Defiance OH 43512. 419-782-8591.

UREI 813B & Bryston 4B studio monitors & amp. R Tieggen, Plum Sound, 335 Merrimac St, Newbury MA 01950. 508-415-5653.

Harris STM-1B AM stereo mon, C-Quam, excel cond, BO. B Bailey, KJEF, POB 1248, Jennings LA 70546. 318-824-2934.

BE AS-10 AM stereo C-Quam mon w/manuals & boxes. Shannon, WENS, 7201 E Hillsborough Ave, Tampa FL 33610. 813-620-9100.

Belar FMM-2, FMS-2, SCM-2, SCA, stereo & RF amp, purchased '86. J Phillips, WZOM, 408 Clinton, Defiance OH 43512. 419-782-8591.

Want to Buy

CCA AMM1D service info, will pay postage & copy charges. P Hess, WPPP, 134 Derwent Dr, Pittsburgh PA 15237. 412-366-1249.

Any older McMartin mod monitors. C Goodrich, 11435 Manderson, Omaha NE 68164. 402-493-1886.

MOVIE PROD EQUIP

Want to Sell

Neumade Super X 16mm rewriter w/foot pedal, \$375. Katherine, Linden Inc, 229 N Henry St, Alexandria VA 22314. 703-549-4424.

RECEIVERS & TRANSCEIVERS

Want to Sell

Realistic PRO-34 hand-held scanner, 200 chnls, receives to 960 MHz, nicads & chrg, like new, \$200; Bearcat BC 220 scanner, 20 chnls, VHF hi, low, UHF, aircraft, gd cond, \$100. M Martin, KWNO, POB 466, Winona MN 55987. 507-454-2918.

AM STEREO RECEIVERS
Portable, Home/Studio, Auto
RRADCO GROUP
708-513-1386

GE MPI (2), handheld 2 W, 2 chnl VHF, w/charger & xtra batteries, \$100 both. P Russell, Bowdoin College, Brunswick ME 04011. 207-725-3066.

Marti RR30/150 dual freq receiver, \$500. M Young, WJON/WWJO, POB 220, St Cloud MN 56302. 612-251-4422.

High quality micro-miniature 67 kHz SCA decoder, about 1" square, prewired and ready to install, \$15. D Jackway, Background Music Eng, 5742 Fair oak, Springfield MO 65810. 417-881-1846.

Scientific Atlanta 9640 video receivers. J O'Neill, 713-621-2800.

REMOTE & MICROWAVE EQUIP

Want to Sell

Potomac Inst RMP-19D-210 digital remote meter panel for use w/AM-19, AM-19D, PM-19 & PM-112 antenna monitors, excel cond w/manual; Potomac Inst DAP-11 digital antenna monitor processing system for auto logging of antenna monitor directional parameters, w/PTR-11 printer & manuals. H Ginsberg, WMEE/WQHK, 2915 Maples Rd, Ft Wayne IN 46816. 219-447-5511.

Moseley SCG-8 FM subcarrier gen & SDC-8 FM subcarrier demodulator, 110 kHz, like new. P Baillon, Miles City Brocsting, 1218 Pioneer Bldg 336, St Paul, MN 55101. 612-222-5555.

Burke TC-8 remote control system w/computer interface, purchased new in Nov. 1989, BO. G O'Rear, WZEW, POB 2608, Mobile AL 36652. 205-432-0102.

Harris/Ferranon Microstar 23 GHz digital STL, 2-hop system w/repeater, (3) 15 kHz analog & (2) 20 kHz digital audio chnls or video & (3) analog chnls, w/Sony PCM audio processor, factory aligned in May, \$15,000/BO. J Bisset, Multiphase, Falls Church VA. 703-379-1665.

TFT 7771 composite STL rcvr (2), separate mainframes, config'd for auto switch-over, work OK; Mod Sciences CLD-2501 composite line drivers (2), separate rack mounts; all excel cond, w/documentation. H Ginsberg, WMEE/WQHK, 2915 Maples Rd, Ft Wayne IN 46816. 219-447-5511.

Moseley MRC-1600 remote control system, CRT terminal, (2) modems, set up for subcarrier but incl telephone link interface cards, \$2850 complete/BO. G Gasky, KWHO, 261 Main St, Weed CA 96094. 916-938-3828.

Hnat-Hindes telephone interlaces (2), vgc, \$150 ea. G Arroyo, WONQ, 2483 John Young Pkwy, Orlando FL 32804. 407-687-9345.

MA-COM MA12XC 12 GHz portable/fixd microwave system, w/xmtr, receiver & portable horn antennas, \$800. N Borenstein, 5406 Hayes St, Hollywood FL 33021. 305-961-7747.

Want to Buy

Moseley STL system for FM. T Noordyk, WSHN, Box 190, Fremont MI 49412. 616-924-4700.

Marti RPT-40 xmtr, freq 148-172 MHz, (1) RX R30/150. J Aguilar, XEKM, Avila Camacho 137, Guadalajara, Jalisco Mexico. 36-570-384.

SATELLITE EQUIPMENT

Want to Sell

Fairchild Dart 384 digital audio satellite receiver w/dow/converter & 100 degree LNA, \$4000. R Cowell, KNTR, Box 308, Ferndale WA 98248. 206-384-5117.

Moseley PCL-505 STL; Moseley RPL-3A remote pickup, 166.250 MHz; Moseley MRC remote control; Mark 4' STL dishes. J Phillips, WZOM, 408 1/2 Clinton, Defiance OH 43512. 419-782-8591.

Scientific Atlanta 7550 satellite rcvr used 18 months on Transtar ACII format, like new, BO. J Curtis, KLSQ/KFRQ, 481 Loop 281 E, Longview TX 75806. 214-663-3700.

Fairchild 384 digital satellite rcvrs (2), (1) w/15 kHz card, (1) w/7 kHz card, 10 months old, call for price. Jonathon, KNLT, 405-789-1140.

IGM EC, compl for satellite, half price. J Phillips, WZOM, 408 1/2 Clinton, Defiance OH 43512. 419-782-8591.

SOFTWARE

Want to Sell

Fairchild Dart 384 digital rcvr w/15 & 7.5 kHz prog modules, 3 kHz voice cue module, new cond, \$4900. J Mandly, WHTB-AM, POB 1400, Fall River MA 02722. 508-677-0505.

POWERFUL PC SOFTWARE
Broadcast Professional

COUNTPOP 1990 US Census
Final coverage area population
INTERCHK (FCC's FMOVER)
Uses graphics to display Service & Interference contours over US map
QCHANNEL & FCC FM database
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Flexible FCC contour generating program
PLOTPATH-STL program
Graphic design of STL systems
PLOTCOMM for HP plotters
Professional contour plotting program
SEARCHAM - SEARCHTV
AM, FM & TV databases & more
(Send for full software list & descriptions)
DOUG VERNIER
Broadcast Consultant
1600 Picturesque Dr., Cedar Falls, IA 50613
Phone: 319-266-8402
Order Line: 800-743-DOUG

Circle 83 On Reader Service Card

STATIONS

Want to Sell

FM w/C1 upgrade. Texas Panhandle, \$95,000 cash or best offer. Includes antenna, tower & transmitter for upgrade. M Jones, 314-431-1216.

AM STEREO

For sale or lease/purchase
South East
Top 100 market
Owner Financing

Paul Edwin
P.O. Box 640
Tomball, TX 77377-0640

AM & FM radio stations for sales in Central Arkansas, selling or or part, some financing. 501-376-0880 week days, 501-470-1525 nights/weekends.

LPTY, CPs in Cincinnati, OH, ADI29, & Lexington, KY, ADI70, gd UHF chnls, excel coverage, favorable tower rental. James, 720 Fairhill Dr, St Matthew KY 40207.

2500 W AM near Huntsville, ALA. Studio & properties included, \$175,000. Call Doyle Hadden, 407-365-7832.

Want to Buy

Radio preacher looking for sm market AM/FM, need a no down-payment arrangement & owner financing, will consider dark & lease agreement. Rev P Fleming, POB 1792, Torrington CT 06790. 203-482-9355.

Group owner seeks troubled/dark stations & EPs fast closing, finders fee paid, forward engineering details, equip lists & price. Republic Broadcasting, 300 Heyburn Bldg, Louisville KY 10202.

Principal wants to purchase AM and/or FM, CP or dark, any situation considered. L Henley, 204 Preston Ct, Opelika AL 36801. 205-749-1521.

Exper brdcstr looking for FM/AM station w/lttle or no money down, prefer New England or southeast. L Haber, 617-246-5634.

STEREO GENERATORS

Want to Sell

CRL SCA-300A mod gen, like new, BO. J Claybrook, WERC/WMMJ, 530 Beacon Pkwy W, Birmingham AL 35729. 205-942-9600.

Gates 99406533-001 stereo gen modules (2), for use w/TE-3 FM exciter, w/documentation. H Ginsberg, WMEE/WQHK, 2915 Maples Rd, Ft Wayne IN 46816. 219-447-5511.

CCA SG-1D stereo gen, \$125. M Gollub, WMJS, POB 547, Prince Frederick MD 20178. 301-535-2201.

Want to Buy

Catel SM-220 stereo gen schematic & operating manual. H Thomas, Thomas Eng, 522 F St, Bakersfield CA 93304. 805-323-5655.

Optimod 8000A, will pay cash, leave message at 703-276-0125.

EMPLOYMENT

To place ads in this section, use the ActionGram form. To respond to box numbers, write Radio World, PO Box 1214, Falls Church, VA 22041, Attn: _____

POSITIONS WANTED

Engineer w/8 yrs exper seeks position as chief/assistant in AZ, CA or UT, exper in AM stereo & directional & FM. Allen, 1854 Granada Dr, Riviera AZ 86442. 602-758-7829.

Anncr w/over 1 yr exper, striving to succeed, anything FT in OK, MO, KS, AR or TX. Richard, 918-256-6164.

Smart Eng, detail oriented, exper w/remotes, audio, prod, equip repair, seeking position at NYC-CT area broadcaster. D Schwartz, 5 Peveril Rd #3, Stamford CT 06902. 203-965-8340.

Multi-faceted GM-GSM team seeks troubled station to turnaround, we'll return your operation to fiscal soundness in xchange for equity and/or purchase option. Ed, 301-722-5499.

25 yrs mgt exper in all phases of radio & TV, seeking mgt pos in Scentral FL. Bill, 813-471-2723.

P-B-P w/7 yrs exper, relocating to NH/MA 9/91, prev positions in SD, PD, MD, GM & OPS, salary not biggest factor, last 6 yrs at same sm-mkt AM. A Ward, 602-855-9672.

AM/FM/combo turnaround wanted for consulting, no equity desired, small unrated mkt only. B Simonson, 208 Blake, Galesburg MI 49053. 616-665-7140.

ATTN Syracuse area stations, looking to come back to area, 15 yrs exper in announcing, talk, news. W Byers, 321 16th Ave NE, Jamestown ND 58401. 701-251-2336.

Anncr w/15 yrs exper seeks position in TX, AR, MO or KY, news prod & sales exper also. T Horan, 501-337-7218.

CE, 4 yrs exper, studio construct, hi-pwr FM, directionals, programming, jock, seeking eng or combo position anywhere E of Mississippi. Paul, 904-654-1697.

Modern/new rock PD, fresh from successful AM turnaround, early 20s. Bree, POB 10247, Pittsburgh PA 15232.

Quality air talent wants to work for your winning team, 6 yrs exper incl programming, prod, copy & script writing, voices, etc. Randy, 704-596-4864.

Helicopter pilot seeks traffic reporter pos in major market or ENG, member AFTRA, w/CBS O&O 11 yrs as eng, can supply Bell 47G on lease back. G Knop, 803-497-0460.

Recent grad w/degree in comm/radio/audio prod, exper & ambitious about all aspects of brocsting. Tina, 26 Mace Pl, Lynn MA 01902. 617-599-1582.

Versatile 5 yr pro seeks stable sports dir/sales/anncr pos w/midwest station, PBR, sales, prod, news, will relocate. Robert, 319-652-6640.

Recent college grad w/4 yrs tech exper in college radio seeking commercial station pos in Rockland Cnty/NYC. D Gablas, 914-735-6844.

Detail-oriented indiv, exper w/brcdst eng, remote recording, audio prod & equip repair seeking staff/per diem pos at NYC/CT facility. D Coe, 5 Peveril Rd #3, Stamford CT 06902. 203-965-8340.

HELP WANTED

Engineer for 100 kW & 10 kW DA AM in South Florida, will maintain transmitters, STLs, RPU's, with heavy emphasis on studio maintenance. Must have leadership skills & ability to interact with other staff members on a daily basis. Send resume w/salary history & requirements to: Radio World, POB 1214, Falls Church VA 22041. Attn: Box 91-07-24-02 RW.

Electronic Engineer Wanted

A manufacturer of broadcast equipment located in the Southwest seeks a person with a strong background in analog and digital electronics with emphasis in audio engineering. Must have experience with DSP and a strong background in analog audio design. Experience in broadcasting and broadcast equipment manufacturing preferred. Company has excellent reputation and good benefits. Send resume only to: Radio World, POB 1214, Falls Church, VA 22041, Attn: 91-07-01 RW.

Be our Engineer and have responsibility for two combo stations fifty miles apart. Growth area, live in the Southwest. If you know AM/FM inside and out, give me a call: Jim Stowe, KEZC/KJKK, 602-782-4321, Yuma, Arizona. EOE.

Sales Engineer, RF emphasis, Radio and TV familiarity, good working conditions, health and other benefits. Send resume to: 1082 E El Camino Real #5, Ste 367, Sunnyvale, CA 94087. EOE.

EMPLOYMENT SECTION

HELP WANTED: Any company or station can run "Help Wanted" ads for \$1.50/word or buy a display box for \$55/column inch. Payment must accompany insert, use your MasterCard or VISA; there will be no invoicing. Blind box numbers will be provided at an extra charge of \$10. Responses will be forwarded to listee, unopened, upon receipt. Call 800-336-3045 for details.

POSITIONS WANTED: Any individual can run a "Position Wanted" ad, FREE of charge (25 words max), and it will appear in the following 3 issues of Radio World. Contact information will be provided, but if a box number is required, there is a \$5 fee which must be paid with the listing (there will be no invoicing). Responses will be forwarded to the listee, unopened.

Mail To: BROADCAST EQUIPMENT EXCHANGE
PO Box 1214, Falls Church, VA 22041

It's Imperial Transmitter's Annual Summer Inventory Reduction & Consignment Sale

In searching for top quality equipment for resale we've turned up the following choice "slightly used" items and offer them now at incredible savings over new. Many items too numerous to mention here are available. . . if you're looking for a piece of gear not listed here, or if you have an item you'd like to sell during our consignment sale, call us; we may just have what you need. All prices are as-is FOB location, standard Imperial terms apply. All items subject to prior sale. Transmitters may be ordered tested, tuned and delivered by Imperial Transmitters at additional charge unless noted. Here's a sampling of our savings:

Harris FM 20K 20kW FM transmitter	\$17,500	TFT 8300 950mHz STL system	\$6,000
Nautel Ampfet 5 5kW AM transmitter	18,000	TFT 844 FM stereo mod monitor, synth	3,000
Optimod 8100 A	2,000	Autogram AC-8, 8 ch stereo, 24 input	3,000
McMartin BF 5M 5kW FM transmitter	10,000	Ampex ACR-25B w/monitors, 2" cart rec.	3,000
Electro Impulse 50kW dummy load	1,200	CSI T-1F 1kW FM transmitter	3,000
Optimod 9100B2/U stereo AM	2,000	BEXT PTX-30, 30 watt exciter	1,800
TFT 8610 remote control, 10 channel	3,000	Collins 831G 25kW FM transmitter	19,000
QEI 675 exciter, wideband, synth.	1,200	BE FX 30 FM exciter	2,000
Phelps Dodge FM antennae	several avail	Belar TVM 101 mono TV monitor	1,200
ERI FM antennae	several avail	Collins 20V 3 1kW AM	3,500
Technics compact disk SLP1300	1,200	Harris SX-1 1kW AM	10,000

We have nearly every variety of audio processing listed. Also, many consoles, cart machines and test equipment.

Hundreds of consigned items on sale. Call—we'll fax you our full updated list! All items subject to prior sale. These are one of a kind used or demonstrator items.

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Fidelipac Mastercart (343), & (224) Audiopak AA-4 audio cartridges, all over 2.30. P Rebmann, WEZY, 1412 E Lime St, Lakeland FL 33801. 813-682-4191.

Fidelipac 300 & 350 cart shells, good cases, all need reload, \$400. J Graham, WSSL, POB 100, Greenville SC 29602. 803-242-1005.

Scotchcart II (400), all/part, \$2.50 ea; (400) Audipak carts, \$1.50 ea. B Downs, KTSR, Box 3248, Bryan TX 77805. 409-846-1150.

Scotchcart II (700), 4.5 & 5.5 min woldies format, \$1.75 ea/\$1100 all; (3) A-Line 200 space cart racks, \$90 ea/\$250 all. J Urbiel, WJQB/WNRS, 3001 Brassow Rd, Saline MI 48176. 313-662-2881.

Pepper-Tanner & TM Prod library records, variety avail. P Wells, KJCY San Diego, 619-238-1037.

B&K 1405 oscilloscope, \$100; Loftech TS-1 oscillator/dB meter/freq counter, \$175. P Cibley, Cibley Music, 138 E 38 St, NY NY 10016. 212-986-2219.

UREI 452A waveform, xmission measuring set, w/audio oscillator & voltmeter, \$150. R McDaniel, KJRG/KOEZ, Box 567, Newton KS 67114. 316-283-5150.

TRANSMITTERS

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RCA BTE-1E 20 kW for \$12,000 or best offer. 10 bay Phelps-Dodge antenna tuned to 94.7 MHz, best offer. M Jones, 314-431-1216.

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CCA AM10000, 10 kW, gd cond, ready to ship; Harris FM25K w/MX-15 exciter, 7 yrs old, excel cond. R Baker, Box 426, Fairburn GA 30213. 404-964-3530.

Continental 816R-3B 25 kW FM xmtr w/B02A exciter, all manuals & compl spare parts kit, has less than 200 hrs, can easily be tuned, \$47,500 FOB St Paul. D Thompson, Minnesota Public Radio, 612-290-1599.

Sparta 701 1 kW AM xmtr, tuned to 1190 kHz, vgc, \$6000, you ship; RCA BTA-10U2 10 kW AM xmtr, tuned to 1220 kHz, vgc, \$15,000, you ship/trade for console & STL equip. G Arroyo, WONQ, 2483 John Young Pkwy, Orlando FL 32804. 407-687-9345.

TAX DEDUCT EQUIP

Harris/Gates FM exciter; also, 19" rack, 5-6' enclosed; will pay shipping. A Hagler, KMUD, POB 135, Redway CA 95560. 707-923-2513.

Educ station needs all types FM brdct & studio equip for start-up, will pick up. M Casey, West End Radio, 303 Main St, Hampden MA 01036. 413-566-2445.

LP community Amer would appreciate brdct exciter donations incl xmtrs, will pay freight. R Schoedel, WMCR, c/o 4305 Eber Rd, Monclova OH 43542. 419-893-7968.

NP educ TV service needs video equip incl 3/4" editing system, monitors, vectorscope, charac gen, time base corrector, lights & more, tax deductible receipts given. H Johnson, 3rd Ward TV, 8926 Daffodil, Houston TX 77063. 713-286-5300.

Monte Vista Christian School, would appreciate any donations of used TV broadcast equipment. T Quinn, 408-475-0423.

Eng student desiring donation of old brdct equip (anything) in repairable cond, will pay all shipping charges, EE student at Purdue. C Gill, POB 371, Indianapolis IN 46206. 317-923-2800.

TEST EQUIPMENT

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*encor SC61 wave analyzer, \$1550; LC75 Z meter, \$400; FC71 freq counter, \$650; HP 239A oscillator, \$385; HP 331A noise & distortion, \$500; HP 400E voltmeter, \$200. B Adene, McKenney Brdct Eng, Rt 3 Box 205, Russellville AR 72801. 501-967-5451.

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Circle 48 On Reader Service Card

General Radio 1606-A RF bridge, late prod serial #1700, grey panel, excel cond, \$475. A Smith, Adams & Smith, 25 Stonehedge Rd, Lincoln MA 01773. 508-841-2209.

HP 1741A 100 MHz dual trace storage scope, \$888; Paratronics 5000 logic analyzer w/pods, \$475; HP 8444A tracking generator, \$1250; HP 5341A counter, \$1200; HP 8445B preselector, \$1100; HP 717A variable klystron pwr supply, \$67. G Wachter, KFYI, 631 N 1st Ave, Phoenix AZ 85003. 602-258-6161.

Technical Material 18K-A 18 kW dummy load, \$895. R Smith, KFGSA, 1122 Via La Cuesia, Escondido CA 92029. 619-739-1835.

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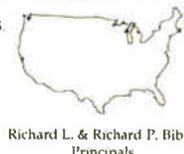
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McMartin BF-25K FM 25 kW, tuned & tested in excel cond, new tubes, completely reconditioned. Goodrich Ent, 11435 Manderson St, Omaha NE 68164. 402-493-1886 or FAX: 402-331-0638.

Nautil AMPFET, 25 kW AM on 1200 kHz, used 10 hrs as back-up, w/some spare parts & all manuals, \$20,000. S Christenson, WDCR-AM, 1227 DePrado Blvd #202, Cape Coral FL 33990. 813-574-1200.

Continental 315 R-1 5/1 kW on 1090 kHz & other misc equip, call for list. G Knop, 803-497-0460.

Elcom Bauer 707 in gd cond. Goodrich Ent, 11435 Manderson St, Omaha NE 68164. 402-493-1886 or FAX: 402-331-0638.

Bext has some show units at sale price. Full 2 yr warranty, like new. Exciters, amplifiers, STL's. First come first served only. Call for details. Bext, 619-239-8462.

McMartin B-910 FM exciter's. C Goodrich, 11435 Manderson, Omaha NE 68164. 402-493-1886.

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UHF low band, chnl 17, any pwr from 2 kW up. S Kalka, KTVG-TV, 941 O St #902, Lincoln NE 68508. 402-476-6000.

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TTC XL10 FM xmtr. G Wilson, KMSU, Box 153, Mankato MN 56002. 507-389-5678.

FM xmtr, 300 W to 1 kW, w/w/out exciter. F Hollon, Rt 1 Box 72, Plymouth IL 62367. 217-392-2340.

Versacount V-322 manual, copies fine. E Mitchell, Star 105, 12201 Merit #930, Dallas TX 75251. 214-716-7800.

Harris Collins 828E-1 5 kW; Harris MW-5A 5 kW AM; Cont MW-315R-1 antenna tuning unit; Kintronics LTJ-5B. J Aguilar, XEKMX, Avila Camacho 137, Guadaluajara, Jalisco Mexico. 36-570-384.

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McMartin AM/FM xmtr, any model, exciter or stereo modules. Goodrich Ent., 11435 Manderson, Omaha NE 68164. 402-493-1886.

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Russco Studio Pro B (2), w/new idler wheels, excel cond, \$100 ea. W Kremer, Kremer Kraft, 301 SW 16th St, Ft Lauderdale FL 33315. 305-524-5652.

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Newmann AM2B disc rcrding lathe & head, the big one, SS elec, excel cond, BO, older Scully cutting lathe w/Westrex 3-D stereo head & tube elec, BO. R York, Jewel Records, 1594 Kinney Ave, Cincinnati OH 45231. 513-522-9336.

RCA 73 disc recording unit manuals; Gramphn Head manual, \$50 ea. H Sewell, Oakridge, 2001 Elton Rd, Ft Worth TX 76117. 817-838-8001.

Empire 1000ZEX cartridge, any cond; Weathers ML1 & ML234; Rek-O-Kut B-12 & B-12GH w/white deck plate; Grey 33H; components PBT; Pickering 800; Scott 710; Empire 698; auto-lift add-on device for manual tonearms, any brand. W Laughlin, 753 Ruth Ln, Hurst TX 76053. 817-282-9033.

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Want to Sell

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Video time base corrector, gd price, call for details. J Schramm, 205-826-0390.

Strand Century CCR600 studio/stage light dimmer system, 8 chnl, 4 kW/chnl, 120 V, semi-portable, compact, full documentation, \$1100. D Boggs, Covenant Prod, Anderson U, Anderson IN 46012. 641-4344.

Sony VO-3800: portable VO-3800 video recorder, needs REP, color video camera DXC-1600 w/Canon TV zoom lens-200, V6x18, 18-108 mm, 1:1.6, camera control unit DXC-1600, color adaptor AC-3000, camera adaptor AC-1600, cart w/camera mount & swivel cords, (4) batt packs, (11) used cassettes, \$300+shipping. W Steinfeldt, AT&T, 320 Holloway Rd, Ballwin MO 63011. 314-227-7545.

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Sony AV 3600 helical scan, portable R-R in carrying case, near mint cond, BO. Pinetucket Rcrding, 205-826-0390.

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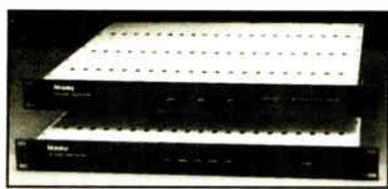
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Moseley DSP 6000

The newest addition to the Moseley STL product line is the DSP 6000 system. The DSP 6000 converts an analog STL—like the Moseley PCL 606 or PCL 6000—into a digital CD-quality link.

The standard DSP 6000 encoder converts two analog audio channels (left and right), and one data channel into a spectrally compact digital FM signal. The decoder provides complementary analog outputs.

For information, contact Dave Chancey at Moseley: 805-968-9621; FAX: 805-685-9638; or circle **Reader Service 73**.



TFT Model 9100

TFT's Model 9100 STL transmitter is frequency synthesized, has an RF output of 7.5 W minimum, a baseband response of ± 0.1 dB from 50 Hz to 53 kHz and 0.02 percent THD. Signal to noise ratio (SNR) is 85 dB, and stereo separation is 55 dB at 1 kHz.

The TFT 9107 is a new composite STL receiver intended to be a companion to the Model 9100 transmitter.

Both the TFT 9100 STL transmitter and the 9107 receiver feature exclusive five-year limited warranties.

For information, contact Herb Didier at TFT: 408-727-7272; FAX: 408-727-5942; or circle **Reader Service 19**.

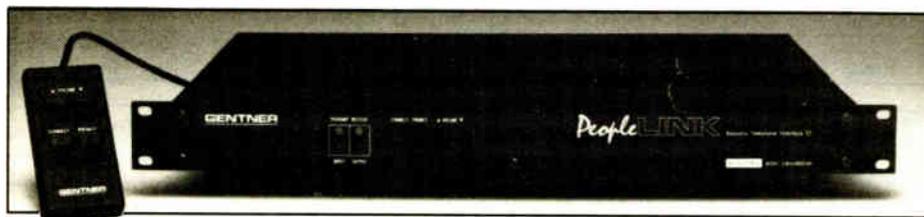
Northern Transdata

Northern Transdata Networks is bridging the gap between telcos and radio stations. New technology allows stations to take advantage of telco's digital dial-up phone lines.

Switched 56 circuits have been provided by the company to cover the shuttle launch, news events and sporting events.

Other upcoming events utilizing switched 56 service from various telcos include the 1992 primary election.

For information, contact Angela Depascale at 516-231-7272; FAX: 516-231-8045; or circle **Reader Service 120**.



Gentner TeleSwitch

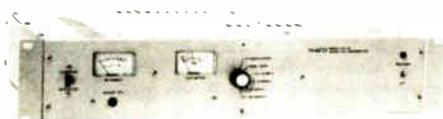
Gentner's TeleSwitch is a five-line call director. Compatible with most business phone systems, TeleSwitch indicates line status, and allows callers to be placed on hold, conferenced, routed to a hybrid, or recorded.

Also available from Gentner are the Digital Hybrid II, an auto-nulling telephone hybrid, and PeopleLink.

For information, contact Dave Finley at Gentner: 801-975-7222; FAX: 801-974-3777; or circle **Reader Service 35**.

TECHNOLOGY BREAKTHROUGHS

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Marti STLs

Marti's STL-10 transmitter and R-10 receiver can achieve an SNR of 80 dB with a received signal level of just 80 μ V. Channel separation is 80 dB.

The Marti STL system has been redesigned to provide an additional 6 dB of audio headroom, and the STL-10 transmitter offers an accurate peak-reading modulation meter. The STL-10 offers a 15-pin connector on the rear panel. Providing outputs for remote control and automatic changeover.

For information, contact Marti at 817-645-9163; FAX: 817-641-3869; or circle **Reader Service 108**.



Dolby STL system

Dolby Laboratories announces its forthcoming digital STL system. Scheduled to be on display at Radio '91, the DP5500 Series DSTL is slated for an early 1992 delivery.

The Dolby Digital STL will provide analog left and right inputs and outputs.

For information, call Kevinn Tam at Dolby: 415-558-0200; FAX: 415-863-1373; or circle **Reader Service 153**.



ComStream CDA201

ComStream's CDA201 Digital Audio Card integrates digital signal processing technology into a single add-on card that fits into any ComStream modem or earth station.

It provides compact disc quality, compressing a signal by a 4:1 ratio to minimize satellite transmission requirements, along with wideband (15 kHz) digital audio.

For information, contact Bruce Rowe at Comstream: 619-458-1800; FAX: 619-453-8953; or circle **Reader Service 45**.

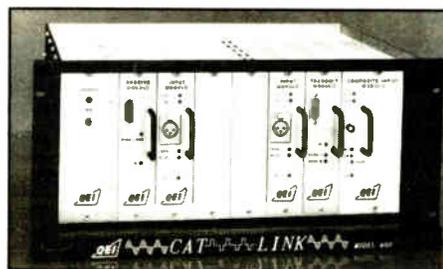
Intraplex 4800 DDAT Link

The Intraplex 4800 DDAT Link (Discrete Digital Audio Transmission) transmits multiple high-quality analog audio channels as a single, standard digital serial data stream.

Although the basic system transmits two 15 kHz channels, the 4800 DDAT Link can be configured to handle additional channels or for two-way transmission. Frequency response is ± 0.5 dB from 20 Hz to 15 kHz, THD+N is less than 0.01 percent, SNR is greater than 90 dB, and channel separation is not degraded in any way.

Also new from Intraplex is the 4500 MDAC Multi-Channel Digital Audio Codec. Using 4:1 compression, only 64 kbps is required for a 7.5 kHz audio circuit.

For information, contact Christine Doyle at Intraplex: 508-486-3722; FAX: 508-486-0709; or circle **Reader Service 91**.



QEI CAT-Link

QEI's CAT-Link is a real-time digital PCM encoder/decoder designed to exploit the T1 service. CAT-Link will accept multiple channels of bi-directional analog audio and control.

One possible "STL" configuration would transmit a composite FM signal, left and right channels of AM audio, plus remote control information to the transmitter site. At the same time, operating as a "TSL," 2 channels of satellite audio and 1 channel each of RPU audio/telemetry could return to the studio.

For information, contact Jeff Detweiler at QEI: 609-728-2020; FAX: 609-629-1751; or circle **Reader Service 79**.



CCS MICRO66i

CCS's (Corporate Computer Systems) new MICRO66i is said to be the first digital audio codec designed specifically for international usage.

The 66i is self-contained in a single 7.5" x 8" box.

The digital bit stream is interfaced via a standard V.35 or X.21 connector, attaching to a customer-provided 66 kbps or 56 kbps modem or CSU.

For information, contact David Lin at CCS: 908-946-3800; FAX: 908-946-7167; or circle **Reader Service 44**.



Telos 100

The Telos 100 Direct Interface Module switches on-air telephone lines to a hybrid directly without the need for key phone equipment. The Telos Link simplifies connection of a production intercom system to a dial-up telephone line.

The Telos 100 features low noise and distortion, XLR balanced input, and an RS-232 port.

For information, call Telos at 216-241-7225; or circle **Reader Service 137**.

Hallikainen Remote Control

Hallikainen & Friends' newest offering is a remote control system, the DRC200, just made available in June. The DRC200 has been designed for control of a single site using a leased line, or multiple transmitter sites using dial-up circuits.

It offers an impressive array of features, including 48 single-ended analog inputs.

For information, contact Harold Hallikainen at 805-541-0200; FAX: 805-544-6715; or circle **Reader Service 154**.

Burk Technology AUTOPILOT

Burk Technology's AUTOPILOT offers fully automatic transmitter control. To simplify set-up, user-defined functions are entered using a "point and shoot" menu system.

Transmitter switching, power and pattern changes, and generator test cycles are just a few of many sequences.

For information, contact Phil Halter at Burk Technology: 508-433-8877; FAX: 508-433-8981; or circle **Reader Service 104**.



Comrex DXP/DXR

Comrex's new DXP and DXR audio compression devices are designed to use the 56 and 64 kbps data services. These circuits include ISDN, switched 56 telco and fractional T1, and satellite. Using digital signal processing (DSP) technology, the portable DXP and rack-mount DXR versions permit 7.5 kHz duplex audio transmission.

Comrex also offers the 3XP Multiline Encoder. When switched 56 and fractional T1 circuits are unavailable, the 3XP uses multiple standard dial telephone lines to improve quality. One line provides 50 Hz to 3 kHz response, two lines extend the response to 5 kHz, and three lines allow 50 Hz to 8 kHz operation.

Real-time audio processing, including noise reduction and automatic telephone line EQ, are standard.

For information, contact Lynn Distler at Comrex: 508-263-1800; FAX: 508-635-0401; or circle **Reader Service 64**.

The new RS-700 from Radio Systems looks like every other DAT machine...



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Programmable logic functions automatically cue-up the tape on cassette insertion and after each cut has aired. Full remote wiring allows broadcast-standard pull-to-ground contacts and lamp drivers for console operator or network control.

And RS-DAT is still the only DAT featuring end-of-message tones, making it perfect for automation or live assist use.

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World Radio History

LAS VEGAS "We're beginning to see more market-driven solutions," remarked Peter Burk, president of Burk Technology.

That statement seems to best characterize the feelings of manufacturers contacted about the destiny of STLs, telco-based products and transmitter remote controls.

Although it's difficult to predict how future events will guide the broadcast industry, a few clear trends are emerging. Some will undoubtedly occur in the near term—others are just too far off to gauge.

Mac McClanahan, president of Marti Electronics, is uncertain of the precise direction radio is heading. But, he says, "the future of local radio is brighter than ever." Despite competition from other media, nothing can serve the local community with the reach and immediacy of radio.

What has been optimistically described as a downturn in the economy, though, has disfigured the financial balance of many small-market stations. As a result, broadcasters are inventing ways to reduce operating costs yet retain a solid local image. Complex STL systems, in part, are providing practical solutions.

As McClanahan explains, a geographically key station is able to feed programming to several stations in outlying areas very economically using a microwave relay network. Changing the point of program origination alone may be enough to return stations to a profitable operating posture.

TFT's Darryl Parker also has seen increased usage of STL systems. Consequently, in a growing number of markets, available STL channels are dwindle-

TECHNOLOGY BREAKTHROUGHS



STL, Remote & Telco Trends

by Dennis J. Martin

Remote, STL, Telco Focus on the Future

ding, he maintains. This is creating a need for high-quality, spectrum-efficient equipment. In addition, as broadcasters become more STL-dependent, frequency-agile devices may ease some of the field-engineering problems.

Remote controlled stations

Sophisticated transmitter remote controls, too, are offering additional alternatives. Dial-up transmitter control was just the beginning, Burk notes. He describes an overwhelming interest in off-premise control of the entire station.

At the same time, multi-site control is becoming highly refined and almost commonplace. A single, well-qualified operator can easily monitor several stations using the new generation of remote control equipment.

Paul Anderson, customer support manager of Gentner Electronics, observed many of the same changes in the

industry. Broadcasters are in pursuit of remote controls with added capabilities, he says. Dial-up access, in particular, is allowing thinly spread contract engineers to make adjustments and verify proper station operation wherever they are.

"Intelligent" remote controls that can perform compound functions by executing an entire sequence of events, such as fault recovery, are preparing broadcasters for what's to come.

Accumulated data analysis is another possibility. The automatic distillation of months of operating logs could forewarn station personnel of pending maintenance: "Change transmitter tube next month," for example. Broadcasters no longer are being driven by FCC rules since deregulation left them hanging, Burk says.

Telephone interfaces also are enjoying increased attention—"the trend is back

to terrestrial services," Anderson says. Fractional T1 and fiber optic circuits are drawing users away from satellites. Probably to no one's surprise, DSP technology is having a profound impact on audio quality.

Doug Hogg, president of Moseley Associates, adds that the marketplace will determine what it wants. That, as he describes, includes the formation of many small networks, especially between co-owned facilities. Digital is able to transmit high-quality audio through a variety of mediums, including fractional T1 circuits, which is contributing to a wide range of options.

Interfacing analog and digital

Even though digital technology is solving problems, it's creating a few in the process. At the "items to be addressed" forefront is interconnectivity. Hogg says that manufacturers need to worry about compatibility with companion products from other sources.

During the "transition" period, it will be necessary to interface existing analog equipment with new digital devices. Parker agrees that it is important to study what forms of digital interfaces will be required.

At the very least, some confusion is likely to result, even if digital equipment is technically compatible. Consequently, the industry as an entity—both broadcasters and manufacturers—needs to develop interconnectivity guidelines. Meanwhile, Hogg believes that connectivity options—whether they are analog or interfaces like AES/EBU—are critical. "Clearly the trend will be digital," Hogg indicates.

(continued on page 40)

7.5kHz International Dial Up Audio

CCS' New MICRO⁶⁶ⁱ Lets Your Voice Be Heard Around the World

In 1989 **CCS Audio Products** set new standards for 7.5 kHz dial up digital audio with the Micro 56 audio codec.

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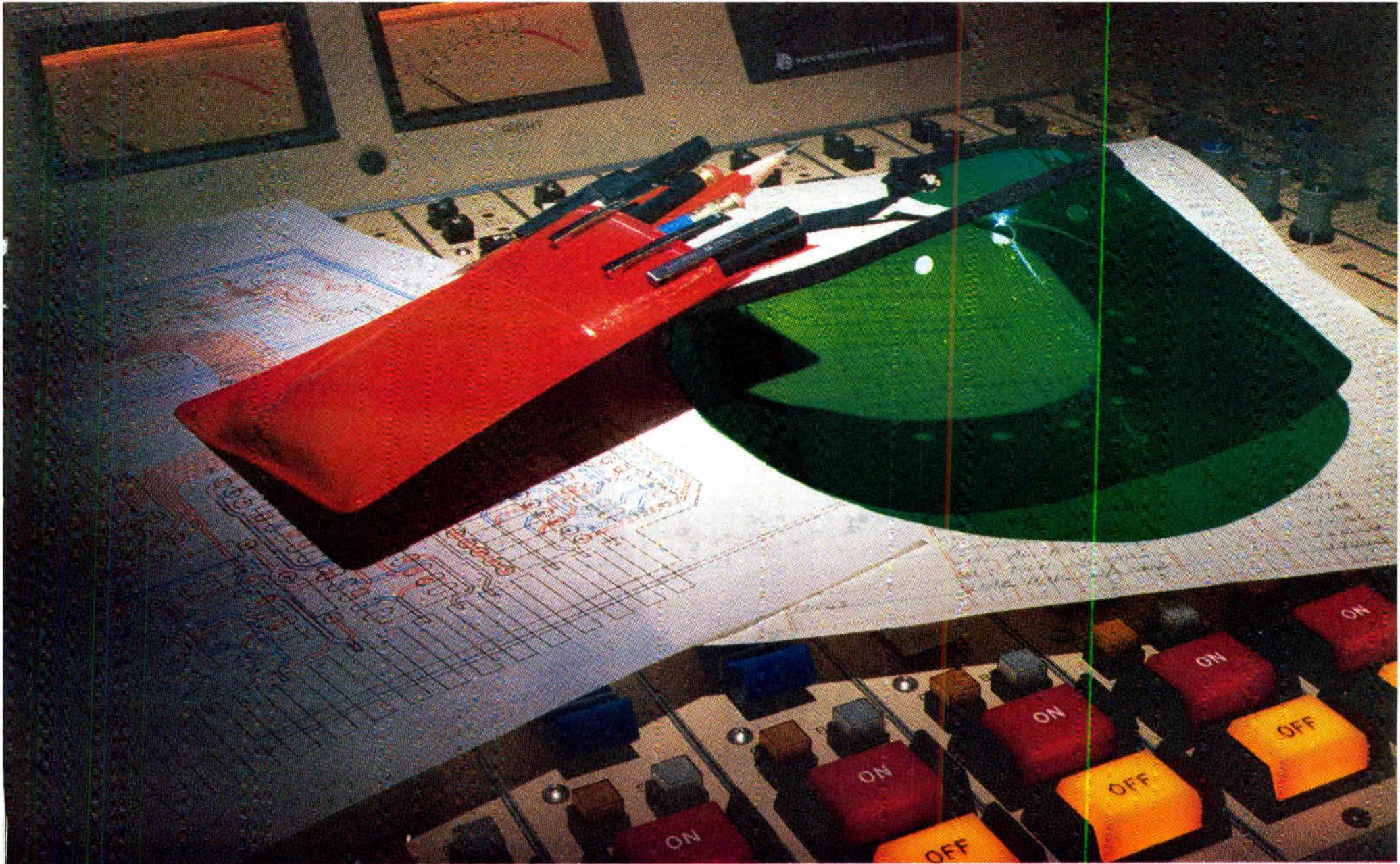
7.5kHz codecs, 20kHz stereo MUSICAM codecs, high quality digital audio and now, international compatibility — only **CCS Audio Products** offers you so much versatility.



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RW

Building a Translator in Five Steps

(continued from page 28)

or execute an article of group agreement.

Keep minutes of the meetings for the record. Secure written authorization from the primary station to rebroadcast and execute a site-lease option, conditioned on issuance of a Commission construction permit.

Order the engineering consultant's services, supplying information needed. If he prepares a complete application, be sure to enter certification information and sign three copy sets for the FCC and keep one set for file. Mail the three sets to Washington and publish required public notice in local newspapers. Notify the primary station and project sup-

porters of progress to date.

After issuance of the FCC construction permit, secure the possibly required building permit and execute the site/structure-use agreement, if necessary.

Build

Order the equipment and arrange for tower and installation services. You have 18 months to put the translator on the air. Upon completion of installation, activate the system, set operating parameters according to terms of application and/or construction authority and check coverage in the field.

Record a complete set of equipment

meter readings for an unrequired, but recommended log. If everything appears correct, remain on the air for continued service.

Complete the FCC application for the license (instrument of authority to operate) and mail it to the FCC. Maintain secure, clean, ventilated equipment environment and enter notations in an unrequired, but recommended log. And don't forget . . . have an on-site, clearly visible sign stating the translator station call and the telephone number of the

person responsible for its operation.

Apprise all interested parties of the state of things, including local news media. Be promptly responsive and keep records of any complaints of interference, notify the engineer-in-charge at the FCC district office of action taken and be aware of license renewal obligations.

Congratulations.

■ ■ ■

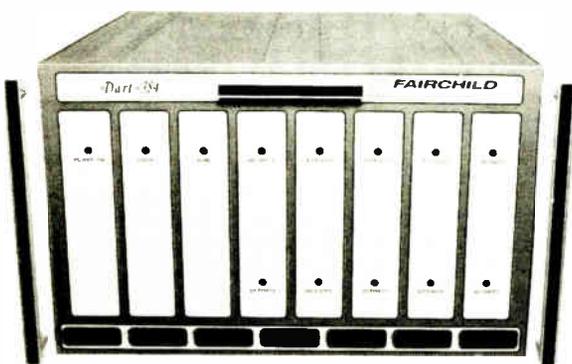
Howard L. Enstrom is a broadcast consultant. He has owned and managed an AM station and is president of FM Technology Associates, Inc., specializing in engineering design and sale of FM translator equipment. He can be reached at 904-383-3682 or by FAX: 904-383-4077.

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World Radio History

TECHNOLOGY BREAKTHROUGHS

NAB

STL, Remote & Telco Trends

Focusing on the Future

(continued from page 38)

Manufacturers, as far as this decade is concerned, are reluctant to guess what products broadcasters may need or want. Rather than offer a solution to a problem that might not exist, they are assuming a passive stance by casting a watchful eye instead. It is premature to talk about new digital products, but all admit they are continuing to evaluate the needs of broadcasters.

Back to business

Some believe that the recession is over and it's time to get back to business, which was evidenced by the number of serious buyers who attended the NAB convention in Las Vegas. "They did their homework

and shopped the competition," Burk says.

Other indicators, in contrast, still point toward conservative capital expenditures. Some broadcasters, largely restricted by tight budgets, are looking for higher-quality used equipment instead of digital quality, added McClanahan.

In any case, the industry seems to be in a period of consolidation, where a single station will take control of several others in terms of programming and remote control. One thing is sure—the way radio operates is changing.

■ ■ ■

Dennis J. Martin is a maintenance engineer for KBIG-FM in Los Angeles, and an occasional contributor to RW.

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COMREX, the leader in remote audio broadcast transmission via standard telephone lines, now sets the pace with satellite-quality audio transmission using standard dial phones or digital circuits. Since 1961, Comrex has been consistently delivering the most reliable equipment and personalized response to broadcasters world-wide.

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Circle 71 On Reader Service Card

BUYERS GUIDE

Studio Audio Equipment & Furniture

Benchmark IFA-9 On The Mark for USA

by Steven C. Thompson,
Network Engineer
and John Scaggs,
Director of Operations
USA Radio Network

DALLAS When the USA Radio Network recently moved into new studios, the prevailing philosophy was that of excellence.

When it came time to purchase equipment for our new talk show studio, at first we tried a few "industry standard" mic preamps; each caused some sort of anomaly. No one likes things that buzz, hum or go "beep, beep, beep" in the night.

USER REPORT

We first became familiar with Benchmark Media Systems when we used the company's HPA-1 headphone amps in our news anchor booth. We decided to try their MIA 4x4 mic preamp in the talk show studio. The results met our expectations—it was transparent and performed flawlessly.

So when the time came to distribute headphone audio to six positions in the talk show desk (a solid oak custom-built desk), the answer was clear: call Benchmark.

Integrity impeccable

Few, if any, in the industry that I know of can claim the specs these guys do. With a four-digit THD (.0009 percent), a -104 dB noise floor and a dynamic range

of 130 dB, we find the sonic integrity impeccable.

In addition to our hourly news, we produce a daily interview and information talk show, "Point of View," with Marlin Maddoux. It incorporates phone and in-studio interviews. The host and guests like the design of the headphone system because they each have their own volume knob.

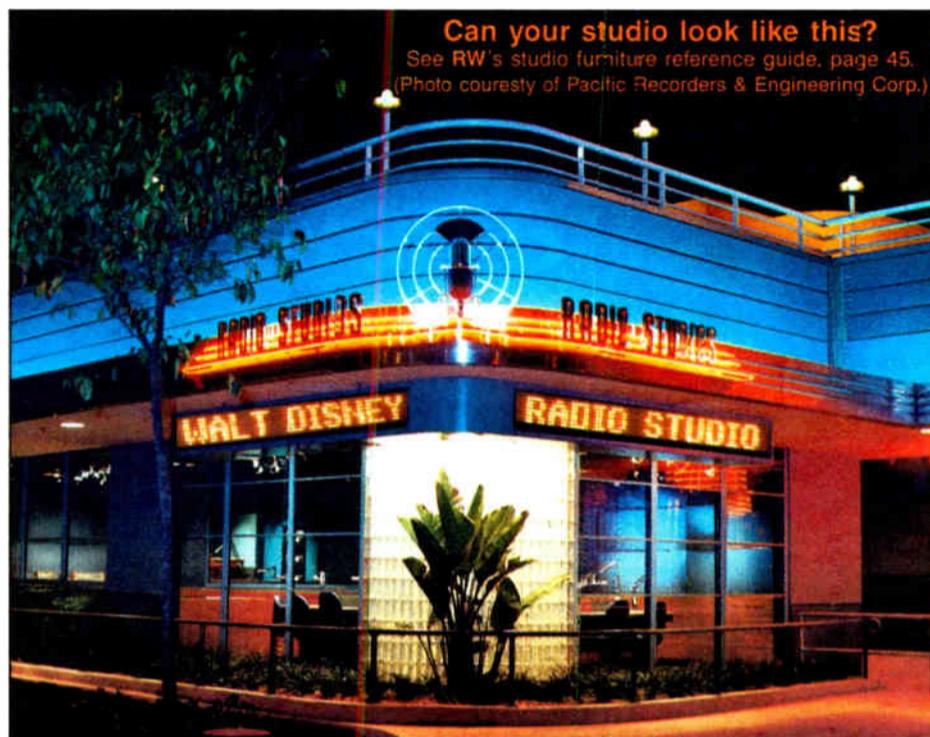
We satellite deliver the audio to nearly 800 stations. Thus, the purity of our audio is critical.

Some items are chosen with both economics and performance in mind. Others are chosen strictly on merit of performance because of critical application. Such was the case at the USA Radio Network with the Benchmark IFA-9, a one-in, six-out balanced distribution device. They call it an interface, because of the DB-25 connector on the back; the unit is only one-third the width of a standard rack space.

Feed the amps

We use the IFA-9 in our talk studio desk. We feed it with one of the monitor outputs on the Series 200 Auditronics console. We then feed the balanced outputs to six different positions in the desk. At that point, we use the Benchmark DIA-2 to unbalance the signal and feed the actual headphone amps (HPA-1s).

This design allows us to run balanced lines to the position, thus taking full ad-



Can your studio look like this?
See RW's studio furniture reference guide, page 45.
(Photo courtesy of Pacific Recorders & Engineering Corp.)

vantage of the RFI and EMI protection of balanced lines.

When the term "balanced" is used, old timers have a tendency to think of 600 ohm source impedance. However,

Benchmark subscribes to the voltage-sourced balanced interconnect system (as do the folks at ABC and Jensen Transformers)—that is, the use of the

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Plus an Industry Roundup from Pacific Recorders & Engineering and a Studio Furniture Reference Guide.



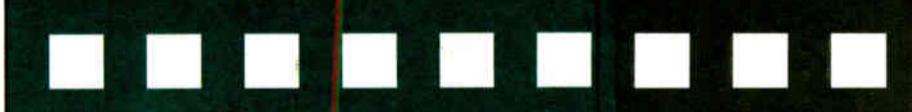
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Auditronics 800. Not just a new state-of-the-art.



A new state of mind.

To really understand the thinking that created the Auditronics 800 series, you'll need more than a new appreciation for the state-of-the-art. You'll need a different state of mind – an open one.

Begin with an ideal: Perfection. Because when Auditronics design engineers began development of the 800, there was only one rule – no shortcuts.

To their credit, they took this opportunity to create an entirely new console whose appearance is more suggestive of high-performance stealth technology than the flight deck of a vintage B-52.

And, the beauty of our new 800 is much more than skin deep. Because beneath its subdued charcoal exterior you'll find uncompromising compo-

nent quality, and superior circuit design that clearly indicates a "no guts, no glory" mentality on the part of our design team.

In short, the Auditronics 800 is designed and built to incorporate the best of everything broadcasters say they need in on-air consoles today, while omitting needless bells and whistles. The results are astonishing – a high-performance console that clearly reflects not only a new state-of-the-art, but a new state of mind.

If this sounds like your idea of the perfect console for your station, we invite you to find out more about the Auditronics 800. Call 901-362-1350 today for complete information.



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World Radio History

Furniture Design Considerations

by **Dave Pollard**
Manager,
Sales and System Engineering
Pacific Recorders & Engineering

CARLSBAD, Calif. "Measure twice—cut once." That old wood-working adage is still true today. When applied to broadcast studio furniture, it could be rephrased: "Design completely and carefully first, then you'll build it right the first time."

When beginning discussions on an appropriate design for new studios, numerous items should be taken into account. Will there be changes to the show

or format, requiring different equipment or a different layout? Will the proposed requirements fit in the room dimensions that you've been given?

After the requirements have been met and the furniture has been installed, will there be any space left for people? Not surprisingly, the lack of actual working space is our most frequent design challenge.

Questions and answers

Following are questions that should be addressed during the design process and the reasons why each should be given priority.

Should the furniture be at sit-down or

stand-up height? This can affect the amount of rack space available. Stand-up height furniture can require less chair clearance than sit-down furniture, thus working better in space-limited situations.

INDUSTRY ROUNDUP

Is there a requirement for wheelchair clearance within control rooms and studios? If the answer is yes, the entire design approach will be different.

Would the operation be more functional with a second broadcast position, say for a news or sports person? This position can be fitted with a smaller mixer and cart machines. The second position also can free up other rooms for production. Where will the system interconnect point be and how will it be accessed? Depending on station needs, this can be a single block or a wall of blocks. Planning for easy access to this wiring will make life a lot easier.

Also, where will inter-room cables enter the furniture? Designing for floor, wall or ceiling access shouldn't be an afterthought. How about access to the rear of equipment racks? If furniture is up against the wall, that is a problem.

Proper ventilation

Solutions include additional access panels, hinge-down racks or slide-out racks. Has proper ventilation been provided for all equipment? By determining in advance where heat-generating equipment is going, those racks can be properly ventilated. Finally, plan in advance for the installation of the furniture. Space limitations of doorways, hallways, stairs and elevators need to be considered before the furniture arrives.

Studio furniture that serves your station and personnel well is best achieved

by planning. Be sure to gather as much information as possible before committing to a design.

It also never hurts to rely on a broadcast furniture supplier that can provide suggestions as well as solutions to design problems, avoiding costly mistakes and making it all sit right the first time.

...
Pacific Recorders & Engineering Corp. is a manufacturer of consoles, cartridge machines, production mixers and custom studio furniture. For information on the company's products, contact Dave Pollard at 619-438-3911; FAX: 619-438-9277; or circle Reader Service 99.

USA Taps Benchmark

(continued from page 41)

1:10 ratio of source to load impedance.

The idea is voltage transfer rather than power transfer. The advantages are less

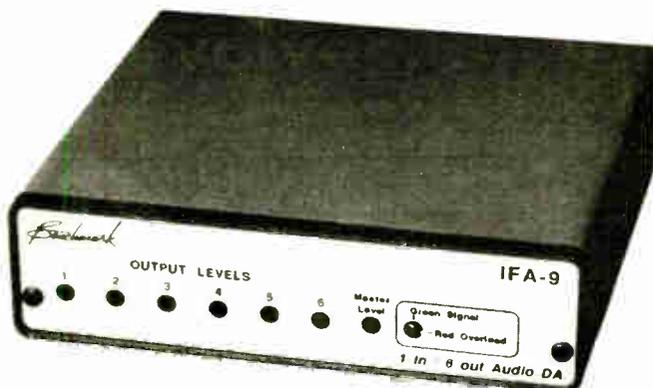
Benchmark has incorporated a special common mode rejection filter in the IFA-9, which further improves the interference protection.

Benchmark is famous for the "component on a stick." Whether you need to retrofit a reel-to-reel with differential balanced outputs, distribute stereo audio or pre-amp your mics, I think Benchmark is the way to go.

Sure, you could sit around and cook up some circuit to do the job. But why? They do it cleaner, smaller and quicker.

We are very pleased with our IFA-9 and highly recommend Benchmark products.

...
 For information, contact Mark Potterbaum at Benchmark Media Systems at 315-437-6300; FAX: 315-437-8119; or circle Reader Service 94.



Benchmark's IFA-9 was first on the list for USA Radio Network.

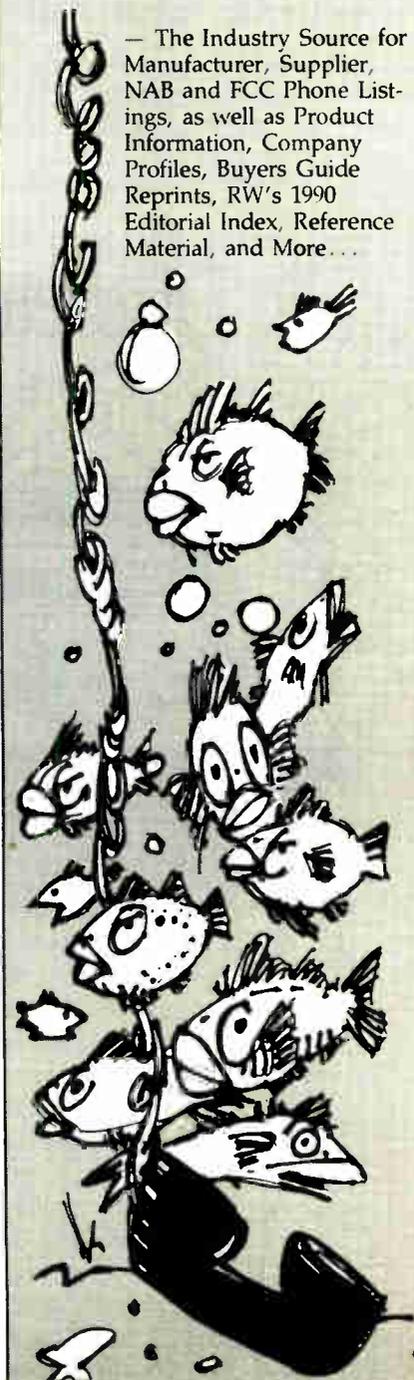
power draw on source devices, much lower noise pick-up and the ability to use longer interconnect lines without loss of high frequency. What is the bottom line? All of this means pure clean audio. (You can read more about this in the AES paper, "Voltage Transmission for Audio Systems," by Richard Hess.)

Fishing For A Phone Number?

Catch it in

1991 Radio World Directory Issue

— The Industry Source for Manufacturer, Supplier, NAB and FCC Phone Listings, as well as Product Information, Company Profiles, Buyers Guide Reprints, RW's 1990 Editorial Index, Reference Material, and More...



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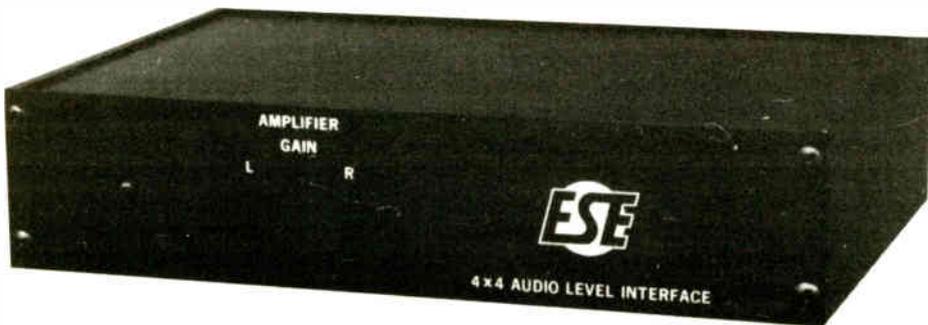
ES-244: Upgrade Of a Good Idea

by Sandra Woodruff
Technician, KFWB News 98

LOS ANGELES The PD just rushed in with a pair of CD players he's been testing at home. They're great and now he wants them on the air.

a good idea. It accepts a pair of unbalanced -10 dBV RCA plugs and amplifies the signal for a pair of 600 ohm balanced male XLR outputs at a continuously adjustable range up to +20 dBm (+4 dBm nominal).

The other side of the ES-244 is an at-



The ESE-244 from the front . . .

A quick look at the back shows no sign of balanced outputs, only the familiar RCA warts.

You have a limited number of ways to hook this illegitimate child into the audio chain, but the simplest is a ready-built audio level interface.

The ES-244 from ESE is an upgrade of

tenuator with two balanced female XLR inputs that feed a pair of unbalanced RCA output jacks. The loss is a fixed 14 dB. Send +4 dBm in, get -10 dBV out—a perfect match for that consumer cassette deck the boss picked up on trade last month.

In the ES-2862 configuration, the ES-

Business . . . Richardson Electronics and Microwave Modules & Devices signed an agreement naming Richardson exclusive worldwide distributor of MMD's FM broadcast modules. The agreement includes the C700-FM10-H 700 W and C150-FM11-P 150 W modules.

Audio-Technica U.S. will be distributing all of its professional audio products throughout Canada. Canadian pro audio dealers should direct inquiries to Garry Elliott or Sally Fish, national sales managers, at Audio-Technica U.S. Inc.: 216-686-2600.

Imperial Transmitter received a contract for tuning and testing all transmitters sold by BESCO International of Dallas.

Kosmik Audio Products has signed a dealer agreement with Rockford Professional to market Hafler Pro Audio amplifiers. These American-made pro amps feature state-of-the-art metal oxide semiconductor field effect transistors (MOSFETs).

People . . . Karole L. White, execu-

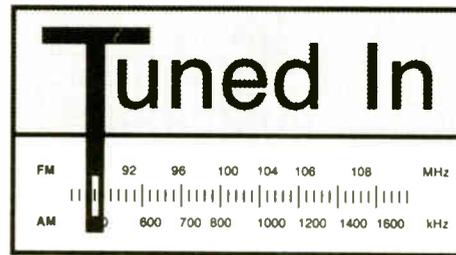
tive director of the Michigan Association of Broadcasters for the last five years, was elected president of the Broadcast Executive Directors Association (BEDA) at its annual meeting in Washington.

Gary Crowder, formerly with Gentner Electronics, has joined Northeast Broadcast Lab in South Glens Falls, N.Y., as director of marketing.

John Schaab, formerly with International Tapetronics Corp. (ITC) was named VP/sales for Broadcast Services/EME. He will be based at the North Carolina headquarters.

Tony Mezey was named field sales representative, opening the West Coast sales office in Los Angeles. He formerly worked for Harris-Allied. Sarah Shankland, also formerly of Harris-Allied, was named field service coordinator for the Los Angeles office.

Thomas M. Spain was named national sales manager for the Revox Division of Studer Revox America, Inc. He will take charge of U.S. sales for all Revox products.



244 box is mounted on the left position of a black 1 3/4-inch rack panel. The right position is pre-drilled and ready to accept a second ES-244. The built-in 120 VAC source makes installation simple. The amp levels are easily set from the

uses it to match the input and output of a consumer reel-to-reel deck where we delay audio feeds. Since this only tied up the left channel of the attenuator and amplifier, we grabbed the right channel to feed a shortwave receiver speaker jack into a spare input.

An optimal use for this unit would be as a stereo interface for a consumer cassette deck or reel-to-reel. You could use one unit to interface the left and right inputs and outputs with balanced station lines.

The red LED on the front is reassuring, too. It's nice to know at a glance that the power is on. ESE designed the ES-244 with input from broadcast engineers.

USER REPORT

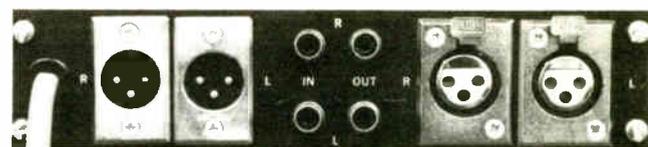
front and offer a wider range than the competing brand, which we already use throughout the station.

The rack mount feature is nice if you tire of numerous little boxes taped and glued in place throughout the station. Of course, if you're into that sort of thing, just remove four screws from the rack panel, and the ES-422 is free to be hidden or taped wherever you want it.

When we got our test unit, I double-checked the published specs and got no surprises. After testing, the interface went into the rack to replace a similar device that was loose on a shelf. KFWB

And here I thought these guys only made timers.

For information on the ES-244, contact Bob Mayers at ESE: 213-322-2136; FAX: 213-322-7033; or circle Reader Service 67.



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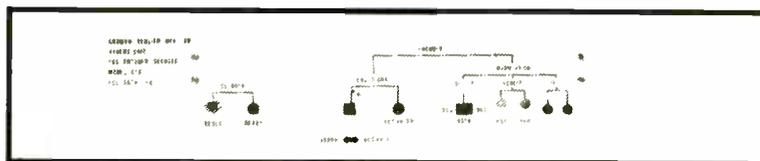
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EBS EQUIPMENT



Model	Price
Model CEB Encoder-Decoder	\$540
Model CE Encoder Only	\$375
Model CE With Stereo Option	\$405
Model CD Decoder Only (REQUIRED FOR LPTV)	\$320
Receiver can be supplied to drive Decoder	\$100

• Encoder FCC Type Accepted • Decoder FCC Certified • Exceeds FCC Specifications •

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Reference Guide: Studio Furniture*

Studio furniture is available through a variety of sources. Contact manufacturers for distributor information.

Company And Contact	Reader Service #	Lines	Price Range	Materials	Pre-Fab, Custom	Pre-wired	Features	How Shipped	Delivery Time
Acoustic Systems Ginny Cookson 800-749-1460 FAX: 512-444-2282	72	Pre-fabricated Voiceover Booths, BB Models 330, 340, 440, 450, 550, 560, 660, 670, 770, 880	\$5650-\$11,325	Steel	Both	Yes	3½" inch doors, 4" wide x 1¼" deep inverted C channel of 16 gauge steel and 4" thick panels. All components rust-proofed and finished with two coats of polyurethane enamel paint	knockdown, truck delivery	under 40 days 7-10 days
Arrakis Systems Inc. Rod Graham 303-224-2248 FAX: 303-493-1076	124	Modulux supreme, Modulux, Modulux II, Modulink® and custom	\$1500-\$15,000	polyboard, hardwood plywood, Wilsonart plastic, solid oak	both	Yes	Modular, flexible, high quality, affordable	UPS, air freight, van lines	3-30 days
Audio Broadcast Group Dave Howland 800-999-9281 FAX: 616-452-1652	33	Pro Studio, Executive, Custom, Video 1000, Design V, Enterprise Series	\$2600 and up	High density composition board, 16th grade formica, solid oak trim	Standard stock systems, and built to customer specifications	Standard AC wiring inc. pre-wires, complete turnkey install avail.	Cable runs, construction exceeds AWI standards, leveling feet, drilled/tapped rack rails, frameless cabinet design, choice of colors	Company truck, blanket wrap, padded van	10-45 days
The Express Group Byron Andrus 619-298-2834 FAX: 619-298-4143	86	Series 1000, 2000, 3000, 4000, 5000, 6000 and custom	\$2915 and up	Void-free birch plywood, poplar wood supports, high grade laminate, steel rack rails, solid hand rubbed oak or walnut	Both	Yes, by Express Group distributors	Superior design, craftsmanship and value. Six flexible modular systems and unique custom designs. All series include oak or walnut trim, standard high quality laminates, premium birch ply and hardwood construction throughout (no particle board). Unique high impact corner guard system, rack rails, sloped or vertical faced modules, quarter turn fasteners, built-in wire passes, passive ventilation, leveling feet and unique edging system. Stand up and one-of-a-kind designs are our specialty.	Truck—U.S., Canada, Mexico; Air freight—overseas	1-4 weeks
Murphy Studio Furniture Dennis Murphy 619-698-4658 FAX: 619-698-1268	115	Avant-Garde, Elite, Premier, Classic & Dub/Edit Stations	\$1000-\$15,000	Solid oak, poplar, plywood, plexiglass, high density particle board, steel, corian (Avant-Garde series only)	Both	Option exists	Superior ergonomic design, bumper base and no laminate to laminate edges for durability, sloped faces on all returns, passive ventilation system, plexiglass covers over rack openings under main console area where operators' feet are located	Blanket wrapped moving van for whole studios, crating and motor freight for small pieces	2-8 weeks
Pacific Recorders & Engineering Corp. Dave Pollard 619-438-3911 FAX: 619-438-9277	29	Custom and Primeline	\$2865 and up	¾" birch plywood, high density particle board, plastic laminate, oak and selected hardwood trim, steel rack rails	Both	Yes, if desired	Custom cabinetry is designed and built to the highest quality standards. Economical Primeline offers a flexible, modular design, while maintaining a quality appearance	UPS, air freight, padded van	Custom: as quoted individually, Primeline: 2-4 weeks
Ruslang Corporation Frank Ruskey, Jr. 203-384-1266	101	Complete line of studio furniture & cart CD-record-tape storage	\$27-\$1700	High pressure laminate	Both	No	High quality	Truck & UPS	1-6 weeks
Wheatstone Corporation Ray Esparolini 315-455-7740 FAX: 315-454-8104	47	Wheatstone furniture	\$5000-\$15,000	Horizontal grade laminates, all oak trim, steel rack rails	Both	Yes	1½" thick counters & partitions throughout, solid oak trim, easy access ouch block housing, copious rack space, fast on-site assembly	Moving van	4-10 weeks

* The Reference Guide is a selected sampling of current products. Specifications and prices are supplied by the manufacturer and are subject to change without notice.

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B. Commercial FM station H. Consultant/ind engineer
C. Educational FM station I. Mfg, distributor or dealer
E. Network/group owner J. Other _____

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007 029 051 073 095 117 139
008 030 052 074 096 118 140
009 031 053 075 097 119 141
010 032 054 076 098 120 142
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014 036 058 080 102 124 146
015 037 059 081 103 125 147
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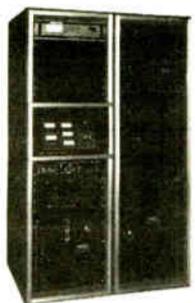
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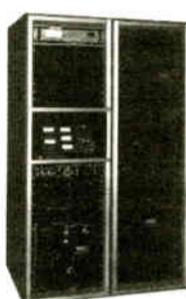


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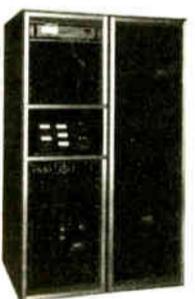


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Eventide Offers Signal Processing with Ease

by Don Teolis
K&D Productions

GREENVILLE, R.I. After using the Eventide H3000SE Harmonizer as my primary source of digital reverb and delay in the production room, I couldn't imagine much else the company's H3000B could accomplish, since the "B" chip is included in the SE version.

USER REPORT

But after being challenged with the opportunity to produce a demo of the unit for Eventide, I soon came to appreciate the well-thought-out broadcast-oriented options available to anyone with an ounce of creativity—and maybe 10 minutes to figure out the easily accessible parameters and program changes.

This is not to say that there isn't enough depth to the capabilities of this unit to keep anyone who wants to spend hours on end creating newer, more exciting patches from being challenged with an array of versatile parameters such as deglitching, fine tuning, pitch adjustments, etc. But that's just it; you don't need hours to accomplish such tasks.

No parameter manipulation

I found that most of the effects I chose needed little or no parameter manipulation to get the results I wanted. Gone are the days of systems sitting in the corner of the production room collecting dust because they were too complicated

for the average jock or non-tech. The H3000B is quite user friendly.

For anybody into sequencing or MIDI-triggering, the H3000B's MIDI implementation is both functional and complete. For my purposes, using a MAC sequencer program synced with an eight-track works out great. That way, I can control feedback, width, delay times, triggers and program changes through the sequencer to make the job of mixing that much quicker and easier.

As far as reverb is concerned, the "Stadium" and the "St. Peter's" patches are excellent large room verbs. "Locker Room" and "New House" are small room verbs that are very appropriately named. "Fade to Dream" is one of my favorites, with a soft key-triggered fade that brings you from reality to dreamland at the touch of a button (sounds like the promo you did last week, huh?).

"Reverb Factory" allows you to create your own verb. It has a built-in gate with response time and threshold, plus parametric EQ for left and right outputs.

The sound effects patches can be a blessing when you're in a hurry for a ba-

Basic pitch shift effects

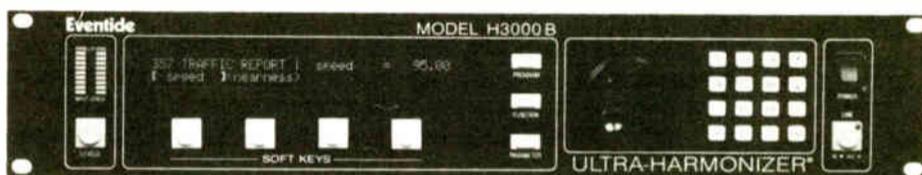
Of course, there still are a lot of basic pitch shift effects that Eventide always has been known for. The "Oksy Ten" and "Alvin" patches are easily fine tuned with Eventide's famous large knob or the keypad; they can operate in phase locked stereo, dual, layered or reverse modes.

There's also a great stutter algorithm that bears mentioning. The "Auto-Max" patch is derived from this algorithm. With some creative parameter adjusting,

I'm very pleased with the H3000B and wouldn't trade it for anything within its price range on the market today.

you can get some interesting and useful variations of that infamous "Max Headroom" effect.

Then there's "Timesqueeze." For those who aren't already familiar with this function, it automatically controls the speed of your tape or cart machine and then adjusts the audio signal to the proper pitch. All you do is enter the cur-



Eventide's updated H3000B Ultra-Harmonizer quickly became a good friend to K&D Productions' Don Teolis.

rent running time and how long you want your program to be.

The H3000B does all the pitch ratio calculations for you. You can set up a different preset for each machine that will be using Timesqueeze. If you've ever been zapped with the, "Hey, we need to stick all this into 60 seconds" challenge, then Timesqueeze is for you. For some of us, this patch alone makes the H3000B worth every cent of its nearly \$3,000 price tag.

I'm very pleased with the H3000B and wouldn't trade it for anything within its price range on the market today. There's really no single all-in-one type unit that is quite as versatile and functional as the H3000B. Keep in mind that it's upgradeable in the field to H3000SE specifications for about \$600. There also is a nice sampler option (23.7 seconds mono, 11.8 stereo) for around \$600.

In today's world of wanna-be signal processors, the H3000B already is.

For information on Eventide's H3000B, contact Gil Griffith at 201-641-1200; FAX: 201-641-1640; or circle Reader Service 51.

MARKETPLACE

Radio World's Marketplace, a compendium of new and recently introduced radio broadcast products, appears monthly in Buyers Guide.

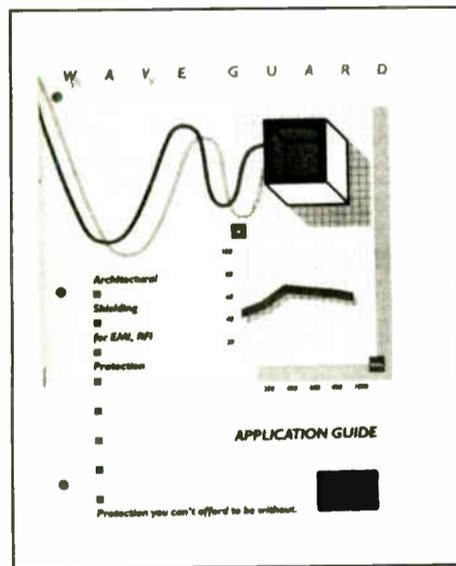


Microphone Stand

The SEMS microphone stand from Sennheiser Electronic Corp. was recently awarded the "Artist Stage Design Prize" by "Artist," a German musician's magazine.

The stand features boom joints with reinforced ABS material and metal shafts. Also, friction washers are used instead of clamping nuts to ensure that the boom will always hold position. A gray on black color reflects any color spot-lights.

For information, contact Al Zang at Sennheiser: 203-434-9190; FAX: 203-434-1759; or circle Reader Service 89.



Reference Guide

A 64-page reference guide describing electromagnetic/radio frequency interference is available from Spraylat Inc. The manual also contains application instructions for Spraylat's Wave Guard™ EMI/RFI shielding paint.

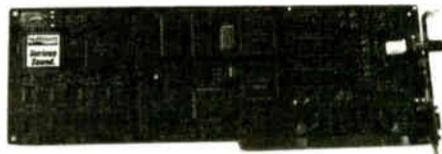
Wave Guard is a line of water-based copper paints used for shielding against EMI/RFI in commercial facilities. The product is said to cost as little as 10 percent of shielding systems with similar performance characteristics.

For information, contact Michael Macre at Spraylat Corp.: 914-699-3030; FAX: 914-699-3035; or circle Reader Service 151.

Measuring System

The Amber Series 7000 System, introduced at NAB 1991, is a low frequency generation and measurement system combining a user interface, analog and digital hardware. It provides analog and digital measurements of audio and acoustic systems.

For information, contact Vincent DeSouza at Amber: 514-333-8748; FAX: 514-333-1388; or circle Reader Service 55.



Sound Output Board

Turtle Beach Systems has announced that its MultiSound multimedia sound output board will be ready for shipping in the fall of 1991.

MultiSound is a 16-bit full-size card, capable of playing and recording stereo-CD-quality sound. The system is based on a Motorola processing chip, capable of 10.5 million instructions per second.

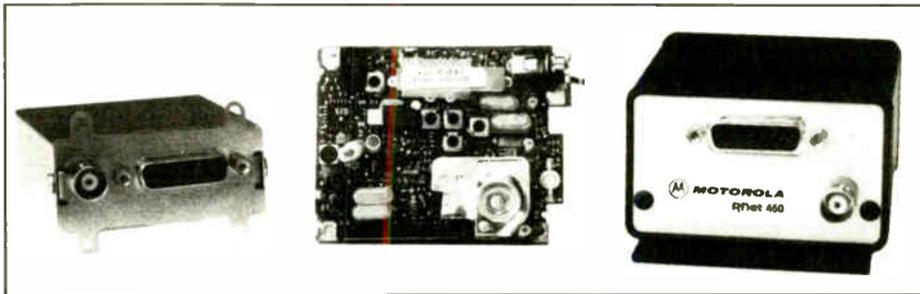
For information, contact Jeff Kline-dinst at Turtle Beach: 717-843-6916; FAX: 717-854-8319; or circle Reader Service 145.

Multiplexer

Intraplex, Inc. has introduced the 3800 VRM variable rate multiplexer featuring several aggregate transmission data rates.

The 3800 VRM combines digitally encoded voice, data and high-quality program audio channels into a minimum bandwidth (64xN kbps) serial data stream.

For information, contact Christine Doyle at Intraplex: 508-486-3722; FAX: 508-486-0709; or circle Reader Service 122.



RNet Extension

Motorola introduced an extension to its RNet Telemetry Radio line, the RNet "SLM," designed for markets heavily involved in using radio frequencies for data transfer.

The "SLM" operates at 403-430 MHz, 450-470 MHz and 136-174 MHz. The slim-line telemetry radio provides two-channel capability, voice and data versatility, variable power levels, low current drain and a three-year parts and labor warranty.

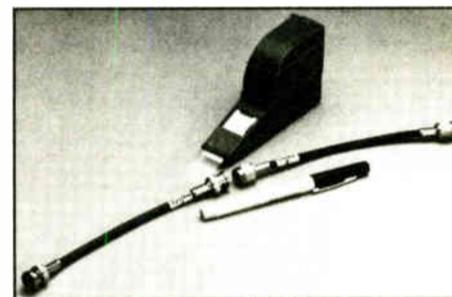
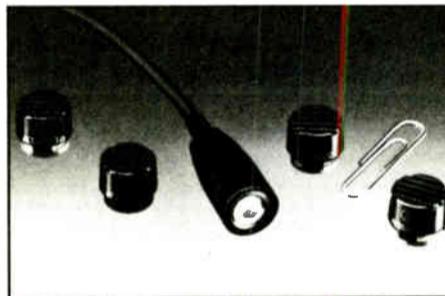
For information, contact Pat Schod at Motorola: 708-576-6612; or circle Reader Service 37.

Interchangeable Mic Elements

Audio-Technica has announced the availability of interchangeable elements for its Unipoint microphones. These parts enable Audio-Technica UniPoint and UniPlate microphones to be adapted for several pickup patterns.

The elements are available in a variety of polar patterns for the AT853 hanging microphone, AT857 miniature gooseneck condenser microphone and the AT851 and AT871R UniPlate condenser microphones.

For information, contact Buzz Goodwin at Audio-Technica: 216-686-2600; FAX: 216-688-3752; or circle Reader Service 75.



Labeling System

Jensen Tools offers a Write-On tape system for labeling wire and cable. Made by 3M, it creates self-laminated labels for documentation and permanent identification.

The system includes a dispenser, pressure sensitive tape and marking pen. Each roll of tape contains 250 labels; tape is resistant to dirt, oil and heat. The pen has a fine point and contains quick-drying, water and ultra-violet resistant black ink.

The system is available for \$17.95. For information, contact Karen Richardson at Jensen Tools: 602-968-6241, ext. 268; FAX: 800-366-9662; or circle Reader Service 20.

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Circle 27 On Reader Service Card

Symetrix 511A Solves Remote Signal Woes

Noise Reduction Unit Takes Care of Background Noise, Tape Hiss and General Grunge at KJR-AM

by Bryan Hubert
CE, KJR-AM

SEATTLE Remote broadcasts are a big part of KJR's programming. Our fully equipped and generator-powered remote unit is ready to go wherever the action is. Sometimes, though, remotes come with

big problems. The 450 RPU signal often has to make two or three hops before it gets back to the studio. By that time, it's loaded with hiss. Generator motor noise is audible inside the remote studio as well. Between them, these two gremlins could seriously degrade broadcasts. Fortunately, we have a Symetrix 511A

low-frequency rumbles.



The Symetrix 511A Noise Reduction unit is cleaner music to the ears of KJR's Bryan Hubert.

Noise Reduction unit. I use the dynamic filter to get rid of the high-frequency hiss from the microwave links and the downward expander to dump the generator hum. With up to 30 dB of noise reduction, marginal signals become completely acceptable and usable signals become great.

low-frequency rumbles.

Over at KXRX-FM, Don Winget also is using the 511A. He told me they use it on 450 RPU-type remotes and also with a Comrex two-line extender. He says it's very flexible, extremely easy to use and capable of clearing up a tremendous amount of noise from less-than-great feeds. It's also useful to control background noise from crowds and so forth, he says.

The 511A isn't just for microwave feeds, by the way. I've also used it on satellite feeds and to clean up my old analog multi-track tapes while dubbing them to R-DAT. Winget uses his in production to clean up dubs from cassette tapes. If tape hiss, background noise or just general audio grunge are a problem anywhere in your station, the 511A is a cost-effective solution.

■ ■ ■

For information on the Symetrix 511A Noise Reduction unit, contact Dane Butcher at the company: 206-282-2555; FAX: 206-283-5504; or circle Reader Service 110.

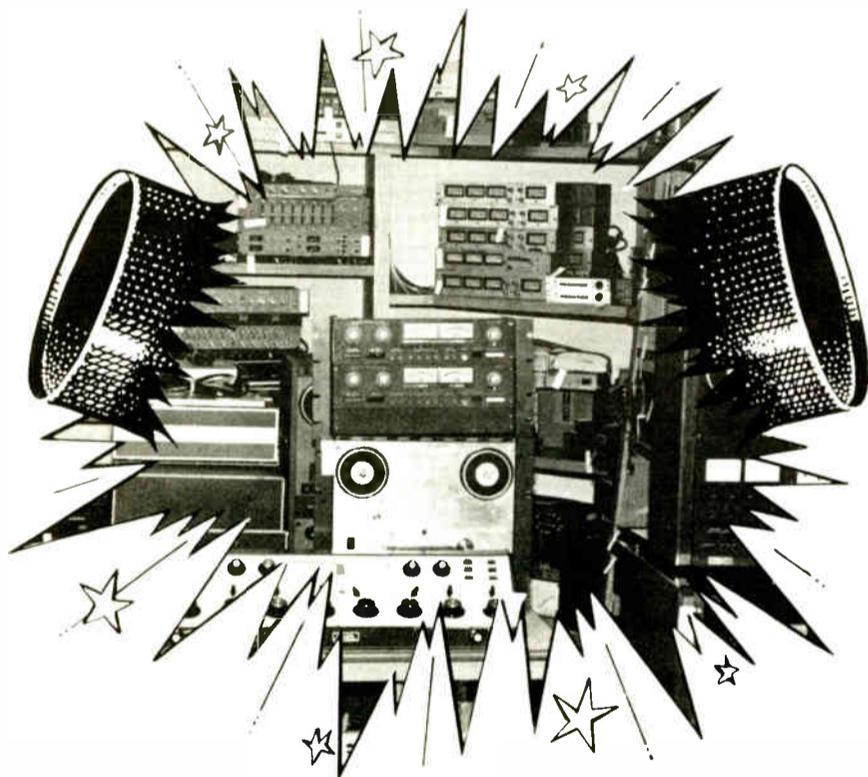
USER REPORT

The Symetrix 511A makes it easy to do this kind of "audio magic." I tweak the dynamic filter threshold control until the hiss goes away, then play with the downward expander threshold and ratio and release controls a little to minimize "pumping" when the speakers pause.

Both processors are switchable, so I can compare the cleaned up signal with the original. The 511A's two channels can be used independently or linked for true stereo processing. There's also a switchable high-pass filter that can take care of any



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Ed Donahue, news director at WKOX in Framingham, Mass., obtains all of his ABC, AP and local news from software.

Replace Paper with A PC on WireReady

by David Gerstman
President
Gerstman Software Technologies

SUDBURY, Mass. Many radio stations today still have wire services like AP and UPI churning paper out of old dot-

TECHNOLOGY UPDATE

matrix printers 24 hours a day. Add network data feeds such as NOAA weather, ABC, NBC, CBS, CNN, Unistar and the like, and stations have a real chore just keeping up with the paper flow.

Printing out almost 1,000 pages a day, these printers can eat up well over \$1,000 a year in paper and ribbons. Large news stations rarely use everything coming off the printer, while smaller stations often use less than one in 10 printed stories at night and on weekends.

Replacing these old wire printers with a low-cost computer system can cut paper and ribbon bills up to 90 percent while making it easier for everyone at a station to get just what they need.

WireReady Newsroom Software now offers a simple, low-cost system for stations to computerize their wire services with standard off-the-shelf PCs. Running on any IBM/compatible computer with 640K RAM and a hard-drive, WireReady lets stations plug as many wires as they need into their computer(s).

WireReady automatically stores and prints just what a station needs and can alarm the staff when urgent material arrives. The system also allows newsroom personnel to word process their local news and edit incoming wire news. Because WireReady is easy enough for even night personnel to browse through news on the screen, many stations are going completely paperless and reading all their material right off the screen.

For small stations that have a computer, WireReady software carries no weekly fees and can be purchased outright for as little as \$549. Twenty-four hour toll-free service and free upgrade support costs as little as \$99 a year. This

pricing allows even the smallest station to purchase a computer and still come out ahead in paper and ribbon savings from day one.

For stations that cannot get a computer, WireReady now is available pre-installed and packaged with a complete AT computer system for \$99 a month with a \$1 purchase option after three years.

Medium and large stations now are using WireReady's advanced versions on third-party networks like Novell and Lantastik. Prices for these systems start as low as \$849 with no per-user fees.

Many stations are going completely paperless and reading all their material right off the screen.

After the first year, 24-hour toll-free support and upgrades are \$199 a year.

One of WireReady's top-of-the-line configurations is a \$3,000 multi-user

multi-wire system that does not require the installation and purchase of a third-party network system or server. This al-

Tracker Archives to DAT

by Chuck Dees
Radio Computing Services

CINCINNATI, Ohio Radio Computing Services, a vendor of broadcast software for the radio industry, has developed Tracker, a digital compression technology that uses digital audio tape (DAT) to create a station log.

The Tracker machine consists of a 386-based IBM-compatible PC with the capability to archive real-time audio on the DAT tape. Tracker allows the flexibility to preset and record three channels of mono audio simultaneously. For example, you could set up Tracker to record your station, while simultaneously recording two of your major competitors.

You also have the option to play back prerecorded audio at your discretion while in the record mode. Tracker playback does not interfere with the recording process.

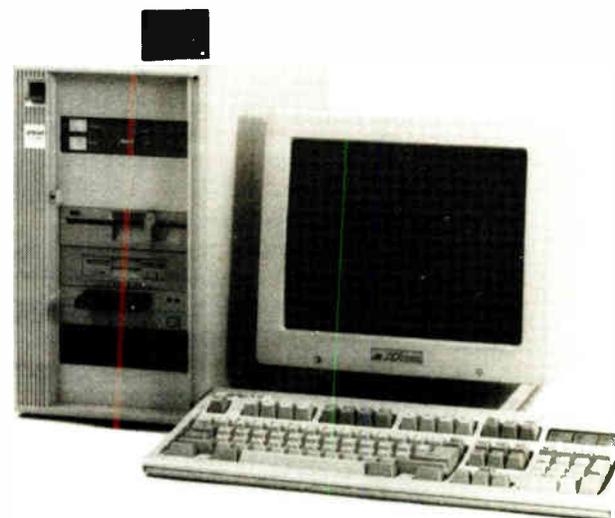
Tracker can store up to eight days on a single DAT tape. Storage of your audio archive is never a problem because

the DATs are so small.

To locate an event for playback, simply enter the date and time you wish to hear on the Tracker keyboard. Tracker will find what you want to hear and play it back. Thanks to digital technology, the tape can be scanned quickly.

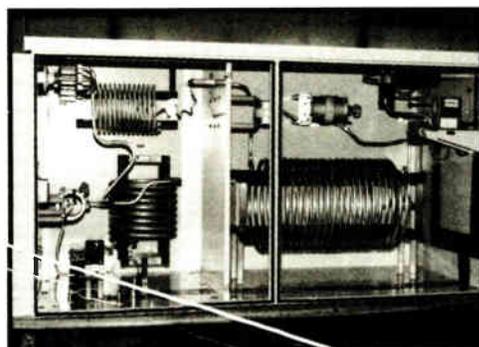
Tracker records what Tracker hears, so it's 100 percent accurate as a broadcast audio archive, a legal defense or a programming weapon. Here's the future and it's available to broadcasters now.

For information on Tracker, contact Chuck Dees at Radio Computing Services at 513-574-5414; FAX: 513-574-5007; or circle Reader Service 63.



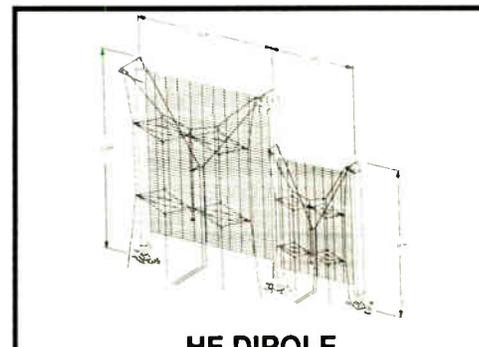
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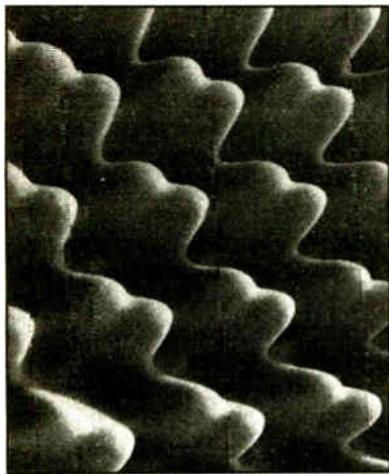
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Installation is made easy with AZ-USA's special foam adhesive and applicator gun. Easy-to-follow instructions are included with each order.

AZ-USA offers a customer toll-free help line with help available from acoustical engineers, technicians and customer service representatives.

For information on AZ-USA products, contact Brent Johnson at 612-661-2290; FAX: 612-661-2103; or circle Reader Service 22.

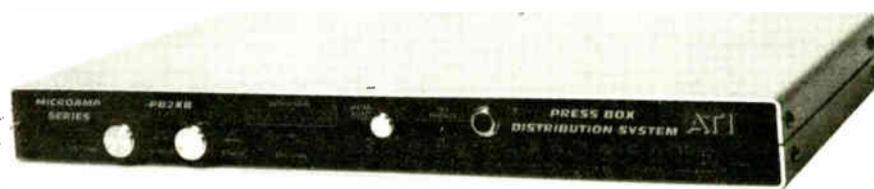
CHESTERFIELD, Mo. Ellason Weather Radar Inc., has introduced the Model E-250B 3D Color Weather Radar.

Features of the system include live, real-time coverage of your area. On-location range is 240 NM. Color Weather Radar is in four-color and offers five screen updates per minute.

Three-dimensional viewing of specific cells analyzes width, height, depth, intensities, movement, speed and build/dissipation of weather.

Remote operation and cost sharing is also possible with the E-250B.

For information on 3D Color Weather Radar, contact Jim DeVries at Ellason: 800-72RADAR; FAX: 314-532-3414; or circle Reader Service 140.



HORSHAM, Pa. Audio Technologies Inc. (ATI) introduces the PB2X8 Press Box mic/line mixer and audio DA.

The box can be used as a stereo 1x4 DA with mic or line inputs and allows a simple two-input mic/line mixer with up to eight outputs. Each channel drives a balanced +4 dBm XLR output, along with a balanced/unbalanced TRS jack at -10 dBu.

Headroom is up to +24 dBm in and out, -124 dBm EIN. Total harmonic distortion of 0.1 percent and 0.25 dB flat response help make the PB2X8 totally transparent in a broadcaster's operation.

For information, contact Sam Wenzel at ATI at 215-443-0330; FAX: 215-443-0394; or circle Reader Service 12.

RICHMOND, Va. Acoustical Solutions offers the Alpha Audio Pyramid pattern and Sonex foam products, which are cost effective ways to make your on-air room or production room sound more professional.

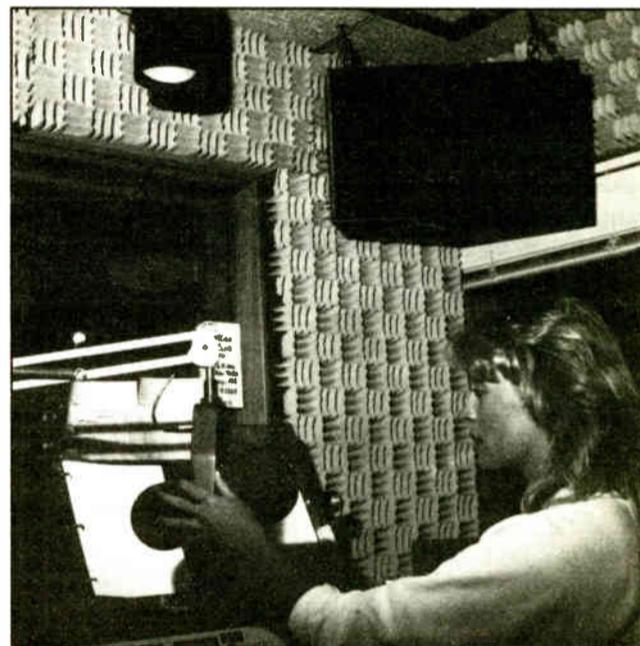
Studios are typically constructed with parallel walls, however, what actually results from this is a "holding in" of more sound energy and the creation of more problems with reflections, standing waves and flutter echo in the room.

Acoustical foam is used to control these problems by employing friction to turn sound energy into silent kinetic energy.

Acoustical products like the Alpha Pyramid and Sonex run from \$2 to \$5 per square foot, depending on the thickness. The result-

ing sound quality, according to Acoustical Solutions, is well worth the investment.

For information, contact Michael Binns at 800-782-5742; FAX: 804-358-9496; or circle Reader Service 18.



— ADVERTISEMENT —



Summer 1991

An Open Letter to FM Broadcasters:

Television Technology Corporation would like to introduce you to High Value Technology—our commitment to building products with the right combination of advanced engineering expertise, dependability and affordability. Our Model X FM Exciter and our FMS4000 Series Solid State FM transmitter are examples of that commitment.

The Model X is the first FM exciter to give broadcasters CD compatible audio quality with a signal-to-noise ratio of 95 dB, dynamic range of over 100 dB and distortion less than 0.01%.

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TTC designed the FMS4000 with vertical modules so that convection cooling keeps you on the air even in the event that both of the dual redundant fans fail.

And with TTC's ferro-resonant power supplies on the FMS4000, you get ±15% line voltage regulation and keep the money you'd normally spend on line voltage regulators and power factor charges from the electric company.

That's just a sample of the High Value Technology we at TTC build in to all our products. Call us today to learn more, (303) 665-8000, extension 456.

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Dirk B. Freeman
President and CEO

Television Technology Corporation
650 South Taylor Avenue, Louisville, Colorado 80027 U.S.A.

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ing rails on both sides, so equipment can be mounted any way desired or even switched at a later date. Concealment doors can be placed on cabinets intended for future electronic installation. Continuous length floor risers assure even cabinet-to-cabinet alignment. We've even included heavy duty ground bonding terminals.

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We've also handled your special requirements as well with a super family of accessories, including a choice of three different telephone modules, an intercom module, an off-line mixer module for your remote feeds, talent control stations, accessory panels, failsafe power supplies, and auto cart and CD sequencing options.

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A-500