

# Radio World

**Special Issue:**  
Our Exclusive Top  
Stories of the Year

Vol 18, No 26

Radio's Best Read Newspaper

December 28, 1994

## Eureka-147 Wins Nod; In-Band Not Out Yet

### Decision Buys IBOCs, IBACs Time to Advance

by Alan Carter

**GENEVA** While recommending Eureka-147 for terrestrial and satellite digital broadcasting, an International Telecommunication Union (ITU) working party did not block introduction of alternative in-band systems under development in the U.S. by declaring Eureka the definitive DAB world standard.

There is, however, another hurdle when this action faces further approval before a study group meeting in June.

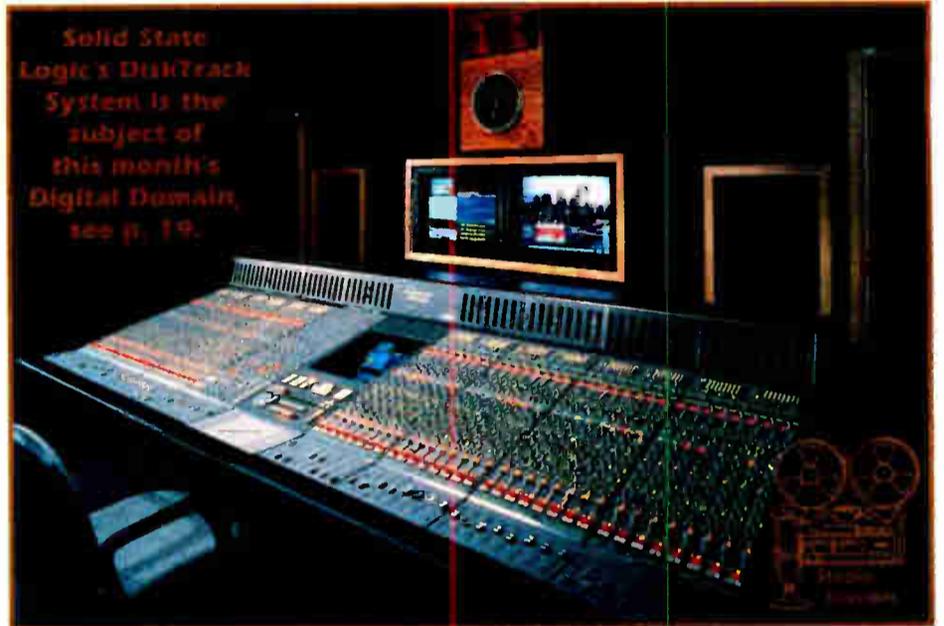
But USA Digital Radio in-band, on-chan-

nel proponents consider this a victory. "We feel that we have another year before they start pushing for a standard," said Jeff Andrew, USA Digital Radio project manager in Geneva for the meetings. "We figure it buys us some time. They made a recommendation but didn't set a standard."

At AT&T where an in-band, adjacent-channel system is under development, Nikil Jayant said the action was good news.

While in-band proponents defined the word "recommends" in the action as not meaning a definitive standard for Eureka-147, supporters of the European-developed system were not revealing any disappointment.

"It gives a green light for Eureka-147,"



said Wayne Stacey, technical advisor to the Canadian Association of Broadcasters on digital broadcasting.

The action was no different from what the Canadian delegation had hoped for, he said, and establishing Eureka-147 as a

standard rather than a recommendation would not have precluded other systems from receiving such a ranking at a later date.

Stacey also said the action has "quite a few conditions" for the in-band systems to meet and expressed his skepticism that the technologies can meet the criteria, which Eureka-147 has passed.

The working party "recommends" Eureka-147 for terrestrial digital sound broadcasting from 30 to 3000 MHz and for satellite broadcasting, according to ITU documentation. But a footnote for both services recognizes the "rapidly" developing in-band, on-channel and in-band, adjacent-channel systems.

The action on the satellite portion appears more lenient toward in-band systems. But both documents stated in-band systems that meet the ITU digital broadcasting requirements may be considered for recommendation.

In somewhat of a contradiction, the working party called for unity in implementation of digital systems.

That seems more and more unlikely as Europe and Canada move aggressively to implement Eureka-147 that requires new spectrum and new allocations, and proponents from those areas begin to market the system worldwide. Eureka-147 is set to go on air across Europe in permanent tests, and interest is developing in China, Australia and South America.

Andrew said USA Digital Radio will be on air for the NAB spring show this April in Las Vegas and on air in San Francisco for official testing. The goal, he added, is to keep the test on in San Francisco and possibly put it on air in Chicago and Washington.

In another interesting twist, Dr. Georg Plenge, one of the leading advocates of Eureka-147 in the early days of the system's inception, confirmed he has developed a new filter for USA Digital Radio.



## List of Winners of Expanded AM Band Allotments Released by FCC

by John Gatski

**WASHINGTON** After several years of proposals for AM interference reduction through an extension of the AM band, the FCC finally release its initial allotment list late this fall.

Out of the number of the nearly 1,000 stations that filed letters of intent, about 80 ended up on the FCC's computer-calculated list. The intent of the expanded band was to move the "worst interference" offenders off the existing band to the new spectrum, 1610 to 1700 kHz.

According to the FCC, that was done as much as possible within the constraints of the commission's computer model.

Stations approved for the expanded band will get a 10-kW daytime, 1-kW nighttime signal. Many stations that filed letters of intent were daytime stations that wanted a nighttime authorization. Stations also are encouraged to upgrade to AM stereo, which was standardized in 1993.

Many radios have had the expanded band frequencies for nearly five years, but the FCC waited to move stations to the new spectrum until after the AM improvement docket was approved three

years ago before it took on the expanded band process.

At press time, the FCC was sorting through reply comments with regard to an allotment plan. Once the list is final,

stations that choose to follow through on their letters of intent will need to file Form 301. They will have up to five years to simulcast their old and new frequencies.

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**RW's Top Stories of 1994  
Continue on p. 3**

## PRODUCT EVALUATION

# JVC's Overly Complete DAT

by Frank Beacham

**NEW YORK** There are not many Walkman-sized portable DAT recorders left in the marketplace these days. One of the few—the JVC XD-PIPRO—is positioned specifically as a professional machine.

Introduced at AES in 1992 and priced at \$1,849, JVC's portable DAT is the only machine in its size category with the ability to record with 16-bit audio in 48, 44 or 32 kHz modes. It can also record in the long-play 32 kHz, 12-bit mode and play tapes in the 44 kHz wide track mode.

Because it has been designated a "pro" device, the recordist is not burdened by SCMS copy protect codes on tapes made with this machine. If these features are important, JVC's portable is the only choice now available on the market.

However, with the PIPRO there is much, much more. In my opinion, maybe a little too much. Upon opening the two-layered carton, JVC has included an almost dizzying array of parts and accessories for a recorder that's not much larger than a deck of playing cards. (For the record, there are twelve of them in all.) It soon becomes clear; this machine is trying to be all things to all people.

Among its more unique design features are a detachable A/D converter unit and a modular microphone with a 1-bit A/D converter built into the handle. Either unit can be snapped into a multi-pin connector on the side of the recorder. Outside of playback or digital-to-digital recording via coaxial cable, the PIPRO requires either the A/D converter or microphone module to function.

This is where JVC's design takes on Rube Goldberg-like characteristics. One must attach the A/D converter or microphone assembly onto the side of the recorder before snapping the NiCad battery pack to the bottom of the recorder, otherwise the converter just won't fit. When the pieces come together, the realization hits that the sum of the parts makes a much bulkier whole than might originally have been expected.

The PIPRO offers virtually every feature found on full-size DAT recorders. It has digital I/O for both coaxial and fiber cables and a wired remote control. A subcode re-recording function allows subcodes to be added to a previously recorded tape. Start ID and program number codes can be recorded or deleted after completing a recording. The recorder even interfaces with JVC's consumer hi-fi products through a proprietary COMPU LINK-1 terminal. This link allows remote

control of the recorder from other components and such features as synchronization with CD players for recording.

Since my primary interest in a miniature portable DAT recorder is field audio recording, I tried the PIPRO in two key configurations: a one-piece unit with the microphone assembly attached to the side of the recorder and a

two-piece system with the microphone assembly detached and configured as a wired hand mike.

In the one-piece configuration, the recorder is somewhat wide-bodied and clumsy to hold. Its weight also jumps to more than 1.5 pounds, making it far more unwieldy than a common handheld microphone. Since the recorder has no automatic gain-

riding circuit, the recordist must keep a finger on the record level control and an eye on the LED peak meter most of the time.

When trying to monitor the level while recording into a mic, the operator can't see the meter, which is side-mounted at the top of the recorder. And the meter has no backlight for work in low light or night conditions.

In the two-piece form, a battery

## Product Capsule: JVC XD-PIPRO Portable DAT



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- ✓ no backlight for VU meter
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adapter holding four AA batteries is added to the microphone assembly handle to create a continued on page 21 ►

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# NEWSWATCH

## Shareholders to Vote on LDDS/IDB Merger

**Jackson, Miss.** Shareholders for LDDS Communications Inc. and IDB Communications Group Inc. will be asked to vote on a merger of the two companies at two separate meetings to be held Dec. 30 in Jackson.

Proxy materials have already been mailed to shareholders of each company.

A registration filed with the Securities Exchange Commission, announcing the merger of the two companies recently became effective.

The FCC also approved the transfer of

control of IDB to LDDS in a merger-related move.

## National Radio Month Celebrates 75 Years of Radio

**WASHINGTON** The National Association of Broadcasters (NAB) has declared next month as National Radio Month, marking the 75th anniversary of the industry.

The first scheduled radio broadcast to the public began in 1920, and today there are more than 11,000 radio stations in the U.S. and more than five and a half million radios—about six for every house-

hold, according to the NAB.

In a written statement President Clinton commended the industry.

"Radio has changed the way we look at the world," the President said. "It has given millions of us immediate access to the events that shape our times, opening new doors to entertainment and understanding."

The theme of this year's radio month is "Radio—The Sound of Your Life," and comes on the heels of the industry's first \$10 Billion advertising year.

Radio stations should have received free kits to help promote the event. The kits include a variety 30 second and 60 second jingles tailored for five different radio formats, a list of promotion ideas, bumper stickers and Clinton's speech.

"Radio is an integral part of our civic landscape, said NAB President and CEO Edward Fritts. "It brings people together and informs them, and—in natural disasters—can be a life saver."

For more information call Doug Wills or Lynn McReynolds at 202-429-5350.

## Owens to Be Inducted in Broadcasting Hall of Fame

**WASHINGTON** Last month the National Association of Broadcasters (NAB) announced that Gary Owens will be the 1995 inductee for its Broadcasting Hall of Fame.

Since the age of 16 Owens has been a key air-personality in many stations throughout the country, located in many different major markets. He later became the vice-president of creative affairs for Golden West Stations and in 1982 moved to Gannett. In the mid-'80s Owens was named as a vice president for Gannett Radio and served as morning host on Cox's KFI(AM) in Los Angeles.

Owens will be honored during a special luncheon at next year's NAB convention.

When looking for a digital audio system for automation of satellite programming or live assist, there would appear to be many choices. But if you're looking for a system which is flexible enough to give you total control without sacrificing your sanity, there is only one choice. The Phantom by RDS.

You will see the difference as soon as you see the Phantom in action. The display provides you with all of the information you need to see in a clean, concise manner, without the crowded look that you'll find in other systems. If you are familiar with the most popular software on the PC, then you may already know how to use the Phantom. The Phantom's pull-down menus guide you through all of the steps involved in setup and daily operation, from creating and scheduling clocks to creating and editing logs.

## The PHANTOM Digital Audio Automation

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The Phantom can retime spots to fit them cleanly into a satellite break without inserting silence, overlapping, or running late. The Phantom



can create reports to keep you informed on a number of topics, from a list of expired spots to an analysis of potential mistakes in your log. The Phantom also maintains a history of system activity.

The Phantom has the features that others would want you to believe are theirs exclusively. The Phantom remains *completely* functional during recording, sensing relay closures and starting breaks as easily as it does when it is not recording. The Phantom can fill incomplete breaks with spots from a list you specify without ruining product separation.

While other systems tie your hands and limit your flexibility by only offering 3 or 4 inputs, the Phantom gives you 6 stereo inputs, using its AMX-84 solid state switcher, with the option of increasing the number of inputs to 14 or more. If your station is News/Talk, you know how important this can be.

The Phantom allows you to change the sampling rate, digital format, and stereo/mono settings at will to meet your needs for an individual spot. The Phantom offers a number of digital formats, including the new Dolby AC-2 format, as an option.

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## Broadcast Equipment Fails Inspection by Local County Officials

by Thomas Pear

**LOS ANGELES** "Just how far can local governments regulate radio stations?" was a question that came to a head this year when Los Angeles County tried to pull the plug on station KKLA(FM) because its transmitter did not have Underwriters Laboratory (UL) approval.

Last summer a Los Angeles County electrical inspector refused to pass the

station's new transmitter facility the station was building on Mount Wilson, Calif., because the transmitter lacked a UL sticker.

KKLA Chief Engineer Mark Pallock was angered because transmitters are type-accepted by the FCC, and he saw the failed inspection as an attempt by the county to empower itself with regulatory control over radio stations.

"Their big claim to fame is that they have authority over transmitters," Pallock

said, arguing that L.A. county's extending its self-proclaimed authority over

### Broadcasters are wary of letting UL set regulatory standards for the industry.

KKLA's transmitter could set a "dangerous precedent," opening a door for itself to regulate the transmitters of all other L.A. stations. Also, requiring all transmitters to have UL approval would inflate the price of transmitters by thousands.

Others, including Underwriters Laboratories, disagree with Pallock, arguing that local governments already have the right to protect their citizens from possible hazards, even if that means regulating radio transmitters.

An Underwriters Laboratory publication said that "the need for third-party safety inspection is indisputable" and cited cases where improperly installed broadcast equipment caused fire and shock hazards.

In 1992, UL published UL 1419, which

specifically addresses safety concerns for professional broadcast equipment by requiring special markings to assist electrical inspectors in identifying UL-listed equipment.

In the past, electrical inspectors have "found it very difficult to verify safe installations in a recording or broadcast studio that was stacked with racks and racks of recording equipment," the UL publication said.

In other cases, Underwriters said new transmitter facilities were merely a bare room with wiring when inspected, but were later stacked with racks of equipment and, in many cases, were never re-evaluated for electrical safety.

In addition to assisting inspectors in identifying UL-listed equipment, UL 1419 also creates one set of safety requirements for broadcast equipment unifying several different approaches to broadcast equipment safety.

Still, broadcasters and equipment manufacturers are wary of letting Underwriters Laboratory, a private organization, set regulatory standards for the broadcast industry.

"Let's face it, UL inspects consumer products, and transmitters are for specialized use on federally licensed premises by federally licensed operators," said Jorgen Jensen, the sales manager for Nautel, a transmitter manufacturing company.

## WOWO(AM) Powers Down after 70 Years Of Service and Sale to Locally Owned Group

by Thomas Pear

**FORT WAYNE, Ind.** One of the more controversial broadcasting transactions of the year has been the purchase of the 50 kW clear-channel WOWO by the Inner City Broadcasting Company (ICBC) for the purpose of lowering its nighttime signal on the 1190 kHz frequency.

ICBC purchased WOWO-AM-FM from Price Communications to reduce the AM station's nighttime signal at 1190 kHz, so it can begin a nighttime signal of its New York station WLIB, which is on the same frequency.

Another sale of WOWO from ICBC to the Pathfinder Corporation is in the works. Under a marketing agreement, Pathfinder is already running WOWO. Its intentions are to keep WOWO alive and running in the Fort Wayne area and possibly throughout Indiana.

Most recently, ICBC filed a petition before the FCC to lower WOWO's nighttime signal to 9.8 kW and modify its directional tower. Inner City also filed a petition to start a WLIB nighttime signal at 30 kW.

The lowering of the clear-channel's signal is vehemently opposed by Peter George of Randolph, Mass., who recently formed the WOWO Listeners Guild to stop the lowering of the clear-channel's signal and is soliciting volunteer legal counsel to represent the guild before the FCC.

"I don't think it's right to destroy an American icon just for the sake of giving New York City another full-time station," he said.

To George's chagrin, the WOWO Listeners Guild may be a little late in stopping the lowering of WOWO's nighttime signal.

Although petitions for reconsideration can be filed against the sale of WOWO, FCC attorneys noted that lowering a station's signal is not considered a major change, and, therefore, the commission does not accept formal petitions to deny. The commission only accepts informal objections.

However, the commission already ignored about 200 informal objections when it approved the sale of WOWO from Price to ICBC.

George is afraid the lowering of WOWO's nighttime signal will create a snowball effect, causing lowering of other clear-channel signals.

"Could you imagine the AM band without clear-channel stations like WBZ or WHAS?," he asked.

Group W Director of Engineering Glynn Walden, who is also a noted expert on clear-channel stations, previously told RW he does not believe the sale of WOWO marks the end of the clear-channel era. Group W owns several clear-channel stations across the country.

Clear channels are a great way for stations to assure their signals will thoroughly cover their local markets, he said.

In many markets on the East Coast, clear channels are the only AM stations that cover an entire city and, therefore, are the only AM stations that can compete with FM, he added.

"Generally speaking, AMs that can cover the entire market can generate some ratings," he said.

Also, there are political factors involved that help ensure the continuation of clear channels, he added.

The United States had to negotiate with Canada and Mexico to establish the clear-channel signals, and the U.S. is continually negotiating to keep the clear channels, he explained.

"I don't think the government is going to give away something it has fought so hard for," Walden said.

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# Radio Tales from Here and There

**WASHINGTON** Passion for broadcasting is usually felt by passionate people. Depending on your individual circumstance, passion for life, freedom and the pursuit of happiness can take many different forms. Look to Eastern Europe. Or look to one of our neighbors, El Salvador.

In a recently published book, "Rebel Radio," by José Ignacio López Vigil, the story is told of El Salvador's Radio Venceremos (We Shall Overcome). The book chronicles life in the rebels' zone during El Salvador's 10-year civil war.

Whether you sided with the rebels or with the government, or really don't even care about the issue, "Rebel Radio" is worth a read because of the great details on how this group kept its voice on the air throughout the war.

The book is raw, with explicit stories of the human ability to torture and maim. But it also tells tales of ingeniousness you may enjoy.

One chapter, titled "Barbed Wire Radio," is of particular interest. At some point during the long campaign, the rebel broadcasters had to break up the radio team and hide the production facilities at one locale, the transmitter at another and the on-air "studio" somewhere else. All three had to be mobile and all three had to rely on each other to ensure daily broadcasts. The studio had to communicate with the Rebel command post. (Some of the pictures show them broadcasting from trenches and caves in the middle of the mountain region known as Morazán.)

In 1984, the group got tired of lugging its 2,000 watt transmitter around, so it came up with a hookup whereby the transmitter was installed deep within the rebels' own territory, and the program was sent via FM from the command post to the "studio" to the unit, where it in turn was broadcast over shortwave.

All of a sudden, the government knew

where the rebels were, precisely. Each and every time. Out would come the helicopters looking to blow the rebel radio to bits. It turns out the Army had goniometers (little devices from World War II that allow you to pinpoint the exact location of an FM transmission). So much for being clever. The rebels tried broadcasting tapes of shows from automated sites but that was no good—the broadcasts lost their immediacy, and the rebels felt they were losing the edge.

From the book:

"The *compas* in the 'Venceremos' workshop were really special. In the middle of an awful swamp they'd perform feats of high-tech engineering. They'd repair radios, build integrated circuits, tune motors... I've seen them make 'Venceremos' work with strips of cloth."

In this particular instance, their solution was barbed wire. Mauricio, the technician who came up with the plan, experimented with short-range barbed-wire communications. He tried voices and music and it worked. The more powerful the tape recorder that sent the signal, the longer the barbed wire could be. They used lines of barbed wire up to 12 kilometers (7.5 miles) long.

Because it was not real coaxial cable, they had to play with

resistance to do away with the "pork rind sounds" of the early barbed wire broadcasts. Another problem they

had was cows and other livestock stepping on or crashing through the barbed wire while they were transmitting. The rebels would have to run up and down the barbed wire lines to find the spot where it

had been breached.

Eventually, in 1988, the rebels came up with an even better system, but you'll have

Carrigan (one of two executive producers for WKNT—the other being Betty Borland), grabbed a cameraperson, an anchor and two reporters and sent them out to cover the story. (Keep in mind, the Westridge Knights are all fifth graders.)

It so happened, said Carrigan, that the first four faces she encountered were



The venerable Berry Gordy (r), founder of Motown Records, was in Atlanta recently to promote his autobiography "To Be Loved: The Music, The Magic, The Memories of Motown." He is welcomed here by FOX 97's Spiff Carner (l) and Randy Cook (c).

to read the book if you want to know what it was.

★ ★ ★

Less dramatic perhaps, but equally interesting (and it too features an Army helicopter) is the following story from Woodbridge, Va.

The broadcasting bug, much like the writing bug, strikes early in life, and if nurtured and cultivated, can lead its bearer to wonderful feats.

A new Army helicopter from neighboring Davidson Army Airfield, Fort Belvoir, Va., was out for a test spin, as it were, when it was forced to make an emergency landing in Westridge Elementary's ballfield in Prince William County.

It turns out the school has a closed circuit television set up in the building and even a news team—the Westridge Knights News Team. No sooner had the pilot made the safe emergency landing than Ginny

girls—even the camera person. They interviewed the pilot and took footage of the downed aircraft. By the time the "real" news teams arrived on the scene, the pilot had radioed for help and completed his interview with the WKNT crew.

The local television stations bought the original video from the WKNT news team and aired it that night on the evening news (WKNT call letters and all).

Nice work and a bit of good luck put the Westridge Knights on the broadcast map. Who knows, the excitement of this one story could inspire one of those kids to seek a career in broadcasting.

Carrigan said the station has been on the air for four years. The executive producers do "mostly crowd control." She added: "They do it all. They do the good and the bad, and they can see first hand what an impact the station has on the other kids." Especially, said Carrigan, when one of the anchors was asked for her autograph at recess one day.

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## READERS FORUM

If you have comments for Radio World, call us at 800-336-3045 or send a letter to Readers Forum (Radio World, Box 1214, Falls Church, VA 22041 or MCI Mailbox #302-7776). All letters received become the property of Radio World, to be used at our discretion and as space permits.

### Managing engineers

Dear RW,

Thank you for Nancy Reist's article "Engineers Need Management Skills" (RW, November 16). Prior to working as a chief engineer at KHQA-TV I was director of biomedical engineering at a local hospital. My duties were similar in requirement to my current job. I planned budgets, participated in strategic planning and conducted the day-to-day operation of a maintenance facility.

Many engineers believe that management functions, save telling the other engineers what needs to be done, are the duty and responsibility of others. In today's world, engineers need to be able to cross the boundary between engineering and management—after all, most chief engineers are considered management. If an engineer is to survive in today's competitive environment, he or she must be able to communicate with those responsible for "turning a profit" within our organization. After all, they pay the salaries.

At the hospital, I was required to attend weekly management seminars on topics general to all facets of the operation, including: personnel evaluation, legal considerations, basic accounting principles, interpersonal skills, etc. These have all proven to be as valuable to me as the intense technical skills I acquired in school.

Engineers are responsible for planning the technical future of a station. You must make the person who only looks at the ebb and flow of money understand the priorities of what is needed to accomplish these goals. You need to convince them of the necessity of your plans. You must acquire an understanding of the financing of a station in order to plan your budget process to make it acceptable to those charged with making the place profitable.

To do this, you must understand how to use words, terms, etc., that non-engineers

can understand. Technical specifications do not mean much to someone with an education in finance. Interest rates do not mean much to an engineer either. But you need to be able to work with, not against those people who can help you further the technical operation of the station. Everyone knows that without equipment, they would have nothing to sell—a fact of little importance unless everyone can work as a team to accomplish this.

I would encourage all engineers to get acquainted with their station's "bean counters." Learn from them what is and is not important in financial operations. The ability to explain technical information in a manner that non-techies can understand is something that will set you apart within the organization. It will solidify your worth to the station.

If principles of business are offered as a course at your local college, by all means enroll. You will be surprised at how easily you will begin to communicate with the accountants, sales people and management. You will also be surprised at how much easier it will be to accomplish your goals for your department.

Mike Seaver  
Chief Engineer  
KHQA-TV  
Quincy, Ill.

## Keeping Up with the DAWs

Radio production personnel seem to be at a disadvantage when it comes to education on the latest equipment trends. Many stations do not send their production staff to the trade shows. You usually can find the chief engineers and the managers at the spring NAB convention. And at the fall NAB Radio Show, you can find the programmers and again the managers, but not many production technicians.

That leaves the Audio Engineering Society (AES) annual convention. You would expect that this large show would be the conclusive one for production personnel. After all, companies are showing the latest version of digital audio workstations, processors, hard disk recorders, DAT, compression boxes, cart replacement, amplifiers, consoles, monitors, microphones. In short, everything a radio station uses and plenty of it.

But judging from the attendance at the 1994 AES show in San Francisco, there were few radio station badges to be seen.

Yes, the production staff is always busy, but not including at least one production representative in trade show plans seems unwise. Who better to know than the person who uses the gear as to what features make the department more productive (within the station's budget, of course)? Although the chief engineer can do a good job of selecting equipment and reporting back from the NAB show, there is no substitute for direct, hands-on tryouts by the production folks.

At a recent NAB convention, a story was told about a station where a multi-thousand dollar workstation was purchased without the production staff's input. The production staff ended up hating it and continued to use the familiar reel-to-reel machines and razor blades. Obviously, this was not a good investment for the station.

To complete the equipment education process, at the very least, station or station group production directors should be sent to the trade shows along with the chief engineer, so they, too, can get an idea of the trends. After all, an enlightened production staff enhances the bottom line; a station will get better quality commercial spots, jingles and on-air audio.

-RW

### GUEST COMMENTARY

## Ruling on EAS Does Right by Radio

by Darryl E. Parker  
Director of Marketing  
TFT Inc.

**SANTA CLARA, Calif.** Broadcasters are certainly heaving a sigh of relief over the FCC's recent adoption of the new Emergency Alert System (EAS) to replace the current EBS. Although the Report & Order has not been released as of this writing, it is clear the commission rejected complex and expensive new technologies and opted instead to adopt an open, non-proprietary protocol that will keep costs down, integrate with other established systems and make the transition as painless as possible.

A recent editorial in *Radio World* on the new system (RW, November 30) failed to emphasize the most important components of EAS: an in-band approach for digital signaling, a standard non-proprietary protocol, and a new digital system based on NOAA Weather Radio's WRSAME (Weather Radio Specific Area Message Encoding). Broadcasters who waited for the commission's ruling will not have the expensive burden of translating other systems that do not comply.

The single most important facet of the new EAS is the commission's approval of a standard, non-proprietary protocol. By adopting a digital standard compatible with NOAA's WRSAME, the commission has obviously insured that broadcasters can shop the marketplace for equipment that fulfills the new requirements without having to shell

out thousands to a single company that may have a stranglehold on the market.

Contrary to what may have been asserted, the commission's action provides compatibility to a standard that is published, deployed, and used already. The National Weather Service has WRSAME transmitters in more than 15 locations and plans to equip all 380 transmitters within two years. Implementation is based on target areas subjected to frequent violent weather. Eventually, 95 percent of the population will be reached by NOAA Weather Radio. The NWS schedule dovetails easily with the FCC deadlines of July 1, 1996, for broadcasters and July 1, 1997 for cablecasters. Actual activations of the old EBS were very heavily weather related (more than 85 percent); therefore, it is logical to relate the services of NOAA, broadcast and cable.

Another important point is that the EAS is inclusive. The commission will require that the new digital information be capable of being received on any radio or television set. This means that an in-band emergency alerting code could be carried on any medium: AM, FM, TV aural, SAP, Pro, VHF, UHF, RPU, satellite, cable, telephone, cellular, etc.

Yet another reason broadcasters have to applaud the FCC is the elimination of the weekly tests and their 24-second, two-tone tune-out. Although a weekly test is expected, it will be "unobtrusive" as far as the listening public is concerned. The WRSAME burst of

data for a test and end-of-message (EOM) signal will be about one-half of a second. A text message for this weekly test may not even be required. Local and state operational areas will have more authority under the new rules to tailor procedures, including tests, to suit their particular situations.

As of July 1995, existing two-tone EBS decoders will have to be capable of decoding a shorter, eight-second two-tone Attention Signal. After July 1 1995, stations may begin modifying their encoders to transmit the shortened two-tone for only eight seconds (and not more than 25 seconds).

We are pleased to have participated with the commission and other manufacturers in the testing of the new EAS last year in Denver and Baltimore. Following these tests, we made several submissions to the FCC about the EAS. We don't see any surprises in the commission's ruling which is almost identical to what we submitted. We're delighted that the FCC has agreed to make the move to the new EAS relatively painless while helping broadcasters achieve their role of serving the public in the time of crisis and emergency with current technology.

□ □ □

TFT Inc. currently has EBS equipment installed in more than 70 percent of the broadcast industry. For questions on the new EAS compliance and equipment, contact TFT by telephone at 800-347-3383 or fax at 408-727-5942.

# Radio World

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## FCC Rules Increased Station Ownership Limits for Minorities; Retains 1992 Changes

**WASHINGTON** Wanting to increase minority ownership, this fall the FCC unanimously voted to allow minority entrepreneurs to own up to 25 stations nationally.

Non-minority owners are limited to 20 stations nationally, but are permitted to have a non-controlling interest in five additional stations that are either minority owned or small business owned.

With the exception of expanded minority ownership, the same FCC vote also retained 1992 rules that restrict owners to two AMs and two FMs in markets with more than 15 stations.

In markets with less than 15 stations,

the rules specify that an owner can have a total of three stations with no more than two on the same band. The three-station maximum, however, is only allowed if the total number of owned stations is less than half the number of stations in the entire market. In other words, a given market would have to have at least seven stations before anyone would be allowed to own three stations.

But despite the new added minority ownership relaxation rules, the commissioners argued that additional incentives are necessary to increase minority ownership.

"Clearly we continue to open the door for people to expand or even get into business from an initial perspective," Commissioner Andrew Barrett said, "but how do we get people from the investment community... to do something," he questioned.

FCC Mass Media Bureau Chief Roy Stewart promised the commissioners they would see other proposals to increase minority ownership of stations.

"The staff proposes to recommend to the commission in the near future that we look at the issue of minority ownership through a rulemaking procedure," he said.

That could include an incubator program, where the FCC would provide incentives for large broadcasting corpo-

rations that hire minorities and train them to own their own stations eventually.

"My personal view is that while mutual funds, insurance companies and banks are certainly a source of funding in minority, female and small business interests, the other significant entity that's available to do that... are the larger multiple owners that have broadcast stations," Stewart

said

"I think we have to keep on exploring ways of encouraging financing for minority ownership," Commissioner James Quello said. "That's where the shortage is; it's economic more than anything else."

## TOP STORIES OF 1994

### EBS Replaced with EAS:

#### A Digital Solution with Open-Architecture

by Thomas Pear

**WASHINGTON** Broadcasters were left perplexed when the FCC established a set of vague guidelines for the new Emergency Alert System (EAS), established to replace the Emergency Broadcasting System (EBS).

Alerting System and TFT's Emergency Alert System (EAS).

Fred Baumgartner, the primary developer of the TFT system, charged into the emergency broadcasting debate, claiming the FCC drew the guidelines to fit perfectly around the TFT's EAS 911 decoder and 912 encoder.

#### Existing equipment must be capable of decoding the shortened version of the two-tone alerting signal by July 1, 1995.

But equipment manufacturers tried to clear some of the confusion for broadcasters by simply saying that the FCC mandated their emergency systems.

A forthcoming report and order should, hopefully, clear some of the confusion for broadcasters. At press time, however, the technical specs were not available. The FCC previously released a written statement with an overview of the upcoming guidelines.

The statement said that EAS equipment must be compatible with a required FCC digital system architecture that will allow broadcast, cable, satellite and other services to send and receive alerting information; will have multiple source monitoring for emergency alerts; will reduce the alerting tones down to a minimum of eight seconds; will create unobtrusive weekly tests; will feature automated and remote control options; will have the ability to issue alerts in other languages; will make provisions for the hearing impaired, and, in the case of television, visually impaired; will prohibit the false use of the codes and the alert signal and will mandate a standard protocol for sending messages.

Stations have until July 1, 1996 to have equipment up and running that complies with the new regulations. Existing EBS equipment must be capable of decoding the shortened eight-second version of the two-tone alerting signal by July 1, 1995.

The recently released statement created a competition between Sage, which developed the Sage 1 Radio Broadcast Data System (RBDS) Emergency

TFT even published a news release to that effect. "The new EAS requirements do not support a specific system but do describe certain technical characteristics. These are almost identical to the EIS 911 system that TFT proposed and developed for FCC field test in Denver and Baltimore in 1993," the release said.

Coincidentally, TFT changed the name Emergency Information System to Emergency Alert System about a week after the FCC adapted the name Emergency Alert System for its national emergency warning system.

Jerry LeBow, the president of Sage Alerting System, charged that TFT is exaggerating things a bit when it claims the FCC is endorsing their system.

"I could say the guidelines sound like the Sage system because they do," he previously told RW. "The FCC simply mandated a national emergency system."

Both systems have multiple inputs where, unlike the daisy chain now being used, emergency messages can be sent to and received by stations through several channels by several different emergency agencies, creating a scenario that would allow emergency messages to get through if a disaster knocks out a channel or two.

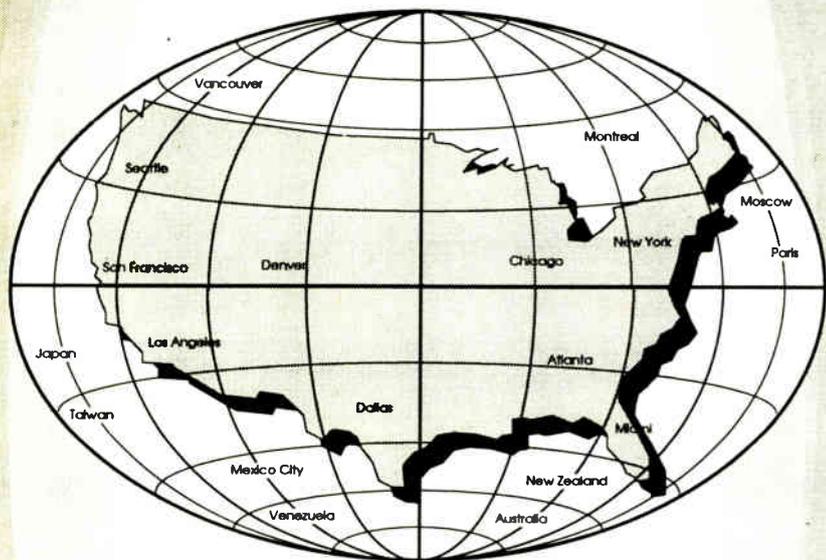
Both systems also allow for satellite broadcast, so emergency officials could reach stations in areas surrounded by oceans, mountains or vast amounts of land.

Information Systems Laboratories is developing an emergency satellite broadcast system that is both RDS- and TFT-EAS-compatible.

## TOP STORIES OF 1994

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## RDS Continues to Make Steady, If Slow Inroads in U.S.

by John Gatski

**WASHINGTON** The Radio Data System (RDS) continued to be adopted by radio stations in 1994, although the pace is not as fast as encoder manufacturers or consumer receiver manufacturers would like.

At last count, there were about 200 stations on the air with RDS, the 57-kHz digital subcarrier that enables stations to transmit call letters and other data, including emergency alert information (for the

new EAS system), song titles and artists, business/consumer retail information (Coupon Radio), global positioning /electronic navigation and computer information. The European-based technology also allows RDS receivers to search out stations by format and switch to alternative frequencies. (The U.S. RDS standard, approved in 1993, is called Radio Broadcast Data System or RBDS, but all manufacturers continue to call the system RDS.)

Several promotional efforts through

Denon and the Electronic Industries Association (EIA) put about 40 National Public Radio (NPR) stations on the air by donating RE America encoders. Differential Corrections Inc. (DCI) also has continued to equip radio stations with its global positioning service.

In 1994, most receiver manufacturers continued to say that they planned to introduce RDS models in 1995. Denon, though, was the exception, with nearly 10 models of car and home audio products available by the end of the year, including two home/studio tuners, several home receivers and auto RDS

cassette and CD decks.

According to Denon's marketing manager, John Casey, sales of RDS radios exceeded 30,000 by the end of the year. Philips, Onkyo and Grundig also had RDS radios available in 1994.

However, the majority of receiver companies said they want to see more stations on the air, which may happen on a larger scale in 1995 through efforts by the EIA. As of the end of the year, RDS had not yet heavily penetrated the large markets.

In anticipation of more stations in 1995, more receivers are expected to be introduced at the Winter Consumer Electronics Show (WCES) in early January.

# TOP STORIES OF 1994

## DAB Testing Continues in U.S.—World Moves Closer to a Standard

U.S. DAB proponents were not quite ready to demonstrate their systems at the major trade shows this year, but several weeks before the World Media Expo in Los Angeles, radio industry executives did get a first hand, mobile listen to USA Digital's AM and FM DAB in Cincinnati and Chicago respectively. Meanwhile, the international community continued its push for a world digital radio standard.

At World Media Expo, the video of the U.S.A. Digital tour, complete with A-B listening, marked the highlight of USA Digital's DAB developments.

The other U.S. in-band DAB systems, one from AT&T and another from Amati with backing from AT&T, made a showing at the World Media Expo as well. The Amati system, which uses the side lobes of an FM signal, was shown in a booth demo with simulated multipath conditions. This demonstration also showed how multipath interference is eliminated with a digital signal.

The AT&T is an IBAC (in-band, adja-

cent channel) DAB system also designed for the FM band. AT&T had hoped to have an over-the-air demonstration of the Amati system at the World Media Expo, but that is now being slated for the NAB spring convention instead.

USA Digital Spokesman Jeff Andrews said that the next step would

be an actual, public mobile demonstration of both AM and FM systems, which was tentatively slated for the spring NAB show in Las Vegas in April. He also noted that talks with chip manufacturers are ongoing, and he expected to announce an agreement with a chip maker before that time.

The latest on testing and development of the U.S. proponents' DAB systems, was the news about hardware modifications to help ameliorate the cost of moving from analog to digital radio. Harris Allied, for example, demonstrated that U.S.A. Digital's IBOC system is fully compati-

ble with a Harris DX-10 digitally modulated transmitter. The transmitter had no problem handling both an analog and

**The Harris DX-10 digitally modulated transmitter had no problem handling both an analog and digital AM signal.**

digital AM signal.

Modifications to the transmitter to receive and transmit the digital signal are minor, and involve about a 20 minutes of work, according to company executives.

Although the U.S. proponents are still embroiled in debates over multipath conditions set up during testing and the exact specs of the RF mask, progress, if somewhat slow, continues to be made.

USA Digital is pushing on the political front as well. A recent decision by an International Telecommunication Union (ITU) working group went as far as recommending the Eureka-147 DAB system for a global standard, but added a footnote detailing progress made by IBOC and IBAC proponents (see story, page 1).

# TOP STORIES OF 1994

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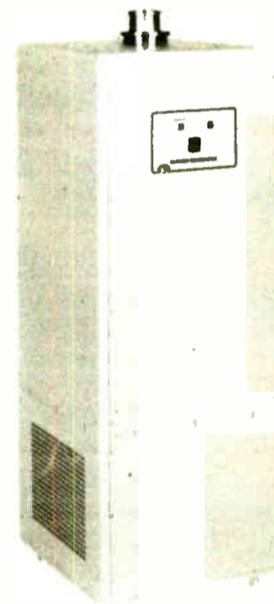
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## Debate on RF Radiation Exposure Continues to Rage in Legal Circles; New RFR Rules in Sight for 1995

by Thomas Pear

**WASHINGTON** Debate continued to intensify in 1994 over the FCC's impending proposal to adopt new RF radiation exposure regulations that could require broadcasters to make modifications to their facilities.

Although there were some predictions that new RF regulations could go into effect by the middle of '95, those predictions may now be a little premature because broadcasters are sure to fight some of the proposals, claiming they are too burdensome, regulatory-wise.

"They (the proposed rules) can have a devastating effect," said Dane Ericksen, a senior engineer at the San Francisco engineering firm of Hammett and Edison.

The proposed regulations are based on the ANSI/IEEE C.951-1992 standard and could involve two separate sets of RF regulations: one for broadcasters and another for industry workers.

Presently, the FCC standard is set at 1,000 mW/cm<sup>2</sup> for FM, and for AM it is

614 volts per meter in terms of electric fields and 1.58 amps per meter in terms of magnetic fields, noted FCC senior scientist Dr. Robert Cleveland.

Under the ANSI/IEEE proposal, for FM 1000 mW/cm<sup>2</sup> would remain the standard for a controlled environment, while the radiation level of 200 mW/cm<sup>2</sup> would become the new standard for an uncontrolled, public environment, Cleveland said.

A controlled environment is defined as an environment that has restricted access. In many cases, these environments are created by placing a fence around a radiating tower. Uncontrolled

up to 100 MHz, limiting a controlled area to 100 milliamps and an uncontrolled area to 45 milliamps.

The first problem with body currents is that there are no devices for measuring current contacts above 30 MHz, Ericksen noted, and there are only prototypes for measuring body currents from 30 MHz and above.

"Hopefully, they would not enforce induced body currents and contact currents until there are readily available measuring instruments," Ericksen said.

Then there is a question of fairness: "Why should stations 100 MHz and below be held to more stringent regulations than stations above 100 MHz?" he asked.

The bottom line, however, is that the regulatory burden of having to prove compliance could be expensive for the broadcast industry, and already Cleveland has been inundated with about 4,000 pages of comments, many protest-

## TOP STORIES OF 1994

### Proposed regulations could involve two separate sets of RF regulations: one for broadcasters and another for industry workers.

environments are environments open to the general public.

For AM, the standard for controlled environment would be 614 volts per meter in terms of electric fields and 16.3 divided by the frequency in terms of magnetic fields, according to Cleveland. For the uncontrolled environment, in terms of electric fields, the standard would be 614 volts per meter up to 1.34 MHz, and above 1.34 MHz, the standard would be 823.8 divided by the frequency. In terms of magnetic fields, the standard would be 16.3 divided by the frequency, he said.

If the ANSI/IEEE rules are adopted, for the first time RF regulations would include induced body currents and contact currents. They would regulate them

ing ANSI/IEEE.

Also, as of yet, the FCC has not preempted any RF rules to prevent state and local governments from adding additional regulations of their own. One of the original purposes of a new RF standard was to provide a benchmark for local lawmakers, so they would not enact unreasonably strict standards based on unscientific reasoning that could cost broadcasters millions.

Another development that could slow the FCC's adopting the ANSI/IEEE proposals is that another set of RF guidelines is being worked out by the Environment Protection Agency (EPA). Sources say the two large federal agencies do not want to come across as contradicting each other.

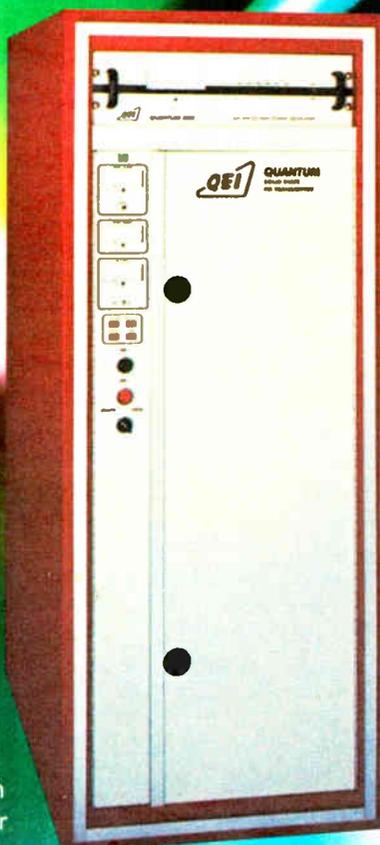
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# Standard for High-Speed Data in the Works

by Alan Haber

**WASHINGTON** A voluntary FM high-speed data subcarrier standard could be in place by the second or third quarter of 1995, according to John Marino, director of technical conferencing for the National Association of Broadcasters (NAB).

High speed data subcarriers can transmit more complex types of information than the Radio Broadcast Data System (RBDS), because of the increased capacity and a significantly faster data rate (between 14,000 bps and 19,000 bps for high speed versus approximately 1,200 bps for RBDS).

High speed and RDS are compatible with each other. The RDS subcarrier is 57 kHz, whereas high speed subcarriers can be placed from around 60 kHz to 100 kHz in the FM band region.

There is talk of using high-speed subcarriers for the Federal Highway Administration Intelligent Vehicle Highway Systems (IVHS) programs; transmitting the Yellow Pages, computer software updates, and complete newspapers have also been mentioned as possibilities. High-speed data can be multiplexed, allowing multiple services to share a single subcarrier.

Dave Kelley, vice president of marketing for navigation equipment manufacturer Terrapin Corp., and co-chairman (with Charlie Morgan, senior vice president of engineering, Susquehanna Radio Corporation) of the FM High Speed Subcarrier Subcommittee of the National Radio Systems Committee (NRSC), thinks initial equipment tests are "probably six months away... I don't think we'll be in a test situation until next summer..."

Kelley believes "high speed will get some honest, real deployment within two years, and then it's going to happen in a very rapid fashion, in that I think you're going to see high speed become a very good income generator..." He added that the adoption of Digital Audio Broadcast (DAB) will cause high speed to "go away," but didn't feel comfortable guessing that timetable.

Regardless of when the standard makes its debut, it's certain that the subcommittee, which has been working toward development of the standard since last summer, is committed to keeping the path of its mission on track. An ad hoc working group has been developing criteria to test the proponent systems (currently there are three—the Mitre Corporation, NHK and Seiko Communications Systems—but more may be coming on board, according to Kelley). Getting the test criteria established, Kelley said, has been "slow going, but I think we're essentially done with the effort."

## A standard necessary?

But is a standard necessary? Kelley feels strongly in the affirmative. "The issue here with high-speed SCA, as compared to traditional SCA, is you're going to have too many people involved in the process," he said. "You're going to have the broadcaster subletting his channel to one or more individuals that are putting data out, and then you're going to have people building receivers that have nothing to do with the business motive of the person transmitting it. And, because of that, we've got to have standards so that someone can build a high speed receiver and not be held captive to a

particular data transmitter."

Eric Small, president of Modulation Sciences, isn't sure a standard is necessary. The making of standards is "a dance between inhibiting new development, because as soon as you put a standard in, you stop development," he said. "There are probably three groups of players in this—there are the manufacturers, there are the radio stations, and there are the potential users.... I can't find any area where all three of these groups want a standard."

Why don't these groups want a high speed standard? Small feels that "the needs are sufficiently diverse, to which high speed data is being put, that there is no

benefit to a standard. A standard only helps you if people are doing the same thing... or where there are consumers involved."

The need for a European Radio Data System (RDS) standard, he said, "was very apparent. They wanted to put these things in automobiles for consumers. So you needed a standard. High-speed data covers such a wide range of needs, many of which are not even defined yet."

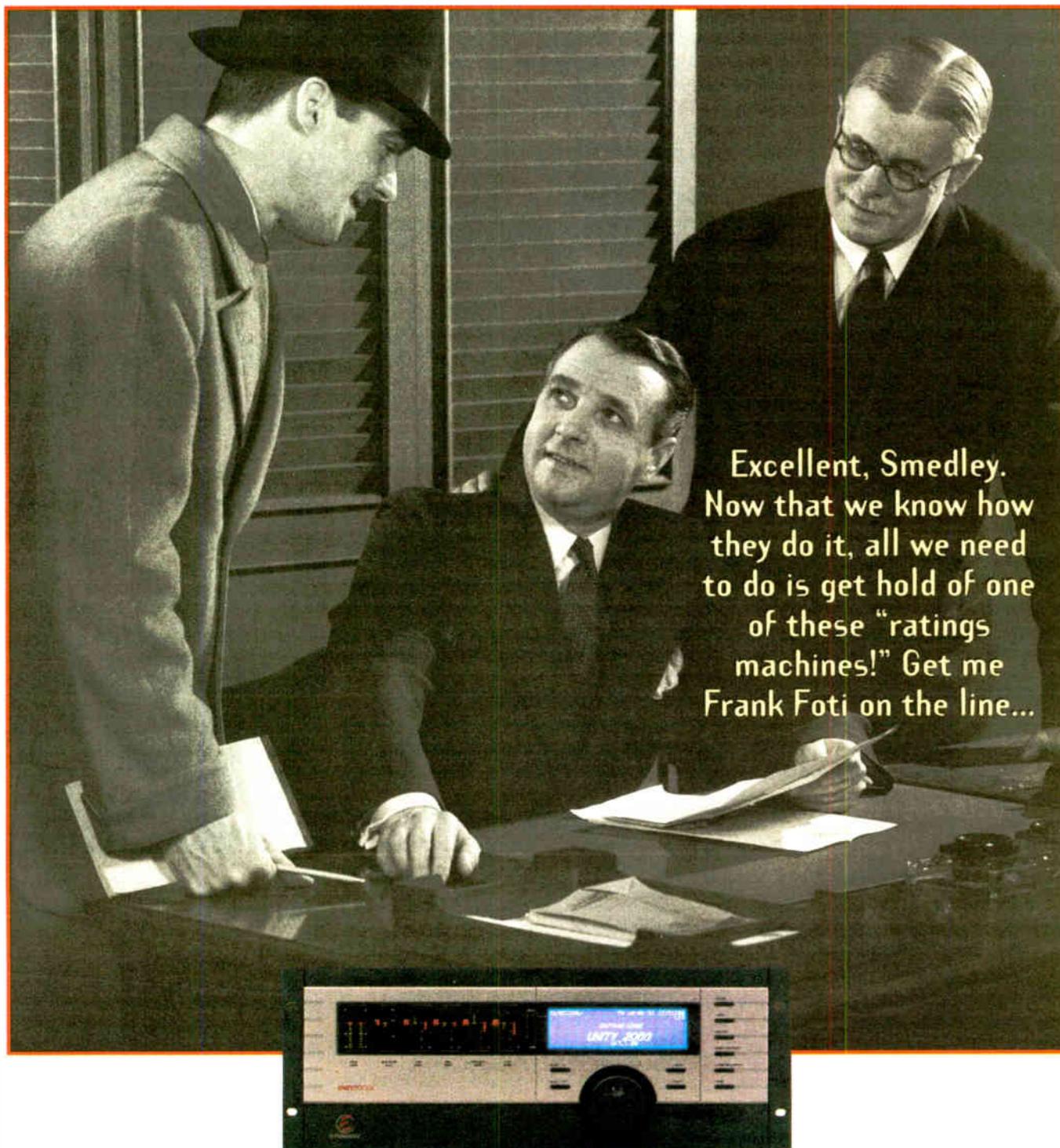
Alan Box, president and CEO of EZ Communications, and co-chairman of the NAB's Futures Committee, said "We can't go through an AM stereo debacle again. I mean, clearly if there can be a voluntary

standard, that's far better (than having no standard). There will be instant consistency. I think the receiver manufacturers would be encouraged to build them far quicker if there is a standard or something they can operate from. All my work with DAB just says you've got to have standards."

## High speed, RBDS and DAB

A high-speed subcarrier standard has to be compatible with (RBDS), Marino said. "That was a given from day one," he noted. "We see this new data channel, or high speed subcarrier, to be used in con-

continued on page 11 ►



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**HARRIS  
ALLIED**

# Data Standard in the Works

► continued from page 9

junction (with RBDS) as extra capacity."

Marino said that the NAB doesn't "see any need to wait for DAB, because, for one thing, if you get these services going, these services will translate directly to DAB if it comes about. The same sort of modulation scheme or conditioning the signal that can be transmitted via a digital subcarrier now can certainly be translated right over to DAB, because there's going to be some (extra) capacity..."

Kelley thinks that by the time DAB arrives, the broadcaster will have recognized "that subcarriers and one-way broadcasting (are) his entree to the information highway, and he's going to want to continue to send data. I would go so far as to say that there will be radio stations that discontinue transmitting music, and go into data full time. DAB is going to allow them to do that, and make a business choice of 'what exactly is it we broadcast over this license we own.'"

Kelley pointed out that both RBDS and high speed subcarriers are backward compatible with the existing DAB proposals. "If you look more closely at the proposals," he said, "you'll see that each of them allows for the eventual-ity of no longer sending an analog FM signal. So it's one of those when-the-business-demands-it-we'll-make-the-choice type of issues."

DAB, he noted, "will be a good business opportunity in that it will be a much better way to deliver data, and I think you're going to find that a lot of marginal stations get into the data business to the exclusion of music." Why? "Because it's more profitable," he said. "This is the one area where a broadcaster can beat the hell out of cable companies and the telephone company."

Gary Shapiro, group vice president of the Electronic Industries Association's Consumer Electronics Group, is more interested in the fate of RBDS than that of high speed. "We are interested in high-speed data broadcast...

but right now the game is RBDS," he said, "and we think that there's great commercial appeal there." Shapiro said that EIA would be promoting RBDS but had nothing to announce at this time.

Shapiro doesn't think that high speed will overtake RBDS. "I think RBDS is here, it's an existing standard; products are being sold by both the radio station equip-ment manufacturers and by the consumer radio market," he said. "It's real. High-speed data broadcast is a concept right now. It's not real. There's a timing difference between the two which is pretty serious."

## A voluntary FM high-speed data subcarrier standard could be in place by 1995.

"Also, RDS is a proven product in Europe, where it's in almost every radio sold," he added. "And it works, although there are those in Washington who have argued that high-speed data broadcast is much more critical than RBDS to the radio broadcasting industry. I think broad-casters are coming around to RBDS." According to Shapiro, RBDS "is where all the action will be the next three or four years."

### Mobility

Where is the bulk of the market opportunity for high speed? Box mentioned transmitting entire newspapers and delivering the Yellow Pages as possible applications; using high speed for the Federal Highways Administration's Intelligent Vehicle Highways Systems (IVHS) programs has also been cited. However, Kelley

said "I think we've recognized that the bulk of the market opportunity is in a mobile user, where you've got more severe fade problems..."

Will there be more consumer than business use, or vice versa, or a combination of both? Marino thinks that's hard to determine. "There are a lot of subcarriers in existence right now that are being run for business purposes that are transmitting data from point to multipoint at fairly high speed," he noted.

But, although Marino acknowledges that high speed uses can be found both in home and mobile environments, he agrees with Kelley that the proposed high speed standard is being specifically tailored with mobile in mind. "What the committee is trying to do is develop something that can be used in the mobile environment, which of course can be used equally as well in an office or in a home," he said.

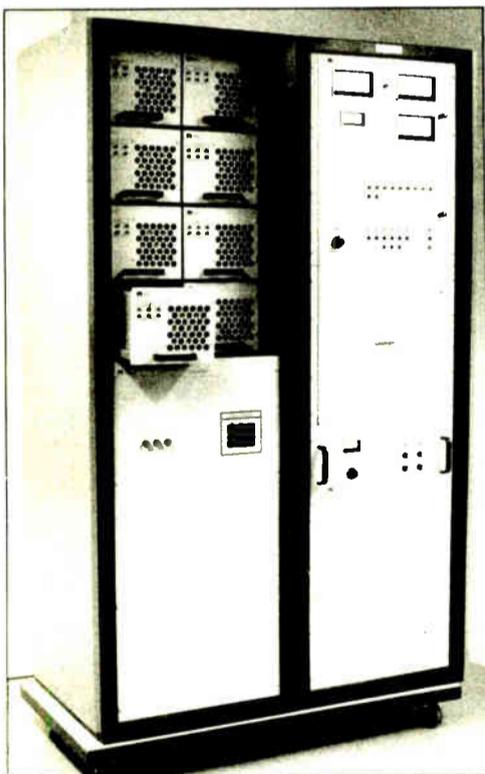
### Benefits to radio

Box feels that high-speed delivery of information to users opens up the ability for radio stations "to have an entirely separate and different profit center. It also allows us to be far more sensitive to the communities.... I really believe that delivering point-to-multipoint data in a quick, effi-cient way is a huge business."

Marino looks at the high-speed data channel as a revenue producer for radio stations. "I don't think there's any sta-tion owner or manager out there that would turn down an opportunity to make some extra money, if there's a tech-nology out there that can help them out without them hav-ing to put a lot into it. And essentially, the station really doesn't have to put anything into it, if they just typically lease their subcarriers out as they're doing today."

Kelley said that his "private hope is that the value of SCA channels will in fact skyrocket. Plus, the broadcaster will be able to choose to sell the entire spectrum to a single source, or to sell spots on his SCA channel.... And a broadcaster that wants to be more involved with that sales exchange, rather than just selling the whole thing whole-sale, stands to make a substantially larger profit on his SCA channel." ☺

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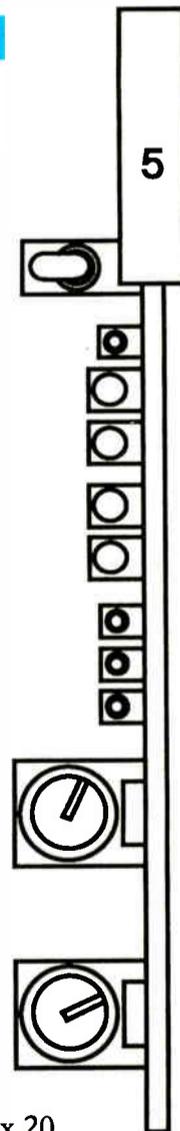
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## PRODUCT EVALUATION

# Max-Efx Refreshes Existing Library

by Al Peterson

**HARRISBURG, Pa.** Every few months I receive a big envelope from Dave Dworkin's Ghostwriters service, filled with offers for music beds, effects, and other survival tools. Recently I gave in and tried Max-Efx, a sound effects collection on six CDs for just under \$200.

For the money, this little collection opens a big window and lets in just the right amount of breeze to refresh your existing library.

Don't expect lasers and zappers. This is a "toolbox" collection; a mix of household, business, military and transportation sounds we need all the time. The collection is a team effort between Ghostwriters and Creative Support Services in California, and is available via mail order through Ghostwriters in Minneapolis.

The order form boasts "true digital recording" and, indeed, discs 3-6 are noiseless and very punchy. But discs 1 and 2 have many familiar-sounding old friends on them, obviously recorded with analog methods and transferred to compact disc. I don't fault anyone for this, as it's nice to have a couple of the classics preserved to CD. But be warned: you may already have several sounds from discs 1 and 2 elsewhere in the studio.

The index is four pages long, so you won't get lost looking for a track. However, if you think your favorite cut is on the CD stamped "Household/Transportation/People," you may be going on a hunt: three CDs out of the series are labeled in that manner. I'd be happier if all the house sounds were on a "house" disc, the travel sounds on a "travel" disc and so on. Furthermore, typographical errors surface now and again in the index (e.g., "eleccator," "prunning shears," "racket wrench"). Still, given the price of the library, these are tolerable oversights.

Having gotten the gripes out of the way, I will say Creative Support Services went to lengths to get some very cool (and very necessary) sounds recorded cleanly onto the Max-Efx library. Here at last are good-sounding smoke detectors and Velcro rips, camcorders and car alarms, bank drive-through air tubes and really arrogant-sounding Harley-Davidsons. And, until I tried this collection, I have never heard a decent gas station bell. Ironically, now that I have one, there are no gas stations left that use them!

I was impressed at how good the effects sounded even in mono; many times an original mono recording will go to CD spatially processed for a stereo image and sound buzzy and metallic when collapsed back to mono. Even field recordings done with X-Y or L-R mics can mono out badly and lose impact. The effects on the Max-Efx library will still sound good coming out of an \$11 clock radio.

Among the effects you're sure to enjoy having: fax machines (disc 3, cut 16), computer effects that sound like computer effects, Hi8 camcorders and my new favorite crowd sound, Department of Motor Vehicles (disc 4, cut 69).

You'll have your own favorites, of course, but there is almost nothing in this little library you can't find a use for. The Velcro ripping alone will find a new home on morning zoo shows.

At \$199, the issue of price could be

tricky. Someone at the station will ask "How good can it be for under \$200?" I admit my misgivings at first as well, but only because I wondered why it was \$200. I've built up an outstanding SFX disc collection on the cheap from record store cutout bins. The Hanna Barbera or Warner Brothers effect collections can be had for around \$500, so why drop two bills on a mere utility-type library filled with everyday sounds?

Simple: because it's necessary. The HB or Warner collections—while outstanding libraries—really shine only when you're planning on catapulting coyotes into cliff

faces or powering an automobile with your feet. Most of us need generic kitchen noise, seashore ambiance, toilets, typewriters and traffic. Invariably, the existing library at the station is adequate, but the same car horn or bowling alley can't be on every spot sounding just the same. And let's face it, it isn't practical to assemble a good library from cutout bins. Obviously there's a reason those discs are there to begin with.

Dave Dworkin's Ghostwriters offers the Max-Efx library at a complete buyout price of \$199. To me, a fair price. There are no license fees, no lengthy paperwork

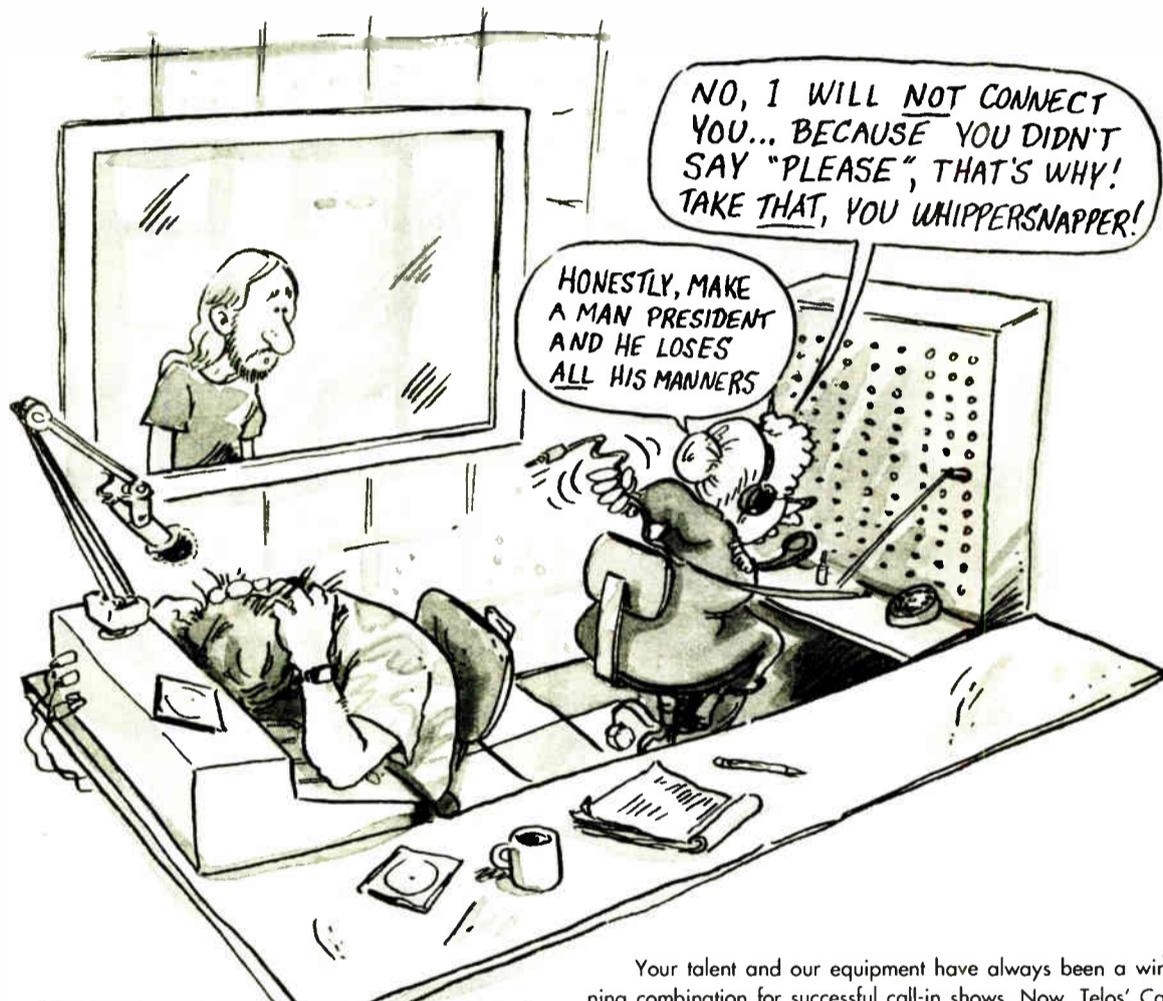
or agreements to sign, and the collection is backed by a 30-day money-back guarantee. I have found that condition to be the most useful; upon delivery, my disc 1 came up defective and, sure enough, Dave is replacing it at press time.

If it's time to give your SFX library the sonic equivalent of a breath mint, send Dave the two C-notes and get Max-Efx for your station. At this price, get it for yourself.

□ □ □

Order Max-Efx through Ghostwriters, 2412 Unity Ave. N., Dept. MAFX, Minneapolis, MN 55422; or fax/phone 612-522-6256.

Alan Peterson is Production Director for WTCY(AM)-WNNK-FM Harrisburg, PA 17110, and writes "From The Trenches" in RW.



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A black and white photograph showing a hand holding a computer mouse over a MIDI keyboard. The mouse is positioned over a key labeled '6'. The keyboard has other keys labeled '6' and '12' visible. The background is a light-colored surface with a grid pattern.

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# Studio Sessions

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Equipment and Applications for Radio Production and Recording

## PRODUCT EVALUATION

# Powerful Processing from Vitalizer

by Ty Ford

**BALTIMORE** Attention psychoacoustic cultists, there is another analog processing box on the market. It's the Vitalizer, from Sound Performance Laboratories, distributed by beyerdynamic.

The single rack-space Vitalizer lets you mess with the audio four different ways. Actually, there are two versions of the Vitalizer: the "Classic" (1/4" \$1,499, XLR & 1/4" \$1,699) and the "Stereo" (1/4" \$1,199, XLR & 1/4" \$1,299). The balanced versions of each provide a ground-lift switch on the rear panel.

## Features

Both boxes do basically the same thing, but the "Classic" allows much finer control. While both versions process two channels of analog audio and have Peak LEDs and by-pass switches, the "Classic" has totally separate controls for each channel. The "Stereo" applies the same control to both channels. The "Classic" has six-position input level switches on the back

small tweak stick.

So what we've got here is an analog processor that allows you to change the low frequencies, mid-high frequencies, harmonics and stereo spread. There is a



beyerdynamic's Vitalizer

fair to moderate amount of interaction between the controls. Opening the mid-high control far enough will also affect some of the upper bass frequencies. Depending on their frequency content, high frequencies can be affected by either or both the "Mid-High" and "Harmonics" controls. Let's start at the bottom and work up.

## Manipulate the bass

Two controls are used to manipulate the bass, the "Deep" switch and the "Sub-Bass" rotary control. According to the manual, the "Deep" switch spreads the frequency range around which the "Sub Bass" is centered. Leaving the "Deep" switch on does increase the bass. The center-detented "Sub Bass" pot makes the bass fatter as you turn it counter-clockwise and tighter as you turn it clockwise.

I found the "Sub Bass" effect to be somewhat program-dependent. During some music passages, as I rotated the "Sub Bass" control into the "Tighter" range, the bass actually decreased; on others it tightened without decreasing.

The Mid-High section is tunable from 22 kHz to 1 kHz and acts much the same way as the Aphex aural exciter's "Tune" knob. You open or close it to allow the range of frequencies through it that you intend to process back into the main signal. The "Sub-Bass" and "Mid-High" frequency bands are then added back into the main signal by increasing the "Process Depth" control.

When the "Tune" knob was set to about 2 kHz, the Vitalizer brought out the voicetrack in a voice-over-music mix. This also turned out to be a good setting for bringing up the crack of a snare in an instrumental mix.

According to the manual, the "Harmonics" section is based on fourth-order filters and phase manipulation. It is driven by a signal combining the original dry signal and the output from the Mid-High Tune filter, while the "Harmonics" control determines "the degree to which the restored harmonics are added back to the original signal."

Increasing the harmonics content added more sizzle to cymbals and instruments with a lot of high-frequency content. When attempting to brighten dull-sounding audio, I found that com-

dB at full spread. Try using this control to create a spatial notch in the center of a busy stereo music mix so that a voice-track will not have to fight as hard for its own space. A mono-compatibility check showed no audible cancellation when the stereo spread audio was combined to mono.

I did find that the "Stereo Width" control reduced the presence of the voice on some stereo voice-over-music spots. These were spots in which I had used a normal amount of stereo reverb on the voice. In those cases, when the "Stereo Width" was increased, the voice track became increasingly washed out.

At one point, the "Classic" got cranky and started passing high-level distorted audio to its right channel output. The problem, a cold solder joint that connected the "Stereo Width" pot to the board, was repaired and normal operation was restored.

## Conclusion

Using a variety of music and voice-over-music sources, I found the Vitalizer is capable of offering a huge spectrum of tonal, harmonic and stereo-widening possibilities. After you get a feel for how the stages interact with each other, making quick adjustments will be easy.

As in most of these boxes, the secret of successful operation is knowing when to stop. I suggest that you wait a few minutes before committing to your adjustments, then give a second listen to make sure you haven't overdone it. Whether you're still in search of your own audio signature, or are in search of a new one, the Vitalizer gives you lots of choices.

## Product Capsule: beyerdynamic Vitalizer



For more information, contact beyerdynamic at 516-293-3200 or circle Reader Service 153.

panel that step from -10 dB to over +8 dB. The "Stereo" version has only a two-position input level.

The "Classic" has front-panel output gain controls that come in very handy because the processing is additive. As you increase any of the effects, the output controls can be used to keep the output level from overdriving the next audio stage. The output controls also allow you to adjust the output levels in situations where you use different kinds of processing on each channel.

The "Classic" version also has front-panel "process solo" switches for each channel that let you hear exactly what is being added to the original signal, sort of like soloing an effects return. This mode also allows the unit to be used in the standard effects send/return configuration.

Finally, the "Classic" includes a pair of front-panel screwdriver adjustments that allow the "Q," or bandwidth, of the "Mid-High" section. Since there are two "Q" adjustments, one for each channel, they must be set similarly for good stereo operation. When you peek through the holes in the front panel, you'll see two red arrows. The shaft of the arrow is large enough to accept a

binning the "Mid-High" and "Harmonics" ranges worked best. During some of these experiments, I had to readjust the low frequency controls after working on the upper end because the "Tune" circuit was open wide enough to allow some of the upper bass frequencies to be processed.

After considerable experimenting, I found that the best approach was to process whatever part of the audio was in greatest need first, and then follow up with smaller adjustments to compensate for any unwanted changes.

## In stereo

The "Stereo Width" control can be used by itself or in concert with the other controls. Increasing the intensity widens the stereo spread and can also raise the output level by as much as 5

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## PRODUCT EVALUATION

# Editing Made Easy with SAW for PC

by Bruce Bartlett  
with Jenny Bartlett

**ELKHART, Ind.** Are you frustrated with your digital audio editor? Maybe it's too slow or too hard to use. Maybe you get tired of waiting for endless calculations and screen redraws. If so, check out the new 3.2 Windows version of Software Audio Workshop (SAW) from Innovative Quality Software. This is one fast piece of work. And in spite of its power, it's easy to work with.

Using the SAW software with a sound card of your choice, you can digitally edit up to four stereo tracks. These tracks mix down in real time to your sound card's two outputs.

The SAW software is a powerful yet low-cost system. Price for the SAW software is \$599, and a utilities disk with signal processing costs \$349.

The SAW system is ideal for creating spots, promos, playlists and albums with CD sound quality. For example, you might create a spot by mixing a stereo music bed, stereo sound effects, and one or two announcers.

## Setup

The program runs extremely fast to mix up to four stereo tracks in real time. It's up to the task because it was written in 386 32-bit register assembly code. Actually, the number of tracks you can

mix in real time depends on the speed of your computer and hard drive, and on the amount of silent space in each track.

When I tested SAW, I used a 486DX/33

audio program records on a hard drive at about 11 megs per minute.)

SAW will work with virtually all 16-bit multimedia cards that run under Windows.

With Digital Audio Lab's CardD Plus or Turtle Beach's Multi-sound card, SAW provides direct hardware-level support. The speed boost this offers lets you overdub on an open track while listening to previously recorded tracks. It works smoothly.

SAW was written by Bob Lentini, a highly regarded audio engineer and award-winning software developer. With some 4,000 hours of razor-blade editing experience, Lentini gave SAW an interface that

audio people can relate to. It's the easiest, slickest way to edit audio that I've tried.

## How it works

Here's an overview of how SAW works. It gives you the capability to digitally record up to 40 different soundfiles onto your hard disk. When a soundfile is chosen, its audio waveform appears on screen. Using a mouse, the sections of these soundfiles are marked and stored as

"regions." These regions appear in a region list. They can be combined in any order to create Play Sequences (playlists).

In the multitrack window, the regions can be placed anywhere in the four stereo tracks. If necessary, the regions can slide in time relative to each other. Crossfades, duck music under voice and other edits are also possible. Edits to these tracks are non-destructive, thus can be changed at any time.

The final mix can be done with the on-screen faders. The level changes are memorized and can be redone. The sounds can be mixed from pre-categorized libraries. Separate solo takes, for example, can be edited into one clean cut.

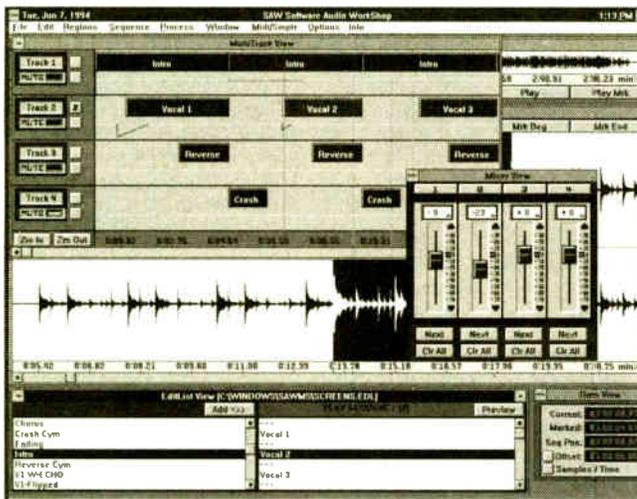
Edits and audio can be archived to DAT and one floppy in real time. The hard disk is then erased for other projects. To work with previous material that is archived to DAT, you must re-load the edits and audio. It's easy to do and works without a hitch.

## In use

I was able to install SAW in about an hour, which involved tweaking my sound-card setup, AUTOEXEC.BAT file and CONFIG.SYS file as recommended by the manual. The manual written by Bob Lentini is excellent — clear, easy to follow, and nicely laid out. It includes a helpful tutorial that gets the user up to speed in two hours. You can master the program in just a few more hours.

The screens are uncluttered and colorful. I especially like that the control buttons are text rather than icons. It can be hard to remember what icons stand for if you

continued on page 18 ►



SAW's software includes an intuitive graphical screen.

and a slow SCSI hard drive, which had an 800 KB/sec throughput. With this system, I was able to mix three to four stereo tracks of music, voice and effects. But three tracks of continuous music wouldn't mix without glitches.

The program requires at least a 386/40 MHz Windows PC with VGA video and 8 MB of RAM. (I tried 4 MB but it didn't work.) The smallest recommended hard disk size is 245 MB. (Note that a stereo

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# SAW's Digital Editor

► continued from page 16

only use a program occasionally.

SAW is easier to use than other editing software I've reviewed. Other software companies can learn a few things from SAW. The user interface is simple and well thought out. You move the cursor with your left mouse button and play audio with the right button, so it's pretty much a one-hand operation. There are quick keys for those users who prefer to work that way.

I did miss the ability to insert crossfades in the playlist, as Turtle Beach 56K lets you do. Doing a crossfade with SAW is more work, but is effective. My computer and drive were not fast enough to handle a crossfade without digital dropouts.

The SAW can create effective spots using music, effects and voice-over. The process is simple. Go to the recording control panel, which has tape-deck controls and VU meters. If the source is analog, set levels. Record the music. Then record all the sound effects and the voice-over. When exiting the Record window, a Full View window appears: a long, narrow window that shows the complete soundfile. In this window, there are silences in between sounds. You simply point and click the cursor to the approximate start of the first region or section you want to define.

The SoundFile View window shows the waveform in selectable zoom levels—all

the way from the complete soundfile down to one sample per pixel. Zooms and scrolls are amazingly fast. Waveform redraws are almost instant.

While listening to a playback, fine-tune the cursor position to the start of the region you want to define. For the voice-over, a region might be a group of correctly read sentences. Mark the beginning of the region, go to the end, fine-tune it, and mark the end. The region you marked is highlighted.

A nice feature here is that the marked area can be looped repeatedly while

tweaking its start and end points. Another nice touch: you can snap the start and end points to zero-crossings on the waveform; this makes edits click-free. A Time View window shows various time markers.

After the region is named, it appears in a list of regions. The mouse is used to assemble the voice-over regions into a playlist. Regions can be deleted, re-ordered, re-edited and so on.

Finally, the music and sound effects are edited the way you did the voice-over.

In the MultiTrack View, any region in any of four stereo tracks can be placed at any point in time. Since each region can be slid in time, speech phrasing can be varied or the timing of sound effects can be adjusted. Now you have three stereo tracks of edited dialogue, sound effects, and music.

Using the faders in the Mixer window, the level can be set at several points in each track. A graph next to each track shows the track's level versus the set level. You can fade between level markers to duck music under voice or to crossfade between songs. Change levels anywhere in a track, even within a region. The mix plays in real time. If you don't like the mix, change it instantly without waiting for a re-calculation.

When applying signal processing to the audio in some DAWs, you have to wait for a calculation. If the effect sounds bad, you have to re-do it. SAW eliminates this problem by letting the user preview most changes before they are written to disk. This saves lots of time. Once the effect is tweaked, SAW will process the soundfile data. SAW calculates its digital processing much faster than other software I've used.

## Other features

The SAW software has other features that work effectively, such as magnify levels up to 60 dB, sample rate conversion, cut and paste editing and vari-pitch. If a 30 second radio spot comes out to be 32 seconds long, it can be vari-pitched down to 30 seconds. It can even correct out-of-tune notes.

The feature list also includes MIDI SMPTE time code capability with optional interface, and manual on-cue region play of the playlist. A utilities disk permits signal processing, such as comp/limiting, multiband parametric EQ, delay, panning, and bit-rate conversion. The processing calculates faster than in many other editing programs, and it sounds clean and smooth.

This company must be complimented on its tech support, which can be accessed by phone or CompuServe. Because DAWs are a recent technology, users often have questions that only the company can answer. The ability to quickly communicate with the designer of the product and receive satisfactory services creates great customer satisfaction and loyalty.

In summary, I would say "Great job, Mr. Lentini!" I rate SAW a best-buy.

□ □ □

Bruce Bartlett is a microphone engineer and technical writer for Crown International, and the author of "Practical Recording Techniques," published by Howard Sams. Jenny Bartlett is a technical writer. Bruce can be reached at 219-294-8388.

## Product Capsule: SAW Digital Editing Software



**Thumbs Up**

- ✓ four-track, real-time mixing
- ✓ attractive, easy user interface
- ✓ useful, glitch-free features
- ✓ automated mixing
- ✓ fast screen redraw



**Thumbs Down**

- ✓ can't easily insert crossfades into playlist

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DIGITAL DOMAIN

# On Track with SSL DiskTrack Console

by Mel Lambert

**LOS ANGELES** Remaining with the theme from last month's column, which considered ABC-Digital's new D-RADIO, I recently spent some time with an all-digital production system that incorporates some remarkable operational and technical concepts. Unveiled by Solid State Logic at the recent AES Convention in San Francisco, the Axiom Digital Production System combines the familiarity of an analog console's control surface with an integral hard disk recorder, code-named DiskTrack.

In this way, the firm argues, anyone used to working with an automated SL-Series console would already be familiar with the complex front-panel layout. (And in the high-end recording, TV broadcast and video/film post market, the firm's admittedly expensive products grace the control rooms of several hundred leading-edge facilities around the world.)

**By contrast**

But, in contrast to other all-digital designs that offer a high degree of assignability, SSL has adopted the design approach of "one control per function; one function per control." To my way of thinking, this philosophy results in a panel layout that's extremely easy to follow; the lack of "layers" or assignable EQ control sections that need to be called up to change system parameters means that Axiom's operation very closely mimics that of an analog console.

Because front panel controls are now being used to extract changes and updates from the user (no audio actually passes through them), some way needed to be devised to both display the current stored value of each knob, and indicate subsequent modifications. SSL's solution—and it's one that's incorporated in several other designs—was to use circular LED displays around the skirt of each knob, plus an alpha-numeric display on each channel to provide confirmation of what signal source is being controlled by each channel strip.

User convenience aside, a fundamental aspect of the Axiom design is its computer-controlled "resource management system" that provides access to input/output options and DiskTrack hard-disk audio storage/editing. While such a phrase might seem more appropriate to the vocabulary of an MBA rather than that of a chief engineer, the thinking behind the concept is particularly interesting. The Axiom's software-based resource allocation enables all input sources to and out-

recording and editing are integrated into a single system; that single system may be a shared resource, maintained centrally by the studio. The same is true of expensive input and output resources. Already studios are used to working with tie-lines to provide flexibility between recording spaces and control rooms."

The resource management capabilities inherent in DiskTrack system, the firm offers, enable this philosophy to be extended to its logical conclusion.

## The Axiom Digital Production System combines the familiarity of an analog console with an integral hard disk recorder, the DiskTrack.

put designations from the console to be assigned to any physical channel strip—the Axiom mainframe accepts 48 to 96 "strips" in blocks of eight.

Upon system startup, all of the available disk-storage capacity is surveyed by the system and assigned across the Axiom control surface as one record/replay track per channel strip. (The hard-disk storage comprises a single, large-capacity disk drive per eight channel strips; each drive provides a total of 180 track-minutes of record/replay capacity, which is dynamically allocable across the system.) Being disk-based, Axiom's recording capacity is available concurrently, meaning that it's possible to simultaneously record and play back from the same track.

**A breakthrough**

In terms of design philosophy, Axiom represents a remarkable breakthrough in combining familiarity with the best that digital technology can offer in the way of enhanced signal fidelity, random-access editing and powerful DSP functionality.

As SSL points out: "Resource management must be a high priority with any developer of sophisticated studio systems. Inputs and outputs are expensive, yet may be redundant for much of the time. The ideal must be a situation where

turnaround between projects.

And the implications for the radio broadcast community are profound. I remain convinced that "the familiar" will be more acceptable to on-air and production engineers than the type of computer-based "glass consoles" and highly assignable designs offered by certain manufacturers.

**Attract new users**

After a great deal of market research and analysis, SSL has concluded that, in the short term at least, high-end studio owners can attract new users to a production system if it looks and behaves much like the analog control surfaces the majority of engineers and producers are readily familiar with.

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□ □ □

*Mel Lambert has been intimately involved with the production and broadcast industries on both sides of the Atlantic for more than 17 years. Now principal of Media&Marketing, a Los Angeles-based consulting service for the professional audio industry, he can be reached at 818/753-9510.*

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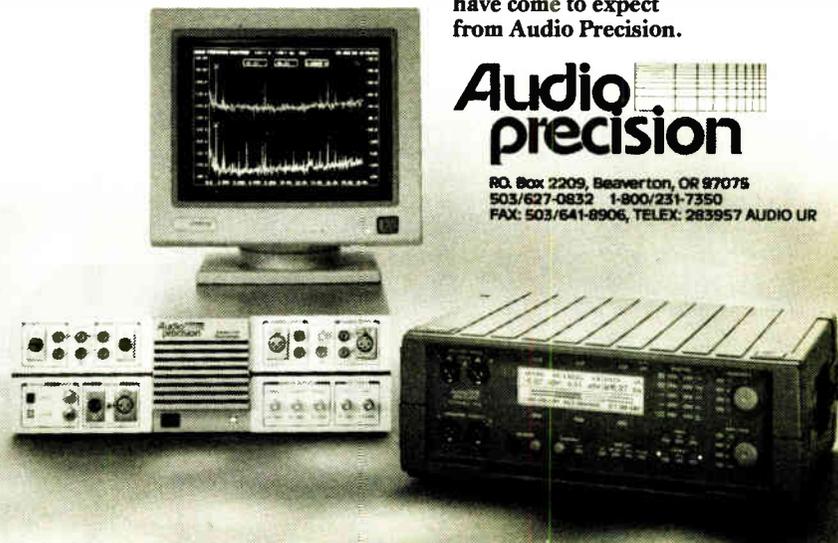
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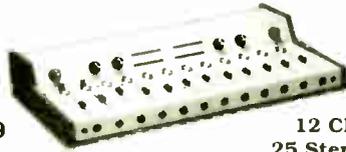
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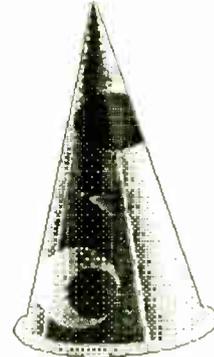
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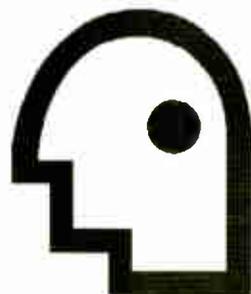
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## AUDIO BROADCAST GROUP

READER SERVICE NO. 220

# SADiE Completes Studio Upgrade

Last in a series

by Ken R.

**TOLEDO, Ohio** You may remember from our last installment in this magazine that we're a busy jingle and commercial production studio in Ohio. Prior to renovation in July of '93, our equipment consisted of a TASCAM MS-16 (1-inch 16-track), four various DAT machines, a RAMSA 16-channel board, two Otari MX 5050s (2-track machines), and a bunch of processing toys.

Our mixdown decks also used DBX 150s to keep the noise down and the whole shebang was monitored mostly through our Tannoy PB 6.5 nearfield monitors. We also own two Neumann U-87 mics which have performed flawlessly for us for more than 14 years. The equipment was a collection of fairly vintage stuff that was

acceptable for the projects we handled, but I really wanted to improve the product and ease of operation.

In the summer of 1993, we undertook a major renovation in which we doubled the size of our control room, added a 32-channel automated board (TASCAM M-3700), and moved most of our office walls while we were at it. But we just didn't plan on a day we'd be tossing away the razor blades and start editing with a mouse.

When we planned our expansion in late 1992, digital workstations were still very expensive. The software was awkward, the memory capacity limited. At the time, I guessed that it would be five years before I could find one I liked and could afford. Then a friend at a studio in England touted the SADiE system. He owns several of them and his suggestions prompted me to investigate further.

This self-contained hard-disk editing system uses a 1.25 GB hard drive and very simple yet powerful software operating on the Windows platform, and best of all, the whole package cost only about \$10,000.

## Until now...

Prior to this time, systems with this much capability cost as much as \$50,000. As someone who almost always pays cash for new studio gear, it was too good for me to pass up.

Once I'd committed to purchase this computer system, I began to second-guess my decision. Would I (a non-tech-geek) ever learn to operate this thing?

How would I integrate a hard disk system into my existing equipment? Would I lose the warm sound of analog? Would it really speed up operations to a point where it was going to pay for itself? Could it bring me new business? Let me tell you what I discovered.

Our physical plant had already been remodeled, but prior to delivery of SADiE, we modified our studio design to include an extension to our formica console desk. Our carpenters built in an indented area for a keyboard and a prime location counter top for the large VGA color monitor. The hard-drive and "breakout box" (for time code connections) are located under the console out of the way... but close enough to put the power switch within reach. Surprisingly,

continued on page 27 ►

## Accessories Overwhelm JVC Portable DAT

► continued from page 17

microphone with self-contained A/D converter and digital output. Though this configuration is far more flexible, the kluged microphone handle lacks good ergonomic design and, for me, was uncomfortable to hold.

On the plus side, the recording level control—mounted in the handle—can easily be operated with the thumb while hand-holding the microphone.

The JVC MU-Z1 digital microphone is quite a flexible device. In addition to the level control pot built into the handle, there is a low-cut switch, an attenuator, a switch to select one's choice of recording mode and a switch to select either a mid-side stereo or super-directional pickup pattern for the microphone.

Because the microphone has a built-in A/D converter, it also can be used directly with digital post-production systems such as Digidesign's Pro Tools.

JVC's PIPRO recorder can be run on either AC power or with rechargeable NiCad batteries. It has no provisions for disposable alkaline or lithium batteries. The standard BN-R602 NiCad, priced at \$159, is specified to run 2.5 hours when recording. The BN-604 NiCad, twice the size and \$269, is supposed to supply five hours of recording time.

With a brand new, fully-charged BN-R602, I got two hours and 11 minutes uninterrupted record time in the long-play mode. In this test, the MU-Z1 microphone was attached to the side of the recorder and powered from the recorder's battery. By comparison, Sony's TCD-D7, a popular Walkman-sized portable DAT recorder used by both consumers and pros, ran three hours and 12 minutes in the long-play mode on a single set of four AA alkaline batteries while powering a broadcast-quality condenser microphone through its input jack.

Although the sonic quality of the PIPRO is excellent (as are all current portables) and it offers tremendous flexibility and an array of features, the maze of options and gadget bag full of parts that come with the recorder left me desiring far more simplicity. And, ironically, highly desirable features that are now available on far cheaper DAT portables are omitted.

For example, NiCads—though they

may work well when new—lose their operating capacity over time when charged on simple trickle chargers like the one supplied by JVC with this machine. The need for several heavy (and expensive) spare NiCads defeats the purpose of a lightweight recorder in the first place. On the other hand, designs such as Sony's D-7 DAT portable have eliminated the need for NiCads altogether and allow reasonably good battery operating time with standard AA alkalines.

Despite these ergonomic caveats, I'd recommend the JVC PIPRO for anyone needing the flexibility of multiple recording modes in a field portable. In this area, it has no competition. But for field recordists who need a highly portable, simple-to-operate machine for general use, I cannot recommend the PIPRO as the best choice. There are better designs (although few portables are being produced at all) now available at a much lower cost.



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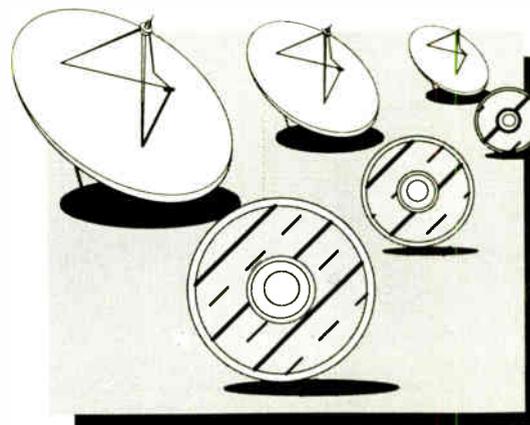
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## SIGNAL-TO-NOISE

# Pop Stars Perform at WQEW Studio

by Frank Beacham

**NEW YORK** A few years ago I had the opportunity to work in the facilities of Radio France in Paris. I'll never forget wandering the halls of that huge, sprawling building, entering one magnificent radio studio after another.

These were serious performance spaces, some larger than a concert hall, used by full orchestras to perform on French radio.

In the United States, the term "studio," as applied to commercial radio

broadcasting, has been reduced to a talk show setup or announce booth.

Well, almost. There's a shining example of a performance studio being used several times a week on commercial radio in New York City. To see and hear it in action is quite a thrill.

The studio, built in the summer of 1989, is owned by The New York Times and is shared by the company's two radio stations, WQXR-FM and WQEW (AM). WQXR-FM, a classical format station, uses the studio for live performances of classical artists. WQEW, with a format of American popular standards, uses the studio for live performances of such artists as Tony Bennett, Rosemary Clooney, Mel Torme and Les Paul.

## A real studio

Designed by Al D'Alessio of Northeast Communications Concepts, New York, the 500-square-foot, multisided studio sounds like a room more than twice its size. There are no parallel walls. The room acoustics can be changed for individual performances by adjusting a series of hinged wall panels.

At one end of the studio is a talk table. It can handle six guest mics, which are processed on a pair of Shure FP410 automatic mixers. On the other end of the

studio, there's a Steinway Grand piano and space for several musicians.

"The studio was designed for both talk and live music performance," said Herb Squire, chief engineer for the stations. "Unlike a typical recording studio, we needed a performance studio that sounded live."



Tony Bennett gives a thumbs-up during performance

Dave Marx, engineering supervisor, compared the use of the studio to a radio version of the Tonight Show. "It's the equivalent to doing the Tonight Show in the sense that we have interviews and performances that relate," Marx said. "So we don't want the acoustics to change dramatically from when you go to the talk table back to the live performance."

I visited the studio during a live WQEW tribute to songwriter Jule

Styne, who died last September. Singing live during the broadcast were Tony Bennett, Adolph Green, Betty Comden and Nancy Lamott. The artists were accompanied by a piano and upright bass.

Rodney Belizaire, one of the top production engineers in New York radio, was behind the 34-channel Pacific Recorders board in the control room.

Confident and alert to every move in the studio, Belizaire went on the air without

the benefit of a rehearsal.

"You have to be on your toes," he said. "It flies. Anything can happen. It's live radio."

Like a pilot, Belizaire has a check list of priorities. His first, because this is a stereo AM broadcast, is to insure mono compatibility.

The engineer must deal with a dozen-plus single-channel mics plus a pair of Schoeps Colette cardioids in an ORTF configuration under the piano lid and a reverb return in stereo.

"I have a little trick," said Belizaire. "Behind me is a Studer reel-to-reel machine. It has a little mono speaker. I turn off all the monitors in the studio and listen on that little speaker. That's my mono check. If it sounds good there, I've struck gold."

## Reverb a priority

Belizaire's second priority is reverb. "I add a little reverb to the vocal mics in particular," he said. "I add a little wetness to the piano and don't do any on the bass." (All vocal mics in the studio are Electro-Voice RE16s. Instrument mics, in addition the Schoeps ORTF array, are Neumann KM140s.)

Number three on Belizaire's priority checklist is processing. "We use an Aphex Expressor," he said. "I used it on Nancy's (Lamott) voice in a purely limiting mode. My hands aren't quick enough to catch her peaks from going over the ceiling and overmodulating. Without this I'd be dead in the water."

For Tony Bennett, Belizaire decided after his first song to engage the studio's Aphex Compellor. "It helped with some of his peaks as a limiter."

For the upright bass, a Urei 1178 limiter was used. "The Urei has a very smooth curve but it can attack very quickly," Belizaire said. "It limits the harsh peaks but enhances the smoothness of the sound."

During the show there was "a quick moment of panic" for Belizaire when Adolph Green was indecisive about which mic to use for a song and, in the confusion, caused one live mic to plop out of its holder. "I had the mic I'm hoping he's going to use at full fader and the mic that he may go to at half fader," Belizaire said. Unfortunately, Green went for a mic that was open, knocking it out of its holder, but Belizaire potted down so quickly it was not obvious on the air.

As pure entertainment, WQEW's Jule Styne tribute was an example of radio at its finest. The show represented an impressive merger of modern technology and old-fashioned human production skills. Herb Squire, Dave Marx, Rodney Belizaire and The New York Times organization have created a great modern-day version of the live performance radio studio. They deserve much credit for keeping alive a grand broadcasting tradition.

□ □ □

Frank Beacham is a writer, director and producer. His address is 163 Amsterdam Ave. #361, New York, NY 10023. E-Mail: [fbacham@radiomail.net](mailto:fbacham@radiomail.net).



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## Meat And Potatoes à la Fidelipac

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The MODEL 400 table-top eraser features a hardwood case, scuff resistant laminate top and removable aluminum pivot pin permitting erasure of audio, video or computer tape reels up to 11 inches in diameter x 1 inch wide.

### Other Accessories

Fidelipac offers CARTRIDGE STORAGE SYSTEMS in numerous configurations including a 25 slot vertical wall rack, a 200 slot mobile carousel rack mounted on heavy duty casters, and table-top units which hold 96 cartridges or up to 48 cartridges (as shown above).

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In addition, other useful accessories (not shown) include alignment cartridges and precision gauges for head insertion and right angle zenith calibration.

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## ULTIMATE Digital Studio II

The screenshot displays the 'UDS II' software interface for 'TM CENTURY, DALLAS TEXAS'. It features a '5:00:06 PM Tuesday' clock and a 'Segue' button. The main display is divided into three sections: 'ON AIR', '> NEXT TO AIR', and '> NEXT TO FOLLOW'. Each section lists song titles, artists, source IDs, CD numbers, dates, and timing information. A large '11' is displayed in the center of the 'ON AIR' section. The bottom status bar shows various system settings like 'Drive', 'Time Update', 'Time Commands', 'Logging', 'Printer', and 'Loading'.

Section	Artist	Source ID	CD	Date	Intro	Time	Ending
ON AIR	Hey Nineteen	01			17	4:19.0	F
	Steely Dan						
> NEXT TO AIR	Invisible Touch	02	SONY CDK-3600	3/15/94	16	3:19.0	F
	Genesis						
> NEXT TO FOLLOW	I Stand For You [Edit]	01	SONY CDK-3600	3/15/94	20	3:47.0	F
	McDonald, Michael						

Drive: [ ] Time Update: OFF Time Commands: OFF Logging: ON Printer: OFF Loading: 00

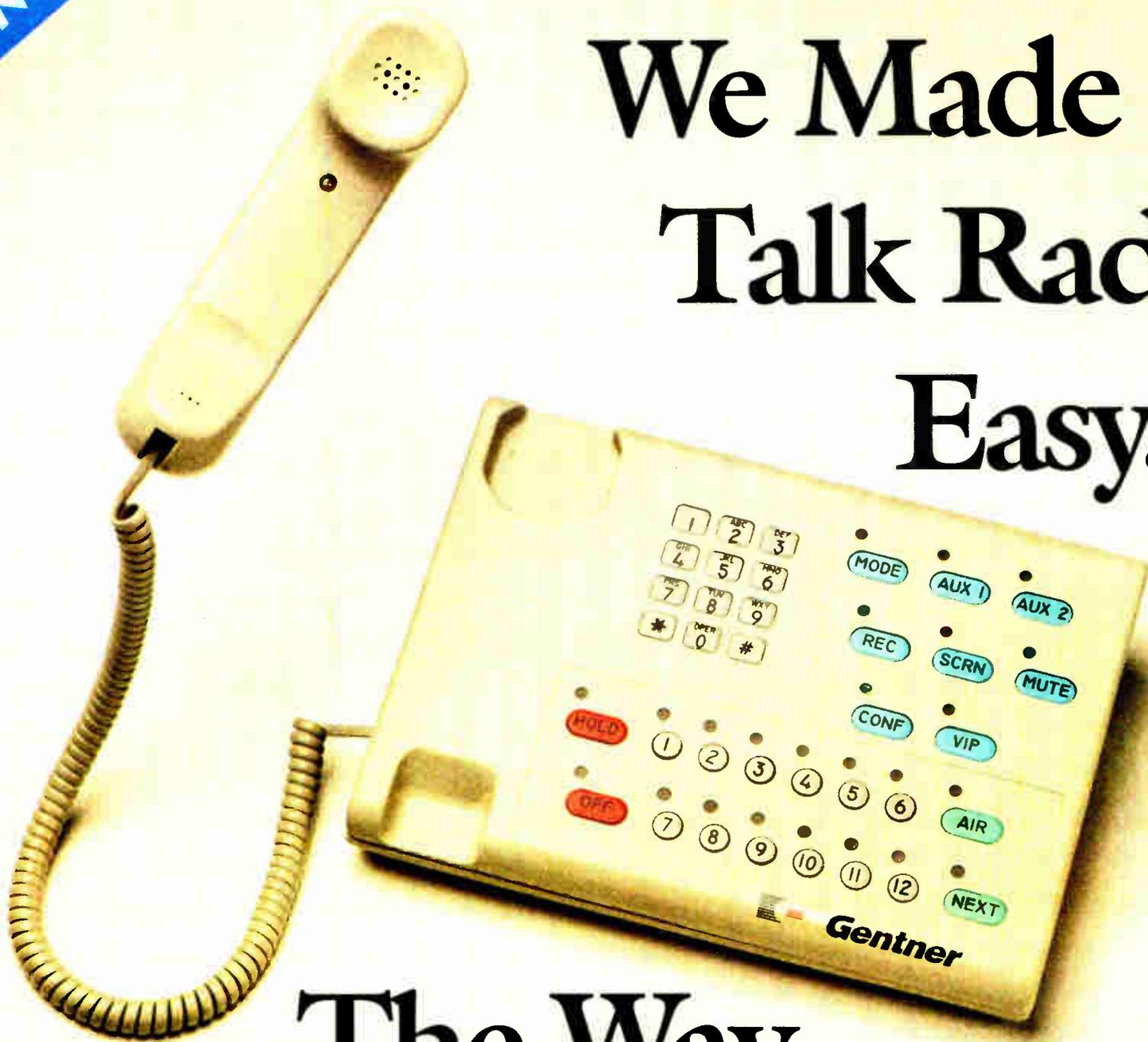
- NEW COUNTDOWN CLOCK SHOWS EXACT TIME BEFORE VOCAL STARTS AND WARNS THAT END OF EVENT IS NEAR.
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Circle (166) On Reader Service Card

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# Studio Adds SADiE

► continued from page 21

the computer itself doesn't make that much noise so it's not a problem to have it nearby.

### The learning curve

After reading the instruction manual, I still didn't feel like I could tackle it. At that point, however, I decided to just jump in with both feet and spend a Saturday playing and experimenting. Suddenly it all came into focus. And with the little on-screen "zipper" icon, you can un-do the last 25 steps you took... so no danger of lurching an important chunk of audio. Now using SADiE is second nature, and so much faster than razor blades. A typical razor blade edit took about a minute. A typical SADiE edit takes me 10 seconds. You don't even have to listen to the audio to edit: you can see the wave forms on the screen and make your marks from the visual cues if you like.

In the course of a long soundtrack for an industrial video, the time savings are

immense. And of course it's far more accurate than the old blade method. There's a button to preview the edit. If you like what you hear you "write it back" to the hard disk with one click. If you don't like it, slide it with the mouse until it's just perfect.

Integrating a hard-disk editing system into my set-up was a dream. SADiE provides up to eight tracks of simultaneous audio, but it has four audio outputs. I just ran them into the mic inputs of four channels on the board. Since you can mix, process, edit, EQ, compress, pan and even time-scrunch right on SADiE, it makes finishing a project very easy.

### Multitrack preference

I find that when we record original music, I still prefer my multitrack 1-inch machine. Where SADiE shines is on production of spots, editing of music and storing short, frequently-used sound elements. Because SADiE has digital ins and outs, you can go back and forth from DAT easily without losing a generation.

We usually back up longer SADiE projects onto DAT as we progress.

What about the sound? It's fabulous. The noise floor is so low it's nonexistent. And the sound seems to give back whatever warmth you put into it—but with brutal accuracy, so if you have noisy room fans or hums in your board, they will come faithfully bouncing back to you from the disk. I now see that noisy old analog stuff made it harder to listen critically because of all the hiss and grunge in the signal.

Did the investment in a hard-disk editing system pay off and bring me new business? Absolutely. Clients I have worked with for years now spend more time here. They count on us to perform miracles and we can come through for them, and we keep them from going to

other studios who have similar systems.

After running my own studio for about 16 years, I feared I was becoming a dinosaur. The technological changes in the last eight years have been astounding, and the prices for this wizard stuff are finally in reach.

Initially I was scared, but I took the risk and I'm glad I did. Taking a bold leap also recharges your internal batteries and helps you face new challenges, learn new techniques and be able to expand the services you can provide to your clients. It may be a little scary to make such a large investment in the "unknown," but in our business, staying where it's safe is even more of a risk.

□□□

Ken R is president of Ken R Inc. He can be reached at 419-243-1000.

## PRODUCT GUIDE

Companies with new product announcements for Studio Sessions Product Guide should send them to Radio World, c/o Studio Sessions Editor, 5827 Columbia Pike, 3rd floor, Falls Church, Va. 22041



**Akai CD3000s CD Sampler**

Akai has introduced a new version of the CD3000s, which allows sampling from CD-ROM, recording CD-ROM to memory and recording from standard CDs to memory.

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For more information, contact Akai Professional, 817-336-5114; or circle Reader Service 107.



**Yamaha MT50 Four-track Cassette Recorder**

Yamaha's MT50 multitrack cassette recorder offers four track recording capability, dbx noise reduction, two-band EQ, 3.75 ips speed.

The deck also includes AuxSends, track four MIDI sync, variable pitch, and optional footswitch control.

For more information, contact Yamaha at 714-522-9011; or circle Reader Service 39.

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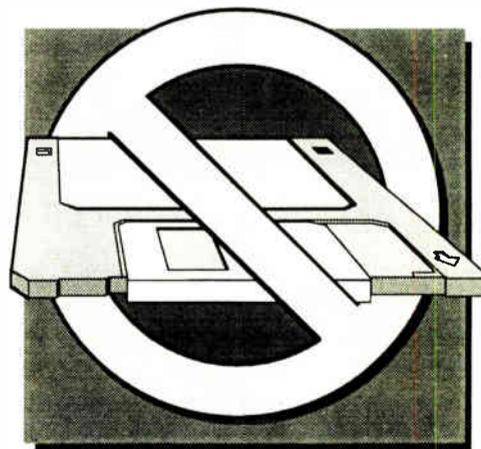
A Digilink workstation stores audio on an internal hard disk and comes out of the box with a capacity of 547 one minute, stereo carts for only \$7,995. Even better, the Digilink hard disk has an average 15 year life. Imagine how many floppies you will break, wear out, lose, and replace over 15 years. That doesn't count all of the floppy disk mechanisms that will jam, break, and simply fail...

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## KEYBOARD CONNECTION

# Safeguard Information on Your Computer

by Barry Mishkind

**TUCSON, Ariz.** Probably one of the most dangerous activities in a broadcast station is opening the back of a transmitter to do maintenance. The voltages stored in those big capacitors, even when the power breaker is off, can be lethal.

Thus, most engineers immediately reach for the grounding rod and touch each place where high voltage can be found. Some though, seeing how transmitters normally discharge themselves

automatically, may get to a point where they ignore the grounding rod. But this is not wise, and sadly from time to time, we read of someone who got "bit."

Fortunately, the dangers in using computers are not quite so life-threatening. Nevertheless, a similar sort of carelessness can be very costly indeed: just consider the unique information inside your computer.

Perhaps it is your list of key sales contacts and their phone numbers. Maybe it is next week's playlist. Or possibly your

entire accounts receivable.

So, what would be your reaction if when you turn on the computer tomorrow an error message informs you the hard drive has crashed, making it impossible for you to access your data? Or suppose you are loading that new killer application, and it shreds your hard drive directory?

One of the earliest computer anecdotes concerns a company which lost all its accounts receivable data. Despite placing advertisements explaining the situation and asking their clients to please pay

what they owed, the company went broke.

On the other hand, if you have been practicing safe computing, you will reply that you would just get your backup diskettes and rebuild any critical data lost. Like the grounding rod properly used in a transmitter, having current backups can prevent financial damage to your station.

## What to safeguard

The problem, of course, is what to back up and how to best do it. This becomes especially important as computer programs and hard drives get bigger and bigger. No one has 10MB hard drives any longer; just loading Windows and one application can take more than 10MB.

For business use, 200 and even 400MB hard drives are the norm. Can you imagine the impact of losing 400MB of data? The time and effort lost would be enormous. Ouch! The result is a backup that might have taken 10 diskettes and 20 minutes six years ago can now take 200 diskettes and half a day.

And there's the rub. Just as the temptation to think the grounding rod is unnecessary, facing doing a full backup regularly can become so big a burden that you might be tempted to do without.

Nevertheless, like the grounding rod, a backup is not something you can do without. Eventually, every hard drive will fail. Fortunately, backup software is not hard to find. In fact, if you have the latest versions of MS-DOS, you'll find that backup programs for both DOS and Windows are included. There are also many third party packages such as Symantec's Norton Backup and Central Point Backup.

Another option is to use some of the compression utilities like PKZip or LHArc and then copy the files to diskettes. One advantage to this system is you can access individual files more easily, in case you need to restore only one or several files. Also since the backup programs usually have one large index file, a corrupted index diskette could lose all your backup files. Copying the files individually prevents that possibility.

## Bigger and faster

With the trend to the larger hard drives, some have found tape streamers to be more convenient than storing the backup on scores and scores of diskettes. Most tapes can hold 20 to 40MB of data each. While this significantly speeds up the process, it can still take 10 or 20 expensive cartridges and plenty of time.

Because many of you have backup transmitters and generators ready to take up the slack should an outage occur, perhaps you are thinking that a second computer would be a good way to ensure safe and quick backups. That is true. Some have taken this advantage a bit further using a notebook computer, so the backup can be taken to a second location for safety. By the way, some notebooks like the Epson 700 series come with a removable hard drive.

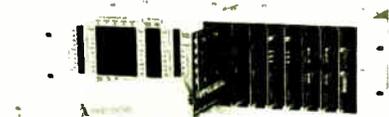
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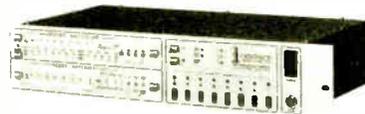
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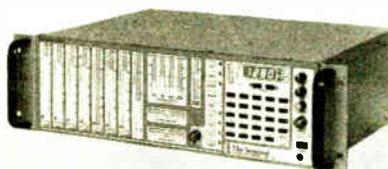
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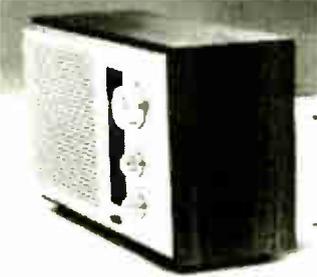
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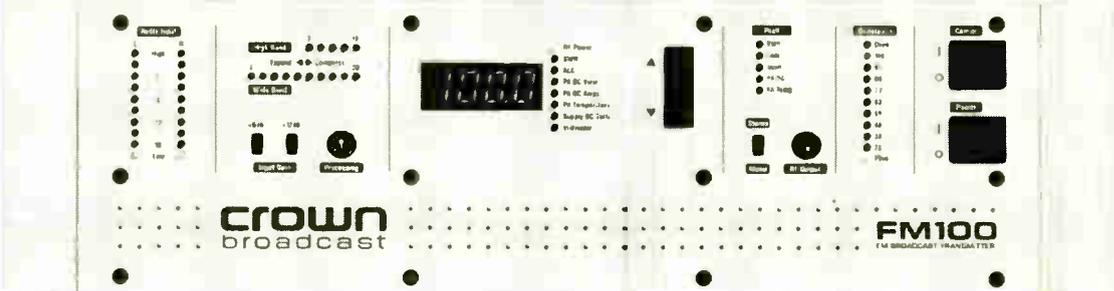


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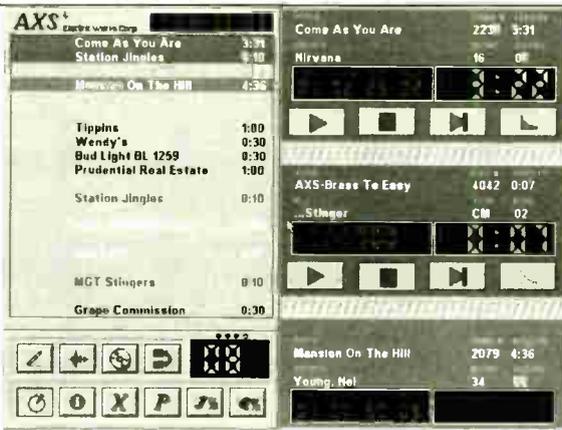
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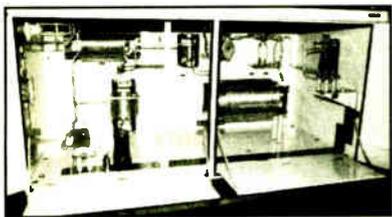
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# Refurbish a 286-Based Workhorse

by Richard Mertz

**FAIRFAX, Va.** Last month this column embarked on a mission to revitalize an older 286 microprocessor-based PC by upgrading the computer's motherboard and other internal cards and components. So far, we have unplugged the power supply cord and opened the case. The 1.2MB floppy drive and hard drive have been removed and cleaned.

Next, unplug the power supply connectors (there are two of them) from the old motherboard. The power supply is attached to the case with four screws. Loosen and remove these screws. (Keep the screws together and away from other case hardware. The threads on these screws are usually different than the others.)

The power supply should now lift out. Clean the power supply just like you did the disk drives, using a small paint brush to push the dust into the vacuum hose. Be sure to brush the dust away from your face.

### Faced with motherboard

Next, remove all of the accessory cards. All that's now left should be the motherboard. The cables still connected to the motherboard are those that connect the keylock, reset button, turbo button, LED, power indicator and speaker. The unconnected remaining cable should connect to the hard drive led indicator. Mark each cable and then disconnect them from the motherboard.

The only thing left in the case should now be the motherboard and several years' collection of dust. In the upper right-hand corner of the motherboard is a small screw. Carefully remove this screw and the motherboard should slide to the left and out of the case easily. If not, look for another screw.

Some motherboards are also secured near the front of the case. Be careful when sliding the motherboard out of the case. There are press-to-fit plastic mounts that support the motherboard. These supports will be recycled and used with the new motherboard.

The dirtiest job in this whole project is to clean out the empty case. After the "brush and vacuum" treatment, use some liquid cleaner on the case both inside and out. It may sound like I'm a cleaning freak. Well, I no Felix Unger, but a clean piece of electronic equipment dissipates heat better and reduces the possibility of component failures.

### Begin the rebuild

Now we're ready to begin the rebuild. Reinstall the power supply. Remember the four screws you set aside earlier? It's time to put them back in place.

Care should be used when installing the new motherboard. Static electricity can easily destroy your investment. Touch one hand to the computer case and keep touching the case while removing the new motherboard from its protective static bag. Install the plastic spacers removed from the old motherboard in the new motherboard. Some motherboards have a series of mounting holes that make it easy to mount in a variety of cases. Use the plastic spacers in those mounting holes that match up with the mounting notches in the case.

Slide the motherboard into the case and secure it in place using the screw in the corner closest to the power supply. Make sure this screw is snug. It is the ground reference for the entire board.

When you connect the two power supply cables to the new motherboard, be sure that the black wires on each connector line up together. To do otherwise would be disastrous. With the power supply cables in place providing a ground return, it's time to install the memory. Modern motherboards use SIMMs, or Single Inline Memory Modules. These modules snap into place. Check the manual that came with the motherboard for configuration and positioning. While you have the manual in hand, connect the speaker, keyboard lock switch, turbo switch and LED, and power LED to the appropriate pins on the motherboard.

### Floppies installed

Install the old floppy drive and then install the new 1.44MB floppy drive in the case. Mount the old hard drive in its usual place in the case. Connect the four-pin power cords to both floppy drives and the hard drives. Install the hard drive controller, floppy controller, I/O and video cards.

Connect the two cables from the hard drive controller to the harddrive. The single cable goes from the floppy controller to the floppy drives. The drive you designate as drive A must be

connected to the connector on the cable after the "twist."

Plug in the keyboard and the monitor and click on the power. If all is well, you should get two beeps through the speaker and a message on the screen that refers to some checksum failure and the suggestion to run "setup."

Setup is an internal program that is activated with a series special keystrokes depending on which BIOS is installed on your motherboard. The AMI BIOS asks for you to push the delete

key; the Award BIOS requires CTRL/ALT/ESC; the Phoenix BIOS will let you access the setup after it has determined there is an error.

Whichever BIOS is installed, follow the prompts on the screen to set the proper time, date, floppy and harddisk drive specifications. There are also additional settings for system board enhancements, cache controls and other goodies. These are too numerous to present here. Consult the manual that came with the motherboard for the details.

Hopefully, your renovation project is a success and everything is operating correctly. Install

your software and away you go. You now have a system that provides improved performance with additional memory and you may even be able to run Windows. For about \$300 more you could add a VGA monitor and VGA video card. Maybe that's pushing things.

I hope that the articles on computer renovation have been helpful. I have already received some positive feedback through e-mail. Thanks for your interest and kind words.

□□□

*Richard Mertz is a principal at the consulting firm of Staffa and Cavell, Fairfax, Va. He can be reached at 703-591-0110; through Compuserve, 73020,3026, or on the Internet at rmertz@dgs.dgssys.com.*

## Back Up Data

► continued from page 28

Multiple and segmented backups of an entire facility can be done easily this way.

On the other hand, a little planning can reduce the time and media overhead, no matter what system you use.

For example, if you are doing a full backup every time, you are copying all the programs on your hard drive over and over again. Instead, why not make a backup of your programs diskettes while installing them, and then concentrate on the data files?

Some users make this easy by using a batch file or a file manager that sorts files by date. Another approach is to purposely partition your hard drive to put all the data files on one partition for easier backup. It reduces the number of diskettes needed. It also does a couple of other good things for your computer.

### Save time and money

First, it saves a lot of time when you defragment the hard drive because you won't have to constantly move your program files. Less well known: smaller partitions save a lot of space. Partitions over 125MB use "allocation units" of 4096 bytes, twice the size of those under 125MB.

No matter how small a file, even 10 bytes, uses at least one allocation unit. If your programs use lots of small files, the difference can add up fast.

There is one more facet of data security that needs to be mentioned, especially if you are in an area where the power is not 100 percent reliable, or storms provide flashes and surges that can damage data or computers. The answer is an uninterruptible power supply (UPS). These units isolate your computer from the wall and can also provide sufficient emergency power to allow you to shut your computer down during an outage without data loss.

However, whether you use a UPS or not, be sure to back up your critical data. Even if you don't use your grounding rod, be sure to make regular backups of your data. Your survivors will appreciate it.

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*Barry Mishkind can be reached at 602-296-3797, or on FidoNet at 1:300/11.3 or "barry@coyote.datalog.com" on Internet.*

**USER REPORT**

## Energetic Offers Variety of Cuts

by Linda Fremont-Garvey  
Executive Producer  
Elanjae Productions/Video

**AVALON, Calif.** Elanjae produces local origination programming for Catalina Cable TV here on the island, including an evening news feature program, historical and nostalgia pieces, interviews with residents and visiting celebrities, and community events. Catalina Island, being a resort town, brings us viewers from all over the world, as well as local viewers.

For the past two-and-a-half years, we've been using Energetic Music CDs on the soundtrack of many of our video productions.

Energetic happens to be the first buyout music company we used, and we have had excellent results with its product. In addition to producing fine-quality CDs,

Energetic offers the variety of styles and formats necessary for our kind of operation.

Energetic buyout music serves us well in our documentaries, features and commercials. For instance, we used a cut from Energetic SK2 for our Avalon sheriff station theme, another cut for "Meet Lynn Franklin, the Original Beverly Hills Cop." Another cut is great for traveling-on-country-roads-type pieces. All of this—13 full-length cuts—featured on just one of Energetic's 15 CDs.

**Cuts for every occasion**

Then there's Energetic BC-1 Broadcast No. 1 with 54 cuts, ranging from full-length to two-second logos on each of nine songs. We used two songs for our Halloween show, another for a segment on a rock dance/party.

Energetic CL-1 Classical No. 1 includes Bach, Mozart, Haydn, Grieg, Beethoven's Fifth and the original "Minstrel's Merriment" by Monty Smith of Energetic Music. Energetic Wedding and Quiet Times CD is not only for weddings; we used two cuts for local high school graduation pieces, 1993 and 1994.

There's a special Sports and Action CD, and the Christmas CD features a marvelous 10-minute medley with bells and gallops, traditional holiday songs in full- and broadcast-length, plus a really great "Jingle Bells" arrangement. We used this CD extensively on our Catalina Christmas '93 special and on our holiday commercials, too.

Energetic LT-1 Logos and Transitions contains 97 cuts, including a news theme, a traffic report with traffic, as well as a traffic report without traffic, bells and choir, fanfares, Kid's Comedy No. 1 and No. 2, a marching band cut, piano riffs, tom toms, lazer sweeps, funny oboes and a mandolin riff.

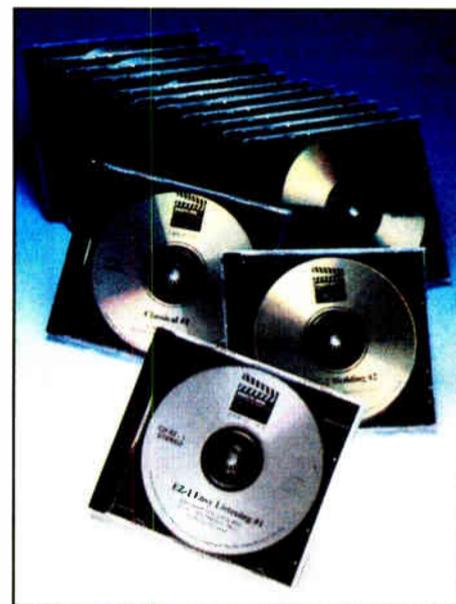
**Prompt disc replacement**

When we first received this CD, we checked it out, knew we could make good use of it and added it to the rest of the library. Shortly thereafter, we received a new "corrected" LT-1 CD from Energetic, apologizing for some small error in one of the cuts or a listing of one of the cuts, something so trivial that we hadn't even noticed. But Energetic noticed it and replaced it immediately, telling us to keep the old CD if we wished.

Energetic's RO-1 Romantic No. 1 CD features 11 full-length cuts, including "Twilight Lace," reminiscent of a classic movie love song, "This Evening Rose," a slow dance song with Southern flavor, and "Urban

Love," which conjures up big-city soul. The TR-1 Travel and Leisure CD contains 12 full-length cuts of music for travel productions. There are rural sounds, jazzy stuff, up-tempo city hustle-bustle, dreamy New Age and down-home tunes. This music is appropriate for underscoring narration, as well.

Recently, Energetic's Country No. 1 saved us production time on a seven-minute, horse-and-carriage-ride-coming-to-Catalina piece. We were able to score it



Energetic Music CDs

completely with three cuts contained on this country western-type CD. This CD also features Southwestern-style music, a "spaghetti Western" piece, honky tonk, old-time sound and modern style.

At this time, we have all 15 available Energetic Music buyout CDs, and we look forward to their next release. Whatever it may be, we'll be able to use it well.

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For information, contact Monty Smith in Washington state at 206-467-7101; fax: 206-467-6931; or circle Reader Service 196.

**USER REPORT**

## Halland Makes Format Change Smooth for KYMC

by Laura Jacobsen  
Station Manager  
KYM(FM)

**CHESTERFIELD, Mo.** Imagine you are a listener. You turn on the radio in the morning expecting to hear what you have heard every morning for the past five years. You stop and think to yourself, "I've never heard this song on this station before," as Harry Chapin hits and holds that long high note in the middle of "Taxi."

Format change: Program directors and general managers cringe at the thought of it. The change is almost always good, but, like moving, it's a pain until it's all over; then it's fresh and exciting.

**Dramatic format change**

Recently, KYMC Radio experienced a dramatic format change. We moved from hard alternative rock to '70s and '80s pop hits. Needless to say, we lost a lot of our listeners. Research shows, though, that for every listener we lost, three new listeners tuned in. Requests doubled, and thanks to Halland Broadcast libraries, we were able to play these requests.

KYMC purchased the Halland Broadcast Library of contemporary hit radio/adult contemporary (CHR/AC) Hits of the '70s and the '80s Plus Library. Instantly, we were able to change our format. This library provides the big pop hits along with some of the harder-to-find "one-hit wonders" that make listeners stop and pay attention to what we're playing.

I researched many music libraries and settled on Halland for several reasons: variety, representation and cost. As a not-for-profit station owned by the YMCA of greater St. Louis, every cent counts. Steve Steinberg at Halland was very

patient in working with us and gave us a deal on the combined libraries that could not be beaten anywhere.

I would highly recommend Halland. The discs are of high quality, easy to read, logged by artist and contain all the original versions of the songs. A database that assisted in the music scheduling was also provided. I think back to our format changeover and how having this music library made the transition surprisingly smooth.

**Nostalgic tunes**

We are also extremely pleased with the content of the library. I personally prefer to program songs that I don't hear very often, such as Abba's "Dancing Queen" or "Come on, Eileen" by Dexy's Midnight Runners. Some of the music is considered "cheesy," but even cheesy songs bring back memories.

Halland definitely helps in bringing those buried memories to the surface. The '70s library is filled with most of the big CHR/AC hits of the decade, including some of the cheesy songs.

I remember spending time with my parents in the car when I was a pre-teen. They were always in control of the radio. They banged their heads to Janis Joplin as she screeched, "Take another piece of my heart now, baby." At the time I couldn't understand what they heard in this music. Now I understand it was the voice of their generation. Today, our generation is in the front seat of the car, as our pre-teens sit in the back thinking, "What is this?"

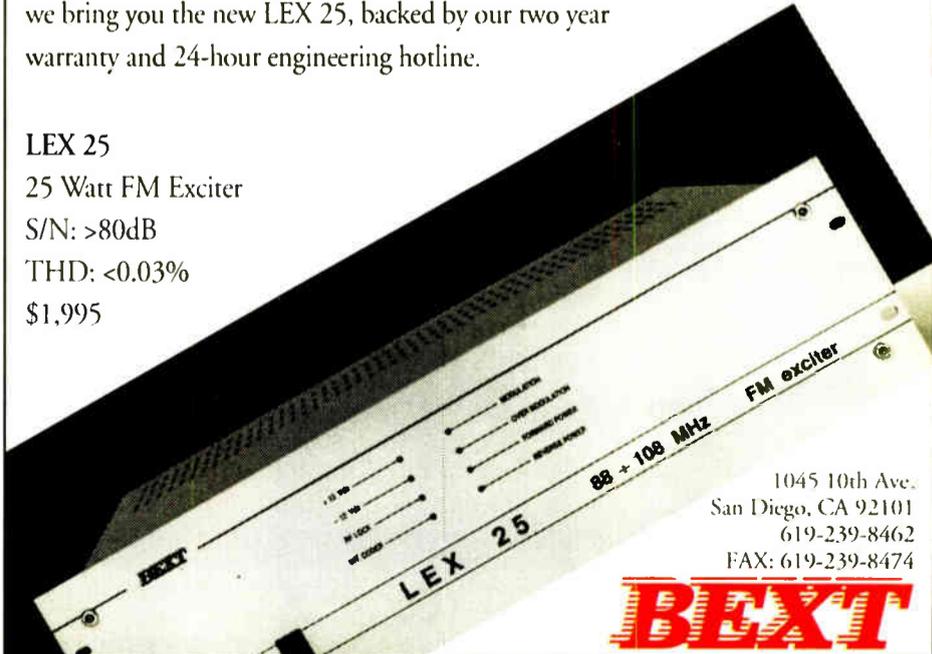
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For information, contact Steven Steinberg in California at 818-963-6300; fax: 818-963-2070; or circle Reader Service 170.

## This is what you get.

You asked BEXT to build the best high-performance FM exciter, put it in a no-frills package, and bring it to you at the most competitive possible price. To guarantee that you get everything you deserve, we bring you the new LEX 25, backed by our two year warranty and 24-hour engineering hotline.

LEX 25  
25 Watt FM Exciter  
S/N: >80dB  
THD: <0.03%  
\$1,995



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# GET LOUD

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NORM OL POWER

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PEAK WEIGHTING

AUDIO FAILURE

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100

DN

UP

THRESHOLD

SETTING

ONE MINUTE COUNT

0

## GET FAT with StereoMaxx®

When everyone in town is processed to the max, what's left? The answer is StereoMaxx, a Spatial Image Enlarger that turns your listeners' Volkswagens into Cadillacs and their living rooms into concert halls. With StereoMaxx in your air chain, other stations will sound flat, dull and lifeless. Call us for a free demo tape!

## GET LOUD with the CP-803

Add up to 6 dB more loudness with the CP-803 Composite Processor. The CP-803 works with your existing audio processing to give you the maximum modulation the law allows, with no ringing or overshoot. Installed at your transmitter site, the CP-803 will make your entire air chain sizzle.

## GET LEGAL with FM ModMinder®

When you need accurate modulation measurement, you need ModMinder. With accuracy within 1 percent, FCC-approved ModMinder ignores brief audio peaks and often lets you increase modulation – legally. Internal calibration guaranteed for two years means you'll know where 100 percent is, right out of the box!

Used together or separately. MSI products keep you at the competitive edge. Learn how to excel in your market. Circle our Reader Service number, call your authorized MSI dealer, or contact the FAT, LOUD & LEGAL authority...

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USER REPORT

# Fresh Library a Valuable Addition

by William Koenig  
Partner  
Bill Rogers Productions

**ORANGE, Calif.** When it comes to music libraries, there are very few that meet my criteria of high usability and low cost. The Fresh Music Library does both.

Few libraries offer enough product to satisfy the radio producer and video producer. The Fresh Music Library, while not as large as some of the most widely used "needle drop" libraries, is a buyout library that makes a valuable addition to any radio station or production house.

**High turn-out**

Bill Rogers Productions creates commercials and spec ads for radio stations in medium-to-large markets. Not just a few spots, mind you. During an average month, we create 200 to 300 ads. Most of our clients are on retainer, so cost is a big factor. And then the Christmas season hits. You want to talk about library burn-out? This is the place.

We first started using Fresh about two years ago when we bought it at an NAB convention. It possessed three very admirable qualities. It was inexpensive, there were a large number of compositions and it was inexpensive. To be honest, I gave the demo a quick listen to make sure it didn't sound horrible and handed the guy my credit card. When I got home and started really listening, I discovered that the music on the original 10 CDs had a very different sound. These folks were covering areas that I hadn't heard before. So, like anything a producer gets, the library got used to death.

**Responsive to requests**

Since then, with subsequent visits at NAB conventions, as well as conversations over the phone, we have found the folks at Fresh to be extremely responsive to requests. Additions to the library have been well-received. Without exception, we have purchased all of their music updates, some of which have been truly innovative.

Fresh has no qualms about sending us updates on a try-it-you'll-like-it basis. They even go so far as offering healthy discounts for those of us who can cut a check within 15 days.

There were a couple of things that quickly became apparent to anyone who used the library often. The loose-leaf pages that hold the discs were a pain. We went out and bought jewel cases. The descriptions of the various cuts, along with their titles, were also in a loose-leaf format, and we found ourselves just listening to the CDs for a faster idea of what each disc had to offer.

But Fresh makes that easy. The first cut on each CD is a Quick Shot, a 10- to 20-second listen to all the cuts with the index number indicating which cut you're hearing a "shot" of. If you already know the library, it makes a great memory flogger. If you are just hearing the disc for the first time, it gives a fairly accurate representation of the entire cut.

**Small slice of heaven**

The full-length pieces are a small slice of heaven, not only for radio production but also for video guys. They're long

enough to be a big help when scoring a video piece. You do not have to continue they are very easy to cut and loop. Also, Fresh manages to stay consistently in one

**The full-length pieces contained in the library are a small slice of heaven, not only for radio production but also for video guys.**

ally "loop" the song. And the music does not go anywhere. A sweet Irish melody won't turn into a protest song halfway into the tune. You won't find a lot of key changes or modulations within songs, so

key through each disc, so one piece cuts into another without much hassle.

The mix-outs and timed cuts are well-edited. Each :60 or :30 cut makes sense as a piece of music. Fresh also does a good

job of keeping the cut slightly under the :60 or :30 timing, so it can be used easily in network avail spots and promos.

This library is called Fresh, and it continually proves its name with changes and updates. Recently, new discs have included solo instruments playing ad-libbed melodies that do wonders when you are trying to get that singular-purpose feel. The electric bass and piano lines have been excellent. Fresh promises more of these. The Christmas CD was a welcome addition because the music is a lot of fun.

Obviously, we have other libraries. All of them cost more, a lot more. Fresh will probably never overtake the larger libraries in size, but it offers more value.

For information, contact Dwight O'Hara in New Hampshire at 800-545-0688; fax: 603-643-1388; or circle Reader Service 51.

## Touchscreen Plays Music and Spots Instantly from Hard Drive

**Play Anything at a Touch**

**Nothing else** makes radio as fast or easy as having all your songs, spots, sounders and sweepers start with your fingertip—**always on-line and ready** to play from hard disk. And nothing else is better for fast, exciting radio than the **new Scott Studio System!**

Here's how it works: Six buttons on the left of the computer touchscreen play what's on your program log. Your songs, spots, promos, PSAs and live copy come in automatically from your music and traffic computers. You can rearrange anything by touching arrows (at mid-screen), or opening a window with the entire day's log. On the right, **18 hot keys** start unscheduled jingles, sounders, comedy and sound effects **on the spur of the moment**. You get 26 sets of hot keys for your jocks' different needs.



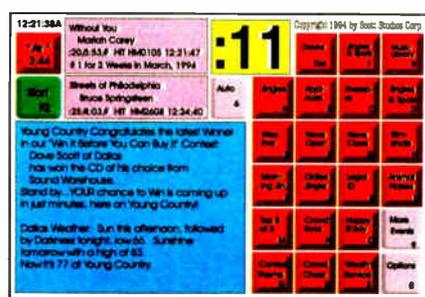
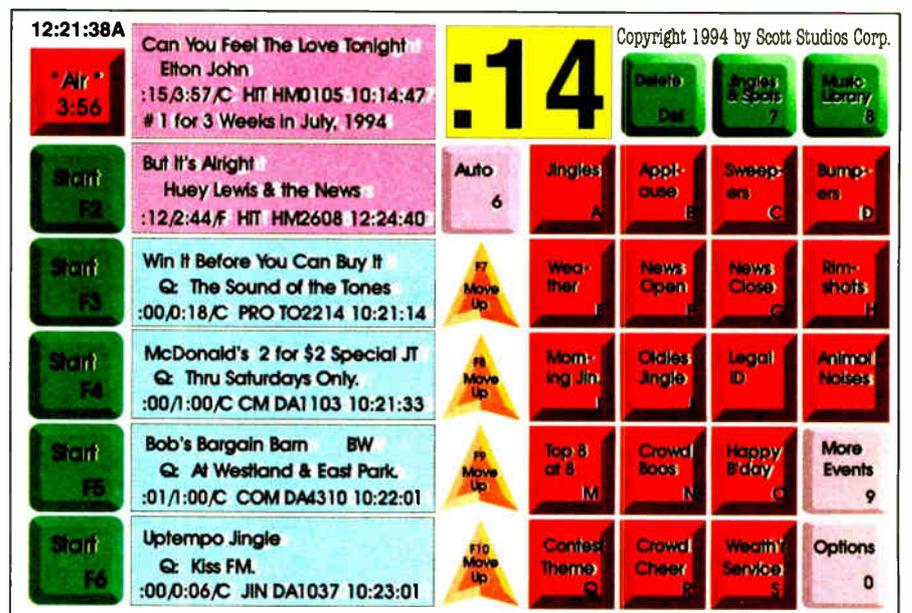
**World's Fastest Requests!**

Touch the Music button at the top right of the main screen to see our "Wall of Carts" with 1,000 songs (or more) **on-line!** They're displayed by title, artist, year, length, category, or any way you like. Touch the song you want and Scott Studios' digital audio hard disk plays it **instantly**.

In addition, all your comedy bits, spots, jingles, promos and PSAs have their own "Wall of Carts" so they start immediately. Or, you can pick any unscheduled song, spot, sweeper or promo and put it anywhere you want in today's log.

**1, 2 or 3 Touchscreens**

Teams of personalities can add touchscreens to share control. Jocks choose whether to handle sweeps themselves or let the Scott System sequence automatically.



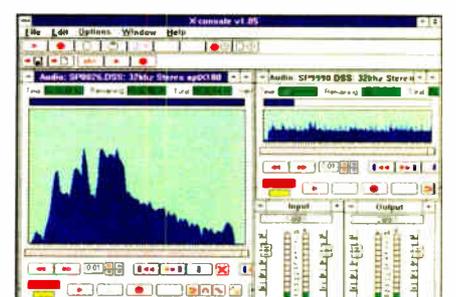
**Simple and Paper-free**

Weather forecasts, live tags, promo copy, contest winners' lists and programming memos automatically pop up on your Scott System's screen. As an option, we can also work with your news wire to update and display selected weather, news and sports copy.

**The Best Digital Audio**

When spots, promos, PSAs, songs, or any other digital audio events are recorded, they're immediately playable in **all** your Scott System air studios. Nobody wastes time carrying carts down the hall or redubbing spots for additional stations.

Scott Studios will even pre-record your music library from CDs at no extra charge. You choose double- or triple-overlap playback (or more) while recording.



**Improve Your Production**

Scott Systems pay for themselves in increased efficiency on-the-air and in production. Our graphic waveform editor quickly cleans up out-takes and works wonders with big productions.

**Disk Prices Plummet**

Compared to mere months ago, hard disk prices have dropped dramatically! Dave Scott and his team has more digital audio and automation success and experience than anyone else in the business! We also offer excellent leases. Call for details.

**Scott Studios Corp.**  
13375 Stemmons, Suite 300  
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**(800) 330-3004**

Circle (151) On Reader Service Card

## USER REPORT

# Dataworld Helps Broadcasters Hit Target

by Mark Jorgenson  
Owner  
Jorgenson Broadcast Brokerage

**TAMPA, Fla.** America has always been a diverse culture made up of many races, ethnic traditions and languages. This is truer today than ever before in our history. While Americans of all backgrounds share many common values, there are distinct preferences among them when it comes to sources of news and entertainment. These differences offer radio and television broadcasters a great opportunity to target a

particular ethnic or linguistic group within the larger general market.

In serving this market-within-a-market, adequate signal coverage of the ethnic community is of paramount importance. Dataworld's contour maps, linked to its U.S. Census data, are an excellent way of demonstrating targeted coverage.

As a nationwide broadcast broker, and as a partner in a broadcast company which owns and operates several Spanish-language radio and television stations, I am quite familiar with the profitable format opportunities that exist in serving ethnic

communities.

I have looked to Dataworld on many occasions on behalf of station buyers and sellers to help identify broadcast facilities to reach a particular target audience. Its maps and census data have also helped establish if a facility's coverage would lend itself to a particular niche format. Either way, the combination of station contour map and ethnic census data can be crucial in determining a station's highest and best use.

In the last 10 years, there has been a proliferation of new radio and television stations licensed in the U.S. Many of these

facilities have technical restrictions which do not put them on par with other stations in their market. Many of the newer radio stations are Class A FMs located outside of major metropolitan areas.

Having a Dataworld contour map clearly showing what a station does cover, along with the corresponding population data, allows a broadcaster to de-emphasize those areas or groups that he does not reach and emphasize those that he does. Having such information in a clear and presentable form can help maximize a station's potential in both programming and sales.

Most niche broadcasters do not rely on ratings to sell their advertising time. The rating services are not set up to measure accurately all audiences in the market (i.e., children under 12, foreign language listeners, etc.). For that reason, niche broadcasters are more dependent on selling a concept than they are on selling by the numbers.

Communicating the concept of targeted

**Talk Radio**  
Can Be Difficult.  
Your Phone System  
Shouldn't Be.

**NOW SHIPPING!**

Weirdo on line one. Bitter psycho on two. Irritated mom on three. Religious zealot on four. Talk radio seems so simple. At least your phone system is, if it's the new TS612 from Gentner.

The TS612 is a six-line (expandable to 12) Telephone System. It features Gentner's Direct Connect Technology™, which allows you to hook it into a regular phone line. Plus, its built-in handset and keypad eliminate the need for another screening phone. With the TS612, you can talk to callers (even the Pizza Guy) off-air, while other callers are on-air.

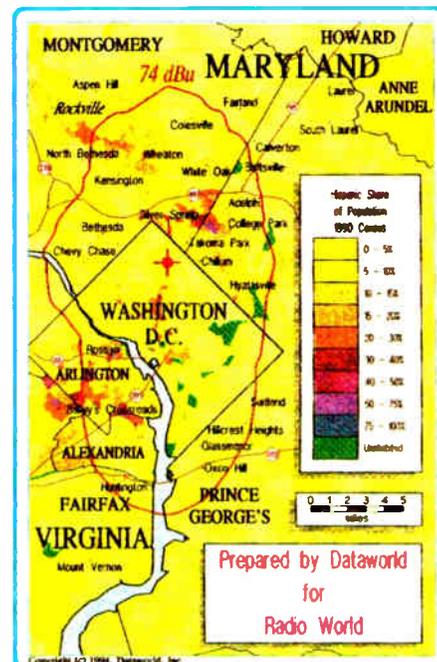


Technologically, the TS612 features built-in mix minus, to complement Gentner's digital audio enhancement. It has two DCT Superhybrids, automatic level control, dual air control surfaces, optional screener control surface, and dual audio bus operation. You also have DCT connection to your hard disk or studio PC, for screening and controlling calls. But what would you expect — the TS612 was designed specifically for talk shows.

See your Gentner rep today, or call 1-800-945-7730 and make your life easier with the TS612. After all, that psycho's still on line two.

**Gentner**

1-800-945-7730



Dataworld contour map

geographic reach without the waste of traditional media is a cornerstone of niche marketing. Working with the analysts at Dataworld to produce a coverage map showing the number of persons of Hispanic, Asian or African descent, several of my clients have turned the perception of limited coverage into a marketing advantage.

Dataworld's population information, which it links to its engineering coverage maps, comes from the U.S. Census. This data not only confirms the diversity of our population but also its mobility. For many niche broadcasters, the tendency of succeeding generations to geographically disperse means the broadcaster is literally aiming at a moving target.

While the geographic coverage of a station may not have changed for years, the audience coverage may have. Just because a station covered its desired audience in 1980 does not mean it still does in 1990 or that it will continue to do so with the Census in the year 2000. Having a station coverage map with up-to-date demographic information is a must in today's market.

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For information, contact John Neff in Maryland at 301-652-8822; fax: 301-656-5341; or circle Reader Service 143.

## USER REPORT

## FirstCom Comes to Rescue for WMXB

by **Holly Buchanan**  
Creative Director  
WMXB-FM

**RICHMOND, Va.** Three years ago, I came to WMXB-FM, B103.7, to take the newly created job of creative director. I was fairly impressed with the production facilities here. We had multitrack capabilities and two production studios. As I got to know my new home, one of my first questions was, "What's the production library like?" My question was answered with a snicker. We were using the SOB music library—on vinyl. That's right, vinyl LP records. The sound effects

library was on vinyl, too.

It was too late to run screaming from the building. My only other option was to convince corporate to invest in a new music library on CD.

### Search for a new library

So began my search for a production music library. I was looking for a library with a full-orchestrated sound, one that was versatile, with everything from hard rock to soft classical, foreign to holiday, country to comedy. But we wanted a library that could do it all with a limited number of discs. **FirstCom** was the winner, hands down.

## USER REPORT

## KXO Creates Custom Sound with RPM Music

by **Carroll Buckley**  
VP/Programming Director  
KXO-FM

**EL CENTRO, Calif.** Most listeners take their radio station for granted. They like what they hear. But how do you achieve a sound that listeners like, a sound they'll stay with?

You could hire programming specialists, do extensive audience testing of music or hire consultants. Or you could do what we did at KXO-FM 107.5: work with Tom Krikorian of **Radio Programming and Management Inc. (RPM)** of Orchard Lake, Mich.

### Long working relationship

KXO-FM began working with RPM nearly 10 years ago when we signed on for their beautiful music format on analog tape. We later adjusted our format to easy listening. All of this was accomplished with the RPM library.

About five years ago, we surveyed our market to determine the need for another format change, this time to adult contemporary.

After listening to a dozen presentations from format services and crunching numbers on costs, we decided that RPM's Spectrum A/C fit the needs of our station.

The RPM Spectrum A/C can be a complete format service or a music source only. The full-format service includes music, voice production, format outlines, music mixes and general policy guidelines. We use a modified version of the full-format service. RPM supplies the music, format outline and mix, and we do the rest. This gives us the flexibility we want with the format integrity we need.

### Support during changes

When we first used the Spectrum A/C service, everything was supplied on analog tape. The transition from tape to CD began in April 1992. The current and recurrent categories were available first, with the entire catalog on CD less than a year later. The changeover proceeded smoothly, and the assistance from RPM was substantial.

The RPM CDs utilize the Ultrasonic-Q system. We implement the format using four Pioneer multidisc CD players that

have been modified by the addition of the RPM NC20 Ultrasonic-Q tone sensor circuit board and several additional connectors.

RPM recommends the Sony 10-disc multiple disc CD player or the Pioneer players that have a six-disc capacity. We opted for the Pioneers.

We also decided to use just four CD players and have the operator program the discs. The complete library consists of more than 2,500 titles. We could install 32 CD players, have the total library in the system at all times, add a computer music playlist and even add a few more bells and whistles.

The RPM Spectrum format comes in a seemingly infinite variety of flavors. At FM 107 we are programming from the middle of the Spectrum, using a core library of '80s and '90s AC hits. AC currents are supplied on a weekly disc update that includes four to seven new A/C releases. The recurrences are updated on a separate disc that is put out every four or five weeks.

### Necessary tools

The RPM basic library provides FM 107 with the necessary tools to build a sound that suits our needs. Tom Krikorian and RPM have not tried to pigeonhole us into a pre-packaged format they have on the shelf.

RPM's policy on returns of defective or damaged discs is excellent. Because all the discs in our library are in the Pioneer six-pack magazines, they should be untouched by human hands after initial loading. However, several discs have been scratched mysteriously. They have been replaced immediately by RPM at no cost. Of the complete library of nearly 100 discs, only one proved to be defective from the factory.

The RPM Spectrum adult contemporary format has worked well for FM 107. The quality of the product, the flexibility of the format, the ease of implementation and operation and, of course, the cost are important factors, but the most important aspect is a superior sound our listeners like and stay with. That loyalty translates into higher billing and revenues our accountants love.

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For information, contact Tom Krikorian in Michigan at 800-521-2537; fax: 313-681-3936; or circle Reader Service 216.

FirstCom saved my life the first few years at WMXB. Our first music library package included the FirstCom Digital Production Library, which consisted of medium-tempo CDs, up-tempo CDs and a slow-tempo CD. We also ordered several selections from FirstCom's Maximum Impact library, which features a variety of hard-hitting and specialty cuts that would fit just about any commercial.

The medium-tempo and up-tempo sections had a wonderful, fully-orchestrated sound, with Maximum Impact featuring more rhythmic and contemporary-sounding music.

That library also included a slow-tempo disc perfect for more dramatic reads, and even children's music.

Then, the CD we almost wore out: the World/Christmas disc. It contained a variety of specialty cuts and several Christmas music beds.

### Custom design

Later it was necessary to expand our library and to bring in some fresh music. Once again FirstCom came to the rescue with its Sound Designer Library, a music library you design yourself. You can pick and choose CDs from a variety of sub-libraries. There's Maximum Impact, which I mentioned before. There are urban CDs, country CDs, specialty CDs, foreign CDs, rock CDs, jazz CDs and, my personal favorite, the Underscore series.

If you work for an adult contemporary station, you should not be without FirstCom's Underscore library. It's a wonderful group of light, jazzy music beds, from low intensity to high intensity. They're perfect for those middle-of-the-road commercials for retail stores, clothing stores, real estate companies, hospitals, etc.

Another nice thing about the Underscore series is the fact that it is organized by tempo. Each CD is full of cuts with basically the same sound. So if you know the sound you're looking for, you'll have 25 or so cuts of music, all on that one CD. Some other libraries combine different tempos on one CD. That makes it tougher to find the kind of cut you're looking for.

While I am a big fan of FirstCom, we also have a library from another company which we use for more up-tempo work and for promo parts. If there is any way you can get more than one music library, you should. It adds versatility and variety to your production.

FirstCom now has a Sound Designer II library, which the company continues to update.

If you're looking for a music library that can do it all, with a reasonable number of CDs, FirstCom is a great bet. Customize it to your particular station's needs. And if you want any tips on creative ways to dispose of that vinyl music library, give me a call!

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For information, contact Andrea Bergeron in Texas at 800-858-8880; fax: 214-404-9656; or circle Reader Service 102.

A Broadcast Industry

# BEST KEPT SECRET

Mono Record Play

**\$1420**

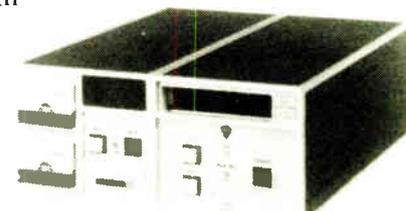
Stereo Record Play

**\$1640**

F.O.B. Factory

Reliable / Rugged / Professional Design

- All Metal Housing with Cast Aluminum Front Panel
- Half Inch Thick Aluminum Deck with Stainless Steel Overlay
- Air-Damped Solenoid with Telfon™-Coated Plunger
- Direct-Drive Capstan Motor
- Three-Point Adjustable Head Mounts
- Input & Output Transformers
- CMOS Logic
- Straightforward / Serviceable Design
- Available as Dual Record/Play for Simultaneous Record or Cartridge Copy
- 30-Day Guarantee of Satisfaction / 1-Year Warranty



DL Series

**AUDI-CORD CORPORATION**

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Available Through Your Regular Distributor

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# Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No.(s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

**Excalibur Electronics**  
**HC-1 Handi-Coupler**



Here is the simplest, quickest, most convenient way to connect audio to a telephone. The HC-1 connects in series with the handset of any phone using modular connectors. No connection to the phone line is needed. Press the front panel button and external audio is available on separate send and receive 1/4" TRS jacks on the rear panel. Release the button and the handset is once more connected for normal use of the phone. Nothing could be simpler!

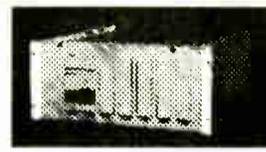
You can find many uses for the HC-1 around your station: on-air studio, production room, newsroom, sales office, field news kits, sports remotes, etc.

EXCALIBUR ELECTRONICS, INC., CHANTILLY, VIRGINIA  
Please circle our bingo number for a data sheet and a dealer list

**READER SERVICE NO. 212**

**The world's most capable, expandable digital satellite receiver**

More and more networks are moving to Satcom C-5 digital. Why take a chance on a less expandable receiver?



**Ariel**  
Used Equipment for All Satellite Formats LNA/LNB/Splitters

Zephyrus for JSA  
Zephyrus 700 SCPC  
Visa/MC/Discover  
Leasing W.A.C.

**Satellite Systems**  
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We Repair & Rebuild all Popular Receivers Quick Service! 24 Hour Tech Support

**READER SERVICE NO. 116**

**DIGITAL AUTOMATION SYSTEM**

- The Best Integrated Play List Scheduler (Music & Breaks) & On-Air Playback Combination Available Today
- Music on Hard Disk and/or CD Jukeboxes
- Dolby AC2 Overlapping Hard Disk Audio



- Feature Rich Digital Automation at an Affordable Price & Updated Quarterly
- Complete On-Line Redundancy
- Provide Your Own Computers/Players and Save \$\$\$, or Buy/Lease From Us
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**READER SERVICE NO. 199**

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- Exciters • AM/FM
- Broadcast Monitors • Remote Control Systems

**SPECIALIZING IN EQUIPMENT BY**

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An authorized TFT service center

**IN CASE OF EMERGENCY**

We can help get you back on the air with our STL Loaner Program. We have STL's available that will be set to your frequency prior to shipping. We also provide over-the-phone technical assistance.



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**(503) 471-2262**

**READER SERVICE NO. 75**

**Shively**

A good FM antenna is crucial to quality broadcasting. An antenna that is merely adequate will compromise the performance of even the best studio equipment and transmitter.

Shively regularly includes standard features that other companies either provide only as options or simply do not offer.

At Shively, we design and build antennas of uncompromising technical quality and performance. And, we build them to last.

call or write for more information

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A Division of Howell Laboratories, Inc.

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**READER SERVICE NO. 95**

**Quality\* Power Tubes**

3CX15,000A7	4CX1500A	4CX250BT
3CX15,000A3	4CX800A	4CX250BC/8957
3CX10,000H3	4CPX800A	4CX250B/7203
3CX10,000A7	4CX400A	4CX150A/7034
3CX3000F7/8162	4CX350AC	5CX1500B
3CX3000A7	4CX350A/8321	5CX1500A
3CX2500H3	4CX250R/7580W	YC130/9019
3CX2500F3/8251		5U4G
3CX2500A3/8161		6AS7
4X15,000J/8910		6550B
4CX15,000A/8281		8560AS
4CX10,000D/8171		811A
4CX5000A/8170		833A
4CX3500A		833C
4CX1600U		
4CX1600B		



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**READER SERVICE NO. 119**

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- WireReady™ • ScriptReady™ • CartReady™ • PhoneReady™ • StormReady™

**WireReady** products let you use your station's own computer(s) to:

- computerize wire services and satellite network log printers,
- manage local news, promo copy, and your sales effort,
- produce, store, and playback digital audio, automated or live.

Ready to find out how to get high-performance features like these for a fraction of the cost of other systems? Then you're ready for **WireReady**. Call today.

**READER SERVICE NO. 54**

**Uh-Oh... ..We Should Have Called CORTANA**



**STATI-CAT** for Affordable Lightning Prevention.

Let Us Design a System for You

Stati-Cat provides a continuous, low-resistance discharge path for the static electric charge on tall structures. Dissipation points are 1/8", type 304 stainless steel rods ground to needle sharpness. They won't bend, not even from ice and severe weather.



Write to us today for a **FREE** brochure!  
P.O. Box 2548, Farmington, N.M. 87499  
Call (505) 325-5336 FAX (505) 326-2337

**READER SERVICE NO. 121**

USER REPORT

# BP Gives WISP-FM Competitive Edge

by David E. Alpert  
General Manager  
WISP-FM

**SARASOTA, Fla.** When we purchased WISP in January of 1992, the situation was grim. As a start-up, our first goal was to operate the station as cost efficiently as possible without sacrificing the quality of the on-air product.

After a thorough market analysis, we decided that the best format from a revenue-with-ratings standpoint would be soft adult contemporary (AC). However, because our market is adjacent to Tampa, the 100 kW AC and soft contemporary Tampa stations can easily be heard and are a clear choice for local listeners. As a matter of fact, of the 28 stations that are ranked in the Spring '94 Sarasota-Bradenton Arbitron, only eight are considered "home to the metro." Therefore, our second goal was to localize the format as much as possible.

**Programming switch**

At first we decided to broadcast live from 6 a.m. to 7 p.m., Monday through Friday, and use a satellite service as our program source during evenings, overnights and weekends. While this proved to be very cost-effective, it did not give us the flexibility necessary to localize the format and compete for audience share with the highly promoted and well-established stations from Tampa.

After three mediocre books, we decided to change our programming service to **Broadcast Programming**, utilizing its Digital CD Soft AC format. We chose

Broadcast Programming because of its reputation for quality and its track record of successes around the country in our format.

With the help of Walter Power, Broadcast Programming's vice president of operations, we were able to adapt our satellite automation hardware and software to operate the 18 Pioneer PDM501 CD players needed to execute the format. Walter was instrumental in coordinating the efforts of our traffic system software provider, DARTS, with the efforts of our automation hardware and software supplier, Systemation, to make sure all three elements worked together. This was not an easy task.

**Flawless operation**

The system operates flawlessly. We now broadcast live from 6 a.m. to 7 p.m., Monday through Sunday, and automate the station from 7 p.m. to 6 a.m. The result is a high-quality, on-air product 24 hours a day with complete control of our inventory. Additionally, we are able to localize the format completely while employing just two full-time and two part-time announcers.

We were extremely impressed with the size and thoroughness of the soft AC music library assembled by BP. We also discovered that BP provides much more than just music. We receive top-quality attention and knowledgeable music consulting. Mike Bettelli, BP's soft AC programmer, makes sure that our music flows perfectly with a great deal of variety and no repetition.

With Mike's knowledge of the format,

programming insight and access to music research, we now know when to add a song, drop a song or rest a song. We know when a current is current and when it should be a recurrent. Mike has our music sounding as good as any soft AC station in the country. With all of this taken care of by BP, our local announcers can concentrate solely on format execution.

**Competitive edge**

We were also impressed with the quality of the digital CD recordings. With just 3 kW of power in this highly competitive market, we take every edge we can get. We consider the technical quality of our

on-air sound a large competitive edge and a major contributor to our success.

Since switching to BP, our 25-54 average quarter hour shares have risen 88 percent, from 3.4 to 6.4, in just one year. With women 25-54, our average quarter hour shares rose 93 percent, up from 5.9 to 11.4, and ranks a solid number one in almost all dayparts. Consequently, our sales have increased dramatically.

We have far exceeded our goals of running a cost-effective operation while at the same time providing an excellent and localized on-air product. I would strongly recommend BP to any broadcaster with similar goals.

For information, contact Dave Newton in Washington state at 800-426-9082; fax: 206-441-6582; or circle Reader Service 12.

## 8 TRACK DIGITAL EDITING BREAKS PRICE BARRIER \$5,495\*

- A digital audio editor designed for *Radio* production
- Learn to use in minutes, *much faster than tape*
- Cut, splice, move, and fade up to 4 stereo tracks
- Use Scrubbing to edit with your ears
- Use visual waveform editing to edit with your eyes
- An UNDO button enables you to go back and fix mistakes
- Digital Networking to transfer audio to your On Air machine
- Add Trak\*Star-8 software to a Digilink for only \$2,000

Trak\*Star-8 is the first cost effective multitrack digital audio editor designed for the radio broadcast professional. Fast and easy to use, produce your commercials on Trak\*Star and then transfer them in digital straight to the Digilink in your On Air studio. Dramatically reduce production time and save money !!!

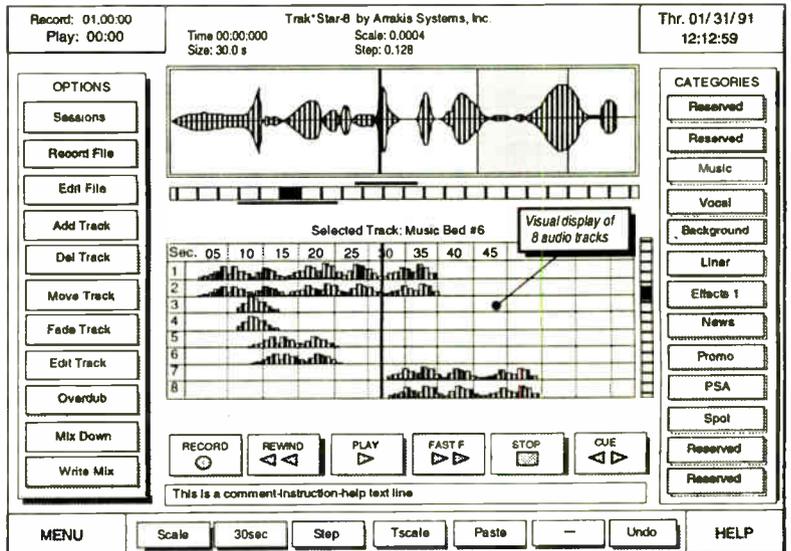
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\* Suggested retail price. Complete system



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Circle (40) On Reader Service Card

USER REPORT

# WLYF-FM Gets Creative Using The Positioners

by Bobby Ellerbee  
Creative Director  
WLYF-FM

**MIAMI** Being the creative director for a station that has been ranked number 1, 12+ for 22 of the past 25 years, is like being head chef in a city's best restaur-

I have been in major-market radio for 25 years, and I have never heard of or experienced a service like The Positioners, not even in the universe of vinyl discs.

**Ready-to-use ideas**

The Positioners offers an excellent assortment of ready-to-use ideas on CD.

Categories include musical/generic jingle campaigns (which can become custom sings), multispot comedy campaigns and single-shot spots.

The jingles, whether solo or chorus, fast or slow, are quality sings and flexible in terms of what kind of advertiser they may be used for. The character voice/situation spots are basically donut-type interactive skits that are easy to work with, especially



The Positioners CD Library

on digital editing systems. The various parts of The Positioners, whether music or situational, are generic. The localization comes from your staff's jumping in at the right spots.

rant. This creative kitchen must produce the best, made-from-scratch dishes. Having The Positioners "instant commercial ideas on CD" from **Broadcast Results Group** is like having a stash of microwavable masterpieces.

continued on page 38 ▶

## USER REPORT

# TMC Satisfies Demanding Clients

by David Witz  
Owner/Operator  
Pine Creek Studios

**ELVERSON, Pa.** To make station production work, you need a dependable production library. Having picked dozens of libraries for dozens of stations over dozens of years, I've found some that work well and some that do not work at all.

Having just left the production studio at Philadelphia's Star 104.5, WYXR-FM, to work in my home-based commercial production studio, I found myself having to purchase yet another library, this time for a very picky client (me) with a very small budget (mine). After many auditions, the winner was TM Century.

## Wide variety of libraries

When TM merged with Century 21 a few years back, they combined a wide variety of libraries under one roof. In the past, I had used Generation III, Digital Director, Trendsetter II, CDPL and MegaMusic. Other TM Century libraries, such as Slam Dunk and Laser Lightning, did not suit my format needs.

While at WYXR, a Hot adult contemporary (AC) station, I took advantage of TM Century's three-for-one deal: three libraries for the rent/lease price of one. This deal offered me a variety of options at a reasonable price. As a bonus, TM threw in sound effects and production parts on separate CDs. The total package, including quarterly updates, can add anywhere from 70 to 100 CDs, depending on your selections.

Of course, even 1,000 CDs for \$9.95 annually is no bargain if the music is worthless. And no library is used 100 percent by any ad agency, radio station or home studio. So the questions that must always be asked are, how good is the music, and how much of it can really be used.

TM's quality, in the libraries I have used,

has usually been better than average. There's a good mix of real instruments vs. synthesized music, and the majority of beds complement and propel announcers without fighting their reads. Many libraries put lead instruments in the way of the voices. TM's libraries, especially MegaMusic, thoughtfully have alternate mixes that solve this problem.

Dance stations could complain that there is not enough dance music, country stations that there is not enough country music. And stations trying to avoid laser-blast punctuators won't find much relief in the selection of production parts. (At Star, we hired a keyboard guy to create a small custom library of zoops, zaps and promo beds.)

On the plus side, the TM Century libraries I have used always offered enough variety to solve most of the problems clients would throw at me. And its catalog system is first-rate. The hard-copy listings are sensibly organized. The software catalog, however, can be challenging. Time and again, I would bypass the computer and head straight for the notebooks.

## Better arrangement

The TM libraries generally give music in :60 and :30 spots, with a few odd :15 cuts thrown in. This arrangement is better than those libraries that waste CD space with 2:30 cuts and other odd lengths that do not lend themselves to radio. Many other cuts I have used edit like a dream; some even have indexes at the edit points. Several libraries, especially CDPL, have lots of little goodies—short tracks with specialty music, like mock TV themes, jazz bongo-and-bass and :10 guitar solos—that are funny and handy.

One more positive feature of TM Century: The customer service has always been outstanding. If a disc was defective, scratched or pilfered, a replacement disc arrived overnight. And when I could not figure out

the library management software, the designer stayed on the phone with me for more than an hour at a time to help me sort it out, although I never quite did.

The next generation of TM Century libraries could add a bit more jazz, some

more whimsy, a little more alternative rock and more techno and club music.

But for quality, price, flexibility and sheer volume of usable, effective music, there is really nothing else on the market that compares with the TM Century libraries. That's why I'm getting three more. Again.

□ □ □

For information, contact Richie Allen in Texas at 800-937-2100; fax: 800-749-2121; or circle Reader Service 57.

## WLYF: Creative with BRG

► continued from page 37

But jumping in is not an arbitrary action. Included with each quarterly CD is a hard-copy script of each spot, as well as an MS-DOS ASCII text diskette and copy suggestions that can be loaded into a word processor. Plus, each campaign idea has a demo on the disc that gives you a feel of how the five or six spots in that flight can work together and for what type of client.

## Continuity, identifiability

The number of spots in each campaign makes it easier to take what may perhaps be a short-term advertiser and make him or her a long-term client who appreciates the continuity and identifiability of a running theme or concept.

In essence, The Positioners creative people have done a lot of work that I, as creative director, would normally have to do to develop the kinds of jingles and character voice spots that our clients expect.

In a station as busy as WLYF, in a market as busy as south Florida and in a time in which local sales are becoming more important, more effort on the part of the in-house creative team is required. The Positioners is a big help in a couple of ways.

First, when I don't have at least an hour to create a brilliant campaign for a new client, I can turn to The Positioners for an idea. Secondly, when sales people come to me for killer spec spots to be turned around immediately, The Positioners rises to the occasion. Other benefits include increased revenue and a possibility of keeping clients on the air longer by making a jingle or comedy campaign exclusively theirs.

## Tangible assets

These creative commercials are tangible assets and, as such, your station can use The Positioners to its best advantage by requiring advertisers to make a greater commitment than they are accustomed to making for running an ordinary spot schedule.

So far, I have been extremely pleased with the flexibility, quality and range of material that The Positioners offers. If your creative people stay busy but are consistently required to produce excellent work on short notice, I suggest you look at The Positioners very closely.

□ □ □

For information, contact Andy Mark in Pennsylvania at 800-600-6165; fax: 610-834-7295; or circle Reader Service 64.

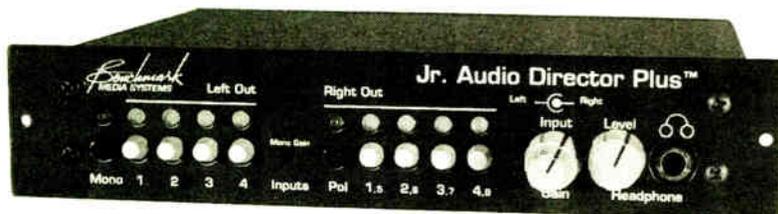
# Products & Services Showcase

For more information on the products shown below, circle the appropriate Reader Service No.(s) on the enclosed Subscription/Reader Service card or contact the advertiser directly.

## Introducing (ta-da) The Jr. Audio Director Plus™!

It's an 8 input to 2 output ON LINE or monitoring device.

\$550



The new Benchmark Jr. Audio Director Plus™ brings more to the party! It brings more control and selection features, and a stereo headphone amplifier, along with the performance and value that are traditionally a Benchmark for the industry.

In a half wide, 1RU high chassis, the Jr. Plus has two input switch banks which allow left and right outputs to select between eight sources. Additional switches provide a Mono Mix, with adjustable gain reduction of 3 to 6 dB, and a Right Channel Polarity reversal. LEDs indicate switch action. Inputs may be passively mixed ahead of the input amp by depressing two or more buttons.

Installation is "instant" with a No-Mod™ Rack Mount adapter and plugable Euro-Style barrier strips.

Available now.

**Benchmark**  
...the measure of excellence.™

**BENCHMARK MEDIA SYSTEMS, INC.**  
Phone 800-262-4675, or 315-437-6300, FAX 315-437-8119

READER SERVICE NO. 58



## A Console for your Future

- DCA (Digitally controlled analog) faders
- Better than "CD" quality sound
- Modular frames hold 6, 12 or 22 mixers
- Five types of input mixers available
- Optional RS-232 serial interface
- LCD displays dynamically label each mixer
- Programmable machine control system
- 2 Mix-Minus outputs, Talkback & more
- Prices start at \$3900

**Logitek**

Call:  
800-231-5870 or 713-782-4492  
for your nearest Logitek dealer

READER SERVICE NO. 13

## INDUSTRY ROUNDUP

# Stations Turn to Satellite

by Whitney Pinion

**WASHINGTON** The proliferation of satellite services and equipment is a reality of the radio industry today. Although satellite technology may seem intriguing to some in a sci-fi kind of way, broadcasters, it seems, are turning to satellite service for very practical reasons.

Many stations pick up satellite programming to lower costs or to enhance their existing programming, says Mary Fogarty, director of satellite services and studio marketing for ABC Satellite Services. "Smaller markets might not be able to afford high-caliber talents," she says. Running big-name shows translates into a higher cume, and the bigger the cume, the more stations can charge for local advertising.

According to John Tyler, president of Rhino Communications, it is definitely content that is driving the satellite market. Stations realize that they don't have to produce all their own material. AM stations have known this for some time. Satellite-distributed programming has helped turned AM stations into profitable entities.

Although larger radio networks have been utilizing satellite distribution for some time, regional networks (those consisting of 50 to 400 sites) are starting to look seriously at converting from analog to digital, says Virginia Williams, director of sales and marketing for International Datacasting Corp. "What's driving them is not as much to have better audio quality as to have the features and functions that a digital system will give them," she says.

These smaller nets want the capabilities that satellite service offers, but they don't have a lot of money to play with. "They want digital stuff that will take them through the next 10 years—equipment that will change as the radio business itself changes," Williams says.

It's determining which satellite equipment will offer this kind of flexibility that seems to be troubling broadcasters the most. Depending on a station's transmission needs, "equipment ranges from the Cadillac to the Hyundai," Fogarty says.

"The economics of the network and radio businesses have led down a path of diversity among brands and types of receivers," says Michael Lowery, president of Satellite Systems. It's this lack of standardization, he says, that broadcasters find annoying. Lowery says that he doesn't see any move toward standardization in the near future, as no one is pushing the satellite business forward in a coherent manner.

## NPR

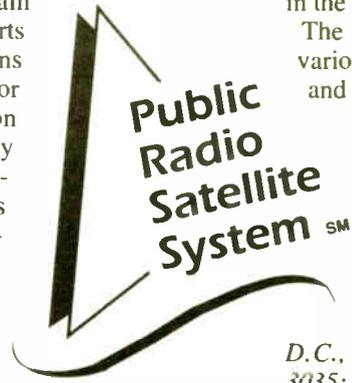
## NPR Satellite Services Offers ComStream Digital Equipment For Increasing Network Control and Maximizing Efficiency

**WASHINGTON** NPR Satellite Services now offers ComStream digital audio equipment that increases network control and maximizes network efficiency. The ComStream ABR200 digital audio receiver can be customized.

This system enables the user simultaneously to send information (via data channels) and programming to stations. The ABR200 also individually addresses receivers so that only authorized affiliate stations receive a program.

The system also allows the user to transmit either two mono programs or

one stereo program in different dayparts to different stations in one network. For instance, a person can simultaneously transmit a talk program and a news program to different stations in the morning and a stereo music program to other stations



in the afternoon.

The ABR200 provides 20 kHz stereo at various data rates of 128 kbps, 192 kbps and 256 kbps.

NPR's satellite space (C-band, SCPC transmission) is on Galaxy IV, Transponder 1 & 3, which can accommodate both digital and analog audio transmission.

For information, contact Miriam Lenett in Washington, D.C., at 202-414-2613; fax: 202-414-3035; or circle Reader Service 111.

# YOU CAN SHARE PROGRAMMING AMONG YOUR RADIO STATIONS ... At a Lower Cost Than Ever Before!

Share programming among your station group or with other stations by sharing day parts, entire formats or by delivering your top-rated talent to other markets coast to coast. You can spread overhead costs, increase the quality of programming at the local station and build your audience by creating a satellite radio network. And now new digital satellite technology makes radio networking more affordable than ever before. Let us offer you a complete solution for your radio networking needs.

**Call us at (202) 414-2626**

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 Has moved to:  
 635 Massachusetts Ave., NW, Washington, DC 20001-3753  
 (202) 414-2626

## COMSTREAM

### New Features Make UPC Tool More Responsive to Network Conditions

**SAN DIEGO** UPC is a satellite network management tool from ComStream that compensates for signal fade from rain, sleet, thick clouds, fog or snow. UPC automatically adjusts power levels of transmitted signals to maintain a near-constant receiver signal at the satellite. By using UPC to adjust signal power levels, users get higher network availability while minimizing satellite costs because there is no need to buy extra satellite power to maintain a constant fade margin.

Several new features have been added to make UPC even more responsive to network conditions. One major enhancement is in the handling of "deep fade" conditions, which are particularly extended periods of low signal-to-noise ratio. UPC now alerts the user to these periods and keeps a database of the last 20 deepest fades. The new deep fade functions allow even finer control of power adjustments for greater cost savings. Also added is the Pass Through command that opens a terminal-like window where the user can enter commands directly to receivers, modems or switches controlled by UPC.

For information, contact Bruce Rowe in California at 619-657-5248; fax: 619-657-5415; or circle Reader Service 162.

## IDC

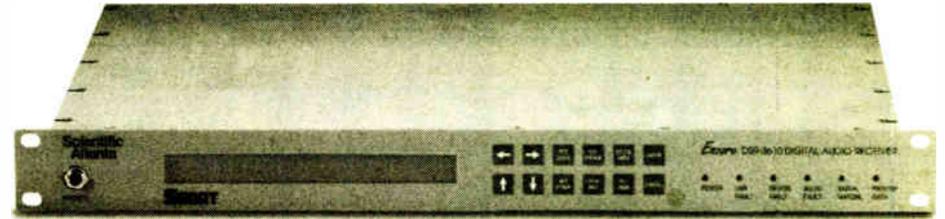
### IDC FlexRoute Satellite System for Point-to-Multipoint Distribution

**NORCROSS, Ga.** International Datacasting Corp.'s FlexRoute satellite digital audio system delivers both high-quality audio and data reception into one receiver. The system is designed for program syndicators or network operators who need point-to-multipoint distribution of information.

FlexRoute operates at SCPC or 2CPC for C- or Ku-band networks. It is ISO MPEG I Layer II and II-compatible, is available with BPSK or QPSK modulation, and features full network control and addressability. The system can accommodate up to four mono or two stereo channels per carrier at channel rates from 64 kbps to 256 kbps.

FlexRoute does not borrow bits from the MPEG data to support network control and auxiliary data. Instead, it increases the aggregate data rate to 133.5 to 267 kbps to accommodate network control data and up to 2.4 kbps of auxiliary data. Therefore, the full data rate is available for the MPEG channels.

For information, contact Virginia Williams in Georgia at 404-446-9684; fax: 404-448-6396; or circle Reader Service 38.



## SCIENTIFIC-ATLANTA

### Encore DSR-3610 Receiver Processes Uncompressed DAT Signals and Compressed SEDAT Signals

**MELBOURNE, Fla.** The Encore DSR-3610, a Scientific-Atlanta Digital Audio Transmission System (DATS) receiver, is part of the DSR-3000 Series of digital satellite receivers.

The Encore DSR-3610 uses Scientific-Atlanta's SEDAT audio compression technology to compress digital audio signals. SEDAT technology allows national radio broadcasters to send significantly more channels over the same satellite transponder space previously required for

a lower number of non-compressed digital channels.

The unit can be configured to meet the range of requirements needed by affiliates of major U.S. national radio networks. It processes the original uncompressed DATS signals as well as compressed SEDAT signals.

For information, contact Laurie Sillay Lahr in Florida at 407-255-3138; fax: 407-253-3701; or circle Reader Service 210.

## CALIFORNIA DIGITAL

### DaX Platform from California Digital Delivers CD-Quality Programming Without Transcoding

**MOORPARK, Calif.** DaX from California Digital is a software-configurable digital telecommunications platform for building CD-quality audio and data networks. DaX utilizes satellite channels, ISDN channels, Switched 56 channels and Novell networking technology as building blocks to gather, manage and distribute CD-quality audio programming in a compatible manner without transcoding.

## CaliforniaDigital™

DaX operates with variable data and flexible channel configurations from a single satellite receiver. Store and forward capacity can be assigned to combinations of receive channels by the head-end system software.

DaX has already been integrated into Basys, D-Cart and other newsgathering systems to fully automate the gathering, organizing and distributing of audio programming, news, commercials, text, pictures and E-mail.

For information, contact Caryn M. Beemer in California at 805-523-2310; fax: 805-523-0480; or circle Reader Service 128.

## ABC SATELLITE SERVICES

### ABC Satellite Services Provides Space on Satcom C5 And Spacenet III, in Addition to Other Services

**NEW YORK** ABC Satellite Services has a 20 kHz SEDAT compressed space segment on GE Satcom C5, reaching over 6,000 radio stations, and 15 kHz FM squared channels on GTE Spacenet III, reaching more than 3,000 radio stations.

ABC also provides facilities and services for broadcasters, including studios in New York, Los Angeles, Dallas and other locations on a case-by-case basis, pulsing and automation support

essential for talkshow hosts, automation control support, backhaul services and refeeds and expert services in ISDN, Switched 56, Ku-band, C-band and SCPC audio distribution.

ABC provides these services daily for major syndicators and sells the same services to other clients.

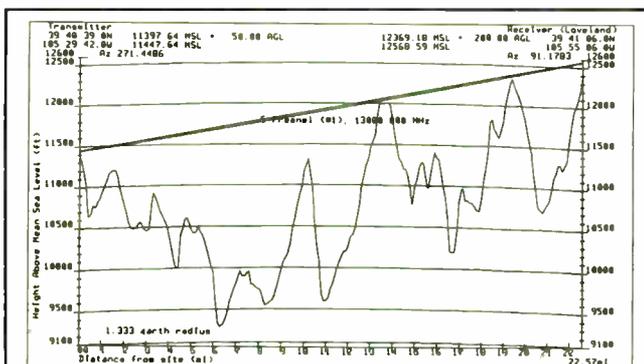
For information, contact Mary Fogarty in New York at 212-456-5606; fax: 212-456-5159; or circle Reader Service 76.

## SOFTWRIGHT

### Version 3.0 of SoftWright's Terrain Analysis Software Monitors STL or Other Microwave Path Obstructions

**DENVER, Colo.** Version 3.0 of the Terrain Analysis Package from SoftWright LLC allows the user to check STL or other microwave paths for clearance from terrain and human-made obstructions on a personal computer.

This software displays on-screen knife-edge diffraction losses and geographic coordinates at all points down the path.



Microwave path profile

For information, contact Larry D. Ellis in Colorado at 303-344-5486; fax: 303-344-2811; or circle Reader Service 202.

It can also tell the user whether or not proposed antenna heights at both ends of the path are suitable. Additional software modules can be added in order to calculate path reliability. Large libraries of antennas and transmission lines can also be included to expedite the selection of equipment needed for a particular STL system design.

## SATELLITE SYSTEMS

### Satellite Systems' Ariel Receiver Downlinks Nets for Stations On Satcom C5

**COLORADO SPRINGS, Colo.** Satellite Systems builds the Ariel digital satellite receiver for radio stations on Satcom C5 to downlink all of the major radio networks. The Ariel replaces the Fairchild Dart and Scientific Atlanta 7300-7325 digital receivers. Five slots are provided for audio and data cards, with a total of 10 channels available. The Ariel accepts Fairchild audio data cards and Scientific Atlanta cards with an adaptor.

Satellite Systems manufactures a 15/7.5 kHz DATS audio card and a 3.5 kHz voice cue decoder. The company also markets the Zephyrus line of SCPC and subcarrier receivers and carries a large inventory of used satellite receivers of all formats. Two full-time repair suites offer same-day repair turnaround on all popular receiver brands.

For information, contact Michael Lowery in Colorado at 719-634-6319; fax: 719-635-8151; or circle Reader Service 27.

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#### Want To Sell

Crown DC300A audio power amp, excellent condition, \$375. Sunflower Radio Products, 9421 Ballentine Road, Overland Park KS 66214. 913-492-5000.

LPB DAI-16 DA, new. J Gelo, J & H Music, POB 1697, Marcos Island FL 33437. 813-642-6899.

Crown D-75 stereo/mon, excellent condition, \$125. K Lamson, KAFR, 510-447-7405.

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Uher CV-140 stereo amp, as new, \$150 + shipping. J Morinelli, 901 Fairfax Rd, Drexel Hill PA 19026. 610-789-5472.

#### Want To Buy

Fairchild amps, TTs etc. D Bisbee, 685 S Roys, Columbus OH 43204. 614-279-6163.

200 - 500 W amps. B Lacy, KARX, 2025 N Hwy A1A, Indianantic FL 32903. 407-773-1962.

McIntosh MI-200 rackmount tube amp. 212-343-0265.

Record Cutting Equipment, records. 612-869-4963.

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H&P 300 MM beacon w/control, red glass, photo cell, side lights, \$500. D Green, KNGT, 9535 Jesus Marin Rd, Mokelumme Hill CA 95245. 209-286-1166.

FM on 104.3, 95.7 or 99.7; 340' of 3" coax. B Lacy, KARX, 2025 N Hwy A1A, Indianantic FL 32903. 407-773-1962.

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ERI 404 isolation transmitter, used 2 yrs, \$2200. G Hofer, KJLT, POB 709, N Platte NE 69103. 308-532-5515.

Shively 3 bay CP, 1/2 wave spaced, \$2500. D Rose, KDUC, 29000 Radio Rd, Barstow CA 92312. 619-256-2121.

#### Want To Buy

FM on 105.9 MHz, 6-12 bay, pref CP, will consider HP; 200' Helix line 1 5/8" or 3"; tower sections Rohn 25G, 45G, 55G or 26 kD. J Powley, WAOM, 1512 Sherwood Dr #3, Reidsville NC 27320. 910-342-1843.

10 Amp f.s. thermocouple RF ammeter, new or used, in working cond. R Miller, KUAU, Box 575, Lahaina HI 96767. 808-572-5534.

Lapp 9860 insulator for self-supporting twr, will pay top dollar. D Mance, WATN, 199 Wealtha Ave, Watertown NY 13601. 315-782-1240.

### AUDIO PRODUCTION

#### Want To Sell

CCS CDQ-1000, Motorola TA220, both used once, sold as package only, \$3700/Best Offer. G Nord, Soundhound, 45 W 45th St, NY NY 10036. 212-575-8664.

Kintek KT-904 stereo synthesizer, exc cond, \$1350. R Beierle, KFYP, 200 N 4th St, Bismarck ND 58501. 701-255-5757.

Shure M67, SE30 mixer, patch bays, Tadco 440 reverb; BBE Sonic 822 Maximizer; Foster Digital 3050. Jim, 414 Washington Ave, Defiance OH 43512. 419-782-8591.

Shure SA-1 headphone monitor amp, phono or line inputs, 2 headphone outputs, \$20 + shipping. G Tonelli, Aquarius Audio, 679 Calmar Ave, Oakland CA 94610. 510-444-3094.

CRL prep processor, Best Offer AM stereo matrix processor, Best Offer; C-Quam exciter, Best Offer. J Kesler, Livingston KY 40445. 606-843-9999.

Owl Multi Filter mono lo cut notch filter (3), \$100 + shipping. G Dunn, No Cal News, 5383 Willow Lake Ct, Byron CA 94514. 510-516-0299.

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Shure SE-30 mixer, 3 channel + aux, has non-std VU meter, clean, excellent condition, \$75. W Haley, Rec Machine Service, Rt 2, Gordonsville VA 22942. Fax: 703-832-5247.

ADC 1/4" patchbays & cords, new, under half price; ADC TT patchbays \$149 up, new cords \$9.95. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

Good used studio tape 1/2" \$15, 1" \$30, 2" \$55. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

Bulk erasers for 1/2" \$79, Stewart direct boxes mono & 4 ch \$50 up, Cue command decoder \$125, ABC Network decoder \$125, Audiotechnica ATP-12T tone arms new in box (2) \$95 ea, Eventide H949 harmonizer \$495, new Tascam midlizer MTS1000 \$750, AB 200w power amp \$249, Dyna stereo 120 rack mount amp \$229, Gates tube Sta-Level pair, both \$400, Sherwood FM tuner, new tubes \$79, Alltec 250 SU classic 10x2 tube recording console, rebuilt \$2500, Infonics 7" reel copier 3 copies \$300 ea, Shure M67 remote mixers \$125, Crown & Furman elec crossovers \$95. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

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#### Want To Buy

Ampex tube mixers, recorders, especially MX10, MX35, 602-1 or 602-2. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

### AUTOMATION EQUIPMENT

#### Want To Sell

SMC DP-2 complete with 350 (3) and 450 Carousels, ITC reel (4), ARS1000 reel, will part out. C Springer, KLMR, POB 890, Lamar CO 81052. 719-336-2206.

Cotec 7000 comp system with 48 tray Instacarts (2), and ITC R-R (4), \$5000. M Shafer, Jan-Di Broadcast, 315 Kennedy, Grand Jct CO 81501. 303-243-3699.

Harris System 90; IGM Go Cart 4216 48 tray (4); IGM Insta Cart 12, 12 tray; SMC Carousel 250. T Wortmann, WJAG, 304 Bruasch, Norfolk NE 68701. 402-371-0780.

Harris 992-5118-001 encoder. T Wortmann, WJAG, 304 Bruasch, Norfolk NE 68701. 402-371-0780.

IGM Go-Cart and Go-Cart 2, both 78 trays, good condition, \$300/ea; spare IGM Basic A parts. R O'Kelly, KLOO, 1221 SW 25th St, Corvallis OR 97339. 503-753-4493.

SMC DP2, 20A switcher, 352 Carousels (2), 452 Carousel, time cart, stereo cart, spare parts, Audicord cart recorder, \$2000. D Rose, KDUC, 29000 Radio Rd, Barstow CA 92312. 619-256-2121.

SMC MSP-1 10 source automation sys with 4 stereo 352 Carousels, including 2 racks, battery back-up and spare parts, BO/Trade. P Johnson, KCRV, POB 909, Caruthersville MO 63830. 314-868-0107.

Sonomag TAC-1 and 700 dual tape play, IGM time announcer, \$200. B Kuiper, WFUR, 399 Garfield, Grand Rapids MI 49504. 616-451-9387.

Sentry FS-12C, good/excellent condition, \$2450; TS-1 also available. Call 806-372-5130.

#### Want To Buy

Smartcaster stereo HD system. B Lacy, KARX, 2025 N Hwy A1A, Indianantic FL 32903. 407-773-1962.

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Otari MX-5050 Mark III-2 1/2 Track Stereo Reel	REBUILT	\$ 2,195
LPB Signature II S-15A 8 Pot Mono Console -	REBUILT	\$ 1,595
Revox B-77 Reel 7 1/2 & 15 IPS -	REBUILT	\$ 895
McMartin B-502 5 Pot 10 Input Stereo Console -	REBUILT	\$ 595
Urei 530 Stereo Equalizer -	REBUILT	\$ 295

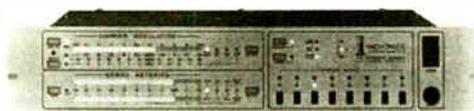
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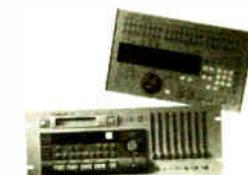
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World Radio History

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ITC Delta I & IV matched stereo record amp and cart mach, \$1500. J McWilliams, Gt Circle Bdcng, POB 397, Meadville PA 16335. 814-724-1111.

AudiCord mono cart machine, mint condition, \$650.00. Call 806-372-5130.

BE 5300C tripledeck, stereo, PB, mint less than 50 hrs, BO. R Kaufman, Pams Prods, POB 462247, Garland TX 75046. 214-271-7625, after 3PM CDT.

## Want To Buy

RCA for parts, particularly head assemblies. R Federal, WGMZ, Box 1339, Gadsden AL 35902. 205-549-0931.

Tapecaster cart winder; Beacart for parts. L Jackson, WGSV, POB 220, Guntersville AL 35976. 205-582-8131.

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Metro-tech 525P r-r, stereo/in, preamp out, \$150/BO + shipping. R Perrine, Imagination Ind, 2475 State Rd, Cuyahoga Falls OH 44225. 216-929-3712.

Otari 8 trk, 1" rcdr, very low hrs, hds exc, 15/30 ips, w/rmote, \$2500; Studer/Revox PR99, 2 trk, 7.5 and 15 ips, low hrs, exc cond, \$1600; Teac 4 trk. L Wagner, POB 1788, Orlando FL 32802. 407-299-1299.

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Revox B-77 1/2 trk 3 3/4 x 7 1/2 ips, \$600; 1/4 track 3 3/4 x 7 1/2 ips, \$450; Tascam 22-2 (2), very low hrs, \$450/ea; Teac X-300, new, \$350; Tascam 234 syncset, new, \$700; Tascam 234 syncset, used, \$450. G Grassie, RNTC Bdcng, POB 146, Dexter NM 88230. 505-734-5565.

Scully 280B servo (3), 2 trks, 2 w/Scully digital vanspeeds, Scully 280B servo FT; Scully S80B servo 4 trk; misc motors, spare parts, exc cond, \$3500 for all/BO. J Danis, Audio Dept Ind, 119 W 57th St, NY NY 10019. 212-586-3503.

Scully 284B-8, 1" 8trk, 3 3/4 - 30 ips w/V576 var speed mod, manuals, exc cond, \$2000. Tom, 415-969-3030.

Tascam MS-16 16 chnl rec w/synchronizer, exc cond, under 75 hrs use, \$5000/BO. Carey, Concordia Lutheran College, 512-406-3180.

Tascam MSR-16 1/2" 16 trk, dbx-1 parallel and serial ports, \$3200. D Lewis, 4th St Studios, 88 4th St, Bangor ME 04401. 207-941-0810.

Ampex 440 2 trk, 1/4", rk mt, \$100 + shipping. G Dunn, No Cal News, 5383 Willow Lake Ct, Byron CA 94514. 510-516-0299.

Ampex AG-440 (2), R-R, R/P, old but works, \$100/ea. Gary, Morningstar Sound, 28 Norse Dr, Howell NJ 07731. 908-938-4217.

Otari MX5050 MK-III, 8 trk, R-R, exc cond, \$1600 + shipping, cash, firm. S St John, St John Prod, POB 641448, Kenner LA 70064. 504-464-8881.

Otari MTR 12 1/4" 2 trk w/time code board, \$2000; Otari MX5050 MKIII, 1/2" 8 trk, \$1500. D Gaydos, WNYU, 721 Bdway, NY NY 10003. 212-998-1663.

RCA M1-12875 RCA cart wire rec, w/2 carts + manual, mint cond, \$250/trade; Tandberg 10x0 open reel, 10" reel capacity, mint cond; \$250 + shipping; Uher Universal 5000, 5" reel cap, \$40 + shipping; Ampex AL-500, 7" cap in port case, mint, \$250 + shipping; Ampro 730, vintage 1949, very clean w/manual, \$25 + shipping. J Morinelli, 901 Fairfax Rd, Drexel Hill PA 19026. 610-789-5472.

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Scully 270 R-R; Ampex 4020293-01 R-R. T Wortmann, WJAG, 304 Bruasch, Norfolk NE 68701. 402-371-0780.

Scully 280 R/P R-R, \$300. M Martin, KATA/KFMI, Arcata CA 95521. 707-822-7223.

Ampex ATR800 mono, Tascam 25-2, Tascam 7300, Ampex ATR700, \$695 ea, Scully 16 track 2" \$3450, Tascam 52 top of line, \$1150, Ampex AG350 electronics \$75, 3M M56 16 track \$5500, M79-24 fully rebuilt \$11500, Tascam locator for 85-16 \$495. Sony TCD-5 & Marantz stereo 3 head portable cassettes both \$475, Fostex E22 1/2" center track timecode deck \$1800, Fostex A80 8 track & 450 mixer \$1950, Tascam 80-8 & M5 \$1950, Nagra 10" reel adaptor \$1400, Nagra 4.2 sync mono, Haliburton case, Tote, AC ps \$2500, Tascam 38 8 track w/dbx \$1650. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

Ampex ATR 100 (2) 4 trk \$3500 ea, 2 trk 1/2" \$4000, (2) 2 trk 1/4" \$2500 ea. 212-343-0265.

Tascam 40-4, 4 trk, 1/4" with dbx NR, rk mt, and remote, low hrs, \$550. R Bragg, Producers Video, 3700 Malden Ave, Baltimore MD 21211. 410-523-7520.

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Ampex 601 portable tape recorders (3) & Ampex 620 portable speaker/amps (3). Working when retired, Best Offer + shipping. Mel Crosby, 408-363-1646.

Otari 5050-SHD 8 trk 1/2" newly rebuilt, heads have full, life left, \$1800. W Gunn 619-320-0728.

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

Scully '100' recorders, record/play amplifiers, 8, 16, 24 track heads. Sequoia Electronics, 4646 Hounds-haven Way, San Jose CA 95111. 408-363-1646.

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## CD PLAYERS

## Want To Sell

Pioneer PD 6050; Denon DCM; Shure D600; Technics SL-P1300, as is, \$100; Denon 950, as is, \$950. Jim, 414 Washington Ave, Defiance OH 43512. 419-782-8591.

## COMPUTERS

## Want To Sell

Texas Instruments 700 ASR data terminal; Excel printer; Panasonic 920ma monitor; Panasonic 930 monitor; NEC FVM125A monitor; TEC Smart Monitor; TEC screen and keyboard. T Wortmann, WJAG, 304 Bruasch, Norfolk NE 68701. 402-371-0780.

## CONSOLES

## Want To Sell

Amek/TAC 16/8/2, 8 trk monitor section; 60 pt prewired patchbay, \$2000/BO. R Friedman, 1137 Rec, 1137 Fillmore St, Baltimore MD 21218. 410-889-4228.

Audionics 110-8, 10 I/O modules, stereo mixout, mono mixout with 2 52 jack 1/4" patchbays, excellent condition, \$1500/BO. J Danis, Audio Dept Ind, 119 W 57th St, NY NY 10019. 212-586-3503.

Audionics 110-2 special 48 track + dual foldback mixing board, as is, Best Offer. U George, Ugly George Satellite, 600 W 58 St, NY NY 10019. 212-969-0240.

Harris Medalist 12 chnl, 5 VU meter; UREI 10 slider, stereo; Gates Statesman, stereo, 6 chnl; BE 8M150 8 pot, dual mono; LPB ch mono Signature II. Jim, 414 Washington Ave, Defiance OH 43512. 419-782-8591.

BE 4M50A new, \$625. G Grassie, RNTC Bdcng, POB 146, Dexter NM 88230. 505-734-5565.

Fostex 2016 8 input, 2 output, sub/monitor, new, w/manual, \$110 + shpng. D Tonelli, Aquarius Audio, 679 Calmar Ave, Oakland CA 94610. 510-444-3094.

Opamp Labs 2008-RS, 20 input, 8 buss + stereo out, 2x15x2 remix/cue sections, \$1500. L Wagner, POB 1788, Orlando FL 32802. 407-299-1299.

Shure SE-30 2 chnl; + aux mixer, non-std VU meter, clean, exc cond, \$75 + shipping. W Haley, Rec Maching Svcs, Rt2 Box 362-B, Gordonsville VA 22942. Fax 703-832-5247.

Soundcraft 200B 8x4x2 8 chnl rk mt, 4 aux busses, 8 returns, w/ext pwr sup, \$500 + shpng. M Novelli, Maya Sound, 1089 Curtis St, Albany CA 94706. 510-526-6090.

Tascam 106 6 input, 4 output w/EQ. C Springer, KLMR, POB 890, Lamar CO 81052. 719-336-2206.

Ward-Beck 24x4x2, P+G conductive plastic faders, 3-band, fully parametric, 2 dynamics modules, 288 point sidecar patchbay, many spares, \$3000. R Friedman, 1137 Rec, 1137 Fillmore St, Baltimore MD 21218. 410-889-4228.

Gates Stereo Yard 8 pot, all solid state, \$300 + shipping. G Dunn, No Cal News, 5383 Willow Lake Ct, Byron CA 94514. 510-516-0299.

Kustom brand 6 rotary pot mono, nds minor work, \$300/BO. R O'Kelly, KLOO, 1221 SW 25th St, Corvallis OR 97339. 503-753-4493.

LPB Signature II, S-15A, 8 pot, 24 input, mono, excellent condition, \$1500. J Wilsbach, WMSS, 214 Race St, Middleton PA 17057. 717-948-9136.

McMartin B-500, 5 chnl stereo, gd cond, \$600/BO. G Fullhart, WVKs, 4665 W Bancroft, Toledo OH 43615. 419-531-1681.

Ramko 12 chnl stereo w/2 inputs, BO/trade. P Johnson, KCRV, POB 909, Caruthersville MO 63830. 314-888-0107.

Shure FP51 compressed mixer, 4 chnl, \$450. Lake, Deep South Sports, 408 S. Leflore Ave, Cleveland MS 38732. 601-843-2587.

Spotmaster 5 input mono, 2 chnl out, \$200. M Martin, KATA/KFMI, Arcata CA 95521. 707-822-7223.

MCI 528 was \$82,000 new, excellent condition \$16500, Quantum 32x16x24 as used by LA Philharmonic \$4950, Audionics 501 \$3500. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

Ramko DC5AR 5 channel mixers, very good condition, \$175 each. 916-725-2434.

## Want To Buy

WE 23C, mixer. W Davies, Virgo Prod, 5548 Elmer Ave, N Hollywood CA 91601. 818-761-9831.

Neve consoles: any condition or parts  
Also: UA, UREI, Teletronics, Fairchild, RCA, Pultec, API, any TUBE GEAR or COMPRESSORS  
Call 201-798-2745 or fax 201-963-4764

McCurdy tube consoles wanted, AU-300 line modules power supply, monitor amps, card cages etc. Also interested in RCA, Collins, Langevin tube modules. Wayne L. 615-251-3003

Neve console, any type and parts. 212-343-0265.

## DISCO-PRO SOUND EQUIPMENT

## Want To Sell

Fostex 3030 10 band EQ, \$200; Delta Labs DLA, delay langer, \$350; Gentner EFT 900 phone coupler, \$250; AB Systems stereo 100W amp, \$200. D Rosa, KUC, 29000 Radio Rd, Barstow CA 92312. 619-256-2121.

## 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

Pro Bdcng Engineer w/25 yrs exp, CE/Dir of Eng pos w/stable, debt-free stn, prefer IL, IN or WI others possible. Jeff, 719-380-1198.

## HELP WANTED

National/Int'l Sales Industry leader seeks experienced Bdcng Equipment Sales professional. Position can lead into upper mgmt in 1st year! For consideration contact: Bob Vaughan

309-685-6273  
FAX 309-685-8860.

## Chief Engineer

Class B FM & Skw full-time AM seeks Chief Engineer. Experience with studio & transmitter maintenance & directional AM required. Minimum 5 years experience. SBE certification is a plus. Send resume & salary requirements to Stephen Granata WJAS/WSHH 1459 Crane Avenue Pittsburgh, PA 15220-4098 EOE

## SALES MANAGER OF SUCCESSFUL RADIO STATION NEEDED

TOP 50 MARKET, SUCCESSFUL, HIGH ENERGY, NEWSTALK RADIO STATION LOCATED IN THE SOUTHEAST IS SEEKING A SUCCESSFUL SALES MANAGER TO LEAD A STAFF OF 9 SELLERS. MUST BE CREATIVE AND A GO GETTER! MUST BE ABLE TO WORK WITH A NEW BUSINESS DEVELOPMENT DEPARTMENT IN PUTTING TOGETHER SALES PACKAGES. PREFER PAST EXPERIENCE AS NEWSTALK SALES MANAGER. DEGREE REQUIRED. ONLY APPLICANTS WITH HISTORY OF SUCCESS NEED APPLY. GENERAL MANAGER OPPORTUNITIES EXIST. SEND REPLY TO: RADIO WORLD, POB 1214, FALLS CHURCH, VA 22041 ATTN: Box# 94-12-14-01 RW

Be unorthodox, call and hire Janet, in radio since 1980, computer literate, anncng and mkng exp; FT anncng/pgmng aspirations, Metros, bedroom communities pref. 502-895-5888.

20 yrs small mkt exp, wants oldies or country midday or PM drive, satellite and automation exp, MO, KS or OK. Rob, 515-682-7678.

Mature bdcng school grad, plus add'l exp, seeks on-air w/prod, Christian sta, need to relocate. Dale, 405-634-8794.

Pro Bdcng seeks combo pos in sm or med mkt, 27 yrs exp, pref NW or somewhere in pines. E Puchalski, 909-881-3812.

Recent bdcng grad seeks entry level pos, prod, board op, etc. Clint, 405-333-2379.

Native Texan, bdcng school grad, seeks FT CW/CR on-air/prod pos in TX. Buddy, 405-670-4533.

Sharp rookie wants to bring fresh AT, Prod and sales talent to your OKC stn. Amy, 405-447-5541.

Country morning A/T attitude, phones, brains, topical and humorous. Mike, 608-723-2723.

If you have position, I have talent, new graduate, creative, love prod and news, will relocate. Kitty, 405-685-1814.

## ABOUT OUR EMPLOYMENT SECTION

## HELP WANTED

Any company or station can run "Help Wanted" ads for \$1.50/word or buy a display box for \$60/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 2 issues of Radio World. Contact information will be provided, but if a blind box number is required, there is a \$10 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 Attn: Simone Mullins

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(800) 275-0185

## LIMITERS

### Want To Sell

CRL System, SMP-900, SPP-800, SEP 400B (2), with NRSC, sharp 10 kHz audio filter, clean, manual, \$3195. B Walker, 30% S Church St, Murfreesboro TN 37130. 615-893-5373.

CBS Audimax 4450A solid state FM stereo, \$300. B Kuiper, WFUR, 399 Garfield, Grand Rapids MI 49504. 616-451-9387.

Inovonics MAP-II multiband audio proc; Inovonics 222 NRSC AM pre emphasis/low pass audio proc, \$300/both. M Martin, KATA/KFMI, Arcata CA 95521. 707-822-7223.

Panaxis Micro-mod stereo audio compressor, \$50 + shipping. G Dunn, No Cal News, 5383 Willow Lake Ct, Byron CA 94514. 510-516-0299.

RCA BA147A mono, good condition, \$450. R Beierle, KFVR, 200 N 4th St, Bismarck ND 58501. 701-255-5757.

Processing Plus IMP III processor designed for AM stations or mono FM, \$500. J Wilsbach, WMSS, 214 Race St, Middleton PA 17057. 717-948-9136.

### Want To Buy

Orban Optimod 8000; also XT2 chassis, Texas Audio Prisms and Texas card for 8100. P Slatton, WB7G, POB 518, Sheffield AL 35660. 205-381-6800.

CBS Volumax stereo FM, slimline version. B Caithmer, WMBI, 820 N LaSalle Drive, Chicago IL 60619. 312-329-4304.

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

Orban Optimod 8000 and Optimod 8100 plus XT chassis. B Lacy, KARX, 2025 N Hwy A1A, Indianalantic FL 32903. 407-773-1962.

Audio prisms and compeller, pair. M Martin, KATA/KFMI, Arcata CA 95521. 707-822-7223.

## MICROPHONES

### Want To Sell

Audio-Technica AT831 lavalier mic (5). C Springer, KLMR, POB 890, Lamar CO 81052. 719-336-2206.

Electro-Voice 660 super cardioid variable-D, exc cond, BO. A Wodel, WHF, 9A Alexander Rd, Estherville IA 51334. 712-362-4119.

EV 183, gd cond, XLR mt, many avail, \$35 ea. U George, Ugly George Satellite, 600 W 58 St, NY NY 10019. 212-969-0240.

RCA 77-44 BK-5 etc. W Davies, Virgo Prod, 5548 Elmer Ave, N Hollywood CA 91601. 818-761-9831.

Sennheiser MKH-805, studio mic sys w/all acces, \$300 + shpng; Audio Technica AT-855, unipoint condenser mic, new, \$100 + shpng. D Tonelli, Aquarius Audio, 679 Calmar Ave, Oakland CA 94610. 510-444-3094.

AKG The Tube, circa 1985, reissue of C12, \$1995. G Fitzgerald, Fitzmusic, 37-75 63rd St, Woodside NY 11377. 718-446-3857.

Sony CRT-5/CRR-4C, tube type wireless mic & rcvr, mint cond, \$150. W Haley, Rec Maching Svcs, Rt2 Box 362-B, Gordonsville VA 22942. Fax 703-832-5247.

Beyer DT-108 headset mic, exc cond, \$100/BO. A Wudel, 9A Estherville IA 51334. 712-362-4119.

Electro Voice RE 27 N/D, as new, \$300. P Russell, Boudoin College, Brunswick ME 04011. 207-725-3066.

NBC Chimes orig promo piece from 40's, mint cond; Little Wonder Mic, mint cond. \$25; J Morinelli, 901 Fairfax Rd, Drexel Hill PA 19026. 610-789-5472.

Sennheiser HMD 224X (2) sportscaster headset wires w/connectors, \$150/ea or \$250/both. Lake, Deep South Sports, 408 S Leflore Ave, Cleveland MS 38732. 601-843-2587.

Sony CRT-5/CRR-4C tube type, wireless mic and rcvr, mint cond. \$150. W Haley, Rec Machine Svcs, Rt 2, Gordonsville VA 22942. Fax: 703-832-5247.

Telex FMR100 diversity wireless mic systems, body pack w/spare XLR cable, \$450. Lake, Deep South Sports, 408 S Leflore Ave, Cleveland MS 38732. 601-843-2587.

Vega 77/67 wireless, diversity port lavalier sys, w/Tram 50 mic, 3 types antenna, pwr sup. \$750. R Bragg, Producers Video, 3700 Malden Ave, Baltimore MD 21211. 410-523-7520.

Sony ECM377 large dia cond mics (2) \$495 ea, RCA 77DX \$950. 44BX matched set of 3 \$3950. Shure SM5 \$325, SM7 \$295, AKG D12 \$195, Crown GLM200 lavalier like new \$125. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

### Want To Buy

77-DX's, 44-BX's, WE KU-3A's On-Air lights, recording lights & audition lights. Top price paid. Fast response. Bill Bryant Mgmt, 2601 Hillsboro Rd, G12, Nashville TN 37212. 615-269-6131. FAX: 615-292-3434.

RCA ribbons, AKG 451's. Neumann KM84's, EV 635A. W Gunn, POB 2902, Palm Springs CA 92263. 619-320-0728.

RCA 77DX's/44BX's ribbon, chrome/TV grey, gd cond, BO. R Kaufman, Pams Prods, POB 462247, Garland TX 75046. 214-271-7625, after 3PM CDT.

## MISCELLANEOUS

### Want To Sell

AT & T partners, 2 line by 6 sets telephone system, incl 5 sets, new in box. C Springer, KLMR, POB 890, Lamar CO 81052. 719-336-2206.

Conex UM-33 switcher-amp; Bird 72R coax switch rack mt; Harris 2.5K spare blower. Jim, 414 Washington Ave, Defiance OH 43512. 419-782-8591.

ITT-Jennings, vacuum variable capacitors, sev sizes and kV ratings. K Lamson, KAFR, 510-447-7405.

Matchbox sky satellite TV vehicles, new. \$10. J Morinelli, 901 Fairfax Rd, Drexel Hill PA 19026. 610-789-5472.

Road cases 24"x 27"x15" suitcase style, heavy duty, military spec. \$100 ea. L Wagner, POB 1788, Orlando FL 32802. 407-299-1299.

Tascam 1/2" alignment tape. 250 Nw/m, IEC EQ, also rack mount for model 38, BO. P Cibley, Studio C, POB 767 Murray Hill Stn, NY NY 10156. 212-532-2980.

Altec input transmitter modules, pkg of 5 pieces, \$20. J Morinelli, 901 Fairfax Rd, Drexel Hill PA 19026. 610-789-5472.

Rotron Blowers for Elcom, Harris, CCA, CSI, McMartin, rebuilt & new. Goodrich Enterprises Inc. 11435 Manderson St, Omaha, NE 68164. 402 493 1886 FAX 402 493 6821

Paradyne 4951-03 equip rack, \$175; Soundolier equip rack, \$120 + shipping. B Lord, Lord Broadcasting, 3824 SW Myrtle St, Seattle WA 98126. 206-932-4839.

Realistic 42-2115 stereo tape control ctr (2), \$10/ea; Archer A/V selector, \$10. G Dunn, No Cal News, 5383 Willow Lake Ct, Byron CA 94514. 510-516-0299.

Remote vehicle Dodge chassis, Master Cruiser USA Motor Co, complete and equipped, 35k miles, \$35,000. J Bridges, WNNX, 3405 Piedmont Ave, Atlanta GA 30305. 404-364-5831.

Tascam 1/2" alignment tape 250 nw/m IEC eq; also rack mount for Tascam 38. Best Offer. P Cibley, Studio C, POB 767, NY NY 10156. 212-532-2980.

Transient Noise Eliminator, Burwen Clone. 210-651-9093.

### Want To Buy

Radiotelegraph study guide or QEZ book for FCC license, used manuals in gd cond. J Book, WOC Radio, 3535 E Kimberly Rd, Davenport IA 52807. 319-344-7000.

Broadcasting Yearbook, last years @ low price for ret eng. E Davison, POB 7167, Springfield IL 62791. 217-787-0800.

Henry Engineering Telecart II or BE PC-1 or other telephone to cart deck interface. A Slauch, Ski Areas of NY, 2144 Currie Rd, Tully NY 13159. 315-696-6550.

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

## MONITORS

### Want To Sell

McMartin TBM2000A SCA mon, gd cond, \$200/BO. R O'Kelly, KLOO, 1221 SW 25th St, Corvallis OR 97339. 503-753-4493.

Modulation Sciences DSCA-188, data Sidekick, \$1800. R Humphrey, WWVA, 1015 Main St, Wheeling WV 26003. 304-234-0057.

TFT 730A SCA monitor. Very little use. Excellent condition, \$850. Wayne L. 615-251-3003.

### Want To Buy

EBS encoder/decoder; FM mod monitor stereo. J Powley, WAOM, 1512 Sherwood Dr #3, Reidsville NC 27320. 910-342-1843.

## RECEIVERS & TRANSCEIVERS

### Want To Sell

Carver TX-2 FM stereo w/18 presets and multipath NR, \$120 + shpng. D Tonelli, Aquarius Audio, 679 Calmar Ave, Oakland CA 94610. 510-444-3094.

## AM STEREO RECEIVERS

Portable, Home/Studio, Auto

### RRADCO GROUP

708-513-1386

General Industries home disc rcdng unit w/2 spd and Shure magnetic cutter head, \$35 + shpng. D Tonelli, Aquarius Audio, 679 Calmar Ave, Oakland CA 94610. 510-444-3094.

GE Superadio III, custom modified w/noise free SCA w/improved selectivity & sensitivity, \$95. Other modifications avail. Performance guaranteed. **800-944-0630**

GE Exec II 35 W 2 meter repeater, Cor & ID boards, \$125. P Russell, Boudoin College, Brunswick ME 04011. 207-725-3066.

## SCA RECEIVERS—ALL TYPES

Reading Service / Ethnic / Data Professional / Table Will work to meet your receiver needs

DAYTON INDUSTRIAL CORP. (Manufacturer) 2237 Industrial Boulevard Sarasota, FL 34234 Tel: 813 351 4454 FAX: 6081

Sony ICF 9660W AM-FM-TV sound, table radio, \$25 + shipping. G Dunn, No Cal News, 5383 Willow Lake Ct, Byron CA 94514. 510-516-0299.

## REMOTE & MICROWAVE EQUIPMENT

### Want To Sell

Cellcast RBS 400, new, \$1600. J Felz, KSCA, 213-845-1625.

Marti STL-10 stereo, 2 trans, 2 rec w/combiner; mono STL-10, mint cond. Jim, 414 Washington Ave, Defiance OH 43512. 419-782-8591.

Marti RPT-15 remote pickup xmt, on 161.76 MHz, exc cond, \$575. Sunflower Radio Products, 9421 Ballentine Rd, Overland Park KS 66214. 913-492-9000.

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## Radio World

5827 Columbia Pike, 3rd Floor  
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Brakers	Limiters	Tax Deductable Equipment
Business Opportunities	Microphones	Test Equipment
Cart Machines	Miscellaneous	Transmitter/Exciters
Cassette & R-R Recorders	Monitors	Tubes
CD Players	Receivers & Transceivers	Turntables
Computers	Remote & Microwave Equip.	Positions Wanted
	Satellite Equipment	Help Wanted

### Classified Advertising Rates Effective January 1, 1994

	1x	3x	6x	12x
1-9 col inch (per inch)	\$60	58	54	49
10-19 col inch (per inch)	55	52	49	44
Distributor Directory	100	95	90	85
Professional Card	65	60	55	50
Classified Line Ad		\$1.50 per word		
Blind Box Ad		\$10 additional		

To compute ad costs: Multiply the number of ad inches (columns x inches) by the desired rate schedule for your per unit cost. Example: a 3" ad at the 1x rate is \$180, at the 3x rate \$174, at the 6x rate \$162, at the 12x rate \$147, etc.

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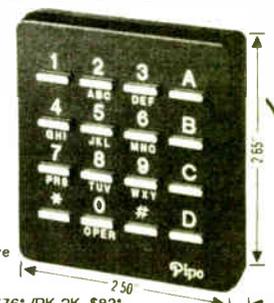
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## REMOTE &amp; MICROWAVE...WTS

Moseley 1620, \$2000; Moseley 1600, \$800 for phone line. W Sowers, KXRA, 1312 Broadway, Alexandria MN 56308. 612-763-3131.

Cray DCP3080/DCP3180 (4) DSU-CSU, never used and V-35 cables for use with 56k line, \$1275. B Kuiper, WFUR, 399 Garfield, Grand Rapids MI 49504. 616-451-9387.

Henry Mix-Minus, \$75 + shipping. G Dunn, No Cal News, 5383 Willow Lake Ct, Byron CA 94514. 510-516-0299.

**WE RENT**  
TELOS ZEPHYR  
QEI QUICK-LINK  
Stereo RPU, NO License  
COMREX  
3 line extender  
Frank Grundstein  
Audio/Video Consultants  
610-642-0978

Symetrix 104 4 line, dual hybrid, on-air phone system, good condition, incl secondary call screener control system, \$1000/BO. G Fullhart, WVKS, 4665 W Bancroft, Toledo OH 43615. 419-531-1681.

Will trade 1 composite 505 system, complete type approved for 2 monaural type approved sys. M Martin, KATA/KFMI, Arcata CA 95521. 707-822-7223.

Zercom Max Z telephone mixing console, power cord and carrying case ind, 4 chnl, \$700. Lake, Deep South Sports, 408 S. Lefflore Ave, Cleveland MS 38732. 601-843-2587.

## Want To Buy

Rust manual, esp of wiring harness. S Weber, POB 453, Oakridge OR 97463. 503-782-2901.

Moseley 505C and 606C. B Lacy, KARX, 2025 N Hwy A1A, Indialantic FL 32903. 407-773-1962.

## SATELLITE EQUIPMENT

## Want To Sell

Wegener 1601 for SMN Pure Gold, \$2000/Best Offer; Wegener 1601 for receiving Classic Rock format, \$2000/Best Offer. G Perry, 915-550-0558.

Wegener 1601 Rcvr rk mt, 1645 tone decoder card, 1610 and 1610-01 Panda II demod cards and 1606-05 block conversion card, exc cond, manuals, BO. A Atkinson, KRLE, SW 345 Kimball, Pullman WA 99163. 509-332-3545.

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Info-Tec M-600 multi code rcvr for sat location, copies ASCII, Baudot, TOR, ARQ and Morse code, \$60 + shpg. G Dunn, No Cal News, 5383 Willow Lake Ct, Byron CA 94514. 510-516-0299.

## Want To Buy

SCPC demod/downconverter, frequency agile, low cost for new 501(c)3 public station. E Truax, KEOS 89.1, POB 78, College Stn TX 77841. 409-779-5367.

Monroe 5002 remote telephone controller for Fairchild, SA, Ariel, Rcvr, in any cond. H Staszewski, Teleradio Inc, POB 1132, Erie PA 16512. 814-835-8012.

## SOFTWARE/DATABASES

## Want To Sell

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Ron Balonis' Broadcast Engineer's Computer Toolbox makes a computer a technical assistant for an engineer. For details, write *Computer Toolboxes*, 118 Rice St., Trucksville, PA 18708 or call 1-717-696-1490 300/1200/8/n/1.

## STATIONS

## Want To Sell

Small mkt FT AM in N GA. J Frew, WYXC, 1410 Hwy 411, Cartersville GA 30120. 404-382-0368 after 6 pm.

Central AR, small AM on 690', no real estate, only stn in county, possible contract wpa, \$125,000. B Bottenberg, 102 W South, Benton AR 72015. 501-778-6677.

700 W 90.5 FM, on 1 acre w/7 room house, \$65,000. D Parsons, KLUH, POB 1313, Poplar Bluff, MO 63902. 314-686-1663.

Profitable small market AM daytime in SW Virginia. Excellent owner operator opportunity. Market at two times billing, with or without, \$160,000.00 in real estate. Currently family operation with principals planning retirement. Contact: JCS, POB 354, Wytheville, Virginia 24382.

## Want To Buy

## RI, CT, MA

Telecommunications company to expand into broadcasting in 1995. Seeks AM, FM, AM/FM Combo or CP within 100 mile radius of Providence, RI. No daytimers. Will seriously consider financially distressed stations. Prefer some seller financing. Reply to: Radio World, POB 1214, Falls Church, VA 22041. Attn: Broadcasting Box

## STUDIOS

## Want To Sell

Prod rec studio equip, furniture and library, Yamaha board, CD players, Otari R-R, TT, amps, carts, 40+ yrs of 45's, 33's and CD's, much more. American Music Formats, 4545 Nicholas Ct, Brookfield WI 53045. 414-783-5551.

## TAPES/CARTS/REELS &amp; CD's

## Want To Sell

Scotch metal reels, 14" & 10", w/boses and tape, \$50. B Kuiper, WFUR, 399 Garfield, Grand Rapids MI 49504. 616-451-9387.

Pams Jingles ref tapes, 1951-1976, BO. R Kaufman, Pams Prods, POB 462247, Garland TX 75046. 214-271-7625.

Cook test record, 10", mint condition, \$35; Vox Hifi test record box set with booklet, \$20; 45 RPM collection (300), inc 90 orig Motown, \$125 + shipping. J Morinelli, 901 Fairfax Rd, Drexel Hill PA 19026. 610-789-5472.

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| C. Educational FM station    | H. Consultant/ind engineer      |
| E. Network/group owner       | I. Mfg. distributor or dealer   |
|                              | J. Other _____                  |

II. Job Function

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

Reader Service

December 28, 1994 Use until March 28, 1995

Please first fill out contact information at left. Then check each advertisement for corresponding number and circle below.

Purchasing Authority		
1. Recommend	2. Specify	3. Approve
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003 025 047 069 091 113 135 157 179 201		
004 026 048 070 092 114 136 158 180 202		
005 027 049 071 093 115 137 159 181 203		
006 028 050 072 094 116 138 160 182 204		
007 029 051 073 095 117 139 161 183 205		
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