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1994

# R&R DIGITAL GUIDE

**INEXPENSIVE PROCESSORS TAKE COMMAND OF LIVE ASSIST AND AUTOMATED TASKS**

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## **Buyers' Guide To The Computerized Control Room Revolution**

- 20 Systems Profiled
- Feature Comparisons
- Mac-Based System Introduced

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**ALSO...CD Music Libraries ...Newsroom Computers...New Digital Gear**

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# C O N T E N T S

## Buyers Guide To The Computerized Control Room Revolution

**M**icroprocessors aren't just for automated radio stations anymore. Inexpensive and sophisticated systems work well with satellite formats and as a live-assist tool.

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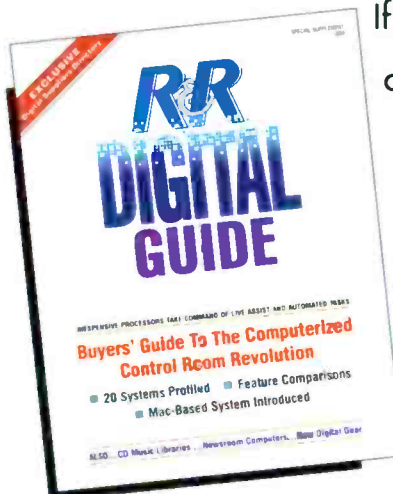
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**CONTROL ROOM REVOLUTION**

**BUYERS' GUIDE**

**T**he all-digital computerized control room is slowly but surely becoming a familiar fixture in radio stations around the country . . . and it's about time. Other professionals in the entertainment industry, such as TV editors and recording engineers, have been successfully using microprocessors and digital technology for years.

Despite the tantalizing possibilities presented by computer control equipment, stations have been scared off by incompatible standards — as well as computer phobia.

**KOSI/Denver PD Rick Crandall** said his on-air crew laid a wary eye on the station's new gear as it was being installed. "Some of the guys who had computer experience were OK with it, but those who were afraid of computers were afraid of this."

**KONP/Port Angeles, WA owner Jim MacDonald** recalled, "At first, [the personalities] were scared to death. It was like, 'Gee, how can this work? I don't have a tape to stick in a machine. What am I supposed to do?' But after the first week, everybody came around and said, 'I can't believe how we used to run this station . . . Now I've got time to think about what I'm going to say after I get out of the spot set.'"

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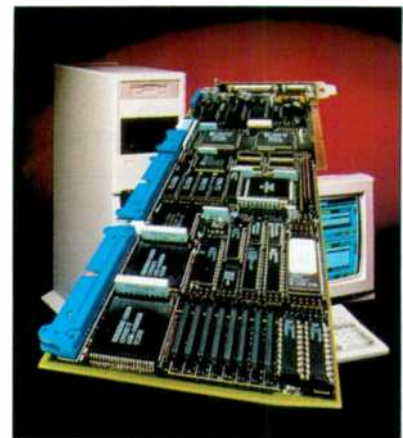
- ▶ How Computer Control Room Systems Work
- ▶ Profiles of 20 popular offerings
- ▶ Comparisons of major features
- ▶ New systems described
- ▶ Digital music libraries

**That Was Then...**



Radio station control rooms haven't changed much over the years . . . most were stocked with the familiar turntables, reel-to-reel machines, cart decks and a console.

**This Is The Future**



Today, about the only piece of old equipment needed is a mike. A computer can do a nifty job replacing the other gear . . . and more.

**Audiences *never* age.**

**Music *never* changes.**

**Formats *always* stay the same.**

**And Digital is *just* a passing phase.**



*The Optimod-FM 8200 Processor*

**Damn.**

We created the first successful all-digital sound processor to give FM stations absolute flexibility. Be able to adapt to new music, personalities, or formats. Tailor sound to attract new audiences. And have the ability to upgrade with simple, inexpensive software—instead of tossing out an entire capital investment.

Somehow, that makes a lot more sense to us than trying to compete in today's radio market with outdated analog technology. But we could be wrong. Dead wrong. After all, digital could be just a passing phase. Elvis could really be living in Cincinnati. And WKRP could be the future. Damn.

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## CONTROL ROOM REVOLUTION BUYERS' GUIDE

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### Bits 'N' Bytes

Engineers shopping for a system — who now have to be as familiar with bits and bytes as they are with amps and ohms — must deal with a breathtaking array of critical technical options; their GMs must ensure that the equipment is compatible with all departments in the station, while PDs and traffic managers often don't want computers disrupting their decades-old tradition of operating with paper logs and analog cart machines.

**Most engineers would probably forgo compression altogether. But a signal is often squeezed and expanded several times even without hard drive compression.**

KOSI Chief Engineer **Roger Tighe** admitted, "I'm more of an RF guy than I am into computers, and I had to get a little outside help when considering what our system was capable of."

Until recently, the broadcast equipment industry had a difficult time convincing station operators to switch to digital gear when prices were high and technology unproven. But their fortunes turned when the bottom fell out of the computer market in the early '90s. Suddenly the cost of switching to computers and mass hard disk storage was cheaper than replacing comparable analog gear. And with improved operating software, computer control systems have become more reliable.

Continued on Page 8



Arrakis Systems Digilink

### Arrakis Digilink

Arrakis Systems Inc.

Distributed by:

Harris-Allied

*Includes processor, 1.2GB drive, 14" VGA monitor, keyboard, mouse, routing switcher, cards, installation kit, connectors.*

**W**ith 600 systems installed around the world, Arrakis says it is the #1 hard disk workstation in the industry. Company President **Mike Palmer** and his staff manufacture their own DSP and SCSI, and I-O cards, routing switcher, cabinets, and cables, which they feel keeps costs lower and quality control higher than by choosing off-the-shelf components.

Several engineers we spoke with, including a few who tested the system but chose another brand, felt the Arrakis outboard Trak\*Star eight-track editor (for an additional \$5500) was among its best assets. A more elementary two-track editor comes standard. Arrakis also pushes its Digilink networking capability, which accommodates as many as 15 workstations (including the production workstation, traffic computer, newsroom unit, and music scheduler).

The operating screen consists of VU meters and timers along with a 10-line "playlist." Events can be scheduled into the playlist by typing in a "cart" number or by selecting from a menu of category buttons (i.e. music, ID, news, promos, etc.) On another portion of the screen, users can set the system mode (On Air, Produc-

tion, News, Scheduler) and operation (Manual, Live-Assist, Satellite, or Automation. In Manual mode, it behaves like a virtual cart machine; in Live-Assist, the sequences are preprogrammed but can be edited on-the-fly.

Among other features: macro programming, cart rotation, up to 10 background record instructions per hour (with dual-play option), background record with simultaneous playback, and an inboard auto-CD scheduler.

### DigiStation

BLU Electronics

*Includes processor, monitor, DSP, 345 MB hard drive.*

**B**en Umberger's **BLU Electronics** offers the DigiStation, designed primarily for broadcasters running automated formats, and "PhoneByte," a new product for stations that actively interact on-air with listeners.

The DigiStation excels in running satellite formats, in which the timing of commercial breaks is crucial. DigiStation senses when spots within a break run short or long, then corrects the break's total time by up to 4% to fill the stopset exactly. Network liners are also automatically timed so they end right before the network jock starts speaking. In live-assist mode, the DigiStation runs preprogrammed stopsets at the touch of a button.

Events can be programmed and new audio recorded on the DigiStation at any time — even when the unit is running audio. With Dolby AC-2 processing, the system can compress data at a 6:1 ratio and, with a sampling rate adjustable up to 50 kHz, it delivers CD-quality audio.

PhoneByte was designed to replace reel-to-reel machines in instances where phone calls need to be taped for future replay on the air. PhoneByte automatically numbers each call, records its time and date, and can categorize each conversation by topic — or importance — with just a few keystrokes. If a call turns out to be

Continued on Page 8

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## CONTROL ROOM REVOLUTION BUYERS' GUIDE

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### Many Choices

But the enormity of choices still remains. Dozens of manufacturers, from garage-factory entrepreneurs to the best-known names in the biz, are offering systems that start at a few thousand dollars.

This edition of R&R's Digital Guide outlines new and established systems from makers of all sizes. We invited every known company to provide us with detailed information about their products as well as a list of their customers. Those that responded are profiled on these pages.

It is beyond our scope, however, to rate or judge the performance or any other aspect of the systems, so each profile contains *some* of its notable features as pointed out by the manufacturer and its users. The grid on Pages 26-27 compares other attributes considered important by various users. Consider this guide as a starting point for your shopping adventure.

### How They Work

At the very least, computer control systems replace analog cart machines by putting commercials on a hard drive. More advanced systems also play music from hard drives or CD jukeboxes for advanced live-assist capabilities. And perhaps the application most common for control room computers is to offer a smooth interface with satellite formats. In fact, the computer control industry blossomed in response to small-market station execs who needed something they could walk away from while they attended to other business during the day and let run the station — often by itself — at night.

Continued on Page 10

## DigiStation

Continued from Page 6

somewhat less than stellar, it can be erased almost immediately.

The device fully interfaces with the studio's control board, and jocks can edit calls quickly and easily. When a finished call is ready to air, PhoneByte will even display time elapsed and time remaining on the bit — perfect for walking up records. PhoneByte's standard PCM recording and optional Dolby AC-2 compression allow for maximum recording time at high quality.

## AudioVAULT daBOX CORE

### Broadcast Electronics

*AudioVAULT system includes company-built 486 system; MPEG Layer-II DSP; 2GB hard drive; Windows software. daBOX supplied with 386 computer (but customers can supply their own 286-or-above computer); 1GB hard drive, Dolby AC-2 DSP.*



Broadcast Electronics CORE

**A**mong this distributor's array of computerized control room products, the AudioVAULT is a modular system. It's one of the few in this guide that uses Microsoft Windows as its operating platform. Screens, like most systems designed with live assist in mind, feature graphic representations of studio equipment. It uses MPEG Layer II compression that can be used selectively on a cut-by-cut basis. BE also sells the out-board AudioVAULT MTE multi-track editor for production room use.

For lower budgets, BE markets "da-BOX." It includes Dolby AC-2 (6:1) compression and overlap/background recording with additional cards.

Both the AudioVAULT and daBOX can work with BE's CORE (Computer Oriented Radio Environment). It's an automation controller designed to run anything (including the ever-familiar SMC 250 cassettes), has full addressability of up to 36 source inputs (each with machine and audio control), and has live-assist features, including countdown timers and a "time line" progress meter. Both devices can also operate BE's Sentry Broadcast Audio Controller, a low priced controller that can control as many as 108 source inputs as well as consumer multi-CD decks.



Computer Concepts DCS

## DCS (Digital Commercial System)

### Computer Concepts

*Includes 486 processor, VGA monitor, keyboard, mouse, modem, network interface card, digital audio board, and software.*

**D**CS, like its name implies, is primarily a system for scheduling and running commercials and, as such, works well in a satellite environment. It can also run in an automated or live-assist situation and, in fact, is marketed as part of the **TM Century Ultimate Digital Studio** for those purposes.

The DCS allows for complete walk-away operation of satellite formats, with an entire day's — or even weekend's — commercial schedules preprogrammed. DCS will monitor the network and automatically record traffic downloads, and it can even do live-sounding prerecorded

Continued on Page 10



# TM Century<sup>®</sup> Inc.

## TM Century Television

Call our television specialists to see our '94 demo reel full of new spots. We'll work with you to develop powerful, cost effective television campaigns that set your station apart from the competition.

Featuring comedy produced weekly on CD, morning show jingles, production libraries, show prep consulting and more! THE SUPPORT TEAM FOR YOUR MORNING SHOW.



## jingles

Get your new demo of "We Play the Hits" produced for KIIS-FM in Los Angeles. Your package will be delivered to you on CD and you'll get a full 99-cut CD of brand new production beds, logos, production elements and effects that are exclusive to you in your market when you buy the jingle package. Also, call about our other new packages that will be ready for the Spring Book.

Call about our newest production library, SlamDunk! Nineteen discs in the initial shipment that are filled with brand new tracks, production elements, and effects that are in styles that you can really use and get your money's worth!



## golddisc<sup>3</sup> COMPACT DIGITAL AUDIO

The World Standard<sup>®</sup> in CD music libraries for radio — used by over 3,000 stations. These are highly researched libraries for virtually all formats. We use 100% digital masters for the best sound you can buy. No data compression means clean, clear sound on your station all the time. Our computer systems clean up any problems in the original recordings... no matter how old or new the song.

The best selection of the newest releases delivered to you on CD each week. All popular formats are covered: AC/CHR/COUNTRY/URBAN/AOR and MODERN ROCK.



# Get the BEST for YOUR STATION!

For information call: (800) TM CENTURY

## CONTROL ROOM REVOLUTION BUYERS' GUIDE

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The core of most systems is usually some form of database management software that directs audio events based on instructions from the live operator or as a result of pre-programming by a traffic manager.

Much of the sound is stored on hard drives — particularly short items such as jingles, commercials, and jock IDs. Although some locally originated stations store entire music libraries on hard drives, most continue to play at least some of their music from cart or CD.

**Your traffic manager will have loads of questions for a computer salesperson.**

Both the software and hard drives are operated by IBM-compatible personal computers (although one new entrant uses an Apple Macintosh as the basis of its system — see Page 28). The key piece of equipment that converts those digital bits into sound is the digital signal processor (DSP) card. On most systems, one DSP is

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## DCS

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local time checks customized to each announcer.

In live-assist applications, the DCS gives jocks 18 "FlexKeys," personalized audio "boxes" that make the personality's favorite drops, sound effects, jingles, etc. available at the push of a button. Three units can use FlexKeys simultaneously, for a total of 54 "carts" that can be used at any given time. When used in conjunction with Computer Concepts' Audio Control Switcher, FlexKeys can be assigned macro-type functions in satellite and automation modes so that they can instantly switch transponders, cut away for local news or remotes, or start/stop recording feeds.

The DCS system is unique in its ability to play two stereo sources simultaneously while recording on a third. With the new AES/EBU option, three outputs can be used at the same time (if no recording is taking place). When recording, you're given the choice of 7.5 kHz or 15 kHz fidelity in mono or stereo, with or without compression. And as long as you can afford to keep buying hard drives, the DCS's storage capacity is nearly unlimited.

Multiple commercials for a single sponsor can be automatically rotated, and the system routinely generates a data disk that provides proof of spot performance. And if there aren't enough commercials to fill a particular break, the system will find alternate audio — a promo, ID, or PSA, for instance — to fill the remaining time.

## DAD486X

Enco Systems

Distributed by: Harris Allied

Base System includes software only.

**E**nco is among the few products covered here that markets itself as software, rather than a full-featured system. But complete systems, with software and hardware, are available.



Enco Systems DAD486X

Enco's main screen emulates a cart machine. When the operator hits the play button, the first (and highlighted) item among a list of menu items goes to air.

Hit the Array button, and the screen switches to 48 little boxes, each containing frequently-used events, such as jingles, sweepers, intros, etc. There are three Array screens, allowing for almost instantaneous access to 144 "carts."

The Enco system also features a two-track waveform editor, can be preprogrammed for full automation, and has interface capabilities to control outboard program sources. Additional units and traffic computers can be hooked up via a LAN.

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## except the paper, the carts, the logs, the errors...

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- In its ultimate configuration, Master Control provides seamless integration of the entire RCS software line and puts you in control. Of course, all of this is backed up by our unparalleled support.
- If you're planning digital audio for your station (or you just want a peek at the future), don't make a move without seeing Master Control from RCS!



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## CONTROL ROOM REVOLUTION BUYERS' GUIDE

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needed to process each stereo signal. Thus, if a station wants to overlap (segue) two sources, it needs to install an extra card in the computer. It would also need another card in order to handle production duties or record a satellite feed for later broadcast. It needs three cards to handle a combination of these functions.

Stations can feed their computer with sound from a variety of sources via hardwired connections, a standard mixer, or, for more flexibility, with an audio routing switcher. That way, a computer can traffic audio sources to various destinations within a station.

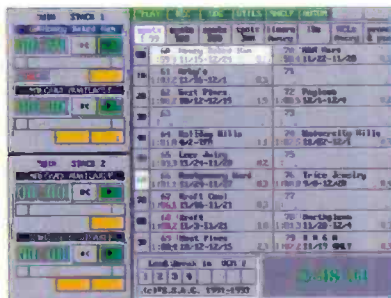
**Some manufacturers will entice you with a great price . . . then only later tell you about the add-ons that allow a system to perform as advertised.**

Programming is added to the hard drive when the system is in some kind of "production mode" or via a separate production console. Cues are tighter and timings more accurate than with conventional carts because events begin when sound is sensed. In most systems, simple editing tasks such as tightening cues or two-track cut-and-paste editing can also be accomplished — sometimes graphically with a waveform monitor.

Some systems offer peripheral add-ons that can execute more complicated editing tasks, handle news events, or operate CD jukeboxes or other outboard equipment.

Among a computer control system's most important functions is its

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Fidelipac Air Marshal

### Air Marshal

Fidelipac Corp.

Base system includes processor; 14" VGA monitor; DSP card; 1GB hard drive.

Perhaps the most royal history among the profiled systems belongs to Fidelipac's Air Marshal. Developed by British Forces Broadcasting as a way to manage programming on its far-flung radio network, the system was adapted for U.S. tastes (i.e. the ability to program commercial stopsets and display time in 12-hour mode) and is now making its way into domestic radio stations.

The Air Marshal is clearly marketed as a live-assist tool, but Fidelipac says it can handle satellite or full automation as well. In live-assist mode, an operator activates an element by picking up a "cart" from a rack on the right side of the screen and dropping it into a "machine" on the left. Each double stack of cart machines requires one DSP card for non-overlap, or two for overlap.

Like many of its competitors, the Air Marshall doesn't depend upon hardwired external contact closures or dedicated software in satellite mode, allowing for flexibility with multiple feeds. It also accommodates jock-specific liners.

In its sales brochure, the Fidelipac folks were honest enough to admit that the Air Marshall is not meant to be a manual replacement for the cart machine — buy it only if you desire some level of automation. It also doesn't control outboard playback equipment directly (that needs to be done via an audio console), and — like many competitors — it doesn't have a high level of editing capabilities.

### Audisk

Harris Allied

DS100 includes main system unit, keyboard, monitor.

DS2000 includes two workstations (processors, monitors, keyboards, programmable "instant play" keyboards), main system unit, LAN, audio switcher, commercial scheduling software.

Harris Allied's Audisk system (formerly marketed by Gentner) offers four different configurations to meet different stations' needs: the DS100 and DS1000 stand-alone systems and the DS2000 and DS2002 workstation-based systems. The DS100 is geared primarily toward live-assist cart replacement, while the others will run satellite and live-assist programming, with CD automation on the horizon.

Audisk will allow as many as 32 workstations to be tied in to a common hard drive via LAN (standard on the DS2000 and DS2002), and it interfaces with traffic and music scheduling systems. If you



Harris Allied Audisk

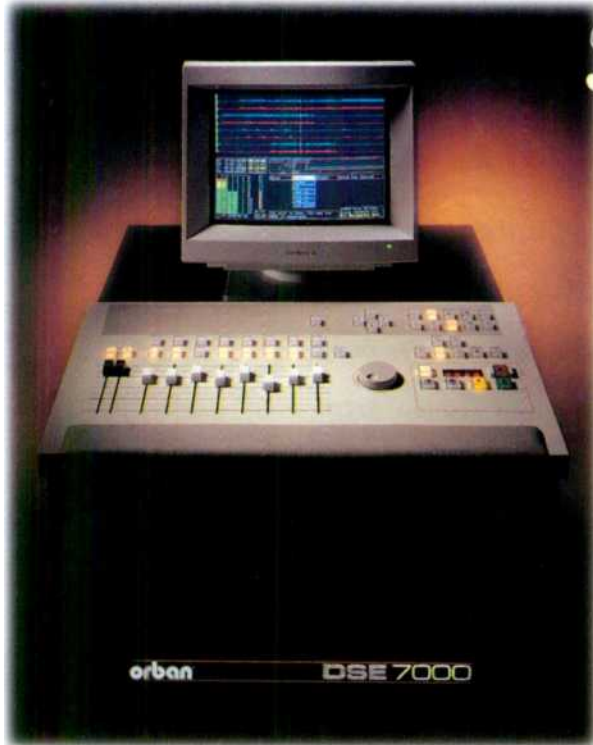
happen to be away from the station, you can call the Audisk to make scheduling changes or even preview audio. After commercials have run, the Audisk will generate a billing log for the traffic department.

The Audisk excels at dealing with a number of different networks. Each of the system's 16 DC control input triggers can be programmed to assume a different function depending on which network is currently running. There are also eight output triggers that can control other studio equipment.

Continued on Page 14

# A 60 Second Look at the Last 25 Years in Commercial Radio.

*The DSE 7000.  
The fastest  
digital  
workstation  
for radio  
production.  
Simplest to use.  
And still the  
best way to get  
sixty seconds  
of history  
on the air.  
Orban.  
Celebrating  
25 years  
in broadcast.*



*The Eagle has landed...New York  
State Thruway is closed, man...And  
Pepsi's got a lot to give...Wake Up,  
Maggie, I think I've got something to  
say to you...Peace is at hand...Bye, Bye,  
Miss American Pie...I am not a crook...  
I shot the sheriff...Plop Plop, Fizz Fizz...  
Tramps like us, baby we were born to...  
Hi, I'm Jimmy Carter...Ah, Ah, Ah, Ah  
Stayin' Alive, Stayin' Alive...No  
Nukes...Are you better off than you  
were four years ago?...Have a Coke  
and a smile...She's got, Bette Davis  
eyes...Where's the beef?...Beat it!...Beat  
it!...Four more years...What's love got to  
do with it?...Gorby! Gorby!...We are the  
world, we are...The ultimate driving  
machine...The Dow fell over 500 points  
today...I'm Tom Bodette for Motel  
Six...we'll leave the light on for ya...  
That's "potatoe" with an "E"...You got  
the right one baby, Uh Huh!*

There is just no faster way to slice through 25 years of radio, or your next sixty seconds, than the DSE 7000. *The New Speed Of Sound.*

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## CONTROL ROOM REVOLUTION BUYERS' GUIDE

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ability to broadcast commercials and music. All systems can be programmed manually, and most can be linked directly with traffic and music scheduling computers. An equally important step would be its ability to certify what was run and, ideally, report that information back to the appropriate scheduling computers.

Finally, and perhaps most importantly, is the system's "user interface" — the information that appears on the computer screen. Some screens are designed to comfort live-assist air personalities by displaying animated "cart machines." The talent "picks up" a cart from a rack on the screen and places

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## Audisk

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The Audisk's production capabilities include background recording, cut-and-paste editing, and automatic recording of up to either three (DS100 and DS1000) or 23 (DS2000 and DS2002) outside feeds.

The most advanced Audisk system, the DS2002, runs two stations in any combination of automation or live-assist modes from a single file server.

## DigiCenter

ITC Corporation

Base system includes processor, modem, SCSI controller, 14" VGA touchscreen monitor, DSP, 1.2 GB hard drive, 32-channel parallel logic interface.

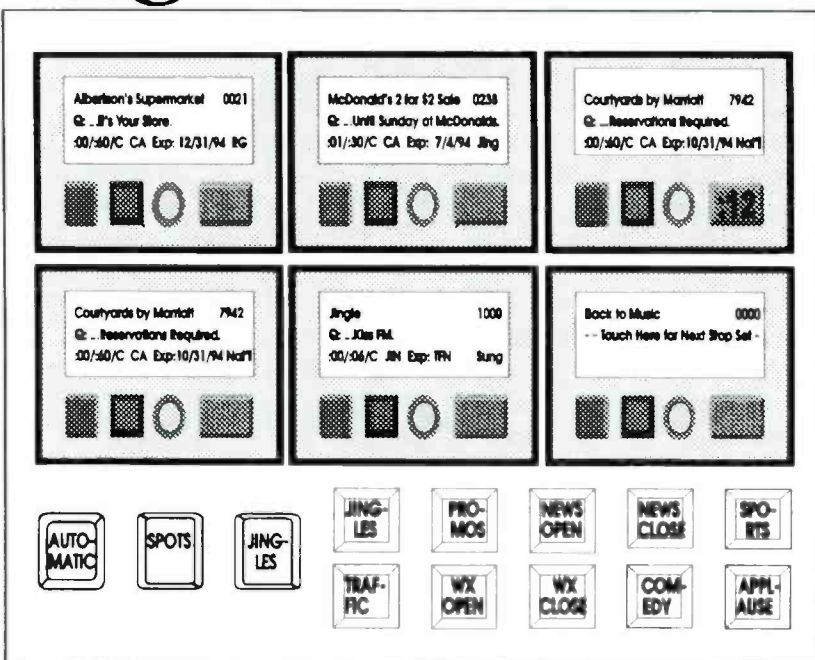


ITC DigiCenter

This premier manufacturer of analog cart machines introduced the DigiCenter with an emphasis on the unique features and integrity of its proprietary hardware. ITC manufactures its own DSP board which it says quadruples the capacity of competing hardware by virtue of its four-digital-signal processor

Continued on Page 16

# Digital Audio that Jocks Like



Scott Studios' CompuCart computer screen shows 6 "cart machines" playing spots and music from your traffic and music computers, plus 10 "always ready" decks for jingles, sounders, liners, PSAs, promos, sound effects, etc. We also offer a companion 8-track waveform editor for production.

At last...hard disk digital audio that's *easy* to use! It's CompuCarts, *new* from Scott Studios in Dallas. You get 16 "cart decks" that play at a touch. Six "decks" load spots and music automatically from your traffic and music computers. You can rearrange spots at a touch. End cues, intros, lengths and end dates show on the screen. Timers count down and flash an "end" light. Ten additional jingles, sounders, sweepers, promos, PSAs, effects or comedy bits of your choice are always ready! You also get databases so you can find and play any hard disk audio in a second. *PC Magazine* (January 11, 1994, page 125) rates our uncompressed sound card "the best for serious audio"! Call Dave Scott for details.

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# There's a Right Way



**"I did it right from the start with Computer Concepts' DCS."**

*I don't sweat* when it comes to our spot-heavy morning drive or complicated LMA formats. The reason is simple: First I did my homework. And then I bought a DCS hard disk system from Computer Concepts. In fact, I bought several.

I smile at the thought of multiple program formats and satellite automation, live and live assist. I laugh at complex spot rotations, two-channel crossfades with simultaneous recording and networking to traffic—they're no problem for the DCS.

And Computer Concepts customer support is terrific. Their software experts can even troubleshoot my DCS and upgrade the software remotely, via modem.

No wonder Computer Concepts DCS has turned hundreds of stations into happy customers. I'm glad I'm one of them. Oh, I almost forgot. The price was right, too.



**"I should have bought a DCS in the first place."**

*I thought* I'd impress HQ by buying the cheapest hard disk system I could find. After all, they all look the same! Their promises sounded good and I wanted to believe.

I found out promises come cheap. But their system wasn't really cheap—not once you added up the little "extras" it took to do the bare minimum. And it still couldn't do all the things our station really needed.

I found out the hard way, at 3 AM when the system we bought crashed. And in morning drive, when missing spots meant dollars down the drain. When I finally reached customer support, they said they were working on software they thought would fix my problem, but they weren't sure when it would be done. Guess what I told them?

Now I know better. We're getting a Computer Concepts DCS. I learned a costly lesson: Get it right the first time. Call Computer Concepts first.

## and a Wrong Way

**DCS by Computer Concepts**  
CORPORATION

Computer Concepts Corporation  
8375 Melrose Drive, Lenexa, KS 66214  
Phone: (913) 541-0900 Fax: (913) 541-0169

# COMPUTERIZED CONTROL ROOMS

## CONTROL ROOM REVOLUTION BUYERS' GUIDE

Continued from Page 14

it into a "cart deck" using a mouse, trackball, keyboard, or touchscreen. Similarly, carts can be started by touching the screen, clicking a mouse, or pressing a button on the audio console.

### Buying Tips

Despite the myriad of computer control systems that currently line the market, it's likely only a few will precisely fill your needs. And remember — your needs may change. **KWMT & KKEZ/Ft. Dodge, IA** President/GM **Jon Jenkins** said he bought his system to run a satellite format, but eventually switched both of his stations to live-assist once he discovered the capabilities of his computer system.

Continued on Page 20

## DigiCenter

Continued from Page 14

chip capacity (two are currently taken for one stereo signal, two are available for future expansion). The system also boasts its Digital Audio Bus, which feeds data directly from the DSP to the SCSI interface, bypassing DOS and its associated bottlenecks. ITC also sets itself apart by being the only major computer control systems distributor that offers no compression options for its hard drive.

DigiCenter is marketed as a multipurpose live-assist, satellite, or local automation system. The on-air, log-based screen displays eight completed, active, or pending events. Below the log are a row of cart-like controls, timers, and labels; and VU meters on the record unit. Users can pre-assemble program elements with its Quick Pick system, then point and shoot them into the on-air schedule.

Virtual and real recorders and reproducers can be assigned to the various networked workstations (i.e., on-air studio,

production, news, etc.) on an as-needed basis. ITC's Varitime production capability allows users to adjust time of a spot to fit the slot needed.

## Digital DJ/2 AXS

### The Management

*Basic Digital DJ/2 and AXS systems include audio card and software (complete systems including hardware also available).*

**T**his Ft. Worth-based company offers two systems; each is capable of automating a studio. However, Digital DJ/2 concentrates on full station automation, while AXS excels as a replacement for cart machines that, with the

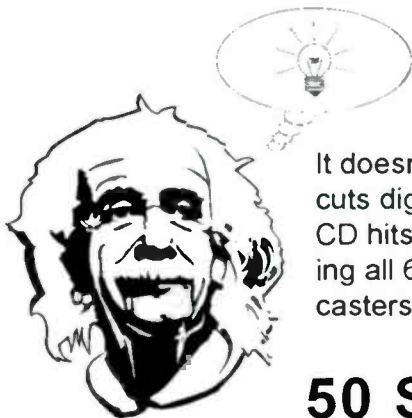
Continued on Page 20

# Did you know?

**CD Music Libraries: 1100 tracks \$2495.00**

**CD Top Hits USA: \$16.95/wk, \$49.95/mo**

**Format Services: from \$295.00 per month**



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- All the proven value and dependability of an ITC product.
- All the advantages of digital technology.

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See DigiCenter in action. We'll give you a hands-on demonstration of how DigiCenter will expand your horizons both operationally and economically. Find out how DigiCenter improves audio quality, personnel performance and station profitability. Call us and begin your future today.

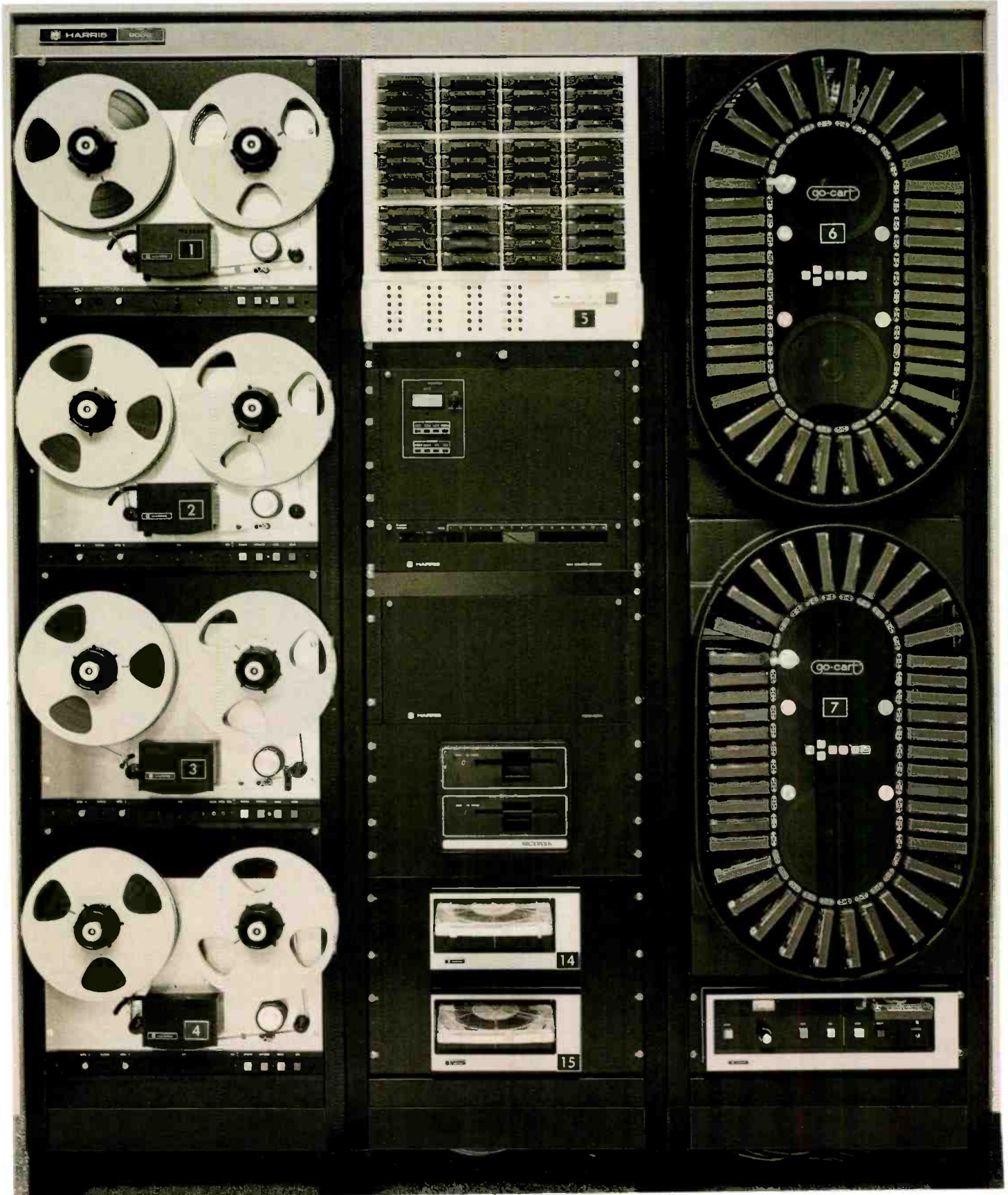


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DAD486x



DSE 7000

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ALLIED**

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# COMPUTERIZED CONTROL ROOMS

## CONTROL ROOM REVOLUTION BUYERS' GUIDE

Continued from Page 16

So how do you figure out which system to choose? Here are a few tips:

- ✓ **Take your key employees shopping with you.** Your traffic manager will have loads of questions for a computer salesperson. She may uncover potential time bombs you wouldn't have otherwise considered. The same goes for your PD, production director, and perhaps a member of your air-staff. But don't bring *too* many people along . . . everyone has an opinion, and you'll never reach a decision.
- ✓ **Investigate the price tag.** Some manufacturers will entice you with a great price . . . then only later tell you about the add-ons that allow a system to perform as advertised. On some systems you may have to pay extra for the ability to record in background, hook the system up to your traffic computer, or automatically switch input sources. Obviously, the bottom line price is what counts.
- ✓ **Compress . . . or not?** Audio compression is a prime topic of conversation among engineers these days and, given their

Continued on Page 22

## Digital DJ/2

Continued from Page 16

proper configuration, is also able to follow a program schedule.

Digital DJ/2 can run virtually any combination of satellite formats, live-assist, or CD automation. Although Digital DJ/2 could run as a stand-alone, the company markets a dual system package for less than \$10,000 (hardware included); the second unit facilitates production and, most importantly, provides complete data redundancy in case of a hardware problem. In fact, the Digital DJ/2 is designed to keep your station on the air and on schedule if such a situation should arise: The system automatically reboots and resets to the current log position so that little, if any, audio is missed.

Digital DJ/2's CD automation runs either a 300-disc jukebox or up to 32 six-disc changers, and The Management backs it up with its own music and traffic scheduling systems.

AXS is a hard disk-based cart replacement system that's designed more to aid jocks in live-assist situations than totally automate a station.

In the control room, it's able to execute a traffic log and — with the optional CD interface — a music log, with sequencing handled either automatically or with a jock's help. If changes need to be made, they can be executed quickly and easily. If a commercial requires a live tag, AXS displays the copy right on its screen and even gives the jock a chance to preview the text ahead of time.

In the production room, commercials can be recorded or dubbed into the system and spot maintenance parameters

can be set up. Add an optional package, and the AXS production system is capable of digital editing as well.

The AXS is also fully compatible with the Digital DJ/2, so the two can be run in tandem to meet the needs of a station that programs both live-assist and automated shifts.

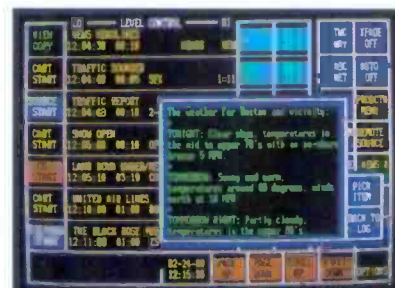
## OpLOG

### Pick 'N' Play MediaDISK

#### Media Touch Systems

*Systems include processor, DSP, touchscreen monitor, 1.2GB hard drive, keyboard, mouse.*

**M**edia Touch literature says its products are divided into two categories. OpLOG and Pick 'N' Play are studio control systems for automated or live assist on-air programming. MediaDISK is a fully networked



Media Touch Systems OpLOG

digital audio system for program storage on hard disk.

Continued on Page 22

Get the best music at the best price! Over 600 stations worldwide rely on Halland to deliver crystal clear digital sound at a price that can't be beat! Choose from Country, AC, CHR, Gold or Oldies. All in stock, all with a complete database on floppy disc FREE. Call Halland today!

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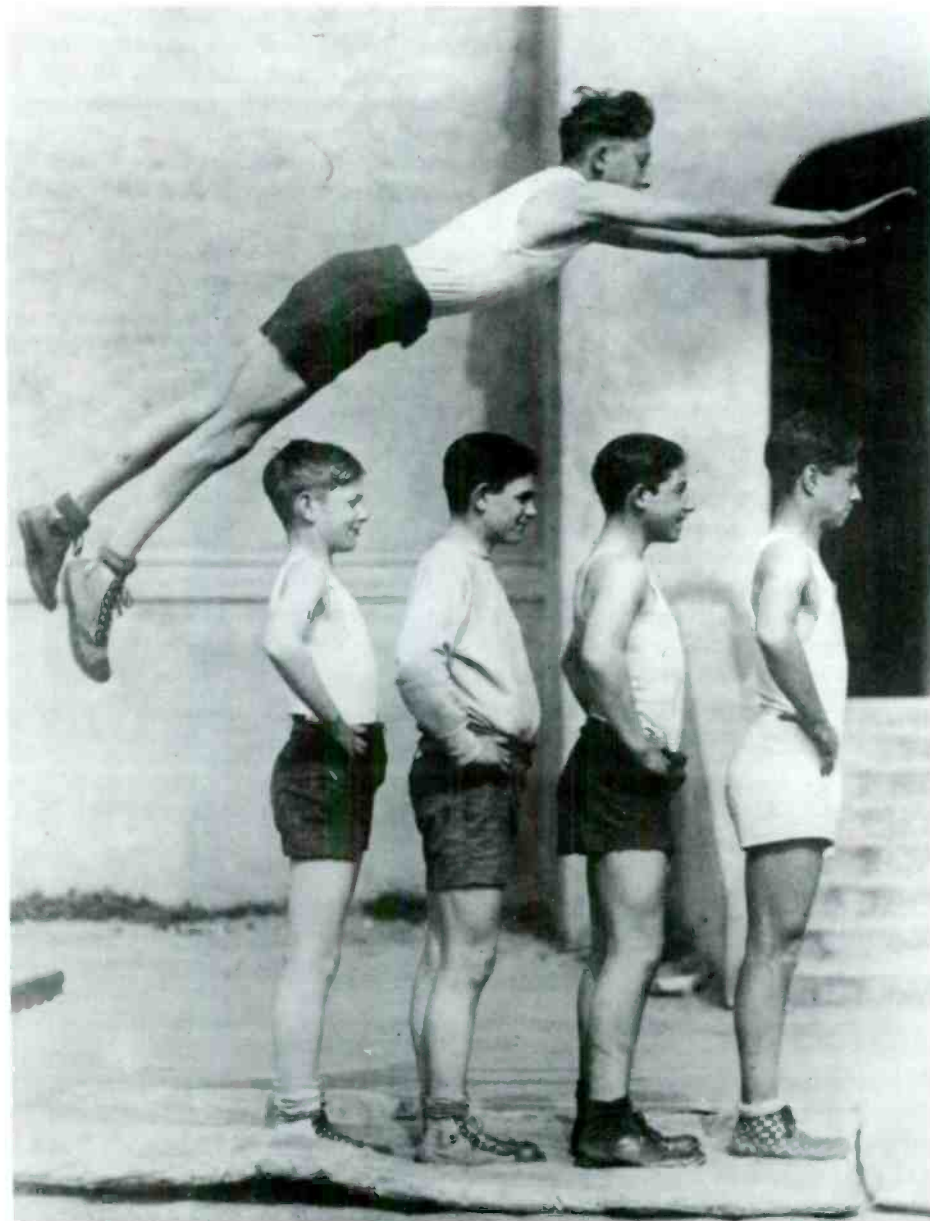
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**P**ut yourself above the rest with a satellite system from NSN Network Services. NSN's digital VSAT audio and data distribution systems have enabled broadcasters around the world to reach new heights in program and spot distribution, while keeping costs grounded.

If you want to program distant stations, centralize commercial production and billing, start your own programming network, or expand your existing operation, call us. NSN has established and supports over 60 digital satellite audio systems, with over 1,000 receive sites worldwide.

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Avon, Colorado USA

Fax 303 ♦ 949 ♦ 9620

## CONTROL ROOM REVOLUTION BUYERS' GUIDE

Continued from Page 20

druthers, most of them would probably forgo compression altogether. But these are the '90s, and a signal is often squeezed and expanded several times in the audio chain even without hard drive compression. But as **WTLN/Orlando Dir./Engineering Jim Hoge** says, "I was decidedly in the noncompression camp until I heard the **Dolby AC-2** board [which compresses at a 6:1 ratio]. It's very clean and hasn't given us any problems at all. I'm now a firm believer in compression." But others will argue that tumbling hard drive prices make compression an unnecessary evil.

✓ **Clear the traffic jam.** As we mentioned above, your traffic director will have plenty of questions . . . but here are a few points to consider yourself:

- You may need auto spot rotations within the same cart number. Some models rotate them in order at random.
- What happens when a spot is scheduled past its kill date? Will the computer alert you when it's logged into the system, or will it flash a warning when the commercial's about

Continued on Page 23

## OpLOG

Continued from Page 20



*Media Touch Systems Pick 'N' Play*

Media Touch says it also sets itself apart from other major supplier by using off-the-shelf operating components. Its only proprietary equipment is a DDI (Dumb Device Interface), which produces closure upon command for mechanical playback equipment or satellite control.

OpLOG is designed to be a fully integrated control system. It offers control via a touchscreen or the CAT, a "tactile feel mini-controller." It also handles automation. Pick 'N' Play is a cart replacement system that can be programmed manually or automatically. Both interface with MediaDISK.

## Music Management & Commercial Control System

Pristine Systems

*Includes two workstations (486 processors, monitors, audio cards, 1.2GB hard drives), LAN, CD controller, eight CD players (144-CD capacity).*

The Pristine Systems MMCS's strength lies in running local CD automation and live-assist applications. Through hardware upgrades, the system can control as many as 48 CD players, accommodating an on-air music library of up to 864 CDs.

Speaking of upgrades, system users praised Pristine's responsive customer service, which includes quarterly software updates. Pristine's **Boyce Williams** actively seeks his customers' input when designing new features. "You have to," he explained. "Otherwise you risk becoming out of touch."



*Pristine Systems Music Management & Commercial Control System*

The MMCS includes an internal music scheduling program and, although it doesn't have its own spot rotation system, it can interface with other commercial systems via LAN or floppy disk. The music scheduler can generate playlists for spans as short as an hour or as long as a month, and it can accommodate DAT machines as well as CD players.

Continued on Page 23



## THE MISSING LINK!

**FAST TRAC II** is the ideal mate for your digital edit system! Use it just like

a console to select your input source, ride gain, mix in a mic, and control your monitor system. All this in 1 3/4" of space!

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## CONTROL ROOM REVOLUTION BUYERS' GUIDE

Continued from Page 22

to play? Some automated systems may even schedule a substitute spot automatically.

- You may need your computer to fill fixed-length stopsets, a feature that would not be of concern with live-assist.

- ✓ **Getting support.** This may be the most important element in your buying decision. There's nothing better than a soothing voice at the other end of the line when something's wrong. There's nothing worse than not being able to reach any voice at all. Keep in mind that many manufacturers add a fee for various levels of service support.

### Reading The Charts

The comparison chart on the following pages is meant only to introduce you to the various systems you may encounter as you venture into the world of digital equipment. In many instances, each listed feature obscures several more issues and options that might be just as critical to your operation. The best way to find out whether something is capable of a particular function is to ask specific questions . . . and expect specific answers.

### Other Manufacturers

Here is a list of computer control room manufacturers that were not profiled in this guide. Their addresses and phone numbers can be found in the Directory, Pages 32-35.

- Broadcast Automation
- Radio Systems Inc.
- Rodman/Brown & Associates
- Schafer Digital
- Schafer World Communications
- Smarts Broadcast Systems
- Systemation

## MMCS

Continued from Page 22

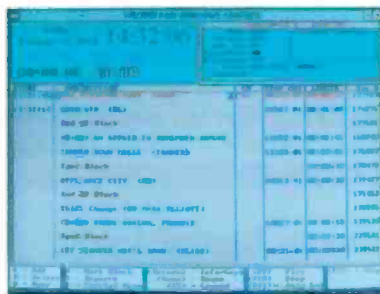
For production purposes, the system accommodates two different types of audio compression and also gives you the option of running uncompressed audio. Audio can be recorded into the MMCS and edited while it's "on the air," and log changes can be entered into the system at any time. The two workstations' hard drives offer complete redundancy of audio files, logs, and playlists, and the network has the capacity for a third terminal to facilitate log entries from somewhere other than the on-air or production studios.

## Wizard For Windows

Prophet Systems

*Includes two workstations (486 processors, monitors, modems, mirrored 1.3GB hard drives), file server, audio server, five DSPs, LAN.*

**P**rophet Systems President Kevin Lockhart described stability as the most important asset of his "Wizard For Windows" system, which is capable of running anything from satellite formats to complete local CD or hard drive automation.



Prophet Systems Wizard For Windows

In the basic system, two workstations — a control room station and a production room station — are hooked up via LAN to the file server, which executes log functions, and the audio server, which stores all of the commercials, liners, jingles, music, etc. Up to three events can overlap — for instance, you could crossfade between two songs while running a liner or sweeper over the music.

Any workstation can access the audio server for playback or record functions at any time, and all of the audio server's files are duplicated to the production workstation's hard disk. This redundancy lets the production workstation take the audio server's place in the event of a disk failure. As workstations are added — and Prophet has plans to eventually offer news-based and sport-based stations — each can be linked to the network and enjoy full access to the audio server as well.

All terminals also have access to the file server, so if a commercial needs to be changed, anyone — from the traffic manager to the GM to the jock in the studio — with access to a terminal can make the appropriate changes quickly and easily. And although Wizard will interface with other traffic and music scheduling systems, it also offers internal scheduling programs of its own.

The production workstation offers full eight-track on-screen waveform editing, while the digital reel-to-reel will automatically record network feeds. The file server generates more than 40 different reports, from general daily activity logs to specialized song and spot rotation reports.

## Master Control

Radio Computing Systems

*Includes processor, DSP card, three 14" screens, network connections, DSP card.*

**T**he industry's leading supplier of music programming software introduced Master Control as a way of tightly integrating a station's various departments into what it calls a "paperless, cartless, and CD-less air studio."

This is definitely live-assist gear that can also be used for voice tracking. Its capabilities rank clearly above satellite automation needs. It's also perhaps the most daunting array of equipment your jocks will encounter — multiple screens flash a log of upcoming jingles, commercials, and music; programming status such as a countdown timer; and live copy.

Continued on Page 24

## Master Control

Continued from Page 23

But Master Control also hooks up to something that's likely to make even the most old-fashioned DJ feel comfortable — a console! The faders and remote start buttons control programming elements just like conventional systems do. Master Con-



### RCS Master Control

rol also provides instant access to a menu of special effects or other sounds with a push of a button.

RCS's file server scheme allows multiple workstations — in and out of the studio — to instantly access audio events . . . even from remote locations.

Among Master Control's notable features is its voice tracking capability. Air personalities can record the live portions of their show while hearing program events as they would sound in real time. RCS says jocks can cut a five-hour shift in about 20 minutes.

## CompuCart Troll

### Scott Studios

Base system includes operating system (DELL 486), color SVGA Monitor, 2 DSPs, 1.2 GB hard drive, 50" peer-to-peer LAN connection to traffic computer, report generator, QIC tape backup, 17" touchscreen.

**D**ave Scott has been marketing radio station equipment for years and has built up an impressive base of customers. He says the systems from his Dallas-based company can handle satellite and automated formats quite comfortably, but admits they're really meant for live-assist operations.

At the low end -- CompuCart's software displays six cart machine-like representations on the screen. The operator can touch any of the six start buttons — which can be located on the console, a separate keypad, or on the touchscreen — and the event on that "cart machine" will air. Each loaded "machine" has a cart label with all the familiar info: Client, outcue, intro/length, end date, cart number, etc.

The screen also displays 10 "always ready" buttons, which can fire jingles, sweepers, or sounders at a touch. Jocks call up other cart numbers via a 10-key pad. It can also be programmed via a traffic computer.



### Scott Studios CompuCart, Troll

CompuCart's bigger brother, the Troll (short for CONTROLLER), is an all-encompassing production/on-air/jukebox system. In addition to the control room computer, a production room unit — which displays a cart record "machine" on the screen — Pioneer CD Jukebox, and remote control modem are included. Spots created in the production room are automatically sent to the hard drives in all the control rooms on the network. Scott also offers music preloaded onto hard drives.

## Ultimate Digital Studio

### TM Century

Includes processor, monitor, printer, proprietary card, three Sony or six Pioneer CD changers.

**P**erhaps most unique about TM's "UDS" is its specialized function. It doesn't play commercials, it has no satellite automation capability, and it doesn't even have a hard drive!

UDS does one thing which the folks at TM say it accomplishes very well . . . CD

automation. The system consists of a processor with monitor and printer, UDS controller card, auto segue mixer box, and Sony or Pioneer pro CD changers.

For stations wishing a hard drive for storing commercials, TM interfaces directly with the Computer Concepts DCS system. UDS works in live-assist or voice track mode, and it can schedule music, commercials, jingles, and other program elements manually or automatically.

UDS reads files from just about every major music and traffic program, and its No STICK CD monitoring can fix a skipping CD on the Sony decks within two seconds.



### TM Century Ultimate Digital Studio

TM is introducing an upgraded version, called UDS II. Among the enhancements: A new audio controller that performs automatic opens and closes of source feeds; improved realtime network join functions; enhanced support for new generation CD players; expanded remote control functions with a laptop computer; additional on-screen displays, such as a red countdown clock during the last 10 seconds of an event; and better LAN support, which, for one, can allow pop-up screens to be loaded with text from other parts of the network.

The company has a solid reputation for its components, which are built in-house, and for its customer support.





## Digital Song Libraries Available

These companies market digital music libraries that are compatible with many of the computer control room systems described in this section:

### **Broadcast Programming**

2211 Fifth Avenue  
Seattle, WA 98121  
(206) 728-2741  
(800) 426-9082

### **Format Productions**

P.O. Box 466  
Portland, OR 97207  
(503) 223-4MAT

### **Halland Broadcast Services**

1289 E. Alostia Avenue  
Glendora, CA 91740  
(818) 963-6300

### **Music Director Programming Service**

P.O. Box 51978  
Indian Orchard, MA 01151  
(413) 783-4626

### **PAMS Productions**

4631 Insurance Lane  
Dallas, TX 75205  
(800) 522-PAMS

### **Radio Programming and Management**

4198 Orchard Lake Road  
Orchard Lake, MI 48323  
(800) 521-2537

### **Scott Studios**

13375 Stemmons Freeway  
Suite 200  
Dallas, TX 75234  
(800) 831-9520

### **TM Century**

2002 Academy  
Dallas, TX 75234-9220  
(214) 247-8850  
(800) TM Century

## Understanding The Terms

**Y**ou're probably familiar with most of the terms listed on the comparison grid — here are descriptions of the more obscure ones.

- **Sampling rates** are listed in kilohertz. Sampling at 32kHz provides a 20Hz-15kHz frequency range, while 24kHz sampling produces a 20Hz-11kHz range. Most systems also sample at 44.1kHz — the same as CDs — and offer a 20Hz-20kHz range.
- **Auto resynch on system reboot** describes whether a system can find its place on the schedule should the system crash or be a victim of a power failure. Some systems maintain audio during the reboot process — assuming, of course, it's external audio.
- **Realtime updating** allows the computer to reset its time from an external source instead of the internal clock, which is not very accurate. The external source could be a network cue, SMPTE code, or other similar method.
- **Macro control** gives operators the opportunity to program a series of events and store them. Companies may call this by various names — they're known as "cue sets" on the ITC system.
- **Off-site control** tells whether the system can be operated from outside the studio, such as from a remote broadcast site or the PD's home, in order to rearrange events. Note that the complexity of off-site control varies greatly by system.
- **Compression** figures are listed as ratios; thus, "4" means 4:1.
- **Background record, audio overlap** can only be performed on most systems with extra audio cards (one card is needed for each audio "process"). Check with your supplier regarding the number of cards supplied with a base system.
- **Realtime network delay** allows a network feed to be recorded, then played back before the recording is finished. This eliminates the need for precise backtiming into a net join.
- **Number of workstations.** Almost all of the manufacturers warned us that extra workstations add streams of extra instructions to the system's CPU. Thus, while it is theoretically possible to network dozens of workstations, few manufacturers were willing to admit that their system would handle that many.
- **Other workstations** indicate the type of auxiliary workstations available to customers.
- **Traffic, music scheduling computers.** This lists whether a system has some compatibility with outboard traffic and music scheduling systems. Be sure to inquire whether the file transfers must be accomplished via floppy disk or by LAN connection (and if this is an extra cost option).
- **On-the-fly log editing.** Changes in the log occur constantly, and systems vary in their ability to make realtime changes to the schedule of events. Some systems allow changes except to the current hour. Others allow changes at just a specific time of the hour.



# Computer Control Room

	ARRAKIS SYSTEMS DIGILINK	BLU ELECTRONICS DIGI-STATION	BROADCAST ELECTRONICS AUDIO VAULT	BROADCAST ELECTRONICS DABOX	COMPUTER CONCEPTS DCS	ENCO SYSTEMS DADABOX	FIBROPAC AIR MARSHAL	HARRIS ALLIED AUDIO/RSK DS100	HARRIS ALLIED AUDIO/RSK DS2000
<b>MAIN SYSTEM</b>									
SYSTEM CPU	386-33	486	486 (7)	286 (10)	486SX	486-50 (10)	486-25	386 (10)	386 (10)
HARDWARE SOURCE	PROPRIETARY	USER/SUPPLIER	PROPRIETARY	USER	SUPPLIER	USER/SUPPLIER	PROPRIETARY	PROPRIETARY	PROPRIETARY
SAMPLING RATES (kHz)	32	32/48/50	22/32 44/48	—	16/32 44/48	32/44/48	22/32 44/48	22/32/44	22/32/44
AUTO RESYNCH ON REBOOT	YES	YES	YES	YES	YES	YES	YES	YES	YES
REAL TIME UPDATING (1)	YES	YES	YES	YES	YES	YES	YES	YES	YES
MACRO CONTROL	YES	NO	YES	YES	YES	YES	NO	YES	YES
PASSWORD PROTECTION	YES	NO	NO	NO	YES	YES	YES	YES	YES
OFF-SITE CONTROL	OPTIONAL	NO	YES	YES	YES	YES	YES	YES	YES
<b>HARD DRIVE/DSP</b>									
BASE HD SIZE	1GB	345MB	2GB	1GB	766MB	-	1GB	980MB	980MB
DSP MANUFACTURER	TI	ANTEX	MPEG LII	PROPRIETARY	MOTOROLA	TI	APT-X	APT-100	APT-100
COMPRESSION TYPE	PROPRIETARY	DOLBY AC-2 CDIC/MUSICAM	PROPRIETARY	DOLBY AC-2	APT-X	DOLBY AC-2 MUSICAM	APT-X	APT-X	APT-X
COMPRESSION RATIOS	1/2/4	4/6/VARIABLE	1-16	16	1/4	1/4/6/12	4	4	4
<b>CONNECTIONS/CONTROLS</b>									
INPUT SWITCHER	YES	YES	YES	YES	YES	YES	YES	YES	YES
CD CHANGER CONTROL	OPTIONAL	NO	NO	YES	YES	YES	NO (12)	NO (12)	NO (12)
ANALOG INPUTS/OUTPUTS	5/12	2/2	2/2	2/2	2/4	1/3	1/1	2/2	2/4
DIGITAL INPUTS/OUTPUTS	(5)	OPTIONAL	1/1 (5)	-	(5)	1/3	1/1	OPTIONAL	OPTIONAL
TOUCHSCREEN	OPTIONAL	NO	YES	NO	OPTIONAL	OPTIONAL	OPTIONAL	NO	NO
KEYBOARD	YES	YES	YES	YES	YES	YES	YES	YES	YES
MOUSE/TRACKBALL	YES	YES	YES	YES	YES	OPTIONAL	YES	NO	NO
BACKGROUND RECORD (2)	YES	YES	YES	YES	YES	YES	YES	YES	YES
REALTIME NETWORK DELAY (2)	YES	NO	YES	YES	YES	YES	YES	YES	YES
AUDIO OVERLAP (2)	YES	YES	YES	YES	YES	YES	YES	OPTIONAL	YES
WAVEFORM EDITING	OPTIONAL	NO	YES	NO	NO	YES	YES	NO	NO
<b>INTERFACES</b>									
NUMBER OF WORKSTATIONS	15	1	(8)	(8)	(8)	(8)	5	32	32
OTHER AVAIL. WORKSTATIONS	P	-	P	-	P	-	P (13)	P	P
TRAFFIC COMPUTER	YES	YES	YES	YES	YES	YES	YES	YES	YES
MUSIC SCHEO. COMPUTER	YES	NO	YES	YES	YES	YES	YES	YES	YES
<b>TRAFFIC</b>									
AUTO ROTATIONS	YES	NO	YES	YES	YES	YES	YES	YES	YES
KILLDATE MANAGEMENT	YES	YES	YES (3)	YES (3)	YES	YES	YES	YES	YES
AUTO SPOT SUBSTITUTION	NO (3)	YES	NO (3)	NO (3)	YES	NO (3)	YES	YES	YES
AUTOFILL ON REQUIRED BREAKS	YES	YES	YES	YES	YES	NO	YES	YES	YES
JOCK SCHEDULE MANAGEMENT	YES	YES	YES	NO	YES	YES	YES	YES	YES
ON-THE-FLY LOG EDITING	YES (4)	NO	YES	YES	YES	YES	YES	YES	YES
<b>PRICING</b>									
BASE SYSTEM	\$7995	\$8500	\$10,000	\$6500	\$9250	\$2995 (14)	\$8950	\$7995	\$15,995
EXTRA AUDIO CARD	-	795	5495	750	-	995+	2225	-	-
EXTRA HARD DRIVE (PER GB)	2500	495(345MB)	2495 (6)	1695	(11)	(11)	1270	1000	1000

**CODES TO EXTRA WORKSTATIONS:**

P - Production  
N - News

- (1) Via external time source
- (2) May require additional DSP card
- (3) Will flag operator
- (4) Except current hour

- (5) AES-EBU Option
- (6) 2GB
- (7) Uses Microsoft Windows
- (8) Limited by system capacity

# Systems Comparison

ITC DIGICENTER	THE MANAGEMENT DIGITAL DJ2	THE MANAGEMENT AXS	MEDIA TOUCH SYSTEMS OpLOG	MEDIA TOUCH SYSTEMS PICK 'N' PLAY	PRISTINE SYSTEMS MUSIC MGT. & COMMERCIAL CONTROL SYSTEM	PRISTINE SYSTEMS WIZARD FOR WINDOWS	RCS MASTER CONTROL	SCOTT STUDIOS COMPLICART	SCOTT STUDIOS TROLL	TM CENTURY ULTIMATE DIGITAL STUDIO
386SX-25	486SX-25	486SX-33	386SX-25	386SX-25	486DX-33	486-33(7)	486DX-33	DELL 486	DELL 486	386SX
PROPRIETARY	USER/SUPPLIER	USER/SUPPLIER	USER/SUPPLIER	USER/SUPPLIER	SUPPLIER	USER/SUPPLIER	SUPPLIER	SUPPLIER	SUPPLIER	SUPPLIER
8/16/32 44/48	8-48 VARIABLE	8-48 VARIABLE	24/32 44/48	32 44/48	16/32 44/48	32/44/48	32/44/48	8-48	8-48	-
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
NO	NO	NO	NO	YES	YES	YES	YES	YES	YES	NO
YES	YES	YES	YES	YES	OPTIONAL	YES	YES	YES	YES	NO
2GB	340MB	340MB	1GB	1GB	1.2GB	1.3GB	1GB	1GB	1GB	-
PROPRIETARY (9)			PROMEOIA	ANTEX DIGIGRAM	ANTEX	ANTEX	MOTOROLA	APT-X	APT-X TURTLE BEACH(9)	-
-	APT-X	APT-X	DOLBY AC-2 ADPCM	DOLBY AC-2 MPEG	DOLBY AC-2	DOLBY AC-2	MUSICAM MPEG LII	APT-X	APT-X	-
NONE	4	4	4/6/8	4/6/8	1/4/6	6	1/2/4/6 8/12	4	4	-
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	OPTIONAL	OPTIONAL	YES	YES	YES	YES	YES	YES	YES	YES
3/6	32/32	32/32	1/3	3/3	48/2	2/8	1/3	1/1	1/1	3/3
1/1(5)	32/32	32/32	1/1	1/1	OPTIONAL	NONE	1/3	1/1	1/1	3/3
OPTIONAL	OPTIONAL	OPTIONAL	YES	YES	NO	NO	NO	YES (16)	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	-
YES	OPTIONAL	YES	YES	YES	NO	NO	YES	YES	YES	-
YES	OPTIONAL	OPTIONAL	YES	YES	YES	YES	YES	YES	YES	-
NO	OPTIONAL	YES	YES	YES	YES	YES	YES	YES	YES	-
3	UNLIMITED	UNLIMITED	(8)	(8)	2-3	3-20	(8)	(8)	(8)	1
PN	P	P	PN	PN	P	P	P	P	P	-
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES
YES	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES
NO (3)	YES	YES	YES	YES	YES	YES	YES	NO (3)	NO (3)	YES
YES	YES	YES	YES	YES	NO	YES	YES	YES (15)	YES (15)	NO
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
\$16,995	\$3500	\$4500	\$15,995	\$15,995	\$18,995	\$25,000	\$16,995	\$10,000	\$23,000	\$10,495 (17)
6995	-	\$1000	895	895	400-2500	750-1750	2900	1500	1500	-
3500 (6)	(11)	(11)	1295	1295	1000	1000	1260	(11)	(11)	-

(9) Runs uncompressed  
 (10) Minimum requirement  
 (11) Market pricing  
 (12) Pending feature

(13) Redundant to studio system  
 (14) Software only  
 (15) Has "Stretch & Squeeze" option  
 (16) Uses lightpen-on-screen

(17) For Pioneer system; \$15,495 for Sony system.  
 Add \$11,500 DCS hard disk storage.



## Specialized Digital Technology Takes On Radio's Specific Tasks

**W**hile the primary focus of this year's Digital Guide is to give you insight into existing computer control systems, these products don't represent the only advances in digital technology.

On the next few pages, you'll see a number of new products — most already available, some still on the horizon — that may not perform all of the functions featured on computer control systems but instead focus on particular areas, like newsroom operations or specialized production concerns.



CBSI Digital Universe

## Custom Business Systems Inc.'s Digital Universe

**T**his well-known manufacturer of computerized traffic systems is rolling out its first control room product — called Digital Universe — this year.

Actually, CBSI says its system is far more sophisticated than simply a live-assist or satellite automation device. Operated from a "super server," the Digital Universe will theoretically seamlessly connect workstations in all departments of a radio station. Even the traffic director will have an audition channel with which spots can be checked before they hit the air.

The company says its product will be superior to its competitors by virtue of its ability to keep audio files in digital mode — without analog conversions — until it's ready to feed the audio chain. It says its proprietary Digital Universe Bus can traffic more than 50 digital audio channels at the same time in real time at high sampling rates.

CBSI's unit uses Windows NT, Microsoft's sophisticated 32-bit operating system.

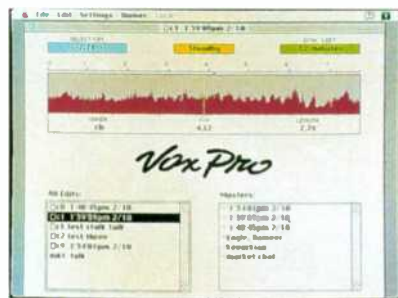


## Audion Replaces Reel-To-Reel Decks With New Digital System

**A**t this month's NAB Convention, Audion Laboratories is introducing the "VoxPro," a noncompressed digital audio recorder with editing capabilities designed to replace your control room's reel-to-reel machines.

The Macintosh-based system features one-touch recording and waveform editing. The on-screen audio can be deleted, moved, or copied to another part of the recording or another file altogether. And since the VoxPro utilizes non-destructive enabling technology, a "bad edit" can be rectified simply by using the "undo" function.

The VoxPro has the standard tape deck controls, but also has reverse play and half-speed play "buttons." Additional features include a "bleep" function to alter offensive language, "highlight play" to instantly review a selected part of a recording, a "play from beginning" command that eliminates the need to rewind, and "record insert," which lets



Audion Laboratories VoxPro

you record additional audio at any point within the original recording.

VoxPro files can be assigned to any of 10 instant-access keys and, through the use of passwords, each user can choose a set of files to be stored on those keys.

A basic VoxPro system with 16 minutes of recording storage time (at a 44.1 kHz sampling rate) lists for \$6495; optional hard drive upgrades costing up to \$1100 can increase recording capacity to as many as four hours. Audion, based in Bainbridge Island, WA, can be reached at (602) 842-5202.

# Digital Bits



■ An update on digital advances in radio and broadcasting

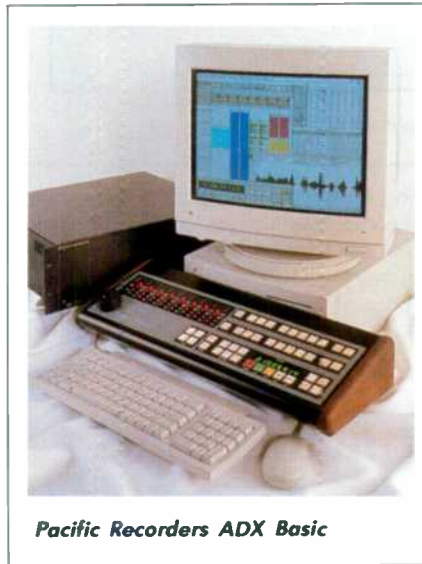
## Pacific Recorders Budget Workstation

**P**acific Recorders & Engineering of Carlsbad, CA has added a budget-priced model to its ADX line of hard-drive systems: the "ADX Basic."

The ADX Basic is a slimmed-down, desktop version of the company's "ADX Workstation." It has an eight-channel digital signal processing unit, a tape recorder-style control panel, and editing capabilities. The unit's internal 1.2-gigabyte hard disk stores three track-hours of audio; additional storage time can be obtained by adding more hard drives.

The ADX Workstation, a self-contained roll-around unit, has all of the Basic's functions plus extra features like a 2.4-gigabyte internal hard drive (for six track-hours of storage) and an optical disk drive that allows users to save and download mixes and production elements.

The Macintosh-based systems are compatible with each other and can be used with any radio console that has eight line inputs; the Workstation can be used in combination with PR&E's third ADX product, the "MixStation" eight-track automated mixdown module.



*Pacific Recorders ADX Basic*

The ADX Basic carries a suggested list price of \$23,995, the ADX Workstation costs \$33,995, and MixStation consoles start at \$18,950. Additional 2.4-gigabyte hard drives — each containing an extra six track-hours of storage — are available for \$2795.

## Digital Receivers Go Desktop

**C**omStream is upgrading its line of satellite digital audio receivers, introducing desktop models of the "ABR75" and "ABR200" models, as well as a new "Remote Performance Monitoring" system, at the NAB Convention.

RPM, a PC-based software system that enables users to communicate with ComStream satellite receivers via standard telephone modems, can monitor performance parameters and keep a history of the receiver's status.

The new desktop receivers provide greater convenience than previous models that required rack mounting; the receivers' performance can be measured on front-mounted display panels.

The desktop ABR75 starts at \$1400; the ABR200 carries a suggested list price of \$1995. The RPM software sells for \$9900.

## Akai's Audio Files For Audiophiles

**A**kai's "CD3000 CD Sampler" is able to process sound files from CD-ROM discs and raw audio from standard CDs — all without any signal degradation.

Because it has a built-in CD drive, the CD3000 bypasses the array of digital/analog and analog/digital converters audio signals usually encounter as they're sampled, so you're left with first-generation digital data.

Once you've loaded the samples you want, you can alter them with the CD3000's

stereo digital effects, time compression/expansion, and dynamic resonant filters, then save the finished product to floppy disk or hard drive.

The CD3000 has an 8 MB memory (expandable to 16 MB), 10 outputs, and a

Continued on Page 30



*Akai DR4d Hard Disk Recorder*



*Akai CD3000 CD Sampler*

# Comrex Codec Moments

In order to accommodate today's digital telephone services, Acton, MA-based Comrex offers three different series of codecs to meet all types of stations' needs.

Looking for a low-cost way to send voice feeds for news, talk, or sports programming? The "DXP" and "DXR" systems use G.722 coding to send 7.5 kHz full-duplex audio over a single 56/64 kB/s circuit. The DXP lists for \$2395, the DXR for \$1995.

The "DX-100" doubles the available bandwidth, giving you the capability to send 15-kHz stereo audio. This system, which utilizes apt-X coding, is ideal for "backbone" transmissions such as STL or high-end production. The DX-100 carries a suggested list price of \$3000.

Comrex's top-of-the-line system, the "DX-200" series, uses ISO/MPEG Layer II



Comrex DX-200 Series

coding, a perceptual algorithm, to achieve high compression ratios at near-CD quality. They can transmit 15 kHz stereo programming over Switched 56 or ISDN circuits. The list price for the DX-200 is \$3500.

# Akai's Audio Files For Audiophiles

Continued from Page 29

variety of special disk functions that make locating samples easier.

The unit comes with five CD-ROM production libraries, providing you with plenty of effects and a wide variety of instrumental and percussion sounds. The CD3000's suggested retail price is \$3995.

Akai also markets a completely self-contained hard disk recorder, the "DR4d," which uses controls similar to those found on cassette recorders and doesn't require the use of a personal computer.

The four-track unit can be run in parallel with three other DR4d machines, creating the potential for 16-track recording (with all tracks accessible via a single remote control). The recorder can store 32 track-minutes on an optional 200 MB internal hard drive, and it can accommodate up to seven additional hard drives.

Other optional features include visual waveform editing capability, MIDI interface, an SMPTE timecode card, and an interface allowing as many as four channels of digital input/output. The DR4d carries a base price of \$1995.

# AIR Debuts Digital Carts



AIR corp Systems AIR cart.mo

AIR corp Systems is introducing a digital cart machine that utilizes no compression, samples at a rate higher than that of CD players, and requires no operator training.

The "AIR cart.mo" uses individual 3.5" magneto-optical discs, each of which can store over 10 minutes of noncompressed audio at the system's 48 kHz sampling rate. The AIR cart.mo lets you preview the intro or outro of each cut you select and requires no keyboards, touchscreens, or hard drives to operate.

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# Putting The New In Newsrooms

■ Hi-tech gear combines audio and copy into instant-access digital form

## Bloomberg Links Radio With Wall Street

**B**loomberg News Radio, a division of New York-based **Bloomberg Business News**, is a radio news service completely driven by digital technology.

Bloomberg flagship station **WBBR/New York** is programmed from a number of fully digital workstations at the company's Park Avenue headquarters. Bloomberg News Radio Services — data, text, and audio — are distributed worldwide via a fully digital two-way communications network accessed through the company's proprietary terminals. Radio affiliates locate the reports they wish to air, then print a hard copy of the story for their own anchor to read — or



*Bloomberg News Radio control terminal*

record Bloomberg's version via an audio port on the terminal keyboard.

Bloomberg News Radio uses no "feed times"; it operates as "news on demand." Once a story is recorded and stored in digital form for airing on WBBR, it can be called up by any affiliate. Affiliates also gain access to audio from the "Bloomberg Forum" program, featuring interviews with company CEOs, financial professionals, and newsmakers.

The service is offered on a market-exclusive barter basis. Bloomberg terminals are currently operational at affiliates in Washington and Albany, NY; more are scheduled for installation at stations in Portland, Spokane, Phoenix, and Wichita, among others. Information is available from Fran Sharp or Michelle Stawicki at (800) 448-5678.

## Newsroom Basics From Basys

**T**he "D-Cart" newsroom system from **Basys Automation Systems** can perform virtually any newsroom function digitally, from recording, editing, and playing back audio to scheduling spots, handling news feeds, and taking stories from field reporters.

Recording starts with the touch of a button and can be audio-activated. Reporters working on stories outside the studio need only dial into the system via phone to file reports; the system's DTMF interface allows them to perform the necessary control functions using the telephone keypad.

D-Cart allows almost any number of authorized users simultaneous access to any material stored on the system — in fact, between 40-50 users can work with a single mono file at any given time. Loading a specific file is facilitated by a search and sort function. The system's waveform editing process is nondestructive, with unlimited undo and redo capability. Finished products can then be scheduled to run — in order — along with commercials and other audio elements.

D-Cart's playlist function can be used to manage anything from a single stopset to



*Basys D-Cart controller*

entire days of programming in either live assist or automation mode. The program log can be modified while the system is functioning, and it can generate printed logs of when audio files were played.

D-Cart can be used in conjunction with the "Basys Newsroom" text writing system to integrate soundbites and copy into a single package. The D-Cart system was developed in Australia and has been in use at **Australian Broadcasting Corp.** facilities since 1989. Domestically, **ABC Radio Networks** uses it at their New York news operation. To find out more about the system, contact Basys' Yonkers, NY American headquarters at (914) 376-4800.

## ITC: Wired For Sound And Text

**I**nternational Tapetronics Corp.'s integrated digital newsroom system, "DigiCenter News," lets you capture — and edit — text and audio from newswire feeds.

DigiCenter News operates on 486DX-33 PCs equipped with Windows and a 16-bit sound board. With its standard 300 MB hard disk, it can store approximately three hours of audio sampled at 15 kHz (audio can also be sampled at 32 kHz for greater fidelity) as well as 700 text files. Controller relays allow the system to record feeds automatically.

Waveform editing lets users easily cut, append, insert, and extract portions of recorded audio for newscasts. Soundbites can be assigned to a corresponding text file, so a news anchor can read a story on-air and have the correct audio available — automatically — at the touch of a button.

DigiCenter News systems start at \$8950. For more information, contact ITC's Bloomington, IL headquarters at (309) 828-1381.



# Directory Of Digital Suppliers

## A

### **Aircorp**

3727 Northridge Drive  
Irving, TX 75038  
(214) 255-0550  
FAX: (214) 252-0020  
*Jim Loupas, President*  
P

### **AKG Accoustics**

1525 Alvarado Street  
San Leandro, CA 94577  
(510) 351-3500  
FAX: (510) 351-0500  
*S. Richard Ravich, President*  
DW

### **Applied Research & Technology, Inc. (A.R.T.)**

215 Tremont  
Rochester, NY 14608  
(716) 436-2720  
FAX: (716) 436-3942  
*Phil Betette, President*  
DW P



### **Arrakis Systems, Inc.**

2619 Midpoint Drive  
Fort Collins, CO 80525  
(303) 224-2248  
FAX: (303) 493-1076  
*Mike Palmer, President*  
C

### **Audio Broadcast Group**

2342 S. Division  
Grand Rapids, MI 49507  
(800) 999-9281  
FAX: (616) 452-1652  
*Dave Howland, VP/Sales & Marketing*  
D

### **Auditronics, Inc.**

P.O. Box 18838  
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(901) 362-1350  
FAX: (901) 365-8629  
*Steve Sage, President*  
CD D DW

# RR DIGITAL GUIDE

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Atlanta, GA 30318  
(404) 351-9816, ext. 103  
FAX: (404) 355-0430  
*Duane Berge*  
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### **BLU Electronics**

1001 Ridge Avenue  
Clearwater, FL 34615  
(813) 442-1665  
*Ben L. Umberger, President*  
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### **Bradley Broadcast Sales**

8101 Cessna Avenue  
Gaithersburg, MD 20879  
(800) 732-7665, (301) 948-0650  
FAX: (301) 330-7198  
*Art Reed, GM*  
D

### **Broadcast Automation, Inc.**

3006 Edgewood  
Suite 13  
Garland, TX 75042  
(214) 487-5810, (800) 336-8004  
FAX: (214) 487-5810  
*Earl R. Bullock, President*  
A C

### **Broadcast Electronics**

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FAX: (217) 224-9607  
*Bill Harland, Director/Domestic Sales*  
A C P

### **Broadcast Services/EME**

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FAX: (919) 934-1537  
*Neal Davis, President*  
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### **Broadcast Supply Worldwide**

7012 27th Street West  
Tacoma, WA 98466  
(800) 426-8434, (206) 565-2301  
FAX: (800) 231-7055  
*Pat Medved, VP/Sales*  
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### **Broadcasters General Store**

2480 S.E. 52nd Street  
Ocala, FL 34480  
(904) 622-7700  
FAX: (904) 629-7000  
*David Kerstin, President*  
D

## C

### **California Digital Audio Systems, Inc.**

P.O. Box 120  
Moorpark, CA 93020-0120  
(805) 523-2310  
FAX: (805) 523-0480  
*Caryn Beemer, OM*  
*Dick Becvar, VP/Midwest* (612) 631-5064  
SU

### **Circuit Research Labs**

2522 W. Geneva Drive  
Tempe, AZ 85282  
(602) 438-0888, (800) 535-7648  
FAX: (602) 438-8227  
*Ron Jones, President*  
P

### **Comrex Corporation**

65 Nonset Path  
Acton, MA 01720  
(508) 263-1800  
FAX: (508) 635-0401  
*Lynn Distler, Sales Manager*

### **ComStream Corporation**

10180 Barnes Canyon Road  
San Diego, CA 92121  
(619) 458-1800  
FAX: (619) 552-0488  
*Gary Howell, Product Mktg. Mgr./Digital Audio Products*  
SU



# DIRECTORY

## C

**Concept Productions**  
120 Main Street  
Roseville, CA 95678  
(916) 782-7754, (800) 783-3454  
FAX: (916) 786-8304  
**Dick Wagner, President**  
C

## D

**dbx Professional**  
1525 Alvarado Street  
San Leandro, CA 94577  
(510) 351-3500  
FAX: (510) 351-0500  
**S. Richard Ravich, President**  
P

**Denon America, Inc.**  
222 New Road  
Parsippany, NJ 07054  
(201) 575-7810  
FAX: (201) 808-1608  
**Harry Klane, Sales Manager**  
CD

**DIC Digital Supply Corporation**  
222 Bridge Plaza South  
Fort Lee, NJ 07024  
(201) 224-9344, (800) 328-1342  
FAX: (201) 224-9363  
**Kevin Kennedy, VP/Marketing**  
D

**Digital Universe**  
P.O. Box 67  
Reedsport, OR 97467  
(503) 271-3681, (800) 547-3930  
FAX: (503) 271-5721  
**Steve Kenagy, VP/Sales & Marketing**  
C DW

## E

### ENCO Systems, Inc.

**ENCO Systems Inc.**  
1866 Craigshire Drive  
St. Louis, MO 63146-4006  
(800) 362-6797, (314) 453-0060  
FAX: (314) 453-0061  
**Larry Lamoray, VP/Sales  
& Marketing**  
A DW

## F

**Fidelipac Corp.**  
P.O. Box 808  
Moorestown, NJ 08057  
(609) 235-3900  
FAX: (609) 235-7779  
**Scott Martin, VP/Sales**  
A CD C CR DW S

## H



**Halland Broadcast Services, Inc.**  
1289 E. Alosta Avenue  
Glendora, CA 91740  
(818) 963-6300, (800)  
HALLAND  
FAX: (818) 963-2070  
**Hank Landsberg, President**  
**Steve Steinberg, VPIGM**  
SL



**Harris Allied  
Broadcast Center**  
3712 National Road West  
Richmond, IN 47374  
(800) 622-0022, (317) 962-8596  
FAX: (317) 966-0623  
**Scott Beeler, Sales Manager**

**Harris Allied —  
Southern California**  
6430 Sunset Boulevard  
Suite 1150  
Hollywood, CA 90028  
(800) 690-2828, (213) 462-6622  
FAX: (213) 462-8468  
**Steve Keating, So. CA Sales**  
D

**Henry Engineering**  
503 Key Vista Drive  
Sierra Madre, CA 91024  
(818) 355-3656  
FAX: (818) 355-0077  
**Hank Landsberg, Owner**  
DW

## I

**IDB Communications Group, Inc.**  
10525 W. Washington Boulevard  
Culver City, CA 90232  
(310) 870-9000  
FAX: (310) 240-3904  
**Julie Spira, VPIAudio Sales**  
SU



**International Tapetronics  
Corp. (ITC)**  
2425 S. Main Street  
Bloomington, IL 61704  
(800) 447-0414, (309) 828-1381  
FAX: (309) 828-1386  
**Willem Bakker, President**  
A C CD DW

## M

**The Management**  
Box 1-36457  
Ft. Worth, TX 76136  
(817) 625-9761, (800) 334-7823  
FAX: (817) 624-9741  
**Pete Charlton, President**  
A C CD

### DIGITAL SUPPLIER KEY

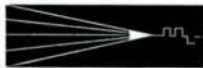
- A Automation Systems
- C Computer Systems
- CD CD Players/Recorders
- CO Consoles
- CR Cart Decks
- D Distributors
- DT Digital Tape Decks
- DW Digital Workstations
- P Processing
- S Studio Equipment
- SL Song Libraries
- SU Satellite Uplinks
- T Transmission Equipment

# DIRECTORY

## M

**Media Touch Systems, Inc.**  
50 Northwestern Drive  
Unit 11  
Salem, NH 03079  
(603) 893-5104  
FAX: (603) 893-6390  
**John M. Connell, President**  
A C CD DW

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**Bill Sepmeier,**  
VP/Engineering  
**Kelly Hethcote,**  
Sales Manager  
SU

## O

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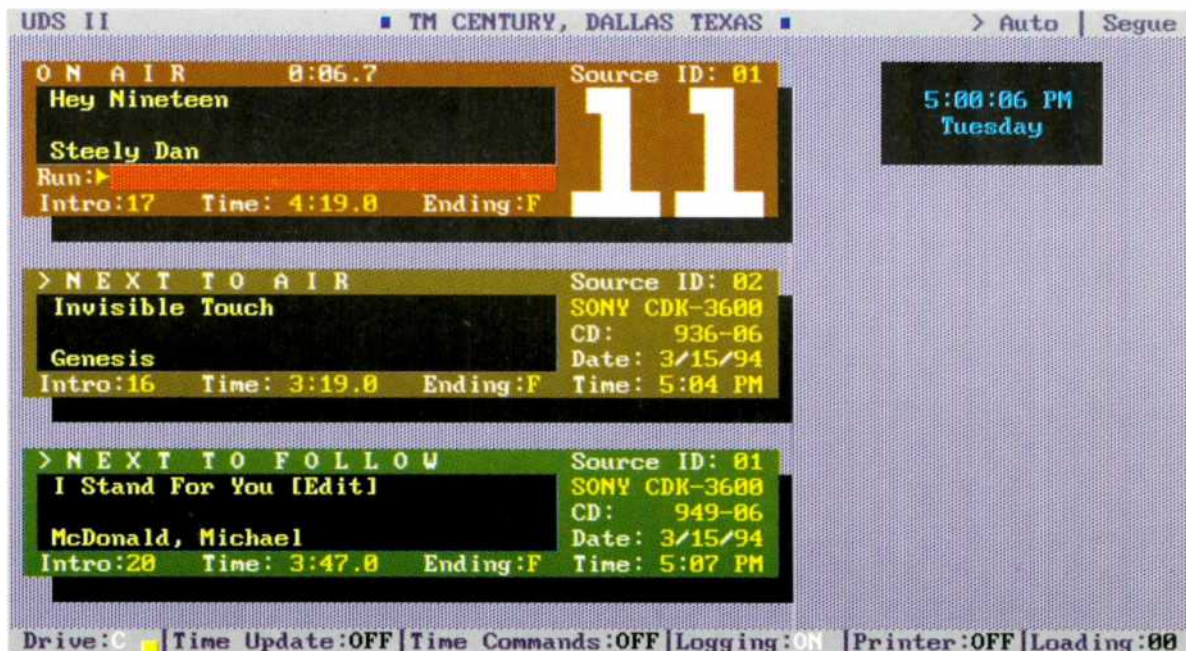
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